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WHITE PAPER
Dear Reader,

Thank you for taking the time to read this white paper. If I may, I want to take this opportunity to tell you a little about my background.


I went on to found a Commercial Real Estate advisory firm in New York in 2001, which turned out to be very successful and profitable. Over the years, slowly disillusioned with the boring and staid world of Commercial Real Estate, I was moving away from that line of work when the Financial crisis of 2008 happened, and like a cherry on the cake, I was now forced to look at other opportunities.
So i took all my savings, which at that time were substantial, and decided to teach myself technology.

After spending time on CentOS forums, learning the difference between a computer and a server, I built my first server in 3 days, the second one in 45 minutes and 4 years after that, I built 40 machines in a week and clocked them at over 20 TFlops on a ROCKS cluster with 10 Gbps networking.

In April 2009, I left New York to open an office in Bangalore, which i setup myself down to patching LAN cables and networking, because I wanted to learn each and everything about computers.

Probably setting up the Asterisk system for the office with 300 lines was a major help in getting my base technology foundation setup.

I taught myself everything in technology that i know now and ended up building the most advanced shopping search engine, which is the core piece of technology powering our marketplaces today.
Every single screen you see on our apps was hand sketched by me before design. Every piece of backend architecture in these marketplaces is mine.

And yes, I have financed this company and its R&D efforts, the supercomputer, the shopping search engine development and launch, all from my own pocket. For the last 10 years.

I am anything if not tenacious. I respect the value of money. I know what it takes to make a single dollar.

If i don’t know it, I learn it. If i cannot do it myself, I hire and respect the person who can do it for me.

I hope you will give me the opportunity and consider me worthy of your trust that I can execute on my vision of building the most advanced ecosystem of marketplaces in the world, and make them wildly successful.
I will not let you down. I will work twice as hard as I have over the last 22 years. Because this time it will be your money. Your trust.

Sukhbir Benipal
EXECUTIVE SUMMARY

Benipal S.A. was founded in March 2009 with the simple aim of creating the most advanced shopping and travel search engine.

Currently we manage multiple e commerce marketplaces across the B2B, B2C, O2O and C2C segments in various countries.

Our core search engine technology with image and voice search powers each marketplace and we aim to be the market leader in each geographic region for the market segment we serve.

Apart from these marketplaces, we also intend in the future to launch a high end fashion focused marketplace, a marketplace to buy and sell Used Cars and Automotive equipment as well as enter into the logistics space in SE Asia and India with our fully owned hyperlocal and pan national delivery service.
OUR HISTORY

We began in March 2009 with a unique proposition to provide a unique combined shopping and travel search experience. Back when, the “Paris Hilton” problem was still a problem.

Over time, as we focused more on the shopping search component, the plans for the travel search experience fell wayside, more due to the nature of the travel search industry.

Why we Dropped Travel Search

There are 4 major players in travel search, GDS or Global Distribution Systems. ITA (now owned by Google and powering Google flight and hotel search), Amadeus, Travelport.

If you own a hotel or an airline, chances are you cannot run your business without them. In fact, for Hotels the cost of simply running a reservation system is as high as 3-4% of their
annual revenue. Simply to gain the market visibility and reservation system provided by all major search engines.

All travel search engines (Travelocity, Expedia, Kayak) have tie ups with one or more of these GDS‘s. Without that, the travel search engines would have no access to even a single hotel or flight booking.

GDSs sell their data at a very high cost, obviously, charged in certain $s per 1000 queries. And since the reservations and availability changes every second, the queries cannot be cached either.

Which means, each time, you as a user refresh your query or click on it again and again, someone is making an API call to the GDS provider and actually paying for it.

So how do travel search engines still survive? By making money off advertising, per reservation booking and hoping this revenue stream would be enough to cover the cost of the API calls made to the GDS provider.

After evaluating this business scenario for a
while, it was decided not to pursue travel search and instead focus purely on creating the finest shopping search engine that had been created thus far.

Of course, we did not anticipate Google Shopping would meta morph from Connect Commerce and establish an illegal hegemony.
The benipal shopping search engine alpha release came out in 2013 and was launched in March 2014 with 300 Million products in the United States, over 1 Billion images and roughly 1.2 Billion titles and descriptions from over 12,000 merchants.

Building a Supercomputer

Running on 40 self built 32 Core Xeon E5-2690 2.9 Ghz machines with over 15TB 1633 Mhz RAM and 1 PB SAS storage, it was no mean feat for someone who was self taught in technology after spending 12 years in finance.
THE MOST ADVANCED SHOPPING SEARCH ENGINE EVER BUILT

The shopping search engine did what no one had been able to do thus far, and probably not till date either.

The ability to do relational and contextual search over long tail queries, and being actually able to understand the meaning of the query itself. It could distinguish each and every Color, metal, size, identifier, product, category, price range, distance. You name it.

As an example, Silver is a metal and a Color. But what is it actually when a user queries “Silver brooch”, or “Silver Book” or “Silver LCD television”.

A metal, plain text and Color.

Now if you have a search engine that can understand this difference, the result becomes
so much more refined, because now it is not doing plain text search but rather a very focused search where it must find “Silver” as a metal or as a Color.

It must also make sure it is in the right category.

And this is where it gets even better. Once you understand the query, then find its meaning, then find where the query belongs and then create your own algorithm from the millions of combinations available and finally execute.

All in under 10 ms for three word queries ans 150 ms for queries upto 10-12 words long. At the heart of this search technology, a core brain that knew everything.

And continually learning from new data that came in and every search query executed.

**Adding Image and Voice Search**

What do you do with the most advanced shopping search engine ever?

You make it even better.
So we went ahead and added Image Search, reverse Image Search and Voice search to what was already a beautiful product.

**The Beauty of Image Search**

With advances in computing power and image recognition technology, it is possible now to create a hash of the image in the mobile phone itself before sending it to the backend server for search processing.

Why type when you can just point your phone at something and get the same results? Point your phone at a design on a piece of fabric and image search can find all related items. Point it at a Mixer Grinder and viola, you have all the mixer grinders available to browse through.

We feel that in the future search will move away from being text based and rely more and more on image and voice.

Search will start with either voice or image and then become a combination of being faceted by voice commands.
With the mixer grinder results, a User may well drill down further by using voice commands and specifying a certain seller or location or price.

Faceting by image itself is a tough proposition and from a UX perspective, we think users will adopt a mix of image and voice.

As it stands now, while everyone in the B2B, B2C, O2O space does have a mobile phone, not everyone owns a computer. Computing has moved away from desk based to mobile.

One of the constraints on mobile phones is the search box text entry and we feel that image search with voice search will slowly overtake text based search in the future.

**The Beauty of Voice Search**

Why type when you can just speak and search. And what better than a search engine that understands context and relation. From the beginning of our search engine development, we knew that one day search would come to be more voice focused and hence we developed technology that would
ideally be in the right place at the right time.

When a user asks a question, it will almost always be in natural language. But at the backend, the search systems still rely on text parsing and word detection.

No More. With our contextual and relational search, we will understand each and every word and form the context based query which will then deliver the search results.

Perfect results for any question. Show me "Mixers and Grinders from Seller A in Location C for less than 500 dollars. Also make it Red color"
The world has moved to mobile computing. Gen Y does not even understand what a "computer" is and assumes a tablet for a computer.

Web versions have had a stranglehold on internet marketplaces for a long while due to ease of browsing and search. No more.

With 1.4 Billion mobile phones shipped in 2018 alone, it is estimated a total of 4 Billion mobile phone devices are in the hands of prospective customers worldwide.

With this in mind, our marketplaces were built for mobile first. UX, UI and search, all were built with this strategy in mind. While we will still offer web versions, we believe those will be mostly used by large sellers with thousands of products and most buyers as well as smaller sellers, whether in B2B or B2C.
space will opt for mobile devices only.

We expect O2O platform usage to be primarily mobile only as well as C2C will also be primarily mobile only.

A O2O seller, your local store, has no need for a desktop or laptop, and probably does not have desk space inside his small store either. But a mobile phone to sell everything and receive payments. Absolutely.

Similarly, a C2C seller and buyer is mostly Gen Y and again mobile only.

While web versions will be launched for all our marketplace properties, we do not expect web usage to match mobile device usage.
Historical Timeline

From March 2009 till date

March 2009
Benipal S.A. formed

June 2009
R&D Office opened in Bangalore, India with state of the art equipment.

January 2013
20 TFlops Supercomputer built and installed in Phoenix Datacenter. 40 Nodes, 640 Xeon E5-2690 Cores, 15TB 1633Mhz DDR3 RAM, 1PB Storage.

June 2013
Alpha version of Shopping Search Engine launched in United States.

March 2014
Beta version of shopping search engine launched.

October 2014
Web version of U.S Marketplace launched on shopping search engine platform.
September 2015
Alpha version of a social ecommerce platform launched

May 2016
Mobile App first strategy is pursued

March 2017
Beta version of C2C platform - beni - launched on Google Play Store

September 2017
Beta version of Global B2B platform - WANT - launched on Google Play Store

April 2018
India focused B2B marketplaces - WANT Wholesale and Benipal (Fashion Marketplace) - launched on Google Play Store

March 2019

All marketplace apps now in release versions:
- India C2C - beni
- Malaysia, Philippines O2O - want local
- Global B2B - WANT
- India B2B - Benipal (Fashion Marketplace), WANT Wholesale
- India O2O - want local
- United States B2B - Benipal

We launched WANT and Benipal B2B marketplaces in 2019 in both United States, India and Globally.


A product starts its life being manufactured in a factory.

Take a typical Mobile phone as an example – Made in China. Can you buy it directly from the manufacturer? If you were buying a Million pieces, sure.

What the manufacturer really needs is immediate cash flow and as a result is willing to sell in bulk to a distributor for a very low margin. This is the first step in the lifecycle of
a product, a Business to Business sale. B2B.

**Executed via our Global Wholesale marketplace – WANT.**

Now the Distributor has a million Mobile phones. Can the end user buy directly from the distributor? Sure, if you wish to buy 100,000 pieces.

So this is the next step. A wholesale transaction.

Now this could be between the distributor and the end seller or it could just be another step in the wholesale process, from one large distributor to a medium size distributor in a different country.

Again, a Business to Business sale. B2B.

**Executed via our Country focused wholesale marketplace – Benipal or Executed via the Global B2B marketplace – WANT.**
Now we come to the entity holding 100,000 Mobile Phones.

Here this could be the end Retailer or it could just be the last step in the B2B sale, where the Retailer is buying in bulk from the Distributor. So let’s say the Retailer buys 10,000 pieces.

Again a Business to Business sale. B2B.

Again, executed using WANT or Benipal.

If you are thinking, what prevents this last stage B2B buyer from purchasing directly from the factory? Nothing. Just the Minimum Order Quantity.

The manufacturer wants a 30 day turnover and quick access to cash funds for his next cycle of manufacturing. If he can make a 10% margin on his manufacturing cost and sell the entire supply, he is more than willing to do so.

Same with the next stage B2B buyer that bought a Million pieces. Assuming he wishes to make another 5-10% and extinguish his
inventory in less than a month, definitely he is willing to sell in bulk at 100,000 piece orders rather than sell piecemeal in 100 lot orders. Product has already been sold in bulk thrice. And each time it is in bulk, from one business to another step down business. **B2B.**

Now the transaction changes. Retailer holds 10,000 Mobile Phones. This Retailer could be online or could be your local Stores, though it is highly unlikely your local store would like to carry a 10,000 Phone inventory. 500 Maybe?

As a End user, you now have two choices in purchasing this phone. Buy from the Online Retailer and have it shipped. And there you have it.

A B2C transaction.

**Executed via our B2C marketplace – WANT.**

Or buy from your local store, and now it is a O2O transaction.

**Executed via our local store O2O marketplace – want local.**
You use the phone for a year and a new model comes out. But the one you have is still running great, no scratches, screen is perfect. So you want to sell this one, put in some more money and get the latest model.

And this is where C2C comes in. You post it and sell locally to someone in your own town, perhaps in your social circle, an acquaintance maybe.

And yes, you use us again – Our C2C marketplace – beni.

As you will notice, Each Buyer is a Seller and each Seller is also a buyer. At different stages in the lifecycle of the same single product, from manufacturer to its used sale.

And this is where our marketplace ecosystem comes in, from B2B to B2C and O2O to C2C.

One Product. Multiple Sellers. One marketplace ecosystem.
IMPORTANCE OF SEARCH IN MARKETPLACES

There are three ways a user finds a product.

Either by browsing and clicking on something the user likes, by sharing something and by searching for what the user wants.

While the importance of both browse and sharing cannot be underestimated, in our opinion search is the cornerstone of any large marketplace.

There is simply no substitute when a marketplace offers millions or billions of products.

It is simply not possible to browse such a large context, even by category or even by faceting. At this stage, the only option left is for the user to search for what he wants.

By making search as easy as possible, whether by text, voice or image, our marketplaces can put a seller’s product front
and centre making it easy to conclude a transaction. The better the search engine, the faster the transaction is executed.
OUR CORE TECHNOLOGY STRATEGY

Search as cornerstone.

We serve each page, each screen, each query via our search engine. With search being tightly integrated into each and every aspect of the e-commerce marketplace experience, buyers are certain to get the product they want without spending too much time looking and sellers get transactions with ease.

Why else create the world's most advanced shopping search engine.

Mobile First.

The age of Mobile. Global mobile shipments in 2018 were 1.4 Billion Units of which over 85% were based on Android, with the rest being iOS and to some small extent others.

In SE Asia and India, a buyer and seller may or may not have a computer but certainly will
have a smartphone.

This is a plain and simple reason why we have chosen a Mobile first strategy, with our Android marketplaces first to market.

**Social.**

This is the age of sharing. Every Business realises that a social media strategy is as important as the quality and price of products being sold.

As such, all our marketplaces are by default also social e-commerce marketplaces and allow for sharing, live feeds, following for product streaming and private discussions with public reviews and comments on Sellers.

**Hyperlocal.**

Each marketplace product is by default also hyperlocal.

We believe your next buyer can be across the country or right in your neighborhood. As such, all our marketplace products are by
default also local and hyperlocal marketplaces.

Location based search, including with voice and images is available for both users and products.
The company relies heavily on machine learning in its core search engine to solve the problems of duplicates, fake products and brand misrepresentation.

While Artificial Intelligence is a much ballyhooed term, the company chooses to not term its efforts in machine learning as such.

It is our belief that Artificial Intelligence cannot be created, yet most of the work done on Image recognition and driver less cars has been directly culled from the efforts of hundreds of thousands of low paid workers in China, India and Philippines directly involved in physically clicking on millions upon millions of images to identify the products, signs and other identifying information in those.

This manual labour was then fed into machine learning datasets to create the base of the Deep Convoluted Neural networks that end up powering much of driver less car features, or
speech recognition and image recognition models. And all called Artificial Intelligence.

There is nothing intelligent about it. Just Artificial.

Our core work relies on machine learning models and we intend to use this nomenclature, including while discussing our work in deep neural nets for image recognition, our image search, reverse image search and auto product classification algorithms.

Our image recognition search was developed based on our 300 Million product dataset with 1.2 Billion titles, descriptions and the over 1 Billion images available for those products.

As each product was already partially categorised, it became easier for us to use the existing taxonomy to reclassify the relevant images.

From that point on, using Caffe, we were able to build our CNNs which enabled us to match closely relevant images and thereby taking into account the taxonomy of their
classification, feeding that into our already brilliant search engine.


Just some standard machine learning with a twist. However, we do note with irony that our image search would not have been possible without the availability of our 1 Billion image and product dataset, which were already partially classified into a proper category structure.

**Virtual Reality**

VR is in its infancy and as is stands, we do not feel much real life use can be derived from it as of date.

However, we intend to keep up to date on our technology development and if VR shows promise whereby it might be added into one of our B2B, B2C, O2O, C2C or Fashion offerings, we will push to build our own technology and integrate into the marketplaces.
OUR BRANDS

B2B

B2C

O2O

C2C

WHITE PAPER
OUR GEOGRAPHIC FOCUS

United States

Europe and United Kingdom
Germany, France, Spain
B2C, C2C

South East Asia
Philippines, Malaysia, Thailand, Singapore
B2C, O2O, C2C

Korea, Japan

India

Brazil
B2C, O2O

Global
B2B
SE ASIA, INDIA AND BRAZIL

Why India

The market. India is the last major e-commerce market remaining to be conquered. Various upstarts have established base but none is close to a winning formula in a land where the price is king.

Data is close to free and everyone has a smartphone in their hand.

1.5 Billion people. 1 Billion smartphone users. 100 Million small business owners. 10 major languages.

Why South East Asia

500 Million people. 400 Million smartphone users. 4 major languages.

Why Brazil

Major Latin America Country with large enough population and large consumer base.
REVENUE GENERATION

B2B

**Global:** We will charge $1999 per year for our Verified Seller / Buyer package along with $99 per month as messaging charges.

**United States, Japan, Korea:** We will charge $999 per year for our Verified Seller / Buyer package along with $99 per month as messaging charges.

**India:** We will charge $199 per year for our Verified Seller / Buyer package along with $9 per month as messaging charges.

**Managed Sales:** We will charge 3% on all sales where payment and transaction execution is guaranteed by us.

B2C

**Europe and U.K.:** Small Stores with upto 100 Products can list and sell free of charge.
For Stores with more than 100 Products, All sales will incur a 2% marketplace Selling Fee.

Payment fees as may be applicable for credit card charges, charged on actual basis.

**United States, Japan, Korea:** Small Stores with upto 100 Products can list and sell free of charge.

For Stores with more than 100 Products, All sales will incur a 2% marketplace Selling Fee.

Payment fees as may be applicable for credit card charges, charged on actual basis.

**India:** Small Stores with upto 100 Products can list and sell free of charge.

For Stores with more than 100 Products, All sales will incur a 1% marketplace Selling Fee.

Free payments via UPI. Payment fees as may be applicable for credit card charges, charged on actual basis.
**SE Asia:** Small Stores with upto 100 Products can list and sell free of charge.

For Stores with more than 100 Products, All sales will incur a 1% marketplace Selling Fee.

Payment fees as may be applicable for credit card charges, charged on actual basis.

**Brazil:** Small Stores with upto 100 Products can list and sell free of charge.

For Stores with more than 100 Products, All sales will incur a 1% marketplace Selling Fee.

Payment fees as may be applicable for credit card charges, charged on actual basis.

**O2O**

**India:** We will charge $2.99 per month for our Verified local store package along with free listings and free payments via UPI.

We will also provide seminars and training.
sessions on teaching local business owners on how to get online and list their store products. Such training sessions and seminars may have a small associated attendance fee.

These charges may be waived off for the first 2 years based on market launch and marketing purposes.

**SE Asia:** We will charge **$2.99 per month** for our Verified local store package along with free listings. Payment charges via Credit card will be as per actual.

We will also provide seminars and training sessions on teaching local business owners on how to get online and list their store products. Such training sessions and seminars may have a small associated attendance fee.

**C2C Global:** Free
## Utility Token Offering

<table>
<thead>
<tr>
<th><strong>Project Name:</strong></th>
<th>WANT MARKETPLACES UTILITY TOKEN</th>
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<tbody>
<tr>
<td><strong>Type:</strong></td>
<td>Utility Token Offering</td>
</tr>
<tr>
<td><strong>Token Type:</strong></td>
<td>ERC-20 on Ethereum Blockchain</td>
</tr>
<tr>
<td><strong>Symbol:</strong></td>
<td>WNTU</td>
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<tr>
<td><strong>Company Name:</strong></td>
<td>Benipal S.A.</td>
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<tr>
<td><strong>Country:</strong></td>
<td>BVI, British Virgin Islands</td>
</tr>
<tr>
<td><strong>Total Token Supply:</strong></td>
<td>1,000,000,000 Capped</td>
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<tr>
<td><strong>Available for Public Sale:</strong></td>
<td>10%. 100,000,000</td>
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<tr>
<td><strong>Offered Price:</strong></td>
<td>US$ 0.40 per Utility Token in ICO</td>
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<tr>
<td><strong>Soft Cap / Hard Cap:</strong></td>
<td>Nil</td>
</tr>
<tr>
<td><strong>Method of Sale:</strong></td>
<td>ICO</td>
</tr>
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**WHITE PAPER**
Minimum Investment: US$ 100

Maximum Investment: No Maximum

Accepts: ETH

Use of Utility Tokens: Payment of Annual and Monthly Fee by merchants on the WANT, want local, Benipal and beni marketplace platforms.

Purchase of Premium offerings available only for purchase with WNTU Tokens.

Advantages: Discounted Fee of up to 50% when paying with WNTU Utility Tokens for Annual and Monthly merchant dues.

Premium functions such as promoted products, better search visibility and push to buyer will only be available for purchase via the WNTU Tokens, thereby creating a
steady demand. 90% Supply retained by Company for Team building, marketing and future ecosystem sales.

WNTU Token Burn: All WNTU Utility Tokens received by the company as payment for services will be burned upon receipt, thereby leading to a lowering of total supply and increased demand of the Utility Tokens, given their status as discounted payment method.

Use of Proceeds: Launch and Marketing of Korean, Japanese Focused, local language Marketplaces.


WNTU AND PAYMENTS ON ROAD CRYPTO MARKETPLACE

Exclusive Payment Method on the Road crypto Marketplace

It is proposed that the upcoming Road crypto marketplace use WNTU as its sole payment method rather than any other crypto currency.

Buyers and Sellers can use the ability of the Ethereum blockchain to purchase physical goods using WNTU ERC-20 Tokens.

In-built crypto Exchange for Road marketplace Buyers and Sellers

Both Buyers and Sellers will be able to convert WNTU to ETH or BTC, USDT among others with an in-built exchange on the Road marketplace platform. KYC/AML requirements will apply for all suppliers and buyers that wish to take advantage of this conversion facility.

Direct deposit and withdrawal of only WNTU
by both parties and usage to purchase or sell physical goods on the Road marketplace will not incur any additional charges or requirements.

**Physical Goods pricing in WNTU**

WNTU pricing for physical goods will be updated live based on exchange rates and both buyers and sellers will be able to withdraw and deposit WNTU and other currencies at minimal cost.

This will lead to greater adoption of the Want Marketplaces Utility Token. By offering the WNTU Tokens as a payment method on the Road crypto marketplace, we offer an all inclusive ecosystem where sellers and buyers can enjoy the advantages of the blockchain and create a direct connection with the physical world.

**Blockchain Adoption by Commerce**

It is our belief that unless and until commerce can happen with blockchain, crypto adoption by the masses will not occur.
Live product pricing updates help both buyers and sellers trade in a close to stable coin manner, whereby any pricing changes are immediately reflected at time of execution of transaction and both parties receive the actual value of the goods bought and sold. With this stability and overcoming one of the Achilles' heel issues of crypto, volatility and inflation deflation, international and local trade can further prosper.

**Blockchain versus Internal Transfers**

By using internal account wallets, WNTU payments will be made from buyer to seller in real time. Only at withdrawal or conversion to another available crypto currency, will any fee be charged.

Further, with minimal withdrawal charges to customer's own outside ERC-20 wallets, Road marketplace will lower the load on the Ethereum blockchain avoiding unnecessary transfers. It is expected that majority of customers will retain their WNTU on the Road marketplace internal exchange itself.
TEAM

FOUNDER AND CTO
SUKHBIR BENIPAL

Sukhbir is the Founder and Sole Owner of Benipal S.A., the company formed in March 2009 for the development of the benipal shopping search engine.

He was previously in Finance for over 12 years and ran ParkSide Real Estate Capital, a highly successful Commercial Real Estate Advisory firm in New York, NY where he advised on over US$ 750 Million of Commercial Real Estate transactions involving various high end Hotel and Office properties throughout the United States.

He is self taught in technology since 2009 and led the funding and development of the benipal shopping search engine, our social ecommerce platforms and our B2B, B2C, O2O, C2C marketplace platforms on Android.
Presently his technology expertise lies in Machine Learning, Computer Vision, Distributed Databases and Self learning Search Engines.

He is also responsible for development of the Smart Contracts used in this Security Token Offering, built upon openzeppelin-solidity audited contracts.

With a total of 22 years of finance, technology and e-commerce experience worldwide since 1997, he has the depth of technical knowledge and market expertise required to take forward his vision and execute in global markets.
USE OF FUNDS

- Marketing
- Technology Enhancement
- Call Center
- Team Building
- Office Opening

5% 10% 15% 10% 60%
Team Building

The company realises that it is vital to have a strong top level leadership and will immediately focus on hiring senior personnel, especially the COO and Head of Marketing for each region.

It is desired to have an extremely lean top level structure so that important decisions can be made quickly and changes can be immediately implemented.

Head Office Premises in New York, NY

We will be based out of New York, NY as our primary office and will be renting new premises to house our core leadership and technology enhancement team.

This 5,000 sqf space is proposed to be sufficient for a total of 50 employees and be in a reasonably priced Class A office building in Manhattan, with rents averaging no more than $60 per square foot annually. Due to high cost of co-working spaces for larger teams, it is prudent to have a longer term lease.
Technology Enhancement Team

It is proposed to have a small development team of no more than 30 members to work on future enhancements of both the search engine and the Android marketplaces as well as upcoming development of the iOS version and the website version.

Small teams offer a better performance boost than larger teams and lead to overall ownership of the technology product. One of the major issues with technology development is testing and it is proposed to hire an equivalent number of product testers on a part-time basis from local technology and engineering colleges to provide a real-world overview on not just the product but also to ferret out any bugs.

Since our core search engine and Android marketplaces are already fully built and launched, our primary technology focus will be on future enhancements along with launch of the iOS and web versions.

The development team will be based in the New York office.
Marketing

As the company already has its marketplaces launched in various regions, it is of prime importance that investment be made in marketing of the marketplace products.

As such, the company has decided to focus on one region at a time to also invest in team building and have necessary management and employee bandwidth to cover one region and one target market before investing energy and focus on the second region and/or market.

At this time, it is proposed to begin the marketing for the India B2B marketplace – Benipal, followed thereafter in four months by the SE Asia market for the O2O product, want local.

Minimal marketing efforts will be directed throughout in other regions to keep the product and offering warm. For those markets and products with minimal efforts, it is not expected those will yield any immediate result,

However, it will have a follow on effect in terms of early adopters and leading to
favourable word of mouth reviews when a more focused marketing push is started.

**Call Center**

It is proposed to hire 100 people in India to begin the call center operations for the Benipal B2B marketplace. This call center team will focus on selling the verification package to all new business customers who install our B2B marketplace on Android.

**Call Center Salaries**

At this time, the going rate for an experienced call center executive in India is $350 per month plus incentives. We intend to offer higher salaries for more experienced employees and English speaking executives while also retaining a well trained vernacular team.

**United States Marketing and Call Center**

Our philosophy is very clear. Local Users, local services, local employees. We intend for our Support Call Center to be based in Phoenix,
Arizona due to low cost of living compared to New York City and a steady supply of experienced customer service executives.

The Phoenix, AZ Call Center will be opened at time when marketing efforts for the U.S B2B operations are started.

**Global Marketing, Sales and Call Center**

Philippines based Call Center.

The Philippines Call Center will be opened at time when marketing efforts for the Global B2B operations are started.
**November 2019**
Open New York Office

**November 2019 - January 2020**
Senior level Hiring for India, U.S and Global operations.
Positions based in New York and India.

**December 2019**
Open India Call Center and Office.
Begin Marketing for B2B Android Marketplaces in India.

**February 2020**
Begin Marketing for O2O Android Marketplaces in India
Launch iOS versions of all Marketplaces

**March 2020**
Open Phoenix, AZ Call Center for United States B2B Sales
Start marketing for United States B2B marketplace on iOS
Launch web versions of all Marketplaces
April 2020
- Open Philippines based Call Center
- Open Singapore based Office
- Begin Marketing for O2O Android, iOS, Web Marketplaces in SE Asia
- Begin Marketing for beni – C2C marketplace in India

May 2020
- Begin marketing beni – C2C marketplace in United States
- Launch Crypto Marketplace – Road Globally

June 2020
- Begin Advertising for beni – C2C Marketplace in SE Asia on iOS, Android and Web
- Launch WANT – B2C marketplace in India on Android
- Launch High end Fashion focused marketplace in United States

July 2020
- Launch B2C Marketplace in SE Asia on iOS, Android and Web
- Launch O2O Marketplace in Latin America

August 2020
- Launch WANT – B2C Marketplace in United States on iOS, Android, Web
September 2020
Launch want local - O2O Marketplace in United States on iOS, Android, Web

October 2020
Setup London Office
Launch High end Fashion focused Marketplace in U.K, Germany, France

November 2021
Benipal S.A. lists one subsidiary on OTC, AIM or Singapore exchange via reverse merger.
Search engine Intellectual Property and Trademarks are already fully assigned to the company.

The core search engine IP, including text search, image search and voice search along with all future efforts in Machine Learning and Virtual reality will be held in the company itself.

Such search technology will be offered as a license to each subsidiary. This allows total control of the Core IP and trademarks, while allowing each downstream subsidiary to innovate and offer enhancements on the respective products.

Each individual marketplace may be assigned the mobile technology IP, including the Android app, iOS App, website, website domains to its respective subsidiary for operational purposes.
Trademarks

The company presently hold trademarks for the word "benipal" in United States and United Kingdom with a pending application in India.
SUBSIDIARIES

The company will establish four subsidiaries in the following legal jurisdictions, with each subsidiary responsible for all marketplace operations in that country or region.

All operations whether B2B, B2C, O2O or C2C will be conducted via such operational subsidiary responsible for transacting in its respective jurisdiction.

Naming nomenclature to follow, however we will attempt to establish each subsidiary with the naming "WANT MARKETPLACES" or some variation thereof.

UNITED STATES
United States operations

INDIA
India operations

SINGAPORE
SE Asia operations

UNITED KINGDOM
Global operations, Brazil operations
BREAKING EVEN

It will be our first and foremost priority to breakeven in the India operations first.

A quick overview in the offering Pitch deck documents will suggest a pricing of $0.10 per Android app install. This coupled with a 33% Rate of full location verified account creation leads to a overall rate of roughly $0.35 per user.

We expect that 10% of these verified users can be converted to our full verification status package being offered at the rate of $199 per year plus $19 per month.

100 Call center executives will each have a target of 2 sales per business day, giving an expected run rate of 5,000 verified buyers and sellers on the platform each month.

The number is expected to drop after the initial 6 months and at such time, it is expected that monthly verified signups will come down to 3,000 a month.
It is noted that verified status and paying users differ from the overall signups on the platform, which are expected at 10 times the total verified user base.

We expect to follow the same strategy while starting our marketing for the United States operations or Globally.
The company will not spend any funds in the marketing of this Utility Token on any websites, groups or via any other means of advertising including website or app advertising.

All funds raised during this offering will only be spent on actual marketing of the marketplaces, opening of new office in New York, hiring of senior team leadership, technology enhancement team and our call centers.
ADVISORS

The company has also decided not to engage with any ICO advisors, keeping in mind that such services only seek to raise the public profile of the offering without adding any real heft to the actual business proposition.

It is reiterated that all funds raised are used only for the actual business operations and marketing of the marketplaces in their respective countries of operations, not on marketing of the ICO itself or on hiring of Advisors who we believe, add no value to the actual business itself.
SMART CONTRACT AUDIT

Our focus is on keeping our development cost low. Our business marketing cost as low as possible, our STO marketing at nil and focus on breaking even.

As such, our smart contracts are built using pre audited openzeppelin-solidity contracts with minor changes as explained on our Public Github Repo.

By using pre audited contracts, we have lowered the cost involved in getting fresh audited smart contracts or using outside parties for so called blockchain contract development, funds which we feel would be better utilised in the actual business operations and marketing of the marketplaces.

As a prospective buyer in this Security Token Offering, we encourage you to look at our public Github repo and our smart contracts, including both the ERC-20 Token and the Crowdsale contracts.
SOLE FOUNDER

Most successful businesses have a sole owner. Dell, Amazon, Alibaba are prime examples.

Most hedge funds are single owner driven operations. Top down approach is best when executing the vision of the founder and too many cooks may definitely spoil the broth. VC backed companies aim for having multiple founders since VC funds by nature aim to have a backup if they cannot work well with a founder, thereby replacing him with another or executing a total team replacement.

What is of prime importance is the need to have a senior top level leadership with experience in e commerce markets and marketing so the Founder's vision and strategy can be executed in a professional manner. Such team can only be hired with a mix of attractive salary and ESOP, both of which we are providing for by way of this Utility Token Offering.
EXCHANGE LISTING

Utility Tokens

The company will make all reasonable attempt to have the Utility Tokens listed on one or more exchanges as soon as is possible after closing of the public sale offering.

However, such listing is not guaranteed.

Subsidiary

The company will endeavour to have one of its subsidiaries listed on a Global Stock exchange such as OTCQX or London AIM market via a Reverse Merger within two years from end of this sale offering.

Such listing, if executed will provide a steady public valuation for one component of the business operations against which the Utility Tokens can be valued as a whole for trading on its own exchanges.
AUDITED STATEMENTS

The company will provide GAAP compliant annual audited statements for itself and each subsidiary at end of each financial year.

Such GAAP audited statements will be uploaded on the company domain and fully available to the public.
PIPELINE

Crypto Marketplace

We will shortly also be launching a B2C, C2C marketplace where the sole currency will be BTC, ETH and / or the upcoming Stablecoins.

This marketplace will be called ROAD market.

B2C and C2C High end Fashion focused marketplace

We aim to launch a high end fashion focused marketplace aimed at the high paying consumer in Korea, Japan, United States and Europe, United Kingdom.

This marketplace will cater to the sole purpose of high fashion and will allow both business, brands and individual sellers to buy and sell their items.
Used Cars marketplace

We will be launching a marketplace that solely caters to the automotive market and allows for buying and selling of cars, motorcycles, other vehicles and auto parts.

Logistics and Delivery Service in India and SE Asia

See additional information at end of this white paper.
DISCLAIMER

Nothing in this white paper should be construed as a guarantee of your investment. Your investment may lose value.

Nothing in this white paper should be construed as this Utility Token Offering being marketed to citizens of the United States and India, except as a Private Offering.

You are solely responsible for being compliant with the respective securities law and framework in your country of residence and respective jurisdiction thereof.
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Github - https://github.com/wantmarketplaces

Facebook - https://fb.me/wantmarketplaces

Twitter - https://twitter.com/wantmarketplace

Linkedin - https://linkedin.com/company/benipal-sa

Angel List - https://angel.co/company/benipal

WHITE PAPER
Product:

e Commerce Platform with advanced Shopping Search Engine and integrated Marketplace provides contextual, relational, semi semantic search such as "silver necklace from rakuten shopping or sears or walmart.com or jewelry.com between $ 100 and $ 200"

Background:

Project started in 2009 to provide a better product search engine than A9/ Froogle/ Google Shopping/ Nextag/ PriceGrabber/ eBay/ Walmart with a highly integrated marketplace, seller store component.

Relationships:

Over 11,000+ U.S Merchants via various Affiliate Programs such as Rakuten LinkShare, Commission Junction, Ebay Enterprise Affiliate Network, Impact Radius, AvantLink, LinkConnector, WebGains.

Search Engine Data Set Size:

280 Million+ Products.

228 Million Categorized. 52 Million UnCategorized. 423 Million Buying Choices.

1 Billion Product Images (Roughly).

30,000+ Categories

Marketplace:

Combined with the Shopping Search Engine to provide a one stop shop for buying from large as well as small merchants and individuals. For Sellers, near live item posting with complete Add to Cart, Checkout and Payment Processing. Individual Seller Stores and Price Comparison with other merchants for same unique products.
**Complete Project Technology Details**

Technology Stack: Hadoop HDFS, Yarn, HBase, SOLR, Lucene, Cloudera MapReduce Indexer, SOLR/HBase Connector, MySQL, Tomcat, Nginx, HAProxy, Hazelcast, HsqlDB.

Coding in Java and Spring with Java 8.

The project is divided into 12 main parts:

1. Data Parsing, Item Matching, Storage and Access
2. Categorization & Classification
3. Index Creation
4. Search Algorithms, Logic and Speed
5. Search Features including Related, Auto Suggest, Spell Check, Highlight
6. Front End Delivery
7. e Commerce Marketplace with Checkout and Payments
8. Image Storage, Rendering, Manipulation
9. Bar Code Recognition
10. Image Categorization, Classification and Recognition/Matching
11. Neural Network Component / Planned Upgrade
12. Cluster Setup and Performance
Detailed Description

1. Data Parsing, Item Matching, Storage and Access


Each Day, the search engine receives roughly 30-40 GB of compressed XML, CSV, TXT Files via FTP from different merchants. When expanded, the total file (s) size is roughly 300 GB, with roughly close to 200 Million + Products updated multiple times daily (As and when a new data file is received).

a) After Decompressing, Files are re compressed using LZO for faster and proper XML/TXT/CSV parsing in Hadoop Yarn for file sizes larger than base Hadoop HDFS block size (64MB).

b) Yarn Indexer runs through entire file set, parses each product and matches it to current data set using a Hbase “Matching Table” with over 1.2 Billion + Records for consistent matching. Eventually, 200 Million+ products (From different merchants. Includes same product being sold by multiple merchants) with over 4-5 matching variables from each product are matched against the 1.2 Billion+ Records.

c) Items which do not match anything are added to the “UnCategorized Products” table to be processed in sequence.

d) Each merchant's Product Page URL is assigned a randomly generated 10 digit URL-ID (usually HK1cHaN77o) for easier redirects such as “https://www.benipal.com/buy/HK1cHaN45O”. Since Buying Url's change usually, roughly 100 Million New ID’s are created everyday.

e) Items which are not being sold currently by any merchants are assigned a unique Identifier that marks these as “no-current-merchant” to separate these at index creation.

d) Roughly 1TB of data is added to the Hbase “Categorized Products” table each day, since each matched item is checked for any existing or new attribute (UPC, MPN, SKU, Title, Author, Artist, Brand, New Merchant, Descriptions, Size, Material, Type and so on). Price History and all Changes are maintained for each product and for the different merchants.

e) Each new product is then cleaned, Identifiers checked, and any changed attributes added to the “Matching Table” for future runs.

f) Lastly, the process creates and updates at each run, what is called the “Analysis-Brain”, the basic brain of the search engine which stores each and every product attribute, identifier, Title, stemmed and unstemmed, color, size, material, Merchant, Brand, Relationships, Counts, Contexts etc in a special sequence and automatically creates and finds Brands, Titles, Authors, Artists using its own version of machine learning algorithms.

Over 25 Billion Hbase requests per 24 hour period. Each Process takes roughly 1 hour from start to finish and is usually done 3-4 times a day.

Based on 480 Yarn Threads. 20 Node Hbase with 128GB Block Cache, 32GB Heap Size and average response time of 2-3ms.
2. **Categorization & Classification**

This is an internally created algorithm based on my own version of machine learning, combined with search.

Tech Stack – YARN, Hbase, SOLR. Coded in Spring and Java.

a) A Classification program runs in YARN, picks up each Individual product from the “UnCategorized Products” Hbase table, matches it in Hbase against the main “Categorized Products” table using a set of defined algorithms, runs the same sequence through the Main search engine indexes and combines both results to correctly identify and categorize any product in any of the 30 Base and 30,000+ Sub Categories. Total of 5 -6 Categorization levels.

Each item is also checked in the same table for duplicate products coming from different merchants.

b) Further after classification a sequential internal ID based on the Category Name (example-BENIBOOKS1) plus a unique 10 digit external ID (UID example - XYR1G4D68C) is assigned to the new product.

c) Upon finishing the entire cycle, the product is moved to the “Categorized Products” table and removed from the “UnCategorised Products” and its matching table. Now available to go into Index on next run.

Entire process takes roughly 3 Hours for a 50 Million “UnCategorised” set. Separate versions (Hbase only, SOLR only) also exist and all versions are used randomly.

Classification Program runs separately from Main Matching and Indexing Sequence and auto runs in a loop.

85% Success Rate.

3. **Index Creation**

Tech Stack – YARN, Cloudera MR Indexer, Hbase, SOLR

A heavily source code modified version of Cloudera's MR Indexer is used to create all indexes. (Main, Analysis-Brain, Price, No-Merchant-Available, URL-Mapping”.

Roughly 15 minutes to access all 228 Million products from Hbase for different indexes and 45 minutes to create the final Lucene/SOLR Indexes. Usually around 125-150 Million Products are live at any given time with average of 4-5 different selling merchants. Excluding products yet to be categorized.

A separate program then downloads the Indexes to the Search Nodes and does a live replacement with no downtime or lag.

“Analysis-Brain” Index of roughly 300GB in Server RAM and Main Index of about 450GB on 1TB Samsung SSDs. Other Smaller Indexes in RAM (latest price, merchants, brands, categories, identifiers, patterns) or SSD.
Auto run:

The entire sequence from FTP data feeds till live index replacement and ongoing product classification is handled automatically by a Auto Run Program with no need for human intervention or oversight.

4. Search Algorithms, Logic and Speed


USP:

Relational, Contextual Search. Identifies every single UPC, EAN, ISBN, Actor, Artist, Author, Title, color, size, material, type and any other attribute relevant to the overall query (Example – It will know silver is a color and material when used in context with “necklaces” or “jewelry” category but only a color when used in context with “shoes”).

Uses live data set to confirm its own understanding as well as to change it. Able to identify any brand or merchant, price ranges or any other identifier from a regular, lengthy query string.

Deduces meaning of the query “lipstick jungle from qvc.com for $22 in Beauty”, extracts entities, patterns, identifiers, categories and passes to algorithms which change with each meaning and generate their own internal queries based on the information supplied by the “Logic Layer” & “Analysis-Brain”.

Uses a process of Occam's Razor, reverse elimination to understand until it cannot deduce any further, double checks live data set at all times to reconfirm correct understanding before making final query.

See more detailed information in Flow Chart on next page.

Average Single Identifier / Word response time – 7ms.
3-5 Word query – under 150 ms
5-8 Word query – under 350 ms
More than 10 Words - 650ms

5. Search Features including Related, Auto Suggest, Spell Check, Highlight

Tech Stack – SOLR, Lucene

Standard Regular features from SOLR, Lucene such as Highlight, Spell Check, Auto Suggest, Similar & Related are provided as part of the search response, as needed.

Similar & Related have been specially tuned for our use case with modified algorithms to provide the closest match to the product being checked.

Faceting is highly tuned to provide very accurate and fast results.

Spell Check and Auto Suggest are as standard.

Search: Fully Distributed on all available Nodes with HAProxy. 24GB Heap Size, 32 available cores and optimally tuned for very high performance and redundancy with low latency. Data in RAM, SSD.
BASIC SEARCH FLOWCHART AND DESCRIPTION

WEBAPP

GENERATE QUERY

LOGIC LAYER

First check / “n”th Check

If Wrong

ANALYSIS / BRAIN

Entity Extraction.
Word, Sentence,
Identifier, Artist,
Title, Merchant,
Brand, other Attribute
identification.
relation + context

Logic Layer deduces the meaning
of each query.
Then finally passes the entire meaning
to the Algorithms to execute

First check for patterns
IF match, go back to LOGIC LAYER / ANALYSIS CORE
with match info to double check. Discard Step if no match

PATTERN CHECKING

There may be “n” checks

WHEN FINAL MEANING IS DEDUCED
GO TO ALGORITHMS

Check Analysis Core
See if Logic Layer needs assistance

ALGORITHMS

SEARCH ALGORITHMS
RULES
STEPS

Check Analysis Core
See if Logic Layer needs assistance

Algorithms create their own internal query
FINAL QUERY GENERATION

No Two queries with even a single word change hit
the same algorithm or rules. Regenerate if wrong.

MAIN INDEX

SERVE RESPONSE IN WEBAPP
REQUIRED FORMAT

FINAL SEARCH RESPONSE
6. **Front End Delivery**

Tech Stack – Custom Spring based Web App, Tomcat, Nginx, HAProxy, Hazelcast. Distributed Web Apps (Shop, Seller) among all available nodes.

Ability to handle thousands of simultaneous connections. Unique JavaScript based Page Faceting and search layout tries to decipher user intent based on the query, the resulting result set and origin of browsing.

Example – A User asking for a product sold only by Walmart will automatically go into a search mode where Walmart is the primary merchant. Until the User searches something which Walmart doesn't sell, and it shifts to main search. Various such permutations are available live.

Average Page Render time – 50ms.

7. **Bar Code Recognition**

Tech Stack – Android, Zxing, Java, REST API, SOLR. Coding in Java.

A Bar Code scanner Mobile Application based on the Zxing Open Source library was developed and heavily modified. Accurately identified all types of Bar Codes and Integrated with the Search Engine to check and deliver all product details, images and complete buying options instantly.

The Search Engine currently has close to 130 Million or so (roughly) available identifiers such as a UPC, EAN, ISBN etc. Available simply in the form [https://www.benipal.com/9781855322196](https://www.benipal.com/9781855322196) or as a parse able json response for any use case.
8. **e Commerce Marketplace with Checkout and Payments**

Tech Stack – Hbase, SOLR, MySQL, Tomcat, Hazelcast, HsqlDB, Memcached, Nginx, Spring. Coding in Java and Spring.

A Fully functional marketplace allowing individual sellers to post any item with a simple 2 click process.

Sellers can search for or choose from any of the existing 253 Million products by selecting any product from the “Have one to sell? Sell on benipal now” Link under each product and the product information, category structure, description, all attributes are auto filled. Modify any info, upload photos and items are posted near live (<10s) to the search index.

a) Fully functional Checkout Process with Add to Cart, Make Payment using Credit Cards.

b) Sellers can choose from different Payment methods including Stripe, Paypal, Braintree, Amazon payments. Currently Stripe Payments are fully functional.

c) Sellers products show up in price comparison as buying option, along with regular merchants.

d) Marketplace charges a set 5% fee on any sale. Change Fee Structure with a minor change in external config file

e) Referral Fee program in place

Products are posted for Sale in the following manner.

f) Each Seller is assigned a unique Seller ID and each existing product (containing current internal ID + Unique ID) is assigned the same identifier with a _S, to maintain uniqueness. Each Posted item is also assigned a unique Buy URL for Checkout which is again as per 1)d) with a _S to maintain uniqueness.

g) Posted Items and Images are sent directly to Hbase with two additional copies stored in Hazelcast and HsqlDB to maintain backup and redundancy in case of Hbase connectivity issues.

h) Images are posted to the “SELLER-IMAGES” Hbase table as bytestream with the original and all required display sizes immediately generated and stored.

i) Seller Posted Items and Images are stored in separate Hbase tables to maintain close to live indexing capabilities.

j) Add to Cart, Checkout and Payments is handled within MySQL.

k) Seller details are added to the Analysis / Brain Core live.

Immediately upon posting an item, a buyer is able to search “electric blue guitar by Fernando”. Also possible to do something like “electric blue guitar by Fernando in Cambridge for $1000” by adding City/Zip Code details to the Analysis/Brain Core as a check able entity.

Pending Upgrade – Kafka and Storm Upgrade with SOLR to make item posting fully live, under 10ms.
PRODUCT SEARCH ENGINE + MARKETPLACE PROCESS FLOWCHART

1. DATAFEEDS → AUTORUN
   - Extract parse match clean
   - Using YARN HBASE
   - Match category using YARN HBASE

2. GET PRODUCT INFORMATION DURING SEARCH OR TO AUTOFILL VIA POSTING
   - POST ITEM TO SELL
   - Primary Hbase backup Hazelcast HSQLDB

3. CATEGORIZED PRODUCTS
   - Seller Hbase tables
   - URL-MAPPING

4. UNCATORIZED PRODUCTS
   - Products images sellers url-mapping

5. CREATE ANALYSIS BRAIN
   - Create search indexes

6. TO BUY FROM SELLER ON ECOMMERCE PLATFORM
   - Buy from external merchant (redirect to merchant website)

7. MYSQL FOR CHECKOUT TRANSACTION EXECUTION PAYMENT
   - WEBSERVER HAZELCAST, MEMCACHED NGINX

8. MAIN WEBAPP
   - Image server

9. MAIN SEARCH
   - Webserver
9. Image Storage, Rendering, Manipulation

Tech Stack – Hbase, Tomcat, Hazelcast, Nginx. Spring, Java based Web Application. Fully distributed. Image Data Set size – 1 Billion (roughly)

a) Auto Image down loader crawls each merchant's provided page / image URLs to store their product images directly under their respective merchantID.productID in Hbase. Runs 24/7 to download any new images.

b) A very high performance Image Manipulation engine has the ability to GET a image bytestream from Hbase, render not only its original size but any size requested by manipulating the H x W to maintain optimum original image ratio.

c) Checks Hazelcast and then Hbase Table for required size first and generates if not available.

d) Stores Re sized Image back into Hbase under its size attribute (\textit{merchantid.productid.sizeattributes}) after rendering for faster access if re- requested. Stores a Copy in Hazelcast for cache.

Average render / manipulation time < 5 ms.

10. Image Categorization, Classification and Recognition/Matching


A Project was fully architected with a prototype developed for Image Recognition and Matching using the training set of 1 Billion images available. Image Recognition was achieved using pixel RGB-HSV matching, shape analysis and Segmented Area Matching with sub sampling. Caffe was added later to the mix for additional accuracy.

A Fully developed Project based on a neural network would have a major advantage in the fact that products are already being classified into various categories / sub-categories based on product information. This would provide a great training set, similar to a “wordnet” integration.

Image analysis and Matching would help not only Image categorization but also final product categorization. In fact, both would be complementary and show highly increased accuracy.

10. Neural Component / Planned Upgrade

Tech Stack – Giraph, Neo4J, Mahout, Spring, Java based Coding. Integrate with Search.

A Project was fully architected with Giraph and Neo4J (prototype d with Neo4J) to integrate a neural network component to live search. This would assist not only in live query analysis, entity recognition and self healing with stronger relationship bonding and live context changes but also look at user interactions patterns based on query result set to refine the true meaning and understanding for each new query. A self learning, healing mechanism would auto propagate itself into live search.
11. Cluster Setup and Performance

Founder personally built a 40 Node Super Computer using off the shelf Hardware in one week. ROCKS cluster. LINPACK at almost 20TFlops. CPU only. With GPU easy to hit 40TFlops.

40 x 2U Machines
80 x Intel Xeon E5-2690 8 Core / 16 Thread Processors. 640 Cores / 1280 Threads.
15TB RAM. 24 x 16GB roughly per node.
1.1 PB HDFS Storage (4TB x 8 disks per node, usable 3.4 TB). 2U Chassis storage capacity close to 2 PB.

Initial thought was to use JPPF and parallel process search, however it was later decided that a distributed system would provide equally good performance as well as due to the major requirement of having a Hadoop/YARN/HBase cluster.

Minor Upgrades / Changes

Change Design and CSS.
Allow Sellers to upload product data feeds directly via HTTP or FTP from account.
Provide Analytics and Price Analysis services.

Planned Upgrades –

Status - Fully architect ed and planned. Various stages of completion.

Storm, Kafka integration for more real time index creations leading to live updates instead of batch processing in both product search engine and marketplace for changing “near live” to “live product posting”.

Giraph, Neo4J, Mahout integration -

a) More accurate Analysis / Brain creation and relationship + context extraction.

b) More accurate product categorization and image analysis. Plus clean up any existing faulty categorization.

c) More accurate image categorization and integration with product categorization above to achieve a highly accurate product + image categorization process.

d) More accurate search that can train and learn from previous queries and result sets and change itself live with each new addition or subtraction to the analysis-brain or main data set.

The full power of this search technology will be evident by Integrating with all Major Open Source Data Dumps such as Wikipedia/DBpedia, Freebase, OpenStreetMaps, MusicBrainz and so on to finalize a highly contextual Relationship Graph based Search Engine able to accurately answer the following query.

“Show me Mr. Pitt's partner's movies from the flower power decade”

“Midnight Cowboy”
Screen Shots

Categorized Products - 228 Million

Job Counters
Launched map tasks=274
Data-local map tasks=187
Rack-local map tasks=87
Total time spent by all maps in occupied slots (ms)=477139072
Total time spent by all reduces in occupied slots (ms)=0
Total time spent by all map tasks (ms)=59642384
Total vcore-seconds taken by all map tasks=59642384
Total megabyte-seconds taken by all map tasks=244295204864

Map-Reduce Framework
Map input records=228378655
Map output records=0
Input split bytes=30155
Spilled Records=0
Failed Shuffles=0
Merged Map outputs=0
GC time elapsed (ms)=410366
CPU time spent (ms)=5756520
Physical memory (bytes) snapshot=73224871936
Virtual memory (bytes) snapshot=1472809664512
Total committed heap usage (bytes)=41876455424

HBase Counters
BYTES_IN_REMOTE_RESULTS=4303562857
BYTES_IN_RESULTS=16091802982
MILLIS_BETWEEN.Nexts=56313892
NOT_SERVING_REGION_EXCEPTION=0
NUM_SCANNER_RESTARTS=0
REGIONS_SCANNED=274
REMOTE_RPC_CALLS=124026
REMOTE_RPC_RETRIES=0
RPC_CALLS=457505
RPC_RETRIES=5

org.apache.hadoop.hbase.mapreduce.RowCounter$RowCounterMapper$Counters
ROWS=228378655

File Input Format Counters
Bytes Read=0

File Output Format Counters
Bytes Written=0
UnCategorized Products – 52 Million

Job Counters
- Launched map tasks=321
- Data-local map tasks=284
- Rack-local map tasks=37
- Total time spent by all maps in occupied slots (ms)=112661648
- Total time spent by all reduces in occupied slots (ms)=0
- Total time spent by all map tasks (ms)=14082706
- Total vcore-seconds taken by all map tasks=14082706
- Total megabyte-seconds taken by all map tasks=57682763776

Map-Reduce Framework
- Map input records=52171609
- Map output records=0
- Input split bytes=42208
- Spilled Records=0
- Failed Shuffles=0
- Merged Map outputs=0
- GC time elapsed (ms)=349416
- CPU time spent (ms)=2898340
- Physical memory (bytes) snapshot=66246864896
- Virtual memory (bytes) snapshot=1724609404928
- Total committed heap usage (bytes)=32710328320

HBase Counters
-BYTES_IN_REMOTE_RESULTS=214997943
-BYTES_IN_RESULT=4543659105
-MILLIS_BETWEEN_NEXTS=8732761
-NOT_SERVING_REGION_EXCEPTION=0
-NUM_SCANNER_RESTARTS=0
-REGIONS_SCANNED=321
-REMOTE_RPC_CALLS=5262
-REMOTE_RPC_RETRIES=0
-RPC_CALLS=105147
-RPC_RETRIES=1

org.apache.hadoop.hbase.mapreduce.RowCounter$RowCounterMapper$Counters
-ROWS=52171609

File Input Format Counters
-Bytes Read=0

File Output Format Counters
-Bytes Written=0
Products Available to Buy Live from Different Merchants – 423 Million

Job Counters
Launched map tasks=4
Rack-local map tasks=4
Total time spent by all maps in occupied slots (ms)=20197416
Total time spent by all reduces in occupied slots (ms)=0
Total time spent by all map tasks (ms)=2524677
Total vcore-seconds taken by all map tasks=2524677
Total megabyte-seconds taken by all map tasks=10341076992

Map-Reduce Framework
Map input records=423901641
Map output records=0
Input split bytes=386
Spilled Records=0
Failed Shuffles=0
Merged Map outputs=0
GC time elapsed (ms)=24529
CPU time spent (ms)=784140
Physical memory (bytes) snapshot=2758377472
Virtual memory (bytes) snapshot=21512335360
Total committed heap usage (bytes)=891813888

HBase Counters
BYTES_IN_REMOTE_RESULTS=20686470221
BYTES_IN_RESULTS=20686470221
MILLIS_BETWEEN(_:NS)ETS=2495794
NOT_SERVING_REGION_EXCEPTION=0
NUM_SCANNER_RESTARTS=0
REGIONS_SCANNED=4
REMOTE_RPC_CALLS=847813
REMOTE_RPC_RETRIES=0
RPC_CALLS=847813
RPC_RETRIES=0

org.apache.hadoop.hbase.mapreduce.RowCounter$RowCounterMapper$Counters
ROWS=423901641

File Input Format Counters
Bytes Read=0

File Output Format Counters
Bytes Written=0
**Search Speed** – 15ms to search 63 Million Individual Products

```xml
<response>
  <lst name="responseHeader">
    <int name="status">0</int>
    <int name="QTime">15</int>
  </lst>
  <lst name="params">
    <str name="q">*</str>
    <str name="indent">true</str>
    <str name="wt">xml</str>
  </lst>
</response>
```

**Search Speed** – 8ms to search an Individual ISBN

```xml
<response>
  <lst name="responseHeader">
    <int name="status">0</int>
    <int name="QTime">8</int>
  </lst>
  <lst name="params">
    <str name="q">9781855322196</str>
    <str name="indent">true</str>
    <str name="wt">xml</str>
  </lst>
</response>
```
What is It?

A Hyperlocal delivery service to deliver products from Brick & Mortar Retailers to buyers in the local city plus delivery service for C2C transactions executed on the parent e-commerce platform, if needed. Also available as last mile delivery service for other pure ecommerce players with in-app integration.

How it Works?

Most national Delivery Services work on the hub-hub and spoke model and most hyperlocal delivery services work on the “nearest driver” approach, leading to major inefficiencies in fleet and driver utilization as well as inefficient route optimization.

The “newco” delivery service is built on a mesh network powered by a powerful algorithm which determines the “best driver” for any pickup or delivery. In addition, each pickup or delivery is treated as a “transaction” with equal weightage. This self-learning algorithm allows the service to provide a variety of features not available with other services.

Features:

1. On demand pickup and delivery.
2. Both Seller and Buyer can choose time of pickup and time of delivery.
3. Seller can be a Business or a Consumer, so long as transaction is executed via e-commerce platform.
4. Mesh Delivery Network with “best driver” algorithm provides highest efficiency in driver and fleet usage with optimum route optimization leading to faster delivery times.
5. Live on Map tracking of Product pickup, enroute to destination and Delivery.
6. Buyer can reschedule delivery at any time up to 15 mins prior to estimated arrival.
7. Delivery Service fully integrated with e-commerce platform to provide a steady order flow.
8. Demand Prediction to shift Fleet and Drivers to an area most likely to receive next orders.
9. Live Fleet, Driver and Route Efficiency Analytics.
11. In App Barcode Recognition, where available on products, for easier pickup and delivery confirmation.
12. Cash on Delivery and Mobile Payment Methods including Credit Cards, Payment Wallets.
13. Phone Number as exact Address and Location.
15. Image Recognition for Deliveries.
16. Driver can decide “Rest” times.
17. Algorithm to decide if single driver will execute delivery transaction, including “pickup” and “delivery” or only “pickup” and transfer packages to another driver at a preset location and time.
18. Algorithm to decide on P2P based Package Transfer in case of vehicle failure, accident or other unforeseen circumstances. No back office intervention required.
Signatureless Image ID Recognition based on mobile proximity for accepting delivery

Deliveries will be made without any signature so long as Customer has their mobile phone on person with App turned on and working Internet connection. User can also add other Delivery accounts to allow another user to accept signatureless delivery so long as other user has his mobile on person.

Customer can also add other People's Face Shots to allow for signatureless delivery without a mobile phone. Driver will take picture and backend will confirm Allowed Recipient using facial recognition.

For deliveries made to Security Staff at Office Receptions, MailRooms or Apartments, Driver will take picture of staff and ID, which can be live matched on next delivery or approved by Customer for future deliveries.

Unique Address ID based on Lat/Lon/Floor/Apt

Buyer and Seller confirm Address based on Lat/Lon and Floor, Apt, Shop, Store etc tied to unique 10 digit code, usually account holder's primary phone number. One time process only.

No need to input Name, lengthy address or any other information on Packages. Simply provide phone number as address code. Example - “From 1724020098 To 9872328968”. For products with available Barcode, only delivery phone number “full or even partial” required.

“Best Driver” Algorithm:

Determines the Best available Driver for any transaction, pickup or delivery or return pickup based on numerous input parameters, including in motion or standby, resting, total time rested, number of packages in hand, distance to pickup or delivery location, total weight carrying, estimated time for current deliveries and calculates the same parameters for all similarly available drivers to determine who the package should be routed to or whether it should be picked up by one and then transferred to another en route.

“P2P Package Transfer”

In event of an emergency, driver can simply choose to transfer all packages to other drivers. Algorithm will decide which driver or multiple drivers should reach original driver to pickup packages and execute transaction, whether other pickups or deliveries. No back office support or knowledge necessary.

Planned Launch:

The hyperlocal delivery service will be launched along with the e commerce platform in Chandigarh and will only service the tri-city area in the initial pilot stage. Out of City or State Orders will be picked up from the Sellers (Business Sellers only, not Consumer) and delivered to a dropoff location with other established national players for delivery via their network.

It is estimated that the initial pilot will service around 100 orders per day with a staff strength of 4. That will be 2 Motorcycle delivery riders and 1 Tata Ace Truck delivery driver with 1 helper. 1 person will be hired for overseeing the drivers and to provide a direct interface between management and drivers and assisting in their day to day operational problems.
After Pilot:

As demand increases, staff strength will be increased on the basis of 30-35 transactions per day per driver. Each transaction involves a pickup and a dropoff. This number will be finetuned per actual operations and might be less to ensure driver safety and health.

Expansion:

The service will be expanded to Delhi NCR, Mumbai, Ahmedabad, Bangalore, Hyderabad, Chennai, Kolkata, Pune and other large cities after the initial pilot in Chandigarh is finished and the entire technology backbone is optimized and operational performance assessed.

Other cities will be added as per transactional and user demand from the parent eCommerce platform.

Hyperlocal Delivery upon Expansion to Multiple Cities:

The service will delivery any and all packages originating and being delivered to its customer endpoints in all cities where it has a presence. Inter State shipments will utilize a existing third party logistics network as a backbone by dropping off all packages at a set dropoff location in Seller City and by picking them up from a delivery hub next day in the destination city, to deliver using its own proprietary technology and tracking.

Team:

Sukhbir Benipal has over 6 years experience in Research on Artificial Intelligence and Machine Learning along with building SuperComputers and creating high performance e commerce Search Engines and Marketplace platforms, PB scale database systems for Billions of Products and Images and Neural Networks for Advanced Image Recognition with self learning algorithms.