Shopin

Keeping Timeless Brands Timeless

Shopin is building the tools for Retail 3.0.

A decentralized global view of purchase data meets a blockchain-powered universal shopper profile, and groundbreaking artificial intelligence.

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Disclosures

1. Shopin is building technology that is deeply entrenched in research and development. Indications within this whitepaper of timelines and of technical or go-to-market strategies may shift to accommodate the nature of the market's response to Shopin's offerings as well as market conditions outside of Shopin's control.
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RETAIL IS NOT WORKING

At the core of why retail is not working is a fundamental issue of not being able to have a full and accurate view of the customer. An oracle is missing.

When the eCommerce customer comes to a retailer site, there is no way to know who they are. Even if they log into the site, the data gathered is only relevant to that retailer and it is incomplete. When they walk into a store, there is no data.

This leads the retailer to turn to behavioral marketing solutions using big data sets that make assumptions on behavior. In addition, the retailer buys third-party data, which is outdated and unreliable. In many parts of the world, laws have been passed to stop this surreptitious gathering of data without user consent.

83% of shoppers see value in being recognized with personalized experiences across all devices. (Magnetic, formerly MyBuys)

73% prefer to do business with retailers who use personal information to make their shopping experiences more personal. (Accenture, via Digital Trends)

88% think retailers should give them the flexibility to control how their personal information is being used to personalize their shopping experience. (Accenture, via Digital Trends)

If the user can be identified via purchase history at multiple retailers, there will finally be a full and consistently current view of the shopper.

Shopin works with retailers to enable their customers to participate via a single global shopper profile with their purchase history data informing superior recommendations to the profile.

This data can be used to drive accurate product recommendations, discovery, and marketing that is based on fact, not fiction, or assumptions. For the first time, the shopper is in the driver's seat. The shopper can also be understood across all retail touchpoints, similar to Amazon, but for the entire web.

There is a place where all retailers share purchase data on a single customer and shoppers have a universal profile... Amazon. This allows retailers to show consumers the right items, at the right price and for shoppers to manage all orders through a single console.

Shopin is bringing this and more to the open web.

RETAIL IS NOT WORKING

Behavioral Marketing

If assumptions-based systems like behavioral marketing worked, then the retail world would not be scrambling for data.

A good example: Imagine you go to Nike.com and look at 20 items, and then you go to Adidas.com and buy a pair of shorts.

In the world of behavioral marketing the thinking would be:

1. You saw the store, and you're interested in what you saw;
2. You must be really interested in what you browsed

In the world of digital advertising, you will then be showered (retargeted) with ads for the 20 items you looked at in a 30-day period, when in many instances you are not interested in those items at all. There is also no signal from Adidas to Nike telling them that you bought shorts.

This is a clear example of how little retailers know about their customers. Only 7% of retailers recognize their customers across different devices and channels. (Magnetic, Formerly MyBuys).

Imagine the bleed on the industry.

Without understanding purchase history across retailers there will never be an accurate view of the consumer.

The only way this can happen is via a single shopper profile across all retailers that is owned and controlled by the shopper but that also empowers retailers to foster a deeper customer connection and align more closely with that shopper's style and product preferences.

Market statistics

1. There were 210MM active U.S. online shoppers in 2015, and 70% of them shop online monthly (Mintel)

2. There were 1.4Bn active shoppers globally in 2015 (Demand Institute)

3. 85% of retailers are inconsistent with their messaging and marketing across multiple devices (Hubspot)

4. For collaborative product recommendations to work, it takes 100MM points of data and it still fails horribly (MIT) - This is a method of comparing users to 100MM other user points of data to show similar items to "audiences".

5. **$20Bn+ spent by U.S. retailers on behavioral marketing in 2014 (Forbes)**

RETAIL IS NOT WORKING

So where is retail working?

I should come as no surprise: Amazon, Alibaba and similar online mega-retailers have created the blueprints for what success looks like. Let's see this in contrast to the rest of retail:

What's the secret of Amazon's power?

THE POWER OF PURCHASE DATA:

- 35% of Amazon's revenue is generated by their recommendation bar, powered by purchase data (McKinsey)
- "89% of our revenue is attributable to personalization based on purchase data" – Jeff Bezos, CEO and Founder of Amazon

THE REST OF RETAIL DOES NOT LOOK GOOD:

- 1 out of 10 in-store shoppers actually make a purchase
- Less than 3% of online shoppers actually make a purchase
- Macy's revenue is down 12.5%
- LBrands (Victoria Secret) revenues are down 45% over the last year
- Forever21 & Barneys: BANKRUPT
- 1 retailer gets hacked a month

RETAIL IS NOT HAVING A BAD DAY. IT'S A RETAIL APOCALYPSE.

Why? Retailers each have very little data on consumers. The consumer has access to the entire retail industry, but brands and retailers have limited access to the consumer and do not share purchase data with each other. Their understanding of the shopper is limited, and padded with unreliable second-class data.

We need a huge shift towards decentralization of Amazon and of retailer and brand purchase data with the right technological artificial intelligence and blockchain tools for retail to survive and evolve.

Retail Rebooted: An Introduction

Shopin is transforming the open retail web into a decentralized Amazon on the blockchain powered by a global purchase-data data fabric, next generation A.I. tools, a universal shopper profile (self-sovereignty), distributed architecture, and cryptocurrency for retail and eCommerce.

Shopin works with retailers to aggregate the decentralized might of their shoppers and purchase data. Retailer brands who join the Shopin Federation enjoy unique advantages of the Shopin technology platform–visual artificial intelligence, ML, protections of blockchain, and deep learning to co-create unique, next-generation cornerstones powering a renaissance for the retail industry.

Retailer benefits:

- Unprecedented online and in-store understanding of the shopper
- Increased transactional conversions
- Your marketing dollars come back into the retail economy
- Enhanced security in a new GDPR-compliant aDHT and blockchain infrastructure built for decentralization
- A paradigm shift in data security

Shopper benefits:

- Enhanced product recommendations / personalization
- Data sovereignty: Securely own and control your data
- Share your profile for perfect gifting
- Get paid when your attention is engaged with a token to spend back with participating retailers
- *Amazon-like benefits, such as:*
  - 1-click checkout on every retail site
  - 1 app for all your wishlists and order management

MISSION

Shopin is dedicated to providing the essential tools to ensure that timeless brands remain timeless and that emerging brands have the best opportunity to become timeless.

We believe that access to a global view of retail's purchase data (including Amazon, eBay and other mega-retailers), our artificial intelligence tools, the Retail Intelligence Data Engine and consumers owning their data are the key to unlock the next retail renaissance.

Testimonials

Retailers, brands and thought leaders are excited about Shopin, and a decentralized renaissance for retail:

"Companies like Macy's are just inundated with data... but a lot of times it's not about having access to data, it's "how do you use the insights from that data to actually make recommendations and implement... The product that Shopin had, which was looking at your portfolio and not only providing insights and analytics, but then taking it one step further and saying "here are some recommendations, and how we would look at correlation of inventory at the SKU-level..." - I thought that was different. It's unique."

VP of Innovation & Business Development at Macy's.

macy's

Watch video >

CEO of TRAUB*

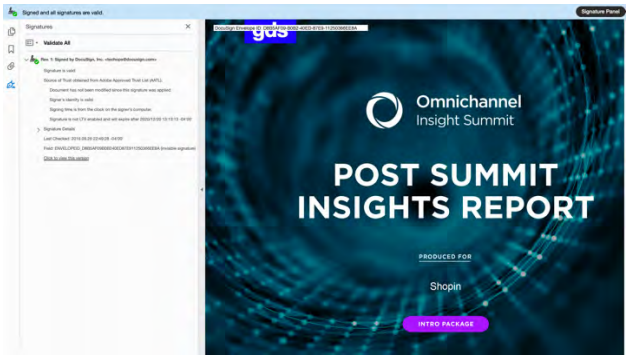
TRAUB*

Watch video >

"I believe that blockchain frankly is one of the most disruptive but also most exciting technologies that will apply to many different industries…
Shopin provides a remarkable tool to protect consumer data and payment information, and the second piece to that is that, is that when a network of retailers partner with Shopin there is in effect a distributed shopper profile that allows for the consumer to get the same kind of customization, personalization that one might find on a centralized platform… I truly believe that with that customization and personalization, because of a distributed shopper profile, combined with the data protection we have a remarkable tool in Shopin."

Testimonials

Recently Shopin met with key decision makers from 14 major retailers for 40 minutes each at GDS Summit, achieving exceptional ratings:



Meetings requesting follow-up

Attendee	Company	Rating	Follow Up?	Suggested Follow Up Date	Comments	Email
Dale Davis	Coach	**10/10**	Yes	05/24/2019		
Debesh Khattoi	Finish Line	**10/10**	Yes	08/15/2019		
Angela Gruszka	MILLY	**9/10**	Yes	05/27/2019	No	
Angela Pih	Halston	**9/10**	Yes	05/21/2019	Very innovative technology	
Wadih Haddad	Ascena Retail Group	**9/10**	Yes	06/15/2019		
Sara Amrani	Michael Kors	**8/10**	Yes	06/14/2019		
Lawrence McMahon	Kohl's Corporation	**8/10**	Yes	05/25/2019		
Karen S. Howard	Renfro Corporation	**7/10**	Yes	01/07/2019	Let's touch base once I am settled in my new role. We have connected on LinkedIn, that will help	

Meeting feedback continued...

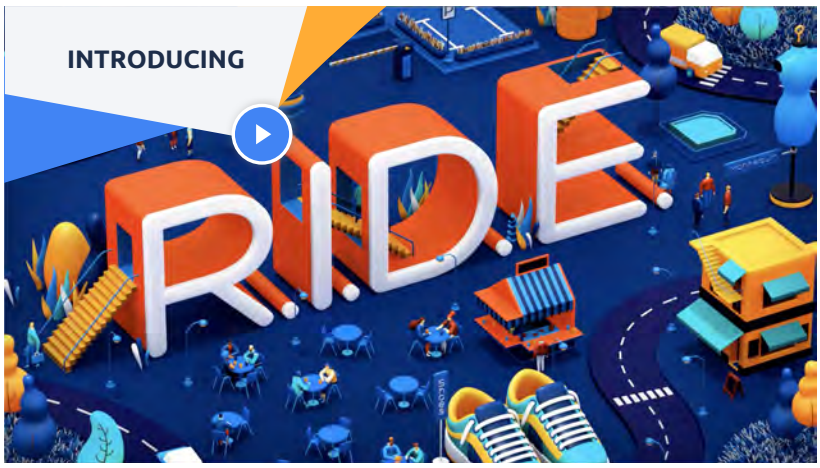
Attendee	Company	Rating	Follow Up?	Reason	Comments	Email
Parinda Muley	Macy's	**8/10**	No	Coordinating outside of this app.	Very interesting technology	
Sumit Srivastava	eBay	**8/10**	No	In built tech for their solution		

R.I.D.E. TO SHOPPER I.D.

Introducing the Retail Intelligence Data Engine™ and ShopScore™

Our first product, the Retail Intelligence Data Engine (R.I.D.E.) decentralizes the purchase data of major retailers, to provide a first-ever global view of retailers, brands, products and the customer behind the action.

This aggregated view of the world of retail enables retailers and brands to make better quanitative-driven decisions and recommendations across their business units, programmatic recommendations in marketing and personalization, whilst laying down the foundations for our Shopper I.D. and ShopChain infrastructure to deliver high conversion-to-sales increases for our universal decentralized shopper I.D.



Watch video >

Retail needs decentralization oracles

Before providing decentralized profiles, it is imperative that oracles are in place to act as sources of truth to provide tangible results in all business intelligence and programmatic delivery. Until there is an oracle (such as a massive amount of purchase data) to power all of these, a renaissance for retail will never be realized nor the vision of a distributed/ decentralized Amazon.

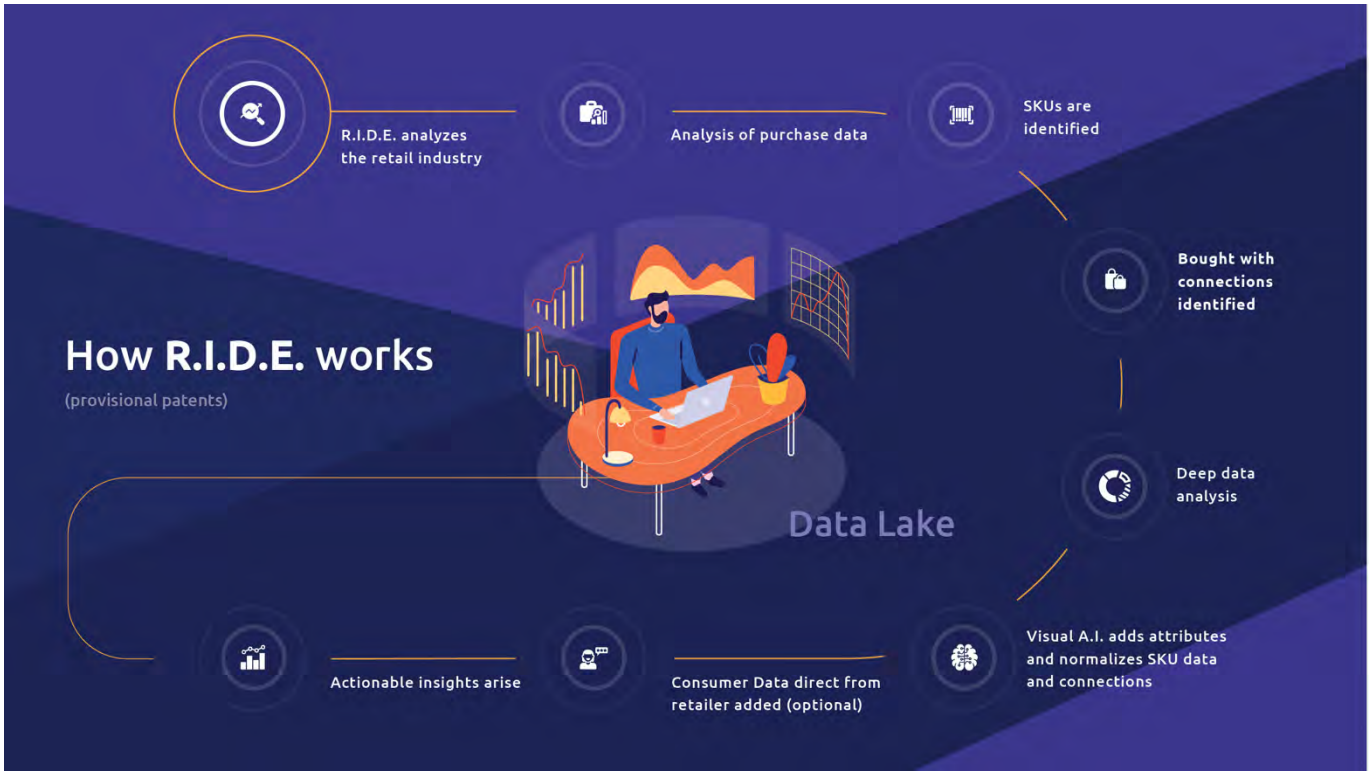
A data fabric based solely on purchase data unveils actual intent post the intent occurring, and post returns. It reveals how every item is sold, how much it was sold for, and what else it is sold with.

Unfortunately, the decks are stacked against the rest of retail:

- Amazon has an enormous data fabric with a huge number of retailers, brands and shoppers with all the purchase data in one place. They also have sophisticated artificial intelligence tools to interpret and use this data across their business intelligence, personalization, and advertising. It is a formidable and expansive ecosystem.
- In contrast, retailers and brands do not share purchase data with each other and suffer from not owning their own technology leaving them to rely on disparate 3rd party providers.

RETAIL INTELLIGENCE DATA ENGINE™ (cont)

How does it work?



R.I.D.E.™ is a patent-protected proprietary artificial intelligence and data fabric, that acquires, and reverse-engineers purchase data from retailer websites.

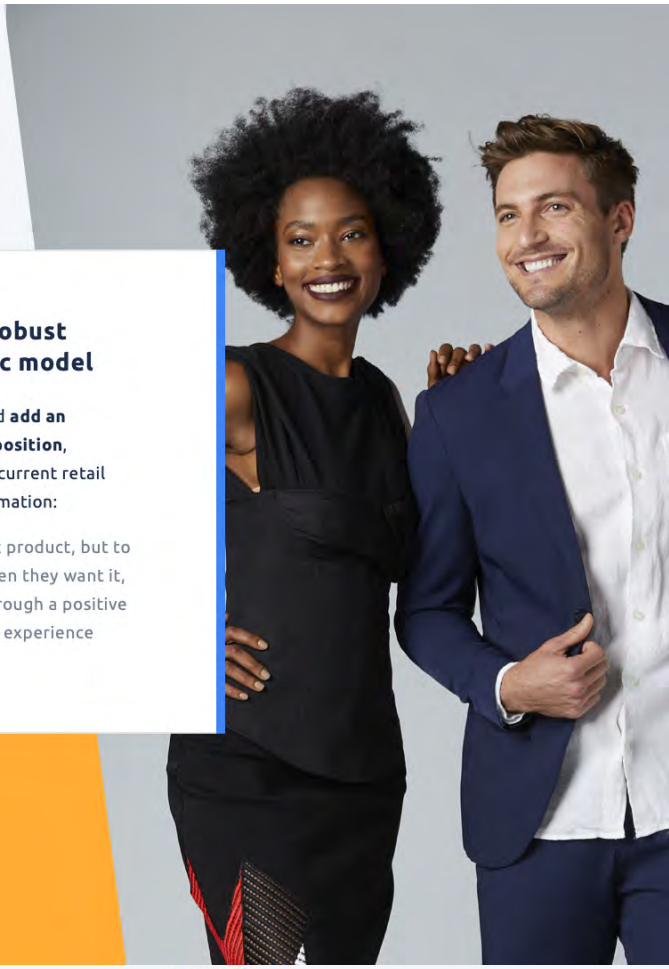
Our visual artificial intelligence and NLP tools detect products across the entire landscape of this massive data fabric, revealing a view of how every product is sold and which items or brands are the influencers that trigger the sale.

Who's in the fabric? Amazon, Macy's, eBay, Bloomingdales, Coach and many more

This data measurement is what we call "ShopScore" ™

RETAIL INTELLIGENCE DATA ENGINE™ (cont)

NEW PERSPECTIVES



Global customer base:

including brand store and ecommerce customers, as well as at authorized resellers and ecommerce sites

Limited access to the customer, while the customer has constant access across multiple channels

to a range of offers and information that influence lifestyle choices and behavior, puts the company at a severe disadvantage with the mega retailers like Amazon

Transition to a robust customer-centric model

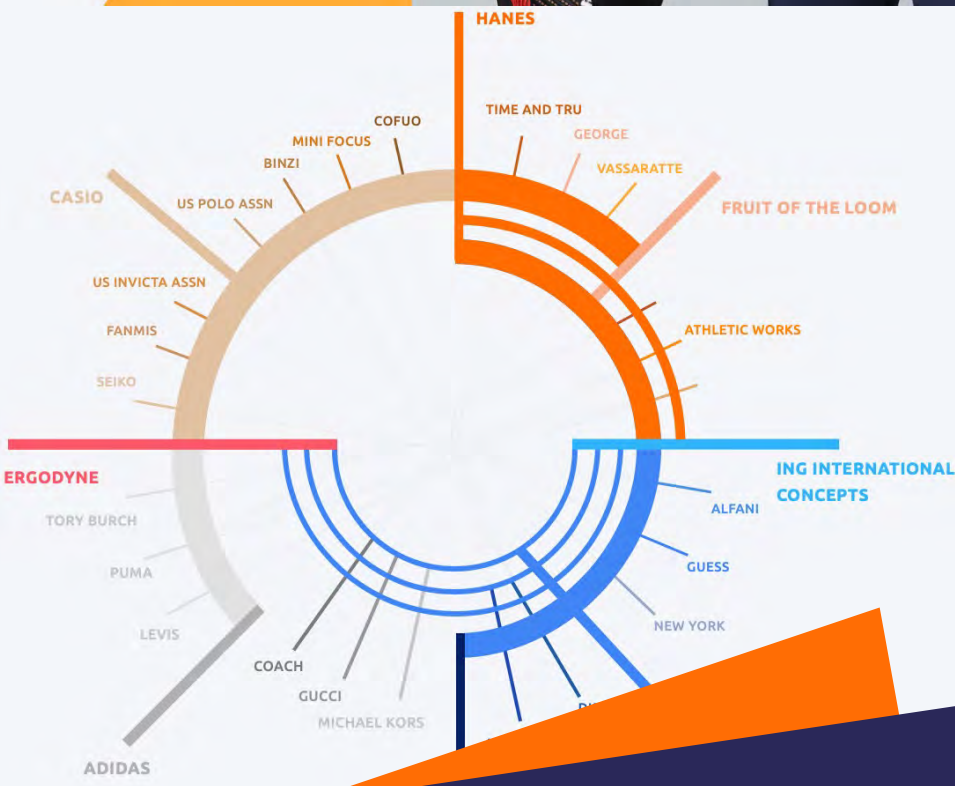
and personalization, and **add an experiential value proposition**, an essential part of the current retail innovation and transformation:

to not only offer a great product, but to **the right customer**, when they want it, for a good price, and through a positive and gratifying shopping experience (online or in store)

R.I.D.E. Capabilities

Product and category profile analysis

- Comparative global analysis
- Brand and SKU co-occurrence essential trends and behaviors
- Identify strength, influence, criticality of the brand
- Identify big opportunities that may be overlooked
- Present state of affairs and predictive (future) insights
- Examples of our data-driven reasoning and intelligence

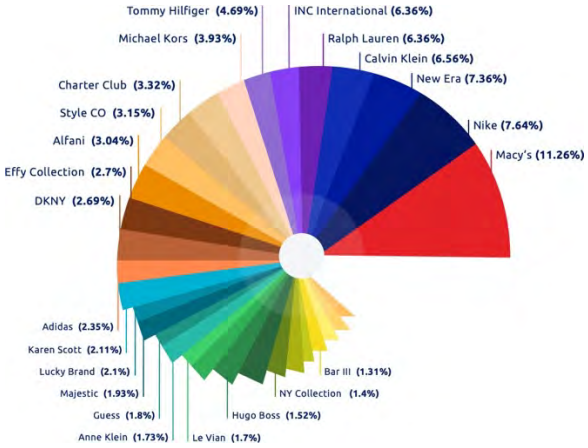


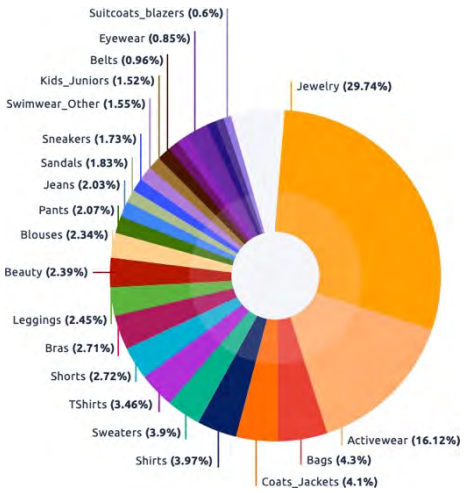
Greatness in granularity

Leveraging Visual A.I. and NLP

By leveraging our proprietary visual artificial intelligence, R.I.D.E. is able to identify and categorize products, even if the written descriptions and SKUs change. We also auto-categorize and auto-tag in scale via machine learning.

This allows us to have great granularity and accuracy to form a universal SKU catalog.





Diving down

The comparative brand and category analysis will be used for describing and ranking the strongest and most successful SKUs, categories and brands in the portfolio.

The system is able to show insights that are meaningful to brands, multi-brand portfolios or retailers.

RETAIL INTELLIGENCE DATA ENGINE™ (cont)

ShopScore™, Co-Occurrence and the ArchCustomer™

What is co-occurrence?

Co-occurrence is a term used to describe how things appear together in sequence or simultaneously.

R.I.D.E.™ goes beyond identifying and categorizing these items, it measures the relationships between those items. This means that one is able to see, statistically measured, how products are bought with each other aggregated across shopping baskets, across all of retail or a set of retailers.

Looking at the above example of Calvin Klein "Gella" shoes, at Nordstrom, R.I.D.E. identifies the strength of the connections between the 1st degree and second-degree products bought with these shoes. It is no surprise that this looks like one person's wardrobe, as these are the statistically most purchased products bought with one another. We call this the "ArchCustomer", or the stylistically archetypal customer behind the action.

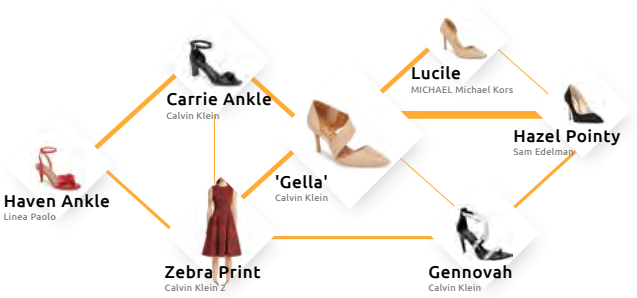
Business intelligence and programmatic recommendation

Shopin can deliver this data to help decide what products to make, the effect of removing a product from a catalog or programmatically to feed into recommendation, personalization, and marketing engines.

RETAIL INTELLIGENCE DATA ENGINE™ (cont)

ShopScore™, Co-Occurrence and the ArchCustomer™

Brand	Cooc_brand	Retailer	Category1	Category2	Cooc_Score
Calvin Klein	Michael Kors	NORDSTROM	pumps	pumps	89
Calvin Klein	Ralph Lauren	NORDSTROM	socks	socks	84
Calvin Klein	Hugo Boss	NORDSTROM	socks	socks	41
Calvin Klein	Nordstrom Mens Shop	NORDSTROM	socks	socks	28
Calvin Klein	Sam Edelman	NORDSTROM	pumps	pumps	26
Calvin Klein	Cole Haan	NORDSTROM	socks	socks	25
Calvin Klein	Nordstrom Mens Shop	NORDSTROM	loafers	loafers	25
Calvin Klein	Zella	NORDSTROM	socks	socks	20
Calvin Klein	Hugo Boss	NORDSTROM	jewelry	jewelry	19
Calvin Klein	Mighty Good Undies	NORDSTROM	socks	socks	15
Calvin Klein	Versace	NORDSTROM	socks	socks	14
Calvin Klein	Honeydew	NORDSTROM	panties	panties	14
Calvin Klein	Halogensupsup	NORDSTROM	bras	bras	14
Calvin Klein	Dansko	NORDSTROM	loafers	loafers	14
Calvin Klein	Sup	NORDSTROM	wallets	wallets	13
Calvin Klein	Linea Paolo	NORDSTROM	sandals	sandals	13
Calvin Klein	Halogensupsup	NORDSTROM	panties	panties	13
Calvin Klein	Vince Camuto	NORDSTROM	sandals	sandals	12
Calvin Klein	Strideline	NORDSTROM	socks	socks	12
Calvin Klein	Nine West	NORDSTROM	sandals	sandals	12



ShopScore™

R.I.D.E.™ measures the strength of the connection between each product sold aggregated across shopping baskets.

It gives a statistically weighted score taking into account:

1. Strength of the co-occurrence
2. Scope of influence – how many products are affected
3. Strength – How internal catalog products affect one another vs affecting external brands
4. Strength of a brand/ retailer's effect on its category or on other brands/ retailers

This system is called ShopScore™. It reveals which products and brands are the influencer products that cause the sale to occur.

Democratizing decentralization of purchase data

Whilst initially Shopin has focused on large retailers and brands (Macy's, ASOS, Coach, Michael Kors, etc.) and mega-retailers (Amazon), we built the product to democratize these tools and data for everyone.

In terms of cost, after analyzing the industry we discovered that many platforms were built on Google Cloud Computing or AWS, which created unscalable costs per API call. To combat this we bought our own state-of-the-art servers which run in a secure co-location. This approach dropped costs from $0.03 - $0.07 per API call to sub $0.01 ranges.

In 2020, Shopin aims to deliver Shopify, WooCommerce, SalesForce, Magento and other integrations which allow companies of all sizes to have access at exceptionally low costs to our business intelligence and programmatic personalization and recommendation tools.

RETAIL INTELLIGENCE DATA ENGINE™ (cont)

ShopScore™, Co-Occurrence and the ArchCustomer™

What function do R.I.D.E.™, ShopScore™ and the ArchCustomer™ play in the overall vision of Shopin's decentralized identity?

Too many projects focus only on the decentralized identity part of the problem of self-sovereignty. However the use cases and importance are difficult to impart to consumers and for mass adoption, there needs to be usability of the data in a way that makes sense to retailers and brands.

Shopin has calculated that it should take 25 purchases to ideally understand a customer's preferences. Until such time that retail adopts our decentralized identity solution in scale, decentralization of purchase data helps retailers find immediate benefits in seeing what that would look like without intense technological overhaul, compliance and legal approval. **We win retailer/ brand trust and approval with very low effort and risk to the client.**

Once a single retailer or brand decides give purchase data back to the consumer to control in their decentralized ID, there will still not be enough data to drive recommendations just from the user data and the retailer/ brand's data. R.I.D.E. provides a powerful data fabric contextually driven by the entire retail web.

The ArchCustomer^{tm} only needs the action on the site of the retailer/ brand to provide a new paradigm in highly personalized recommendations based on the industry's statistics, the retailer data and the customer data or online behavior. We compare the consumer to the "archetypal" users to know what to show and when.

Beyond this, when the user has played one of our white-labeled onboarding games for retailers the personalized recommendations become intensely more accurate.

In-store, R.I.D.E.^{TM} is able to function much in the same way by leveraging our visual artificial intelligence to either analyze what the consumer is wearing and comparing this to the store catalog and the ArchCustomer^{TM}, or doing the same with the products they point out that they love in the store.

SHOPCHAIN™

Retail needs a hard reboot.

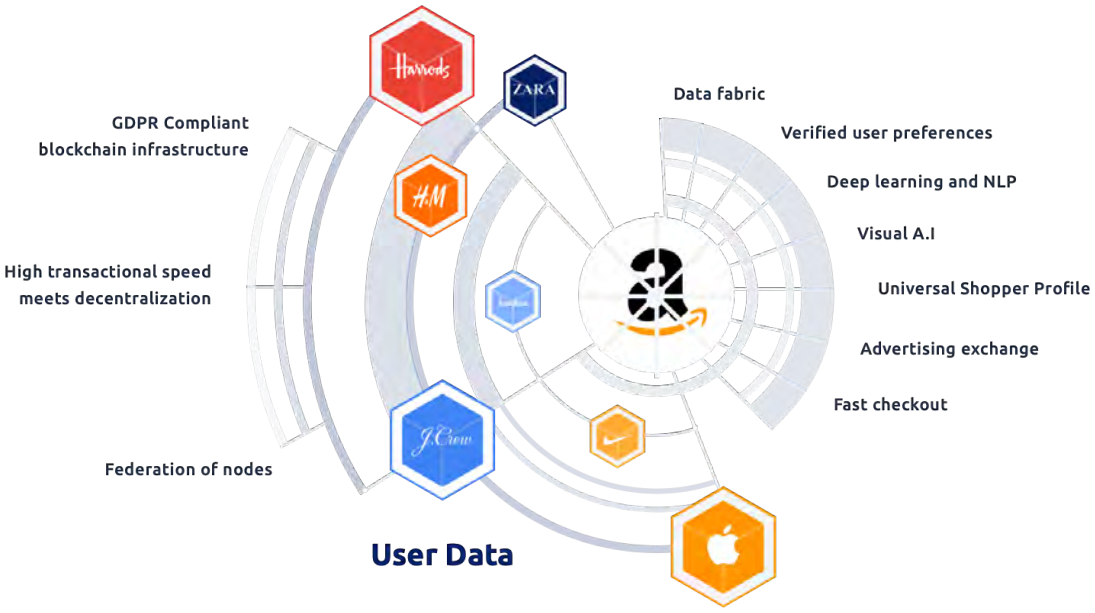
ShopChain™ is the next evolutionary leap in personal data management, ownership, and reward.

By leveraging the power of decentralized systems and the blockchain, Shopin aims to allow consumers to securely manage their personal data, including online shopping data, personal ID, payment information, and user credit reputation while delivering an Amazon-like experience and product recommendation for shoppers on every site and store they go to.

Shopin will put the user in control of their historical purchase data from multiple retailers, and reward the user when retailers use it to enhance the shopping experience online.

We believe that there is no better single source for a shopper's purchase history than themselves, for them to control and share, and shape how they experience the open retail web. Think of it as turning the open retail web into a decentralized/ distributed Amazon model.

Distributed Amazon Requirements



ShopChain™ is a vision and mission that aims to decentralize consumer data in a safe GDPR-compliant distributed asynchronous data exchange, make it portable and functional wherever the consumer goes online and offline.

SHOPCHAIN™

Retail needs a hard reboot.

Phase 2 & 3
Decentralized Identity

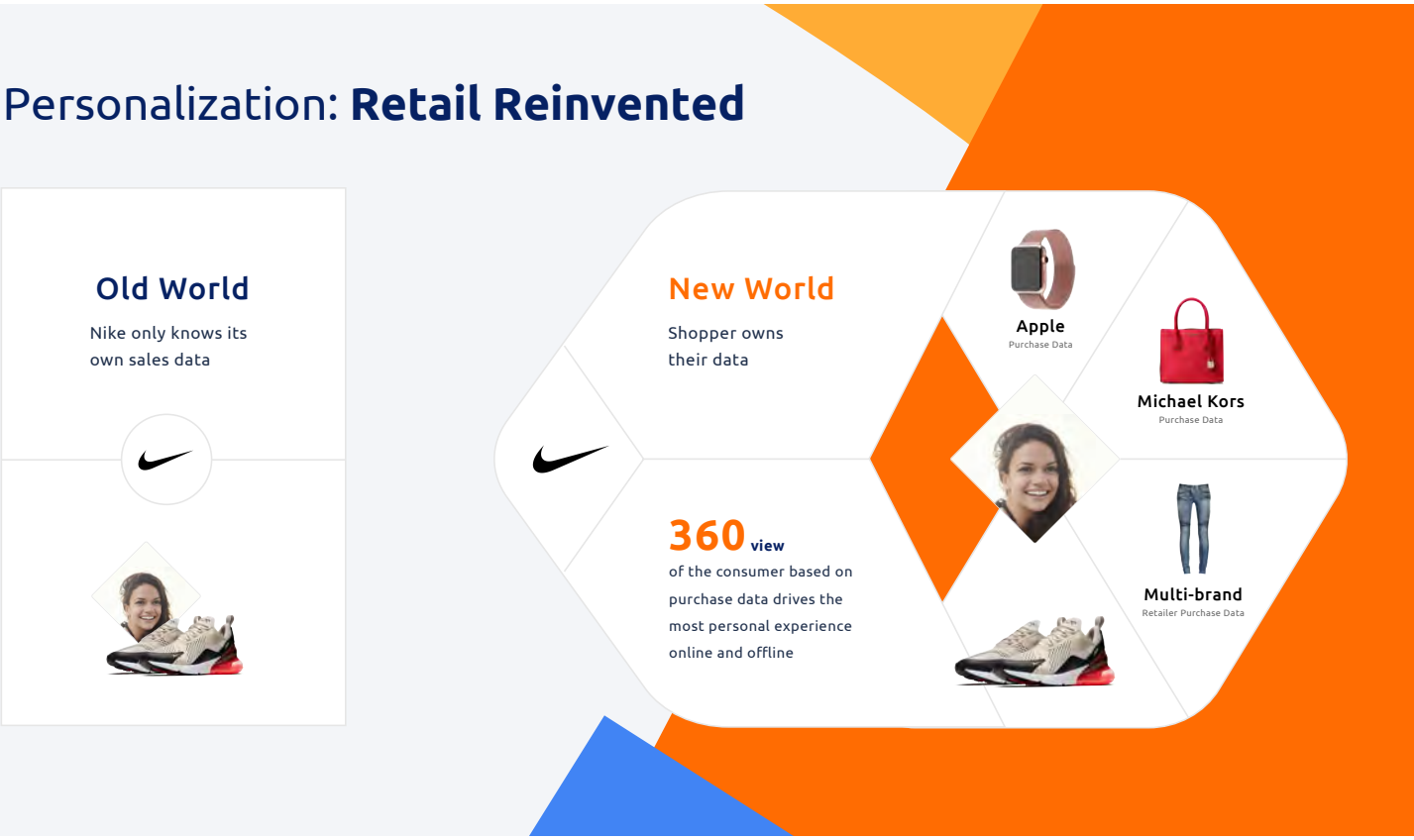
Watch video >

What is ShopChain™?

- a single verified source of all personal shopping data
- an incentive management system for all retailers
- a verified identity source
- securely manages your payment information
- puts all this information in the user's control, allowing verified access by the user when visiting retail sites
- secures the data using blockchain so it is always safe from prying eyes
- empowers retailers to reward shoppers with a cryptocurrency which they can offset against their online and in-store purchases by way of discounts and exclusivity
- a cryptocurrency that does not require a money transmitter license

SHOPCHAIN™

Retail needs a hard reboot.



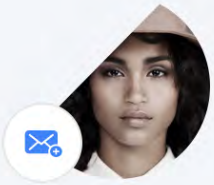
The Shopin App and Wallet

Via the Shopin App, wallet and single-sign-on, shoppers will be recognized across the retail web via their historical purchase data. It is a single way of achieving a true understanding of who your customers are, based on what they put value on as they visit every site, ensuring that they have the most personal shopping experience, built just for them.

- Shopin will employ a mobile app which will store and distribute personal data in an encrypted form on the distributed file exchange called ShopChain™
- The App will secure all the data using standard encryption techniques.
- The Shopin App will also act as a wallet for the management of the Shopin Tokens used as incentives in partnership with retailers, rebranded as the retailer's own token
- Shopin users will be able to log onto retailer websites using the retailer login (oAuth) or instore with a simple QR code

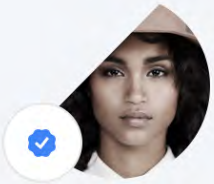
How It Works

01



Retailer invites customer **to join Shopin.**

02



Customer opts in to create a Universal Shopper Profile.† Retailer populates profile with 3-5 years of **verified first party purchase data.**

03

Shopper enters personal preferences **via Shopin IQ game** which are added to the USP.

04

Shopin gathers the purchase data of the user **from all sources** in the Federation and consolidates it in the USP.

05

Universal Shopper **Profile is created.**

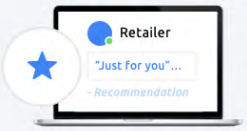
06

New retailers continue to join the Federation and **add user purchase data and preferences** to further enhance their profile.

07

A.I. analyzes retailers inventory based on knowledge from USP.

08



Just for **You personalized recommendations** are offered the shopper on the retailers website.

RECOMMENTATIONS AND ARTIFICIAL INTELLIGENCE

Retail in disarray

Whilst building our solution, Shopin discovered a series of opportunities to resolve key challenges in creating a decentralized / distributed Amazon model.

One of the biggest ones was that as humans, we are not great with consistency. Specifically, this manifests in retail in two ways:

1. Mistakes or omissions in spelling, correctly categorizing and labeling items;
2. We creatively describe products in different ways, either because we feel a need to express our own creativity or a new description falls in line with a brand guideline.

Our team would find these issues would manifest in:

1. The same product having different SKUs or descriptions across different retailers
2. Missing descriptions
3. Paired down descriptions

When building a universal SKU catalog that overarches all of retail, this presents serious challenges for our natural language processing (NLP) engines in correctly categorizing products. As a result, we turned to visual artificial intelligence for a solution.

Why visual artificial intelligence?

Since online retail is an intensely visual experience, even when one cannot rely on written descriptions being constant, correct or present, luckily a dearth of images always accompanies the product listing. Visual A.I. helps by analyzing the product images and breaking them down into attributes and categories that we teach our system to recognize. This metadata is then compared to our existing library for matches and combines or adds descriptions as is applicable, as well as categorizes them correctly.

Analysis of existing solutions

Our analysis of the existing visual artificial intelligence engine market offerings revealed many learnings, which led us to discover the following challenges:

1. A common flaw in their build was an over-reliance on a large team of taggers and stylists working through tens of thousands of images to categorize them. This is a hard proposition to maintain and scale both financially and systematically.
2. Some offered NLP and some offered visual A.I. – rarely did they offer a robust solution of NLP, visual A.I. and machine learning (M.L.) cohesively interoperating from day one.
3. They have pretty much all been built on Amazon Web Services and Google Cloud Computing, or similar. This is a totally understandable obvious choice for scalability and uptime. All choices have costs, however. In this case, the price is heavy spiraling costs that have to be passed onto the client. In many cases, the vendors were charging $0.07 per API call or breaking a single SKU into attributes. When one is dealing with a few SKUs, that's not terrible, however when dealing with tens of thousands, hundreds of thousands or even millions of SKUs, as well as the constant influx of new SKUs – the costs become absolutely prohibitive.
4. Some had sub-optimal approaches in identifying products
5. They had all been built on online catalog data and social media data. There was no access to purchase data to understand the customer behind the action, in any form of scale.

As a result, it was impossible to partner with an existing solution

Note:

Although Shopin has created its own innovative approach and technology for visual artificial intelligence, it is a tool in our overall products. We have no desire to sell visual A.I. as a product in such a saturated market. Visual A.I. by itself has become highly commoditized.

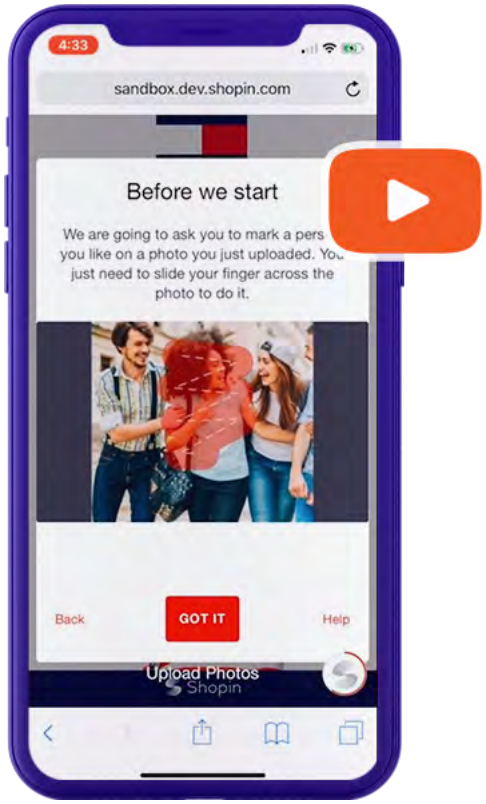
RECOMMENTATIONS AND ARTIFICIAL INTELLIGENCE(cont)

Approach

Our approach has been shaped through critical thinking and intense research and development. Our first foray was built working with a significant external vendor to do the research required. At one time we had 14 engineers and data scientists, combined with 25 taggers intensely focused on solving the visual artificial intelligence problem. This approach taught us everything about what we wanted to build next.

1. We use stylists sparingly, only to validate categories and deal with stylistic anomalies (for example: seeing that leopard print is a category of animal prints vs polka dots which is a pattern). We removed the reliance on taggers to identify and categorize hundreds of thousands to millions of products and teach the engine. Instead, we built a programmatic auto-categorizer and auto-tagger leveraging machine learning expertise of our team
2. Our NLP and Visual A.I. engines are constantly working together and teaching each other in a unique manner:
    a. NLP examines the descriptions of all the products (SKUs), identifying and categorizing them within our data fabric and universal SKU catalog.
    b. Where description is too light or missing, the visual A.I. analyzes the images of accompanying the products and breaks it into categorized attributes
    c. Our engine scours Shopin's data fabric to see if the same or similar products already exist in the fabric and see if there is any new data to add or conflicts to resolve (such as erroneously renamed products)
    d. Our engine compares the NLP and visual A.I. outputs and blends the two to produce the optimal descriptions, categorization, and tagging.
3. When experiencing costs of tens of thousands of dollars a month just running R&D (not even live and in production) using Google Cloud Computing and similar platforms, our team purchased sophisticated Lambda (https://lambdalabs.com/deep-learning) deep-learning machines focused on serving our requirements. For less than the cost of one month of billing on GCP, we contained the spiraling costs. Our servers now sit in secure co-location reducing running costs of R&D or serving clients by 15x-20x.
4. In the search for a huge amount of purchase data, we invented the Retail Intelligence Data Engine and ShopScore that feed our recommendations, unveil actual intent and the customer behind the action. We also created onboarding visual games for retailers to engage their shoppers on their own sites to gather verified customer preferences.

RECOMMENTATIONS AND ARTIFICIAL INTELLIGENCE(cont)



Watch Video >

Visual A.I. identifying object attributes

On the left you can watch a video of Shopin's visual artificial intelligence at work on a brand's products, identifying items. Behind the scenes our system is breaking the items into several attributes such as (but not limited to):

1. Type of neckline
2. Fit
3. Length of sleeves
4. Materials
5. Colors
6. Styles

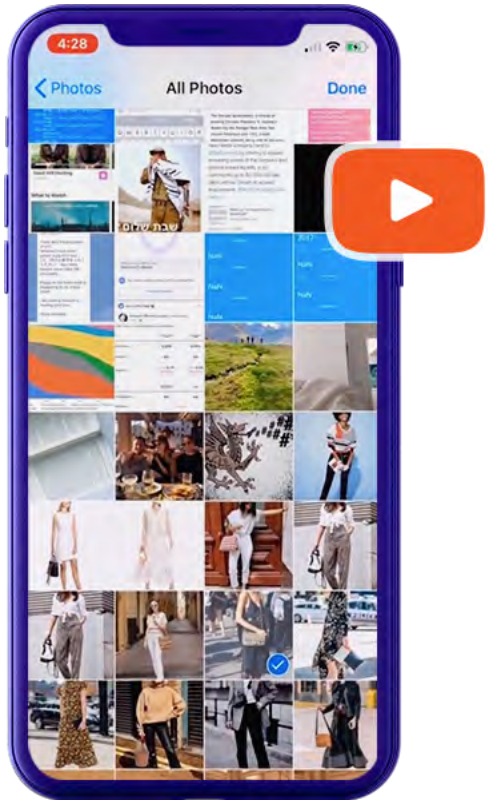
Onboarding experiences

Until such time that there is sufficient purchase data given back to the shopper, Shopin recognizes that one of the best ways to provide the best recommendations against our data fabric is to engage the shopper to verify their preferences.

We provide white-labeled visual surveys to the brand to engage the shopper and create more robust profiles, all powered by our proprietary artificial intelligence tools. Watch the video to the right to see one in action.

Watch Video >

RECOMMENTATIONS AND ARTIFICIAL INTELLIGENCE(cont)



Watch Video >

Visual A.I. matching recommendations

On the left you can see Shopin's visual artificial intelligence engine producing recommendations just based on what a user looks or chooses.

Today, with the Retail Intelligence Data Engine in place, combined with our A.I. tools alone, Shopin can produce highly accurate recommendation, personalization and programmatic targeting.

Combined with user-verified preference data from our onboarding experiences, and (at a later stage) shopper purchase data in a decentralized I.D., retail and other industries are poised for a renaissance.

A sustainable solution

It is time for a solution that puts verified purchase history data in the customer's hands, and rewards the shopper for access to a constantly growing data pool which acts as an oracle... yet never exposing that data.

The more the decentralized pool grows, and the more the data is leveraged successfully, the more valuable the data becomes.

We are creating an economy of verified data at Shopin, and shoppers are at the heart of our rewards mechanism.

Our core benefits for consumers are:

1. **Transparency and control:**
See an activity feed of how your data is being used. Easily control permissions and sharing.

2. **Accurate recommendations, reduced discovery:**
Whilst owning your own data, when logging onto a retailer site with your Shopin profile, retailers can give you a more personal "just for you" experience. Yet, the retailer never sees your data. The Retail Intelligence Data Engine connects to your data and the retailer catalog to provide recommendations. This includes showing you the best products, the right size, and style preferences as well as giving you the right pricing deal based on what you actually pay for products. You will even get one-click checkout on every site, just like Amazon.

3. **Centralized order management**:
Wishlist products from any Shopin-powered retail/ brand site, and a one-click checkout - no matter how many products or from where they originate. You can track and manage all of your returns from one place.

4. **Sharing:**
Share access to your Shopin taste profile with friends and family so that they see the world of retail through your eyes, buying you the items you desire. You can also gift tokens to one another. We call this your ShopinLens™. Turn someone else's lens on, and you get their programmatic recommendations, whilst their profile becomes enriched.

SHOPCHAIN™

The ShopChain™ body of work is dedicated to our friends who supported our mission.

Including but not limited to:

Mr. Activated
Brad Yasar
Rana Gujral
Mark Plaskow
Richard Linares

ShopChain™

An approach to create a new layer of decentralized infrastructure that provides value to retailers by assigning consumers ownership of their data.

Technical Whitepaper v0.01 (aka Skunk Works)

Lane Campbell and Georgi Gospodinov
https://shopchain.shopin.com

Abstract

We describe a novel approach to a GDPR compatible blockchain relying on proof of activity for consensus with reasonable security, survivability, and with provable decentralized governance, decentralized identity management, decentralized naming service, and scalable performance, that operates without degradation regardless of nodes geographic distance, while acting as a **decentralized data exchange.**

This approach ensures GDPR compliance by taking great care to store all personally identifiable data in a manner that is both mutable and able to be nullified through indexing with a distributed hash table that routes it between nodes that store the aggregated data in persistent storage outside of the immutable ledgers that power the naming service and audit logs.

Through this approach, the immutability of blockchain can provide proof of activity within the network by serving as a shared name service and acting as a log of auditable events where the exchange of data has taken place within the network. It is with the amalgamation of these proven decentralized technologies that we establish an enterprise-grade network capable of empowering users to have complete control of their own data.

1. Terminology

To help aid in the readability of this document we have prepared a table that outlines the terms and corresponding definitions. If you have any questions about this document do not hesitate to reach out to the authors using the contact information above.

Term	Definition
Network	This is a blanket term used to describe the infrastructure that facilitates the exchange of data as described herein.
Node, Data Custodian, Custodian	This is a retailer participating in the network.
Super Node, SNODE	This is a wallet provider participating on the network.
Decentralized DNS, dDNS	This will be powered by NameCoin
Decentralized Identity, DID	This will be powered by NameID and OpenID
Distributed Hash Table, DHT	We will be using a modified version of Kademlia
Data Connector	We will be using SQLAlchemy to write middleware that can talk with enterprise systems to build the DHT and to transfer data between Nodes and Super Nodes.
Setup Wizard, On-boarding Wizard	This will be a web based interface for on-boarding a new server to the network.
ShopStack	The software that acts as middleware for connecting a node to a retailers database of consumer data. This is what is driven by the Setup Wizard.
Universal Shopper Profile	This is a profile created on the network with structured data that represents a consumer.
Universal Transaction History	This is unstructured data stored outside of a Universal Shopper Profile on the Super Node.
Consumer, Customer, User, Shopper, End User	These terms are used interchangeably to describe the individual who will own their data on the network. The terms used to describe them will vary based on context in how they are participating.
Operator, Node Operator	This is the person or entity in charge of

2. Overview

This approach provides an enterprise grade network to transport data between consumers, retailers, and wallet providers. We purposefully avoid inventing technologies whenever possible and instead opt to leverage our expertise in algorithms and networks to create a new type of distributed hash table network to act as an asynchronous data exchange. This technical leap is necessitated by the challenges facing well established retailers and brands who are suffering from declining business trends and well publicized data breaches. In the age of limitless online competition, these brands have failed to keep up technologically and have yet to find a strategy that provides sustained growth. Retailers are aware that personalization in their marketing and in the consumer experience yields revenue growth. Few retailers have succeeded in implementing it as they lack access to data on their consumers, due in no small part to the existing barriers to sharing data between retailers.

Our approach enables a consumer to own their data regardless of where it is created on the network. The consumer can elect for their data to be custodied by a third party (e.g. ShopIn.com), another third party on the network (e.g. Microsoft Azure), or to hold it on their own devices (i.e. Microsoft Project Bali) that are peered to the network. We seek to ensure that a consumer can determine where their data is stored, how it is accessed, and if they would like to see it monetized. While the data exchanged must be able to be forgotten, all of the activity that occurs to data stored in the solution will be tracked in our blockchain, creating an immutable audit log.

Decentralization of consumer data provides retailers the ability to create more personalized messaging to consumers. This is accomplished by returning ownership of data to consumers through a decentralized network. Consumers will have true freedom and optionality for where their data is stored, how it is accessed, and how that data is monetized. Retailers are going through an apocalypse. Decentralization enables personalization on a level that exceeds anything possible with a centralized system.

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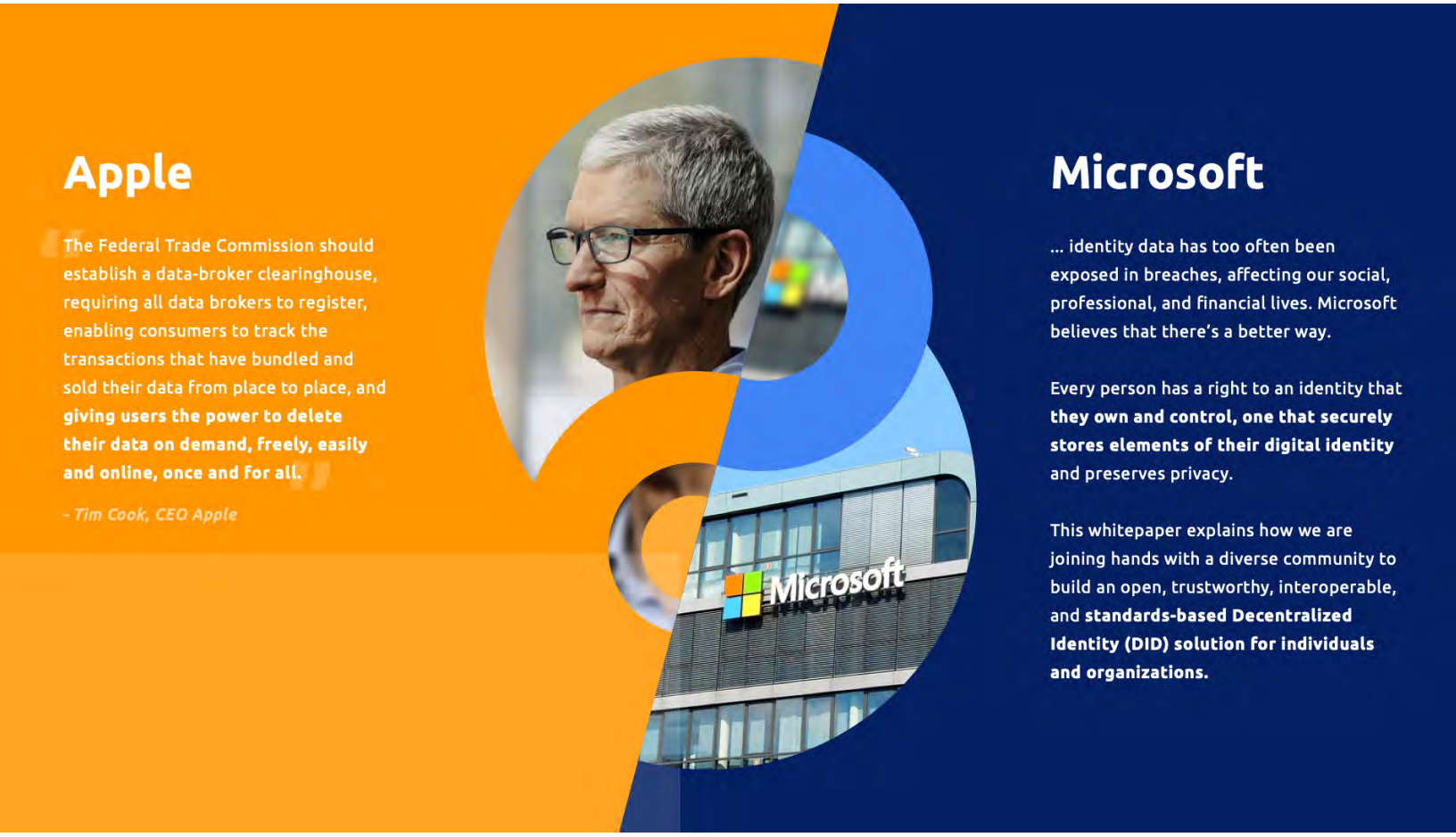
2.1. Why ShopChain™?

"He who moves not forward, goes backward"

Johann Wolfgang von Goethe



In the last two decades, the Internet has brought a massive technological shift to the retail industry. We have witnessed new shopping behaviors being brought to the developed world and an overall increase in the consumer class within developing nations. While the retail industry has grown by orders of magnitude, this transition has been demonstrably catastrophic for many established retailers.

It has become commonplace to read reports of massive and devastating data breaches. These breaches are difficult to prevent with legacy technologies. Blockchain technology has matured and is ready to take the onus of securing this data. We believe that retailers need a platform where they can securely decentralize data in an effort to ensure the integrity, security, and privacy of their customer information.

2.1. Why ShopChain™? (cont)

The incumbent leaders of the retail industry today are closing stores and going bankrupt. The media has dubbed this trend the “retail apocalypse”. Analysts regularly speculate that prominent surviving retailers have uncertain futures. We believe that the problems faced in the retail industry are solvable. We can prove that if retailers are technically equipped to embrace change they will get back to growth. We are ready to introduce that technology. Our approach brings new infrastructure that is designed from the ground up for the retail industry to provide this functionality.

2.2. Retail Industry Market Conditions Necessitate Decentralization

Retailers view the data they collect on consumers as a valuable asset. In some jurisdictions, consumer data is regulated and the exchange of consumer data to a third party faces legal barriers. In conventional thought, it is also considered anti-competitive for retailers to participate in the direct exchange of consumer data between one another. The existing regulatory and conventional thought barriers have limited each individual retailer to build their business solely by working with the data they have collected themselves or have been able to purchase from a third party. Third parties that sell consumer data to retailers include data brokers and credit rating agencies.

There are several market leaders in the retail industry that at the time of authorship control very large data-sets stored in data silos. These market leaders know they have an unfair advantage by being able to craft uniquely personalized experiences for their customers. Jeff Bezos has publicly spoken to how effective personalization has been to growing Amazon’s business. On one occasion, he attributed almost 90% of all their sales to their personalization engine. We recognize how powerful this data is today and how powerful it will be in the future. We choose to design a decentralized network so advanced that not even the authors of this paper will be able to control the data on the network. With decentralization, a strong economic model for participating on the network, and proof of activity for consensus, we believe that no one entity can own the data ever again. We hope to mitigate the consolidation of industry and encourage future entrepreneurship with this approach.

2.2. Retail Industry Market Conditions Necessitate Decentralization(cont)

Retailers currently work with these third parties to acquire a more complete profile on their customers. Purchased data from one of these third parties are always considered stale or obsolete unless a mechanism exists for it to be synchronized from the place it originated to the retailer who has purchased it. There is currently no feasible way for that data to be kept up to date after it is sold at scale. Limited amounts of data being available to retailers make it more difficult to create personalized experiences when they market to their customers.

Consumers convert at a higher percentage when they receive a personalized experience. Retailers are accelerating their efforts to provide personalized marketing and shopping experiences to consumers. To personalize the consumer experience, a retailer must collect and use data about the consumers who purchase from them. It is also possible for retailers of any size to acquire new customers by targeting their desired demographic through social media or personalized ad campaigns tailored for that population.

With our approach, we seek to aggregate the many partial data sets on the consumers that retailers hold individually. We then seek to assign ownership of this data back to consumers.

When speaking with retailers, we have received feedback that there is no anticompetitive perception of putting the ownership of the data into the hands of the consumer.

It is the perfect market opportunity to decentralize the data stored by retailers so it is owned by consumers. Participating retailers on the network empower consumers to own their own data. It is the consumer who can then elect to monetize their data either directly or through a third-party data custodian.

3. ARCHITECTURE

3.1. Design decisions

The manifestation of this approach began by contemplating the needs of retailers. We recognize that bringing users into a decentralized network individually would be a monumental task that is not well suited to a small team. We are aiming to partner with retailers who can bring large numbers of users onto the network at one time. To attract retailers, we need to produce a value proposition they can understand. To any retailer, value means growing revenue. That means all the work being done on our approach is focused on driving additional revenue for retailers. To achieve higher levels of revenue for retailers, we must present a value add proposition to the consumers.

Consumers value financial incentives to save them money when shopping. Ultimately, it is the consumer who picks winners and losers as they choose how to spend their money. The founding team of this approach will launch its own custodian service under ShopIn.com to reward consumers with a token that can be used for discounts with retailers. The approach itself will remain an open standard that others can also use to work with retailers and try their own approaches. Our custodian service will offer financial incentives to consumers who allow their data to be used for personalized marketing.

3. ARCHITECTURE

3.1.1. BLUEPRINT

Architecture: Asynchronous DHT + Blockchain

	RETAILER A	RETAILER B	RETAILER C	RETAILER D	SHOPCHAIN	
Decentralized authentication solution for the shopchain network	Open ID					SHOPIN
OPFS API Data Exchange	Decentralized API					
Store of Universal Shopper Profile	Retailer A DHT NODE	Retailer B DHT NODE	Retailer C DHT NODE	Retailer D DHT NODE		
Retailer Ownrd SQL Instances of Consumer Data (may or may not include transaction history)	Retailer A Consumer Data	Retailer B Consumer Data	Retailer C Consumer Data	Retailer D Consumer Data		Microsoft Project Bali
Audit Log	Retailer A ETH Blockchain NODE	Retailer B ETH Blockchain NODE	Retailer C ETHBlockchain NODE	Retailer D ETH Blockchain NODE		
Retailer Ownrd SQL Instances of Consumer Transaction History Data (may or may not be part of Consumer Data)	Retailer A Transaction Data	Retailer B Transaction Data	Retailer C Transaction Data	Retailer D Transaction Data		
Data stored in Retailer Owned SQL Instances that surrounds a product image of the catalogue	Retailer A Product Catalogue Context Data	Retailer B Product Catalogue Context Data	Retailer C Product Catalogue Context Data	Retailer D Product Catalogue Context Data		Compliant Custodian / Wallet Provider
Image of a product stored in the product catalogue. Typically in a fiele system but may be in SQL	Retailer A Product Catalogue Image Data	Retailer B Product Catalogue Image Data	Retailer C Product Catalogue Image Data	Retailer D Product Catalogue Image Data		

3.2. Stakeholder requirements

Retailers understand there are approaches that increase revenue including:

a. Personalized marketing automation software
b. Personalized shopping experiences for consumers
c. Retargeting automation software

3. ARCHITECTURE

3.2. Stakeholder requirements(cont)

To help retailers grow revenue while we bypass the anti-competitive concerns, we take an approach that ensures:

a. A decentralized network between retailers and consumers where retailers can store and access all the data they collect on their consumers without sharing that data with any other retailer
b. Ability for retailers to market to their consumers with increasingly personalized content
c. That there is a reasonable monetary cost for new users to be added to the network so only serious actors participate, and abuse is mitigated

Consumers must trust the network and be incentivized to keep their data with a custodian:

a. Proof that their data on the network is reasonably secure, portable, mutable and able to be nullified so as to be in full compliance with GDPR
b. Ability to claim a username on the network that tracks where their data should be sent, to determine what custodian they are using, and to let other network participants (their friends) share data with them
c. Control over where their data routes on the network regardless of where the data originates

The network must build trust with all participants and include provable survivability:

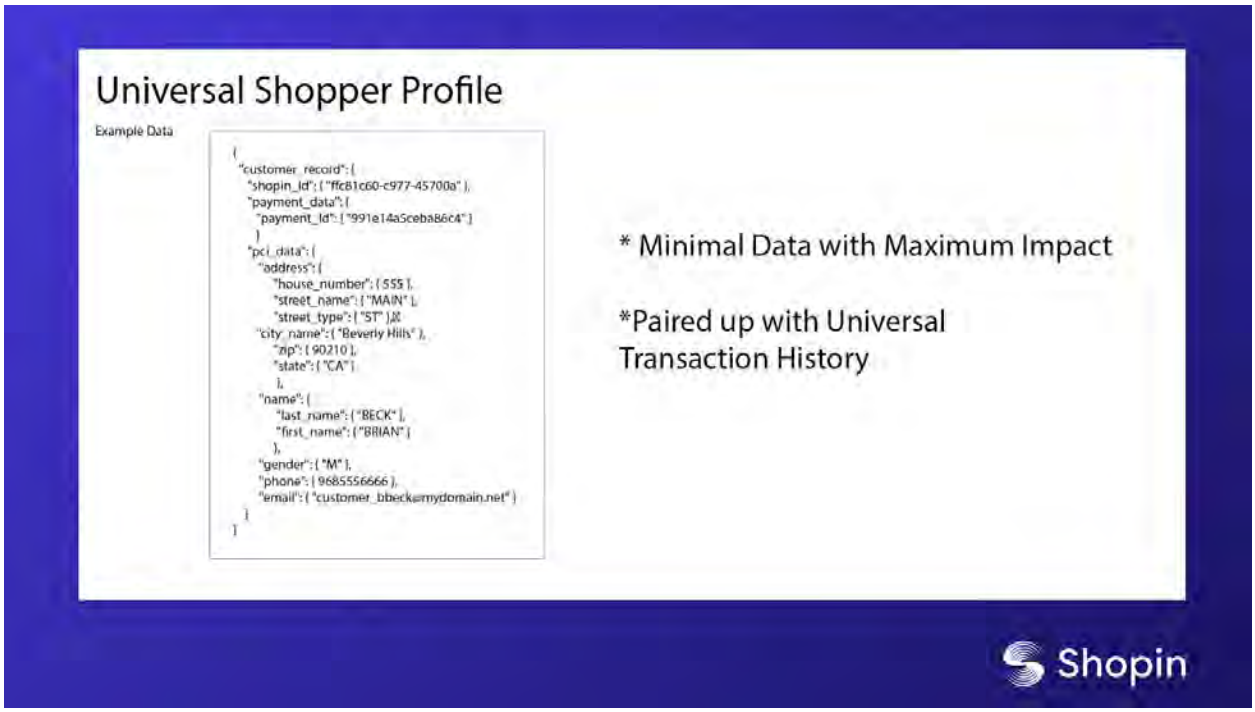
a. Software to check that a node is online before sending data to it
b. Validation that nodes and super nodes are who they say they are
c. Software that can connect to multiple super nodes over DHT
d. Software that provides non-nominal encryption using keys that are ultimately controlled by the participant

3. ARCHITECTURE

3.3. Technology

This approach all begins with each user owning their own decentralized identity that can manage the security on data as it enters an asynchronous data exchange leveraging distributed hash table technology. The DHT will index the data required to form a universal shopper profile.

The Universal Shopper Profile is the centerpiece for how data is stored for a user. We outline below the default structure of our approach for this component.



The network in our approach requires the use of various technologies to provide all of the outlined functionality. To set realistic functional requirements, we focus not on the human who is making purchases online but instead on the retailers who will be key for driving the adoption of our technology. This network is designed to be self-regulating in order to sustain itself beyond the initial phase of the ongoing transition to a future where decentralized data storage and identity management are used by all online retailers.

3. ARCHITECTURE

3.3.1. Overview

Our team has identified and plans to integrate, several core decentralized technologies into our approach. The core of our security model and the usability of our network stems from each participant having a decentralized identity. Encryption keys for different nodes and super nodes can be stored in our decentralized identity. We have chosen OpenID for this critical component because it is a provably scalable enterprise decentralized technology.

3.3.2. Usability

It is imperative that we ensure users on the network are not intimidated by this new technology. With our approach, a consumer can choose a human readable name as their username. This username will be able to store information on where the data assigned to that consumer should be routed.

3.3.3. The ShopStack

Each node needs access to retailer data and the mechanism to encrypt it in order to provide it to a super node over the DHT. With our ShopStack middleware we leverage SQLAlchemy, MongoAlchemy, and other open source data connection and encryption libraries. We foresee this as a backend technology stack that enables nodes to encrypt and transfer data that is stored at retailers in various persistent storage environments.

3. ARCHITECTURE

3.3.4. Decentralized DNS and Naming Service

To facilitate the naming system in a decentralized manner, we will implement within our network instances of both NameCoin and NameID. NameCoin will provide a decentralized naming service akin to a decentralized DNS. NameID will provide integration with OpenID for facilitating private storage and reasonable security for authentication.

These technologies will allow for nodes on the network to provide consensus for names chosen by users. Network participants will be required to pay a fee to create user accounts. This will act as a barrier against abuse and ensure the network can offer an immutable audit log for data transferred as proof of activity.

3.3.5. Decentralized Security

With this approach to identity management, our nodes and super nodes will be able to store and gain access to private keys from anywhere in the world. These keys will be generated for each retailer and from each super node. Nodes and super nodes that are entrusted with encryption responsibility will use their access to these keys for the encryption and decryption of the consumer data. It is vital to our mission that we select robust and proven technologies to build this infrastructure so-as to truly provide consumers with ownership of their data.

3.3.6. Distributed Hash Table

At the heart of our network lies an implementation of a distributed hash table. We start with Kademlia. We will not be able to rely on the vanilla version of Kademlia as its implementation of XOR for finding peers presents peering challenges. In our approach, we have restricted the network so that multiple nodes can establish a many-to-one peer relationship with a super node. The super nodes each are permitted to establish a one-to-many peer relationship with multiple nodes. The data in the distributed hash table is encrypted by ShopStack before being transported to the super node chosen by the retailer during the initialization phase.

3. ARCHITECTURE

3.3.7. Decentralized DNS and Naming Service

Maintaining GDPR compliance requires that we transmit and store data in a manner that is both mutable and can be nullified. The data exchange model of our approach ensures that user data is never stored in an immutable manner. The immutable ledgers on the network are used specifically for proof of activity audit log and for the naming service. This design gives us an unfair advantage of proven scalability over other the approaches taken by alternative blockchains that promise to move large sums of data at scale.

Given the need to ensure we have decentralization at scale, with full GDPR compliance, our approach makes use of a distributed hash table network that transfers data between peers using its provably scalable and enterprise grade routing capabilities. We have taken the approach of customizing DHT:

a. to allow nodes and supernodes to perform an asynchronous exchange of data between one another;
b. to change how the routing facilitates these exchanges over complex networks.

These technologies will allow for nodes on the network to provide consensus for names chosen by users. Network participants will be required to pay a fee to create user accounts. This will act as a barrier against abuse and ensure the network can offer an immutable audit log for data transferred as proof of activity.

3.3.8. Decentralized Data Exchange

There are many available options for exchanging data over the internet. We choose DHT for its functionality and decentralized functionality. It has the capability of routing between networks to speak with peers behind various barriers, remotely searching a participant on the network, and requesting additional data from a peer. This specific feature set is ideal for our use case. This approach relies on a modified version of the Kademlia distributed hash table software. Our approach to DHT is to use the key value pairs distributed between a retailer and the super node as a store of consumer data that will be used to create a Universal Shopper Profile.

3. ARCHITECTURE

3.4. Open Source and Open Standards

It is our wish to see this network adopted by as many nodes and super nodes as possible so we are releasing everything as open source. We are working with the IEEE to establish the Universal Shopper Profile and the Universal Transaction History as open standards. We would like to co-create all of this work with other leaders in the industry.

3.5. Monetization

This solution is proposed as the manifestation of our team's shared belief that humans who shop online should ultimately be able to decide how their data is stored, accessed, and monetized. We believe that this decentralized infrastructure will be supported through a vibrant decentralized ecosystem comprised of consumers, wallets, and retailers.

The super node in our network is designed to act as a custodian of consumer data on behalf of both retailers and consumers. We are creating a vibrant business model for an economy that supports the operational infrastructure in place. While our approach to this infrastructure should satisfy the concerns of decentralization purists, we believe that the vast majority of online users will focus on usability over data sovereignty.

Custodians of consumer data will be able to monetize the data they are entrusted with. The expectation is that users will be compensated for that data in a mutually agreeable manner. In the case of ShopIn.com, we expect to provide financial incentives for users to allow us to custodian their data.

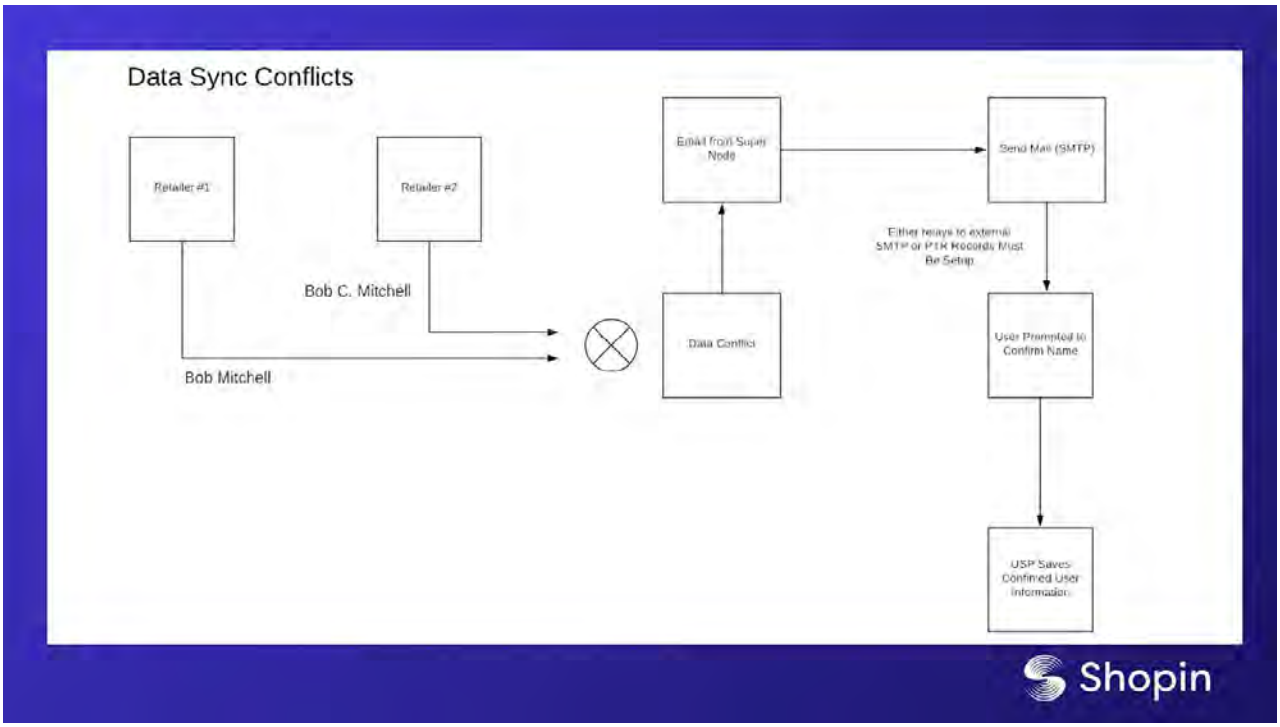
3.6. Survivability

The network needs to be able to operate in a fully decentralized manner with survivability if a given node is no longer online.

3. ARCHITECTURE

3.7. Conflicts

It is expected that retailers may attempt to aggregate conflicting data into a user's profile. We expect to have the user take action to resolve these conflicts



3.8. Scale

At the onset of the network, we expect to see mid-market and enterprise retailers onboarding their consumer data. We have zero retailers ready today. We have still decided to plan for scale to satisfy the requirements of organizations with tens of millions of users.

Larger retailers can bring many consumers onto the network at one time and offer many other advantages. Retail organizations that have achieved scale are large enough to understand their needs, have capitalized enough to pay for help, and often value hiring specialists who can help grow revenue. It is the concerns of organizations that fit this description that we aim to address with the design, implementation, and operation of this network.

4. USER ACCOUNT CREATION

While a user can initiate creating an account from either a node or supernode public web interface, there will be a cost to having them create an account on the network. This can be paid for by the user, the node, or the super node. The cost comes in the form of a fee to register the user account on the naming system within the network.

5. SECURITY AND AUDITS

5.1. Supernode Audits

Trust is earned and not given. We expect these third-party custodians to be focused on securing data for their users. Custodians should undergo regular audits from third parties to create trust on the network. At this time of writing, we believe that a SOC type II audit is the minimum required for a wallet provider to be considered trustworthy. Ultimately there is no control over entrants to the network starting up a super node. On the other hand, it is not going to be a trivial task to get a retailer to send data to an unknown super node.

5. SECURITY AND AUDITS

5.2. Sane Security for Reasonable People

> "The reasonable man adapts himself to the world: the unreasonable one persists in trying to adapt the world to himself. Therefore all progress depends on the unreasonable man." *Richard Stallman (aka RMS)*

The world of blockchain has been defined by unreasonable people building distributed secure systems that can solve global problems. With our solution, we must anticipate the user will have little to no technical aptitude for security. We do not intend to store any financial information on our platform. When we designed this network we were careful to learn from unreasonable people but to focus on usability for sane and reasonable people. After all, no code is the best way to write secure and reliable applications. Write nothing; deploy nowhere. In the retail world, we need to provide functionality for non-technical people providing reasonable security. The consumers who rely on the network will not be highly technical so sacrifices must be made on the security model to provide higher levels of usability. Establishing a DID on the network will be done when a consumer either claims their identity from a retailer or creates a new account.

5.3. Encryption

The data that persists within the exchange is protected with non-nominal encryption. The key for the encryption is generated by one of three parties. The retailer, the wallet provider, or the user. The full security model of this network is managed by a decentralized identity.

Decentralized identities are created when a user either establishes their own account on their own accord or when a user takes possession of their data from a retailer. The keys for any user are aggregated and stored within the decentralized identity. Private keys stored within a user's DID are able to be copied and held by authorized third parties if authorized. It is with one of these private keys that a user controls the flow of data by managing a domain name assigned as their username through a decentralized naming service.

5. SECURITY AND AUDITS

5.3. Encryption

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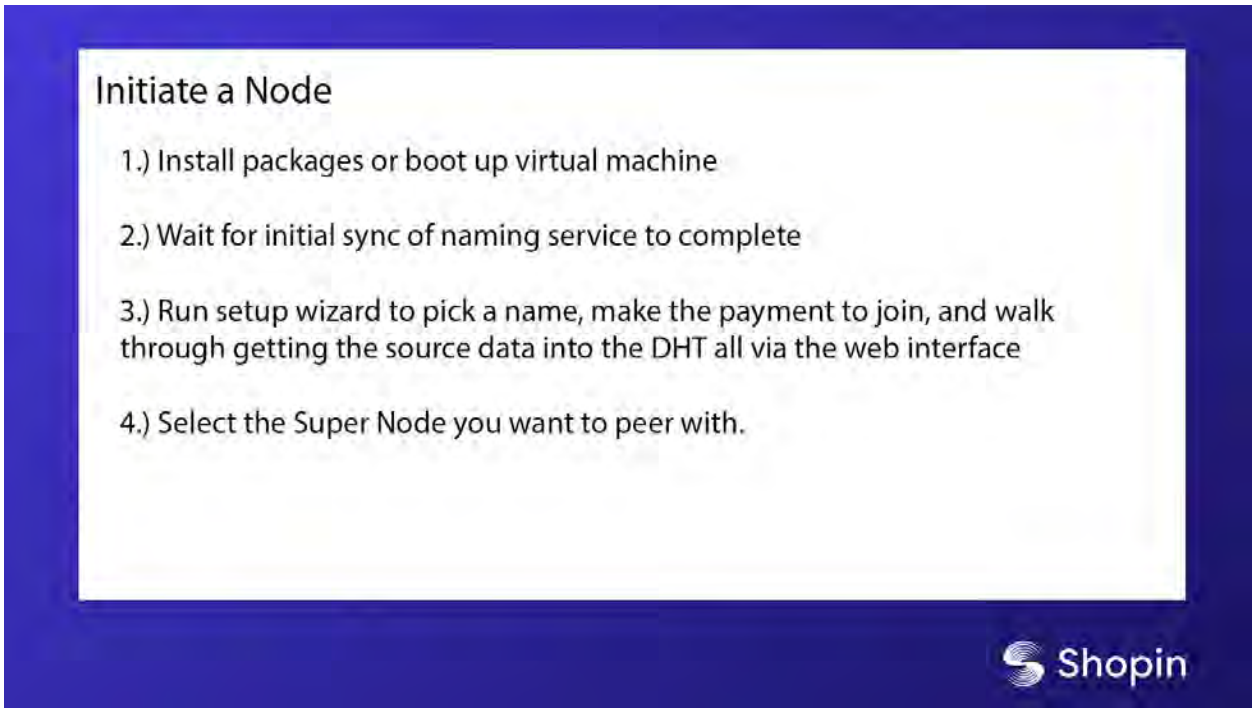
6. INITIATING A NEW NODE

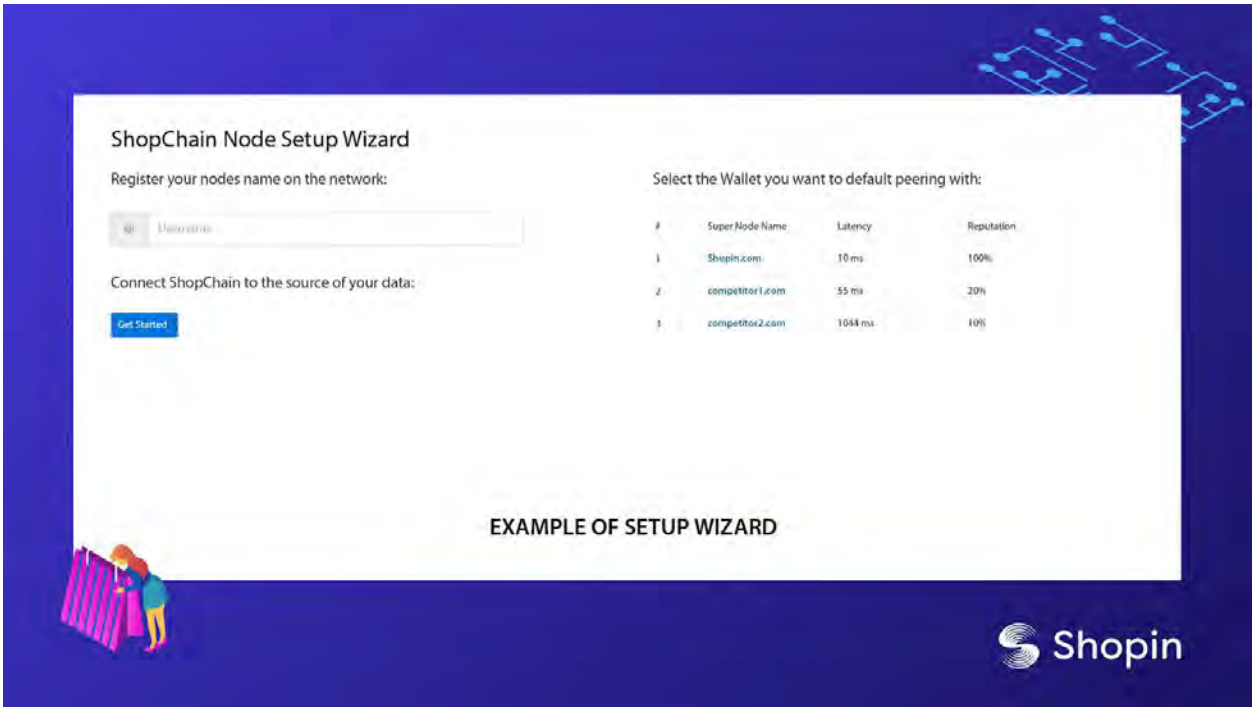
Initialization is completed via the included on-boarding wizard. After the initialization, all transfers and peering through the network are to remain asynchronous until a user establishes a synchronous transfer between a node and a super node for their account. We plan to make use of the decentralized naming service to establish records for a user to authenticate the synchronous transfer.

Initializing a node on the network will not be free for the operator. This is by design to mitigate activity from bad actors, to help encourage additional operators to run infrastructure, and to add real cost to participating in using the shared name service on the network. Each node on the network will initialize and begin to originate its locally stored consumer data to a selected super node.

There are some qualifying questions that a node operator must answer during the on-boarding wizard to select their data and to peer with the network. They must choose a name for the node to join the network and ultimately then pay the fee to reserve their chosen name. Node operators may elect to use a Shopin.com provided installer or operating system image that will come as a free downloaded already pre-loaded with all required packages to connect and exchange data over the network. The Shopin.com installer or operating system image will automatically self select the Shopin.com wallet as the default location for storing consumer data on the network.



6. INITIATING A NEW NODE(CONT)



[e.g. of the potential interface for the initialization wizard when adding a Node and selecting a Super Node to peer with]

In the above figure, the naming service will be used to parse all potential nodes and super nodes, showing just the available nodes and super nodes registered as online at that time.

7. CONCLUSION

The changes in the retail industry present an opportunity that arguably necessitates decentralization technologies. We seek to create a better internet together.

SHOPIN LEADS IEEE GLOBAL STANDARDS FOR UNITED DECENTRALIZED IDENTITY

Shopin has joined the IEEE as an advanced corporate member. As a leader in the blockchain industry, the company is forming this working group and bringing together a consortium of experts who offer a strong foundation of web 3.0 decentralization technologies. Promoting a strong foundation and shared vision, the company expects more retailers will be ready to adopt decentralized identity technology to help drive increased personalization that can boost revenues.

Eran Eyal (CEO of Shopin) shares: "*The best way to improve adoption and outcomes for our clients is to encourage the industry to co-create these standards. To further our commitment to open standards we are forming this Working Group to facilitate industry wide change that we steward with our technical leadership*".

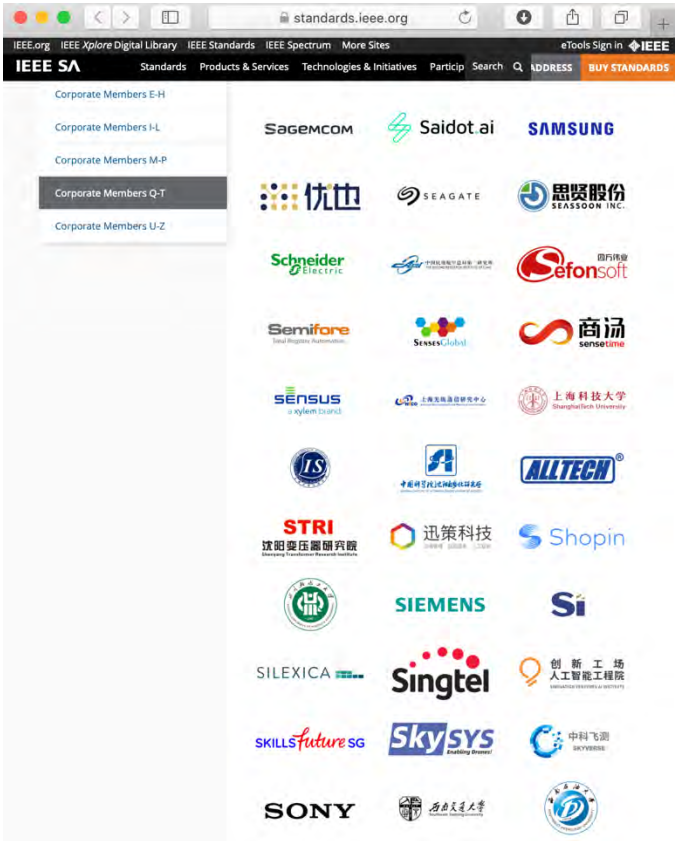
SHOPIN AND IEEE(CONT)

Eran Eyal the CEO of Shopin shares: "*The best way to improve adoption and outcomes for our clients is to encourage the industry to co-create these standards. To further our commitment to open standards we are forming this Working Group to facilitate industry wide change that we steward with our technical leadership*".

"*We're proud to take our place alongside prestigious members of the IEEE like Sony, Samsung, Qualcomm, AMD, Apple, Google, IBM and more. It's humbling to see Shopin's logo on the roster.*"

In furtherment of these goals, Shopin has revealed a proprietary patent-protected enterprise-grade GDPR-compliant data exchange which leverages a unique asymmetrical and asynchronous Distributed Hash Table (DHT), blockchain, and artificial intelligence architecture. This solution will be open-source.

Shopin invites all retail and technology companies or individuals interested in joining the UDID Working Group to contact us at IEEE@shopin.com.



TOKENS:

Introducing a new paradigm in loyalty and reward

With the shopper finally in control of their purchase data (and other types of data), Shopin foresees a new paradigm in rewards and loyalty. Since the consumer is an oracle for the best of their data, it makes sense to incentivize the owner of the data directly when their loyalty or attention is engaged.

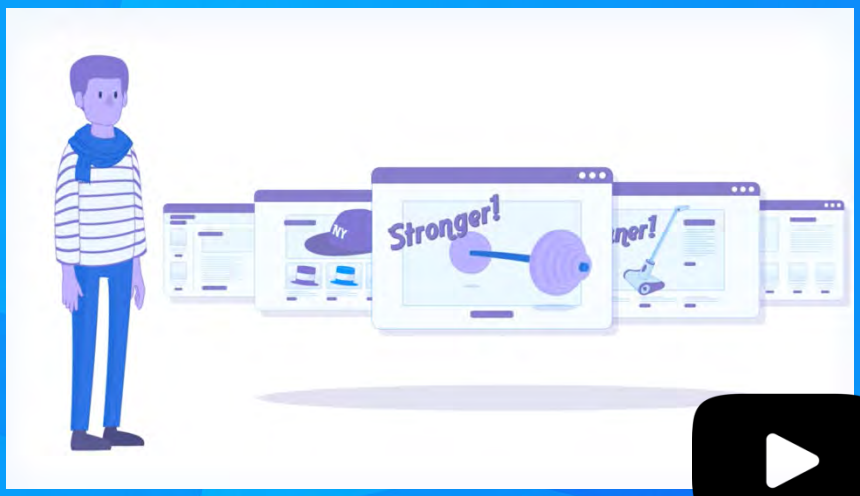
Retailers and brands will be able to use the token to entice shoppers in the following ways:

- Direct marketing
- loyalty
- referrals
- push advertising
- pull advertising
- gifting
- exclusivity of access

The shopper will use the token to retain the value of their interaction and the sharing of their data for use in future purchases.

Because the tokens are a fungible and easily circulated asset, they can be exchanged with anyone, who can then use the value of the token. This enables gifting of tokens between shoppers and even the donation of tokens by shoppers and/or retailers to third parties.

By enabling opt-in advertising, shoppers will be able to control the way they receive information on products, and retailers will lower their acquisition barriers and cost of each customer. This will allow retailers to redirect advertising budgets as rewards for shoppers who share their data and preferences with retailers in a targeted and secure way.



Watch video >

TOKENS:

A compliance challenge:

Most cryptocurrencies employ an unrealistic expansion strategy. Major markets* like the US require money issuance or transmitting licenses for a cryptocurrency to be redeemable against the purchase of goods or assets.

This brings enormous legal, compliance and auditing costs as well as time delays, which businesses can seldom afford.

Entrepreneurs such as Charlie Shrem** are wel- known case-studies of innovators who have faced the wrath of the legal system for contravening such laws, even unbeknownst to themselves at the time.

Solution:

Shopin has partnered with Blockwell (https://blockwell.ai) to solve this problem is an innovative manner.

Shopin offers brands the ability to convert Shopin tokens into their own wrapped/ branded tokens.

These branded tokens can be attributed with discounts and exclusivity of access. Neither of these, when redeemed, requires a money transmitter license. The issuer or the brand can, at any time, turn branded tokens back into Shopin tokens to sell back on exchanges.

This technology is live and can be tested on the Rinkeby network:

https://medium.com/@ShopinApp/shopin-live-product-demo-tokens-for-retailers-and-brands-a47fe7925762

Since the brands have autonomy on how they attribute either discounts or other features to the tokens, and different brands are more exclusive than others, we expect their tokens to be more exclusive than other brands, creating an element of desirability and perceived value over-and-above the value of a single Shopin token's value, or that of another brand's tokens.

This gives way for a perceived future when Shopin will launch a decentralized crypto-to-crypto exchange for shoppers to barter different brand tokens with each other, with no middleman. The peers in the exchange will self-regulate the value of different brand tokens through fair barter.

* https://www.loc.gov/law/help/cryptocurrency/world-survey.php
** https://www.wikipedia.org/wiki/Charlie_Shrem

Solution (cont)

Process:

1. Retailer/ Brand (advertiser) acquires Shopin tokens, and converts tokens into their own branded tokens. They can acquire tokens via Shopin, OTC or direct from exchanges. Shopin would prioritize acquiring tokens for clients directly from participants on exchanges.
2. Advertiser attributes the tokens with discounts or exclusivity of access (for example: a token or certain amount of tokens are required to access an exclusive event, purchase and limited edition item or access content.)
3. The advertiser targets shoppers to engage with offers, ads, loyalty, content through Shopin, leveraging the Retail Intelligence Data Engine data fabric.
4. The shopper is delivered the branded tokens. The shopper can either turn these token back into Shopin tokens with one click or redeem them at the adverting brand.
5. The advertiser uses the Retail Intelligence Data Engine for increased conversions through personalization driven by ShopScore's data fabric.
6. The retailer realized their ad revenue back, a higher conversion environment and can either use the tokens again to continue engaging shoppers or convert to Shopin tokens and recoup advertising capital.

TOKENS

Solution (cont)

The solution presented here solves a complex issue that has long plagued adoption in the enterprise retail environment.

It can be scaled to apply for all situations where commerce or loyalty comes into play and lowers the barriers of entry. More importantly, territories that require money transmitter licenses can continue to maintain their regulatory environment whilst not stifling innovation.

CRYPTOCURRENCY FOR RETAIL

The $SHOP Token:

Blockchain technology is empowering entrepreneurs to develop economic tools that incentivize user participation in their protocols and services. This new model is directly opposed to the status quo, where successful companies generate significant financial profit from recording user participation and their data in return for offering a service in, for example, social media eCommerce. These corporate services are free to use; however, the companies are not economically reciprocating true value with their users, putting them at unnecessary risk to identity theft and manipulation.

Right now, the data market is the most robust market on earth. Nearly every company and government monitor digital footprints - websites visited, items purchased, emails sent. One dominant property of a decentralized and cryptographically secured ledger is the accessibility to, and ultimately the protection of, consumer data from malicious or exploitive characters.

The decentralized revolution is cost-effectively providing the infrastructure to ensure that no site needs to "own the data." Moreover, the associated economic revolution lets users receive assets (in this case, tokens) for their participation. Instead of a system where companies protect valuable centralized databases by using the password "password" (looking at you, Equifax), data can be cryptographically secure on a blockchain, fostering a better system of trust. Instead of making companies extremely rich by having users voluntarily giving out their own data, users can receive assets like tokens in return for their contribution to the ecosystem.

Entrepreneurs who have long accepted that the users themselves are the rightful owners of their data now have a platform to empower and incentivize customers to use services and control access to their digital footprint.

CRYPTOCURRENCY FOR RETAIL

The $SHOP Token (cont.)

Shopin respects consumer data rights and allows the users to decide if they wish to share their data with Shopin's artificial intelligence to be leveraged by retailers and advertisers. We ask for permission and deliver experiential and economic value back to the user.

Users' purchase data is attestable, and smart contracts maintain systems. At Shopin we see that user ownership of data is a non-negotiable component of client relationships. We strive to create a moral, reciprocal economy of data for both shoppers and retailers through our token economy.

Our approach is easy:

Shoppers store their personal and transaction data in their profile, which lives in an asynchronous data exchange (asynchronous distributed hash table, aDHT.) and protected and attested to on an ERC20 blockchain.

Retailers and brands will work with shoppers to programmatically engage the shopper attention. The market will be a fair market based on supply and demand to advertise to, or engage with the shopper.

The retailer or brand rewards the shopper with tokens in a value equivalent to their measured margin over time. (We aim to eventually marry physical -store and eCommerce data for the user via our mobile app). The retailer rewards the shopper with branded tokens which carry discounts, and other rewards.

Shoppers receive rewards for access to the leverage of their data, and the shopper does not need to sell nor expose their data. Meanwhile, their data is as secure as it can be.

$SHOP TOKEN DYNAMICS

The Market

Retailers find it difficult to transact sales using loyalty points since most loyalty coin incentives have limited utility by being confined to just one or a very limited number of retailers.

Shopin offers a common system that will allow incentive tokens rewarded by multiple retailers from multiple purchases to be pooled together and redeemed. The end result? An ehanced overall user experience, and an increase in average sales conversions among retailers participating in the network.

The use of smartphones to manage and redeem the tokens also presents a far more interactive and compelling value for the user. Gone are the stack of loyalty cards in the wallet with an opaque and uncertain value. Shoppers will be able to see the actual monetary value in the app at any time. Shoppers will be able to redeem this value by scanning QR codes on their smartphones into an online store's digital payment system.

Shopin effectively solves traditional, multi-brand reward schemes by pooling rewards from multiple retailers into a single, universal reward system.

Data value dynamics:

The core premise at the heart of Shopin's token is that data has value.

1. In retail and advertising purchase history is the most valuable data.

2. The more the data is used successfully to increase transactional ROI, the more the user is verified and the more valuable the data becomes.

When each source of data contains more layered and cross-verified data, the value of the total data set increases. The value of that set is related to the value of the transactional lift when it is leveraged. The sum is greater than the parts.

SHOPIN TOKEN DYNAMICS

The Shopin Token:

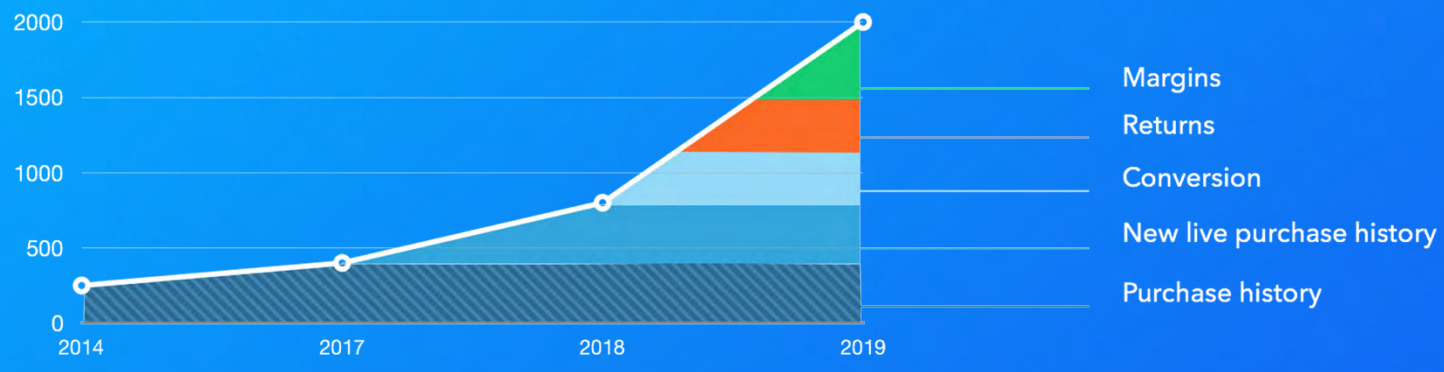
Shopin will employ a digital token that will be used to manage incentives offered by retailers. This token will be an integral part of the economy around data sharing and validation on the Shopin network. Shoppers will be rewarded each time their data is used by retailers for analytics on their own websites.

What is the purpose of the $SHOP Token?

Shopin is building the most valuable data source for marketing and sales conversions — an attestable, continually updated, lifetime value of a shopper based on purchase data.

This means we understand all the purchases of the shopper in context across the whole web, ranging from conversions and returns to whether they are a full price or discount customer. As a result, Shopin understands the true lifetime margin value of a customer. The Shopin Token is a tool used by retailers to access that value and loyalty of the shopper, while the shopper is paid with a cryptocurrency they can redeem on purchases at any retailer.

Understanding the true LTV of a shopper



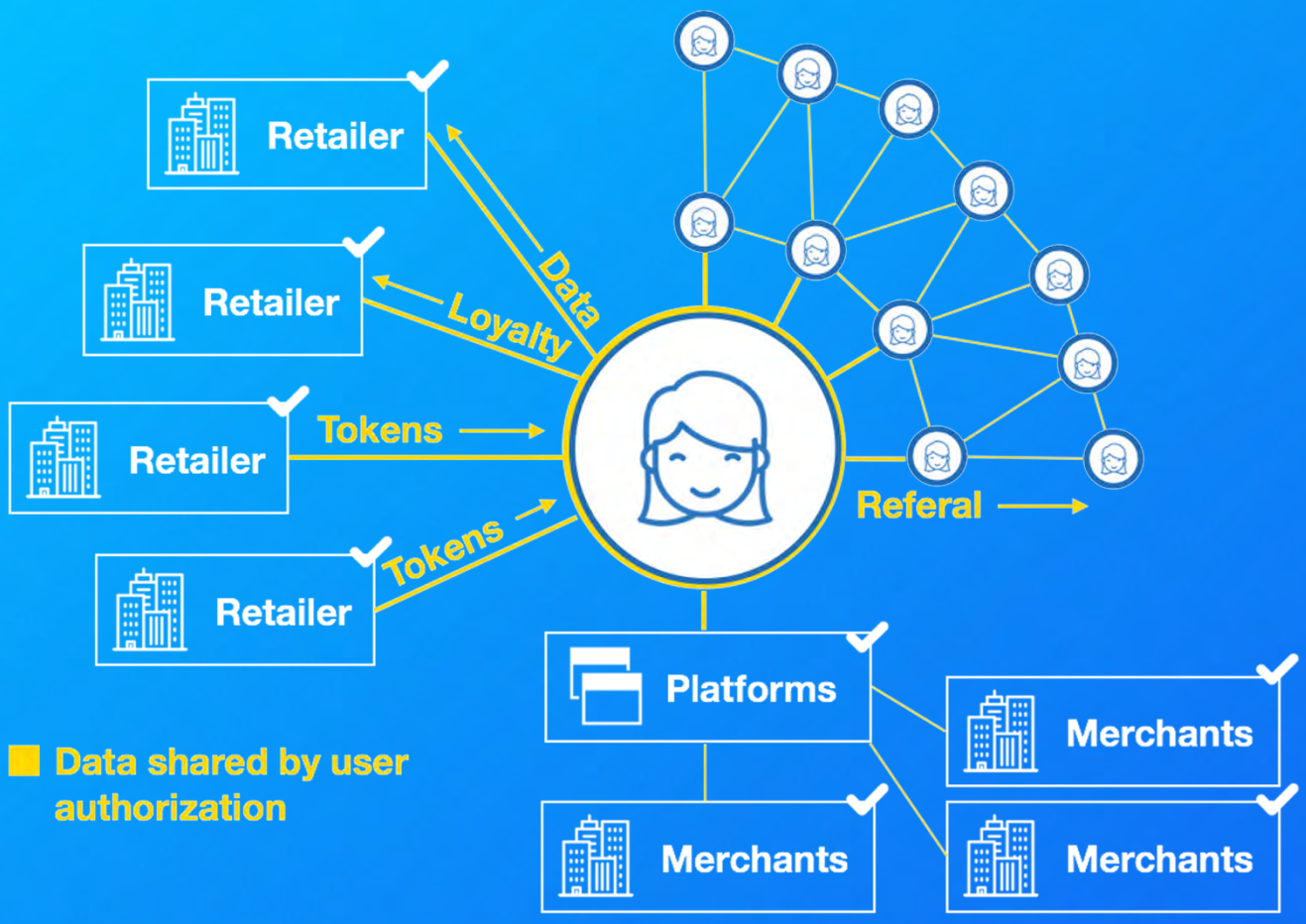
Introducing the LTM – customer Lifetime Margin

Once the customer's data is owned by them, a full view can finally be perceived of the lifetime margin: It is not just how much was spent, on what or where. What was returned? Was it on sale? How is behavior shifting? Best of all, the only person who owns it is the shopper... and it never needs to be handed over to be leveraged – all secured safely on ShopChain™.

$SHOP TOKEN DYNAMICS

How the token will be used:

Retail brands reward shoppers with branded $SHOP Tokens that shoppers can spend back with the brands via discounts or alternatively, getting access to exclusive products and events. Retailers can also incentivize shoppers to distribute tokens to referrals (who will have to pass KYC).



Shopin's contract and network consist of 1.5 BN tokens.

Incentivizing retailer launch partners to adopt:

The ultimate question of a utility token: how to make sense of adoption cycles and ensure there is a reason for utility and for holding onto the tokens?

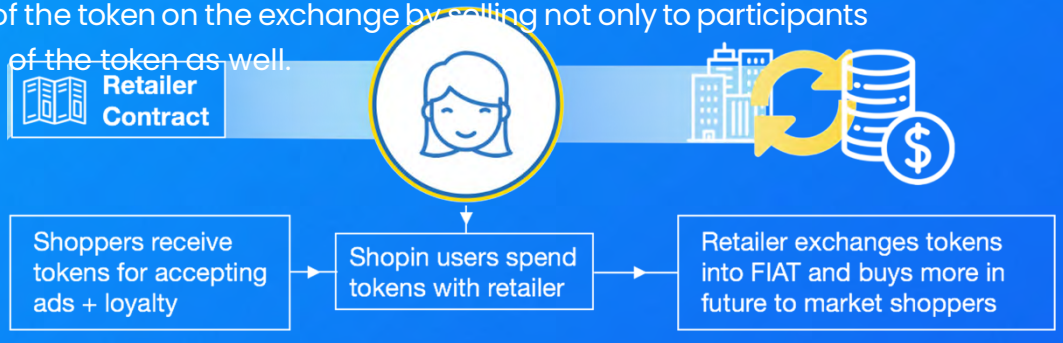
Since Shopin in a nascent stage of this market, and we assume retailers will take time initially to enter into a tokenized economy, we are planning on implementing several innovative strategies to help kickstart the value of the $SHOP Token on the exchange:

1. Retailer brands pay to receive product recommendations on their pilot SaaS contracts (for 18 months) based on a percentage of transactional sales lift.

2. To advertise to the shopper profile and engage in other programs, the retailer pays/ rewards in $SHOP tokens, which shoppers can redeem to offset purchase prices.

3. To kickstart the adoption of the token, Shopin will offset 30% - 50% of the retail brand's commercial contract value by purchasing tokens from the exchange

This will create a system of more immediate adoption into the ecosystem and invigorates the value of the token on the exchange by selling not only to participants but to the main users of the token as well.



Retailers Marketing Advantage

Through the Shopin App, retailers will be able to target relevant users who have raised their hand and are willing to engage with marketing, advertising, content or loyalty campaigns, Reducing the reliance on advertising with Amazon, Google, and Facebook, and instead allocating those budgets to what matters most: Shoppers! This closed-loop economy instead rewards your shoppers for their time, attention and loyalty, enabling sophisticated targeting and dynamic storytelling based on their Shopin profile versus pushing one-size-fits-all messaging.

Generalized Opt-in Advertising

ThenShopin App will serve as a direct line of communication from retailers to customers by offering customers more rewards when they respond to direct, opt-in advertising.

This service can be monetized by Shopin and serve as a source of rewards for customers who opt-in to the service.

When a customer opts into the service, the Shopin App can receive push advertising from the retailer that is matched against the customer's data and buying history, while the customer shares in part of the advertising revenue.

Specific Opt-in Advertising

Another feature of Shopin will be an opt-in system for advertising and promotions on specific products in which the user has recently expressed interest in buying.

When users opt in this way, their interest will be sent to all retailers with the product they have selected, and retailers will have the opportunity to directly target deals or opportunities for the customer.

Referrals, Rewards

Shopin can facilitate a referral-based rewards system for the retailers using social media and referral links to products that the shopper shares with friends and family.

Each shopper will be rewarded for future purchases made by the referral by receiving part of the retailer Shopin Token incentives.

In both of the above cases, retailers will use branded tokens as incentives for shoppers in the ecosystem.

TEAM

We're a group of entrepreneurs striving to ensure timeless brands will remain timeless. Our management team encompasses over 15 years of experience *each* ranging from a professor of mathematics who was the previous director of insights and analytics at Walmart, through to a professor at M.I.T. or startup veterans that have had multiple acquisitions.

Eran Eyal – CEO & Founder

Eran is a serial entrepreneur with three exits as a founder and more than a decade of experience in retail and ecommerce. He is the winner of the United Nations World Summit Award for Innovation, Fast Company's Most Innovative Startup, and he is an investor and advisor for many startups.

Professor Georgi Gospodinov – CTO & CDO

Georgi hails from Walmart where he served in his tenure as a leading data scientist and director. After earning his PHD in Mathematics, he turned to topological data analysis, artificial intelligence, complex networks, and dynamical systems and worked as an applied mathematics professor in Boston and NYC. Georgi also holds patents in blockchain, artificial intelligence and fraud.

Lane Campbell – Active Advisor, Inventor of ShopChain

Lane is a lifelong entrepreneur who has realized five exits in his career. He is a founding member of the Forbes Tech Council and the CTO and CoFounder of Humble Advisors, a wealth management firm for high net worth companies and individuals. Lane is an active advisor, spending dozens of hours a month working on Shopin, and is the inventor of ShopChain.

Randy Shifrin – VP of Revenue

Randy is a veteran of the retail industry. Formerly Randy was the founder and CEO of Shoezone, and Chernin Shoes, both of which were acquired.

TEAM(cont)

Henrik Rasmussen – VP Business Development & Investor Relations

Henrik is an experienced technology executive who has worked across several sub-sectors in technology related industries as a business developer over the past 20 years. Educated as a process engineer, Mr. Rasmussen has held management positions since the late 90's and has successfully branded and launched multiple products.

Vladimir Ustinov – Senior Dev-Ops Engineer

Vladimir has served as a senior engineer at Maker's Brand, Flow Health, EigenGraph, and other technology startups. He holds a Master's Degree in Radio Physics and has a strong data mining and numeric analysis background.

Alexey Kyulkin – Senior Dev-Ops Engineer

Alexey served as a front-end engineer at Maker's Brand and as the backend engineer at Flow Health. Prior to his startup career, he was formerly Head of Department at Tomsk Polytechnic University.

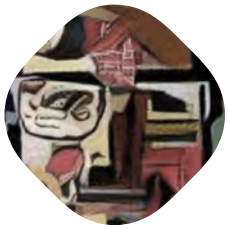
Mark Plaskow – Active Advisor and ML Lead

Mark Plaskow, founder of Scientific Clinics, is a Machine Learning thought leader. He has recently worked with some of the greats such as Sears building their entire A.I and ML, and before that companies like Ebay.

Professor Richard Linares – Active Advisor and NLP Lead

Professor Linares is a Charles Stark Draper. Assistant Professor of Artificial Intelligence at M.I.T. Before his tenure in Cambridge, he served as assistant professor and University of Minnesota.

TEAM – ADVISORS(cont)



Amadeo Brenninkmeijer – Advisor

Amadeo is an accomplished angel investor with a strong background in retail from the C&A family, Europe's largest Dutch retailer.

Buent Brad Yasar – Advisor

Brad is an entrepreneur, investor, mentor, and advisor who has started and bootstrapped several companies from inception to maturity over the past 30 years. Brad is currently the Founder and CEO of Beyond Enterprizes offering strategic and technical leadership, advisory, and support capabilities to projects in all stages of blockchain implementation and development.

As the co-founder of Blockchain Investors Consortium (BIC) with over 5 Billion dollars allocated to blockchain and cryptocurrency projects and has access to extensive deal flow and experience analyzing disruptive technologies, Brad has participated in dozens of successful crowd sales, which have raised billions from 100,000s of investors since 2016.

Rana Gurjal – Advisor

Rana Gujral is an entrepreneur, speaker, investor and the CEO of Behavioral Signals. Rana has been awarded the 'Entrepreneur of the Month' by CIO Magazine and the 'US China Pioneer' Award by IEIE, he has been listed among 8 A.I. Entrepreneurs to Watch in 2019 by INC Magazine and Top 10 Entrepreneurs to follow in 2017 by Huffington Post. He has been a featured speaker at the World Government Summit in Dubai, the Silicon Valley Smart Future Summit, and IEIE in New York. He is a contributing columnist for TechCrunch and Forbes.

TEAM - ADVISORS(cont)

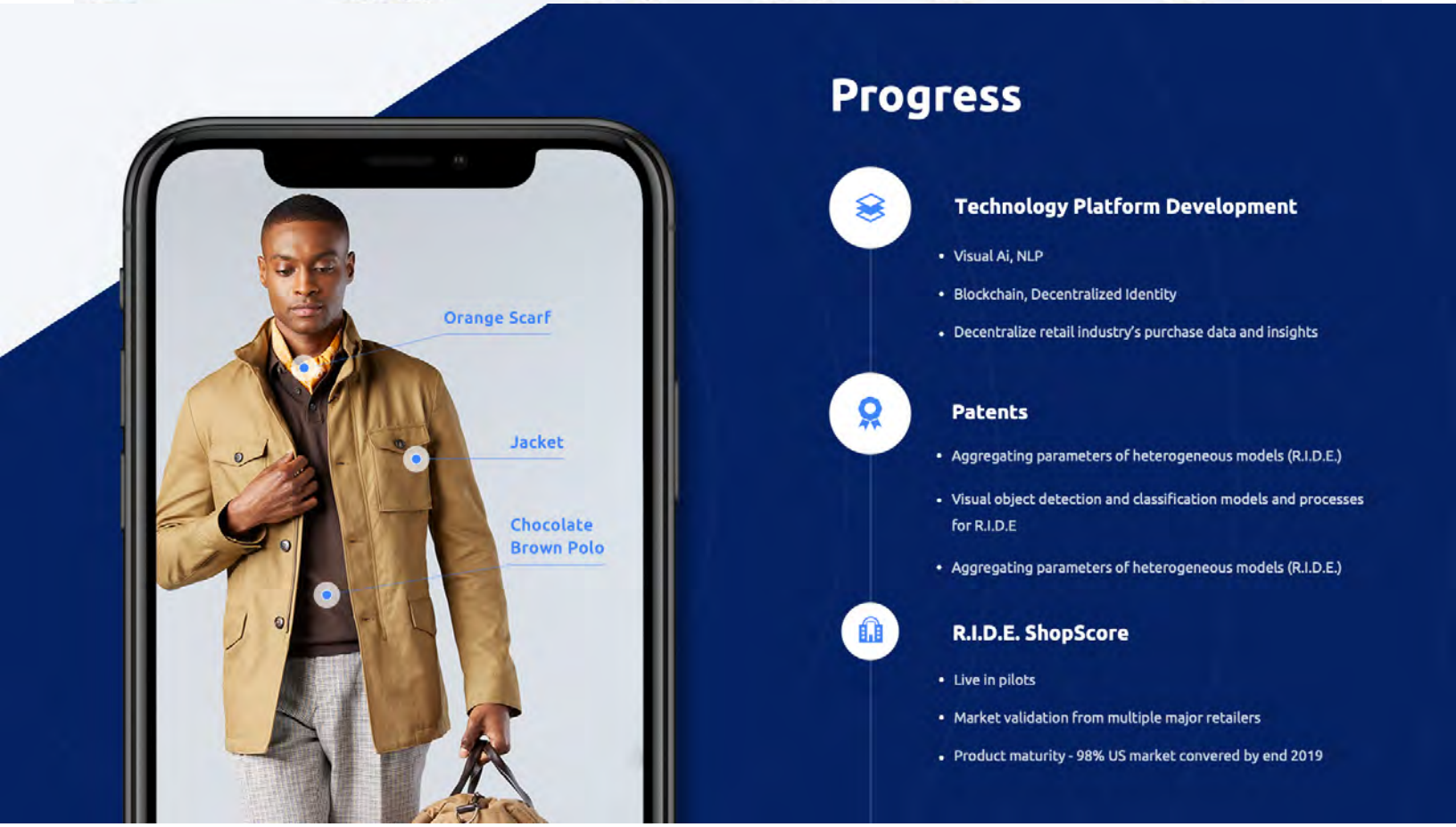
Shahriar Sikder – Advisor

Shahriar is an accomplished and well recognized CTO specializing in artificial intelligence and blockchain development. He serves as CTO of RecordGram and TuneToken and has consulted with NFL, Walmart, Samsung and many other Fortune 500 companies.

David Klauser – Advisor

David is a passionate technologist and sales professional currently serving as the Director of Americas. Previously David served as a converged specialist at Dell and VCE as well as a data center specialist at Oracle.

ROADMAP



Conclusion

Shopin is positioned to create an ecosystem where purchase data and user-verified data are the coins of the realm, to revolutionize the world of retail and beyond.

In this paradigm, shoppers and retailers are finally part of the same conversations while consumers are the driver's seat.

We take a realistic approach to decentralization that is in touch with the current needs of the market, and it's ability to absorb solutions as a part of a thoughtful strategy.

With consumers eventually in charge of their data and the introduction of Shopin tokens, retailers will be in a better position than ever before to service their customers. Whilst we work toward that utopia, ShopScore™ delivers unprecedented purchase data-driven insights and tools

The more that consumers interact with retailers and each other in this tokenized economy, the greater the value of their data becomes.

Control, visibility, value. Shopin is becoming the coin of the retail realm.

For more information on Shopin, visit our website Shopin.com, and please join the active conversation on our social channels: Twitter, Facebook, LinkedIn, Reddit, Steemit