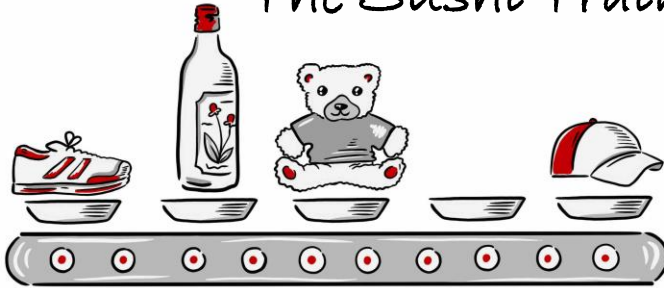


Defining **interactive** e-commerce

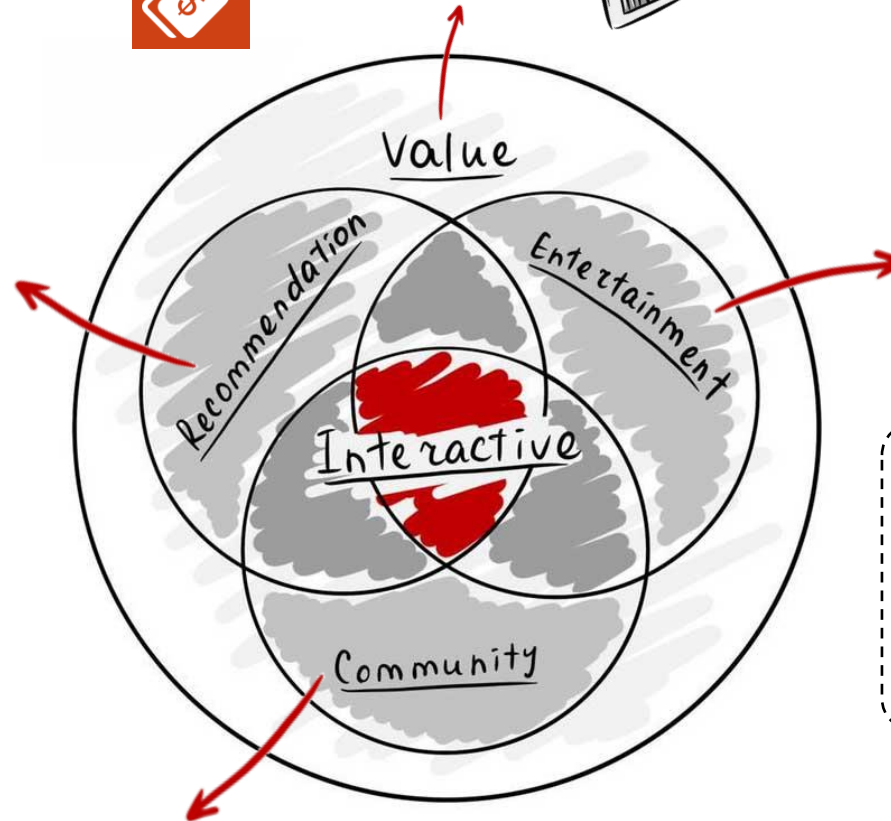
A model as observed through
the case of **Pinduoduo**

The Sushi Train

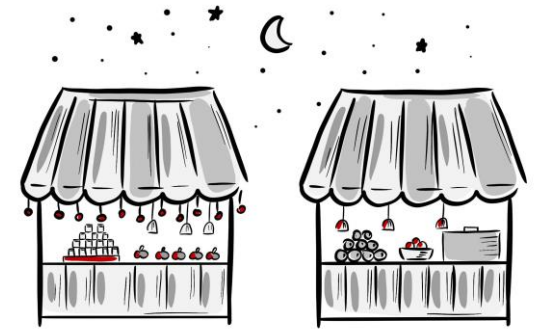


- Simple scrolling, no text input
- Curiosity, discovery driven
- Mobile friendly
- Short fragmented pockets of time
- Emotional, impulse

- Guiding principle
- Core user need



The Night Market



- Delight and engage
- Foster daily usage habit
- Dynamic, lively interface
- Constant new features & games
- Build sense of achievement

The Girl's Day Out



- Team purchase for lower price
- Seamless experience across social platforms & native app
- Share purchase history w/ friends
- Livestream interactions with buyers



Interactive Ecommerce



Digital Carnival

Live
Stream
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Disclaimer and Methodology

This report is researched and published by China Channel, in collaboration with Pinduoduo. Opinions, predictions, and interpretations expressed in this report are those exclusively of the authors and do not necessarily reflect those of China Channel or Pinduoduo. Research for this report was conducted through literature review, interviews with Pinduoduo management and users, as well as independent research by the authors.

Executive Summary



This paper seeks to define and explore the concept of “interactive e-commerce,” as illustrated through the rise of Pinduoduo. Interactive e-commerce can be understood as an integration of consumer-facing elements of user experience: recommendation, community and entertainment - enabling supply-side optimization to offer increased value to the consumer.

Interactive e-commerce can be viewed as an extension of the popular “Disney and Costco” characterization: “Disney,” as it provides an entertaining, engaging, and socially connected user experience. “Costco” in that it can leverage insights drawn from users and direct relationships with manufacturers to achieve efficient economies of scale, and thus superior value for money.

Interactive e-commerce humanizes the online shopping experience. It is an approach that recreates the enjoyable experience of shopping in the physical world for the digital age.

While aspects of this model have been applied in a number of ways throughout the digital economy, Pinduoduo’s rise provides perhaps the clearest case of a company whose success is directly tied with the application of interactive e-commerce. It is the largest and most prominent e-commerce company to build its business model purposefully around the notion of interactive e-commerce: **combining community, entertainment, and recommendation to provide more value for money to the end-user.**



Introduction

E-commerce has come a long way from the Yellow Pages-style online catalogs with a fax number to the one-click, same-day delivery to which consumers in some markets have become accustomed.

It is in China, home to the world's most advanced e-commerce industry, that the move away from the legacy search-based model of e-commerce continues at an accelerated pace. Replacing the old is a new interactive experience that more faithfully represents how people shop in the physical world, offering a fun

experience for the shopper along with improved value for money.

The development of e-commerce until a few years ago has largely been driven by a focus on efficiency, wider choice, and convenience. **It has largely neglected the broader recreational and emotional role that shopping has traditionally played in societies.**

Shopping is as much a pastime and method of bonding with others as it is a commercial exchange of money and goods. Offline shopping often holds a delightful element of discovery and serendipity that is missing from the step-by-step process of traditional e-commerce.

In the physical world, a wide diversity of successful business models have risen to meet such broader human needs. Shopping malls serve as weekend family destinations not simply for their stores, but movie theaters, gaming arcades, and children's playgrounds. Farmer's

markets and bazaars attract shoppers as much for their lively environments as for the goods they sell. Tupperware or Mary Kay parties provide opportunities for friends to connect. Luxury boutiques on Rodeo Drive don't simply sell expensive clothing but offer an environment of sophistication and prestige that transcend their products.

Humans do not shop simply to acquire products rationally, but as part of a pleasurable experience to feel things as well.

Modern mobile e-commerce interfaces are lively, dynamic and interactive



The genesis of this paper

To the outside world, PDD is often considered a classic case study of “social e-commerce,” a term popular with media and investors, as an attractive shorthand for the consensus that social networks have immense potential to be harnessed towards the facilitation of e-commerce, itself an inherently social activity.

Yet last year when conducting interviews in the early stage of researching this topic we uncovered a quite unexpected detail. **When describing the PDD model, we found that the term “interactive” was frequently used as the primary descriptor.** It is this term that our paper aims to define.

Upon further exploration, we found the social aspects of PDD’s platform to be one element among several in a broader model. “Interactive e-commerce” was not a buzz phrase generated for public relations purposes; to our knowledge, at no point had it been communicated externally. It had simply gained traction amongst staff as an accurate shorthand to describe what they were doing.

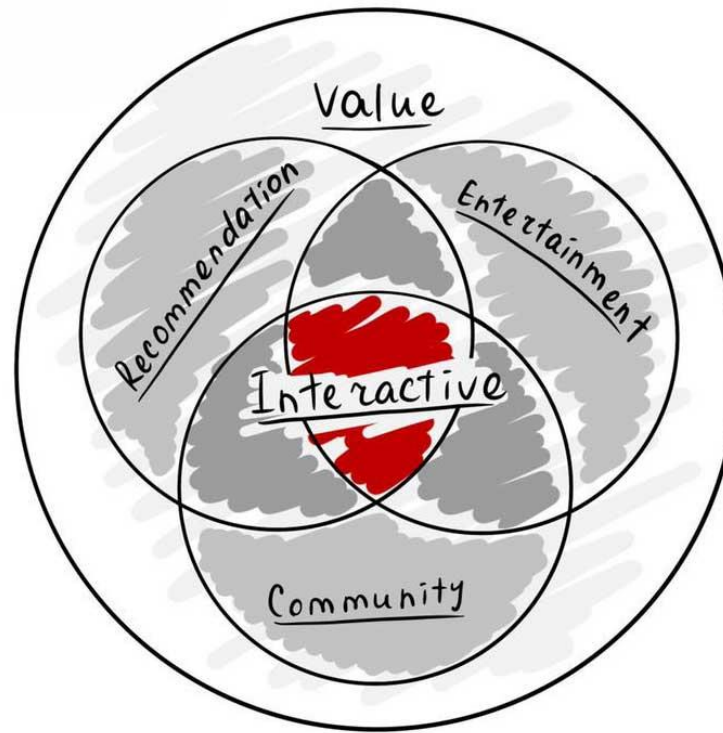
Terminology matters. We sensed a disconnect in vernacular between industry observers and practitioners that was worthy of exploring.



Interactive e-commerce is a model that humanizes the online shopping experience. It is an approach that takes the enjoyable, social, and psychological experience of shopping in the physical world, and applies it to the digital age.



What is interactive e-commerce?



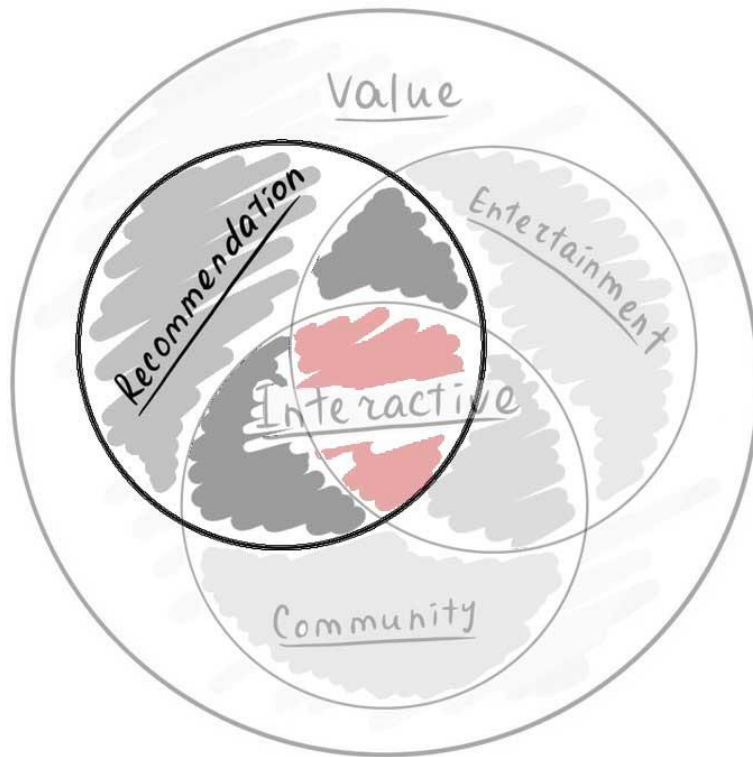
Interactive e-commerce can be understood as a philosophy toward online shopping that humanizes the online shopping experience, applying insights and design approaches that have been more traditionally associated with gaming, social media or entertainment platforms.

In traditional e-commerce, platforms are often designed under the assumption that shopping is a task to be crossed off a to-do list, that what ultimately motivates the user is efficiency, price, and convenience. In contrast, interactive e-commerce platforms are designed with the notion that online shopping can itself be a leisure activity, as offline shopping has often been.

This approach has led to an integration of tools from elsewhere in the digital economy: recommendation, community, and entertainment together with one core proposition: value for money.



Recommendation



Traditional Search E-commerce

- Intent driven
- Type carefully refined search term
- PC or desktop friendly
- Longer continuous session times
- Careful price or feature comparison

Interactive E-commerce

- Curiosity, discovery driven
- Simple scrolling, no text input
- Mobile friendly
- Short, fragmented pockets of time
- Emotional, guided by impulse





Traditional e-commerce has been largely designed around a search-based, intent-driven experience. This goes along with the assumption that the shopper has a clear idea of what product they are looking for, and will seek out that product, typically through typing terms into a search bar. When recommendation has been integrated into such search-based platforms, it often draws primarily from insights based on past purchases or search

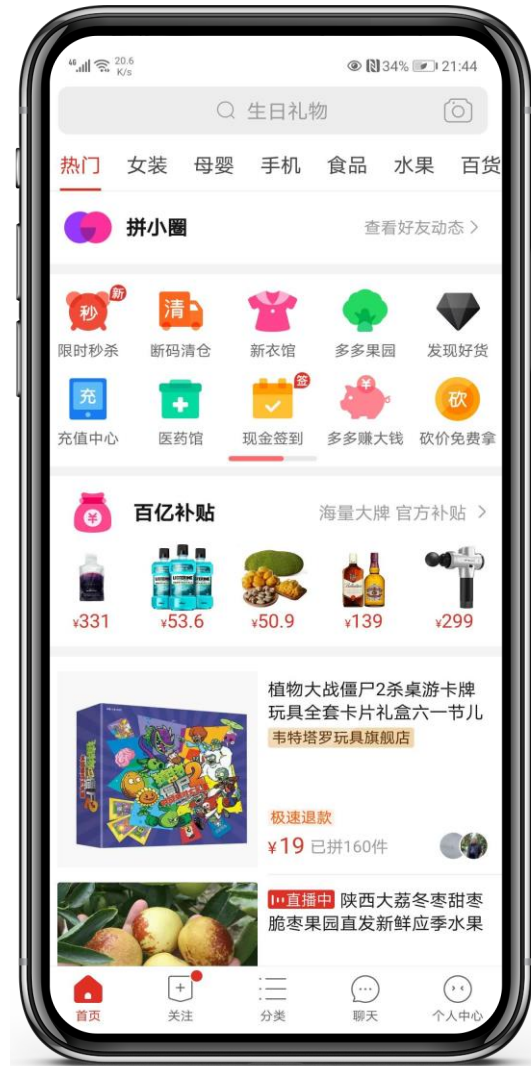
behavior. In an example recognizable to most e-commerce shoppers, such recommendations will suggest complementary products, such as accessories to accompany the purchase of a smartphone, or a new novel from an author whose previous works the user had purchased.

While certainly successful, this model of search and recommendation fails to provide users with what many of them enjoy most about the shopping experience. As a Pinduoduo representative puts it: .

“Except for when you are out of toilet paper or pasta and need to replenish supplies at the supermarket, much of shopping in the physical world is more serendipitous. Like spotting a particularly nice dress while passing by a window shop, or a tip from a friend for a bargain buy, or a great review of the flat-screen television by a co-worker,”

It is that notion of “serendipity,” so key to the pleasurable shopping experience in the physical world, which interactive e-commerce aims to introduce in the digital

sphere. Rather than assuming that the shopper largely knows what they are looking for beforehand and pursuing an efficient experience, the assumption behind the interactive e-commerce model is that the shopper does not always have a clear idea of what product they are searching for specifically, but that through the shopping process, they can find the elusive item that they did not yet know they needed and find the deal that will make their day.



Recommendation in the interactive e-commerce model draws not only from insights based on a user's browsing or shopping history, but also those based on the trends and preferences of the user's social network.

In the case of Pinduoduo, its recommendation algorithm centers on each user as a distributed node and includes similar user activities and their interactions with friends.

“People often shop without a clear idea but browse for fun online. Every consumer is an independent individual. Those with similar needs are likely to form a group. That means our algorithm values localized information very much with a distributed nature,” explained

then-CTO Chen Lei in a 2019 Harvard Business Review¹ article.

Compared to the search-based model, Pinduoduo's Chen found that the product recommendations were timelier and more relevant, even to inactive users. The large amount of information on user-to-platform and user-to-user engagement created a virtuous cycle, in which more significant insights could be gathered, and the experience tailored further.

With a more granular understanding of users' preferences, better-personalized recommendations can be delivered.

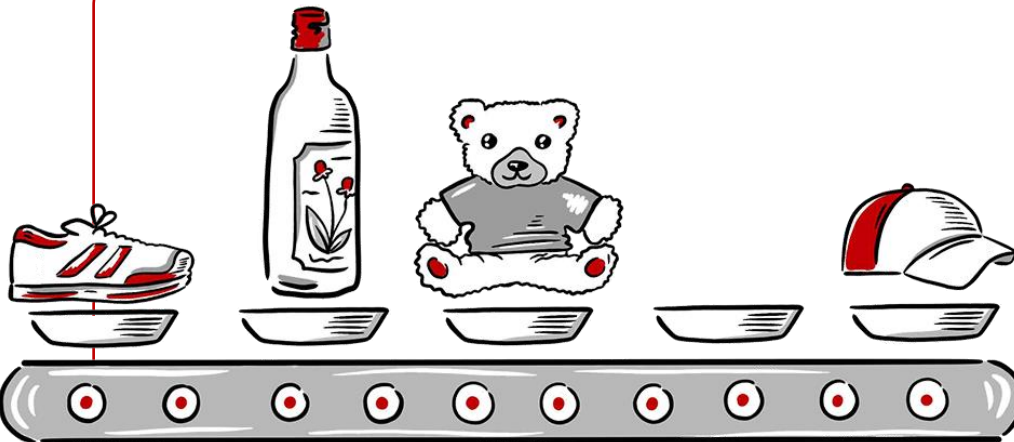
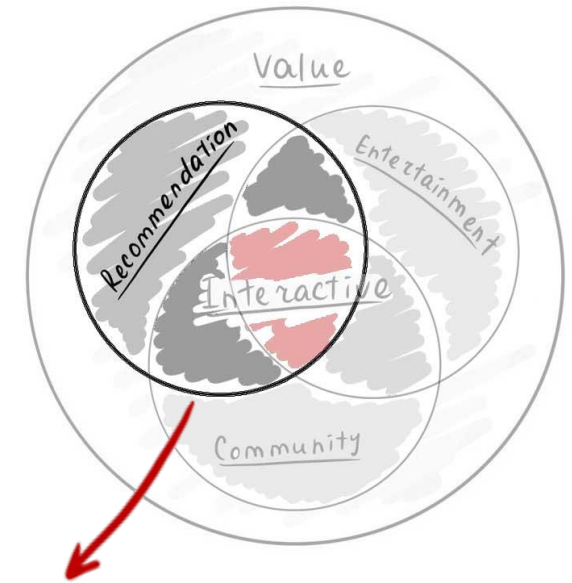
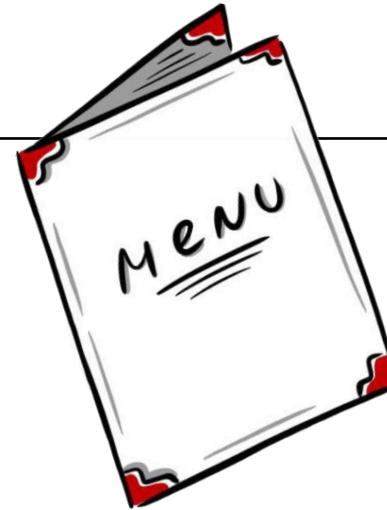
¹ HBS CASE COLLECTION | SEPTEMBER 2019 (REVISED NOVEMBER 2019), Pinduoduo by Feng Zhu, Krishna G. Palepu, Bonnie Yining Cao and Dawn H. Lau <https://www.hbs.edu/faculty/Pages/item.aspx?num=56853>

Recommendation Analogy

Restaurant Menu

Traditional Search E-commerce

Consider traditional e-commerce to be similar to the experience of ordering from a large, diverse restaurant menu - so much choice, where to begin? The burden is placed upon you, the customer, to read each item and carefully select your dish.



The Sushi Train

Interactive E-commerce

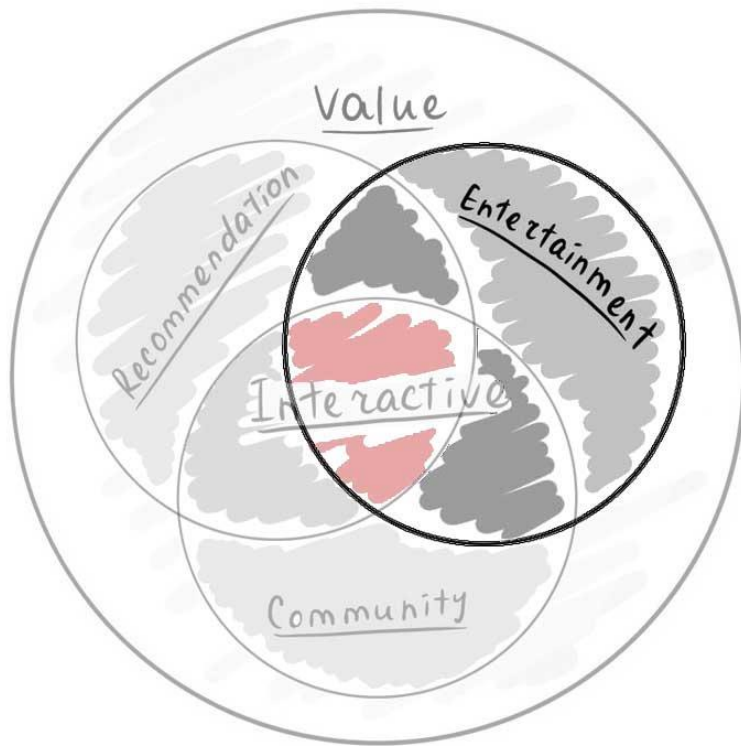
Contrast this with the interactive experience of a “conveyor belt” sushi restaurant. You simply sit down and select from the options as they pass you by. Select light, small dishes at your leisure when something grabs your attention. The conveyor belt is fun, and children love it.

The sense of anticipation - what could be next?



Entertainment

Entertainment



Traditional Search E-commerce

- No or few entertainment elements
- Infrequent need driven usage
- Standardized UI
- No games
- Efficiency-focused

Interactive E-commerce

- Delight and engage
- Foster daily usage habit
- Dynamic, lively UI
- Constant new features and games
- Build a sense of achievement



Entertainment helps build daily habits.

Whether in the form of live streaming, games, flash sales, or countless other methods, the second component of interactive e-commerce prioritizes fun and stimulation for the user, attracting them to the platform, lengthening the duration of their visits, and incentivizing regular and active involvement.

While an emerging phenomenon in the digital sphere, the concept of

blending commerce and entertainment is hardly novel in the physical world. Carnival games and performances of all types are popular aspects of traditional night and weekend markets in communities throughout the world. Shopping malls include not just retail outlets, but cinemas, arcades, and playgrounds. In the case of Minnesota's famous Mall of America, such amenities even include mini golf, museums, and roller coasters.

The essence of the entertainment component of interactive e-commerce lies

in that it both continuously and predictably delivers a stimulus to the user, while involving a sense of novelty regarding such a howstimulus will be applied.

In China in particular, the intertwining of entertainment and e-commerce is seen as an essential aspect of online shopping, as gamification, live streaming, flash sales, and holiday shopping galas are commonplace.

“

The shopping revolution will combine e-commerce and entertainment, where both are equal in importance. Toss in gamification and boom.

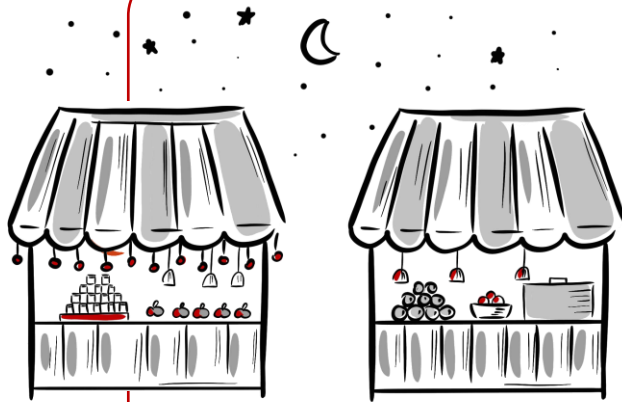
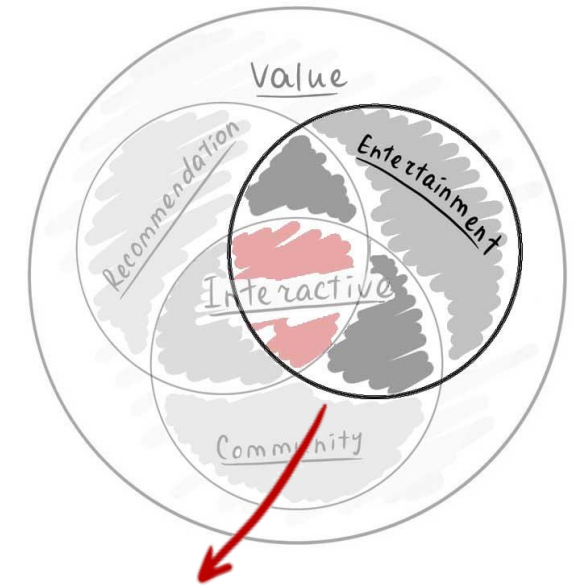
”

Connie Chan
General Partner
Andreessen Horowitz

Entertainment Analogy

Big Box Store Traditional Search E-commerce

Consider traditional e-commerce to be similar to visiting the big superstore at the edge of town. A sterile and predictable retail experience awaits - neat aisles of products. It's convenient, it's safe, and it's oh so boring.



The Night Market Interactive E-commerce

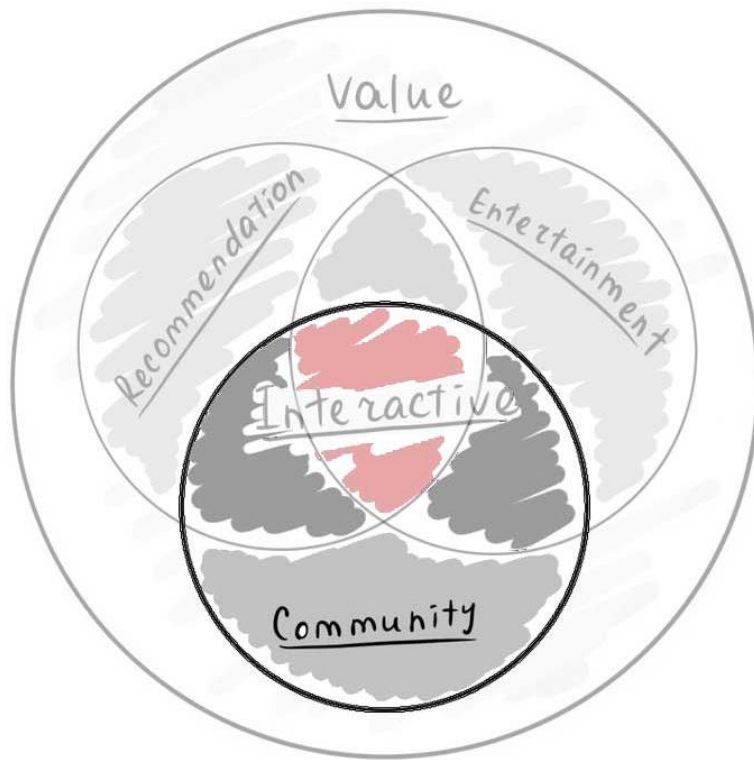
Contrast this with the night market. The atmosphere is lively and bustling - music fills the air. A stall owner calls you over to take a closer look; the smell of tasty street snacks makes your stomach rumble. Entertainment is on every corner, such as simple games for young and old. Throw hoops, shoot the balloon, test your strength and strike the bell.

Interactivity meets you everywhere.





Community



Traditional Search E-commerce

- Sharing non-essential
- Solitary purchase experience
- Limited integration with social platforms
- Purchase history private
- Limited or no live stream

Interactive E-commerce

- Sharing activity incentivized
- Team purchase for a lower price
- Seamless experience across social platforms & native app
- Share purchase history w/ friends
- Livestream interact with buyers



With interactive e-commerce, the involvement of a broader social component not only provides insights for improved recommendation, but also **creates a digital shopping environment that meets the innately human need of connecting with others.**

In the early stages of Pinduoduo's rise, this was done by leveraging Tencent's popular WeChat app. Pinduoduo's team purchase feature (explained in greater detail in section III of this paper) offered discounted prices on everyday goods like produce and household staples for group-purchasers.

In order to compose a large enough group of buyers, Pinduoduo's users were encouraged to recruit members of their social network to join their group.

In their 2019 F-1 filing,² Pinduoduo explained the multifaceted benefits of their team purchase feature, saying:

"We leverage social networks as an effective and efficient tool for buyer acquisition and engagement. This feature provides us with low-cost organic traffic, rapid growth of buyer base, and active social interaction as our buyers share their purchase experience and product information with their

friends, family and other social contacts. Buyers on our platform actively introduce us and share products offered on our platform through social networks in order to take advantage of attractive lower product prices available under the "team purchase" option, and new buyers in turn refer our platform to their broader networks of friends and families. This interactive feature also transforms online shopping into a fun and interactive experience."

The early success of the team purchase feature demonstrated the effectiveness of many of the key features that have gone on to become indicative of

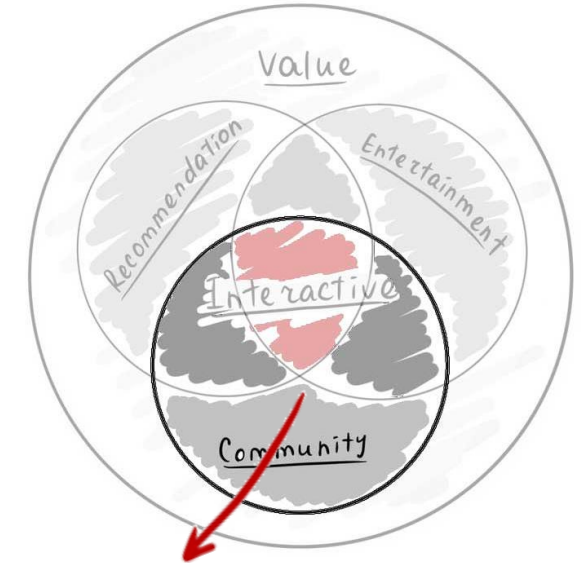
interactive e-commerce: Through sophisticated recommendation, entertainment, and community, **interactive e-commerce blurs the lines that have traditionally separated the digital economy, offering an engaging and fun shopping experience.**

² SEC Filings
<http://investor.pinduoduo.com/financial-information/sec-filings>

Community Analogy

Routine Weekly Shop Traditional Search E-commerce

Consider traditional e-commerce to be similar to a parent's weekly grocery shop. It's Tuesday and the kids are dropped off to school. Dutiful mom or dad makes their way over to the supermarket, mechanically crossing off items from the list as they are dropped off in the cart. Alone and tired, their mind wanders elsewhere. These chores never seem to end.



The Girl's Day Out Interactive E-commerce

Contrast this with the girls' day out shopping. "Oh my. You guys, come over. Look at this!" Susan had discovered the perfect gift for Karen's upcoming birthday. Loud squeals and a group hug followed. The best friends were not even mid-way through their shopping spree and the bags were already piling up.





Value

'væljʊ:



Value for money is a central element of the interactive e-commerce approach. It is less a direct interactive aspect of user experience and refers more to a principle core user need. The mechanisms for delivering value are various, including the consumer to manufacturer model, lower priced team purchases, and limited time promotional coupons.

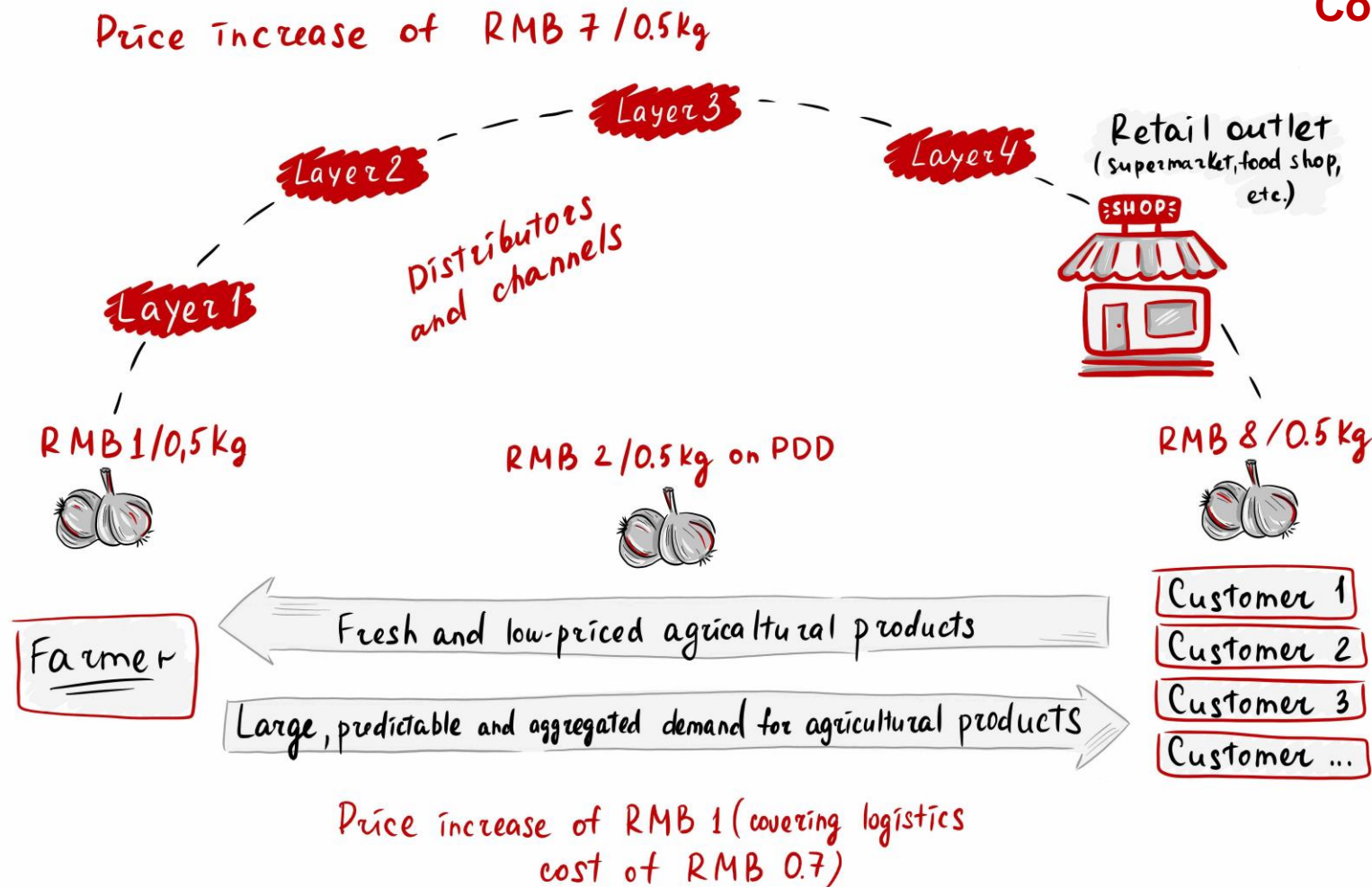
The consumer to manufacturer (C2M) model, outlined below, delivers exceptional price value to the end consumer by simplifying the value chain. Middlemen distributors, retail outlets and other channels are removed facilitating a “direct to consumer” relationship.

Price is always the best vector of competition and the most direct method to delight consumers





Consumer to Manufacturer

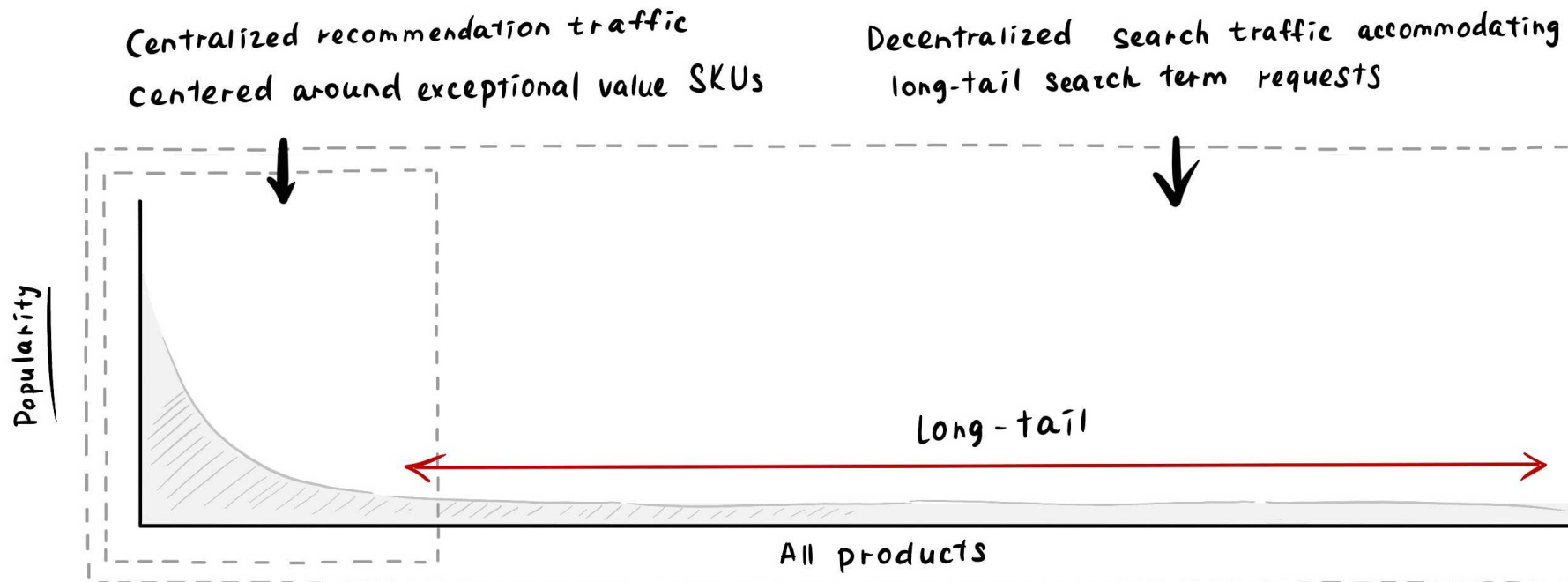


By removing the added cost and friction of the traditional distribution chain and replacing it with a digital consumer-to-manufacturer (C2M) model, producers can more accurately predict and aggregate demand. This helps to lower the price of products while ensuring that producers are offering what consumers find most valuable.



Traditional search model e-commerce platforms require an abundant selection of products to account for thousands of long-tail search term requests. The recommendation feed-based model, however, allows for a more centralized traffic

distribution that requires fewer products. Combining this dynamic with the C2M model allows for exceptional value individual products to be recommended to a large audience of targeted consumers.



The Rise of Pinduoduo & Development of Interactive E-commerce

Although the approaches and features characteristic of the interactive e-commerce model have achieved widespread adoption among myriad players in the digital economy worldwide, there is perhaps no one firm whose philosophy, growth story, and impact is more tightly intertwined with interactive e-commerce than Pinduoduo.

Founded in 2015 by former Google engineer and gaming entrepreneur Colin Huang, the digital environment in which the Shanghai-based startup came to prominence was

radically different from that of its more established industry peers. Pinduoduo as a young company entered the e-commerce landscape uninhibited by the baggage and legacy of traditional models.

Both the time and location of Pinduoduo's ascent offered unique circumstances to facilitate its rise. The technological and business landscape at the time which enabled Pinduoduo's interactive e-commerce model included the following.

Smartphone penetration and the mobile internet

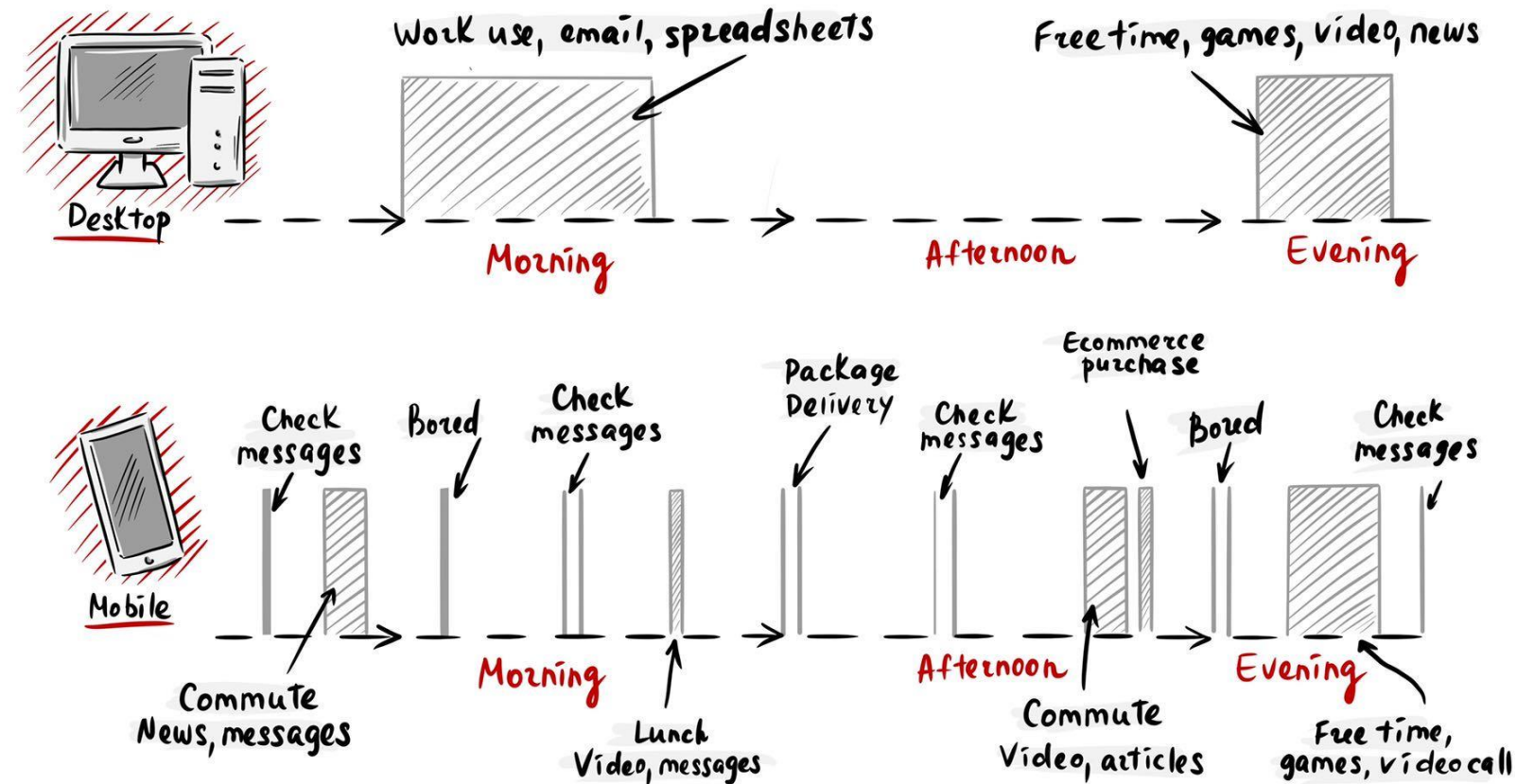
For much of the developed world, the bulk of the population was online via desktop or laptop computers years before the first iPhone. This is in stark contrast with much of the developing world, for whom regular internet access remained difficult, expensive, and in many cases impossible before the advent of relatively low-cost smartphones and mobile internet.

In China, intensive investment in telecommunications infrastructure, a rapidly growing economy, a large unified market, and the emergence of homegrown low-cost smartphone makers led to hundreds of millions of Chinese people - many from rural districts and lower-tier cities - becoming regular internet users for the first time, often exclusively through their mobile device.



By the time of Pinduoduo's founding in 2015, nearly 89 percent of China's internet users were online via smartphones, a number significantly exceeding that of desktop (68.4%) and laptop (42.5%) computers.

Adoption of the smartphone as the device of choice for accessing the internet also opened the door to feed-based models of content delivery, as user's time spent online became fragmented across many short sessions per day.



E-Commerce and logistics infrastructure



Secondly, just as the widespread penetration of smartphones provided many in China with their first induction into digital life, so the explosive popularity of e-commerce did with consumption habits.

China's stage of development allowed the retail sector to “leapfrog” many of the physical-world manifestations taken elsewhere, and instead grow more robustly in the digital sphere. This was in contrast to North America, where well-developed brick-and-mortar retail adequately served the needs of consumers, which limited the convenience and value-add of e-commerce in many scenarios.

This compounded with a growing consumer class, internet access, superb logistical infrastructure,

numerous highly-dense urban areas, and an abundance of low-cost labor, and the setting was primed for the historic explosion of e-commerce.

By the time Pinduoduo emerged in 2015, urban consumers were comfortable using e-commerce platforms. There existed a rich ecosystem of merchants selling online, from the biggest brands through to small family-run operations and rural farmers.

Lastly, logistics networks had matured rapidly to the point where sending packages across China was efficient, reliable and low cost.

Mobile payments

Thirdly, by rising when it did and how it did, the unique payments ecosystem in China opened the door to e-commerce and digital retail business models that would not be feasible in other environments.

While the prevalence of credit card ownership in the developed world provided a clear mechanism through which to process online transactions, credit card usage in China is remarkably low, with only 21 percent³ of the population in ownership of a charge card. This is a fraction of the over 850 million⁴ Chinese internet users, the vast majority of which

access the web via smartphones. This imbalance has driven the growth of a QR code-based mobile payments system spearheaded by Tencent's WeChat Pay and Alibaba's Alipay, a system so popular that it became the preferred method of payment for the majority⁵ of Chinese consumers within four years of its launch.

³ The World Bank Global Findex
https://globalfindex.worldbank.org/#data_sec_focus

⁴ Xinhuanet: China has 854 mln internet users: report
http://www.xinhuanet.com/english/2019-08/30/c_138351278.htm

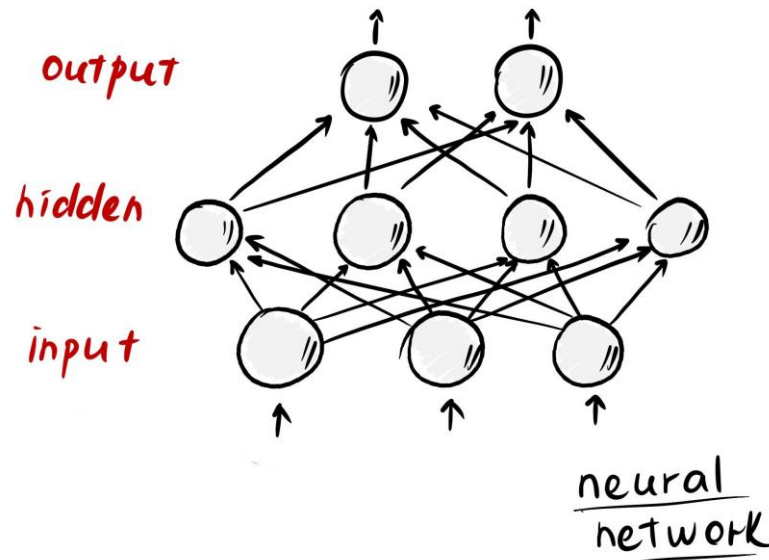
⁵ PWC India: The continued momentum of e-commerce growth in China, Gustavo Arora
<https://www.pwc.in/consulting/financial-services/fintech/fintech-insights/the-continued-momentum-of-e-commerce-growth-in-china.html>



Mature recommendation technology - machine learning and deep learning

The fourth condition of Pinduoduo's success was the maturation of recommendation AI. Pinduoduo's founding year of 2015 coincides with what is considered a watershed moment for AI, when Google's AlphaGo defeated three-time European Champion Fan Hui in a match of the traditional Chinese board game, often thought to be the world's most complex.

A former Google engineer himself, founder Colin Huang was among a cohort of entrepreneurs recognizing the potential of applying sophisticated AI-enabled recommendation to the existing digital economy.



“

We are more like Facebook than Google in the e-commerce world. We push our product recommendation feeds to the consumers rather than wait for them to search on our platform.

”

Lei Chen
Pinduoduo Co-founder & CEO



WeChat and social media

Finally, perhaps the single most essential app for China's smartphone users, its combination of widespread use among nearly every online demographic in China, dominance over social networking and communication in the country, and early positioning as a leading processor of mobile payments made it one of the most valuable digital platforms on the planet.



Yet what enabled developers and entrepreneurs to more fully utilize the value of the WeChat platform was firstly official accounts and later the introduction of mini programs: a light, app-like feature, requiring no download and accessible only within the WeChat app. For an e-commerce startup such as Pinduoduo, this combination of factors provided the application, social network, payment system, and development model upon which to jumpstart their growth.

The Pinduoduo Story



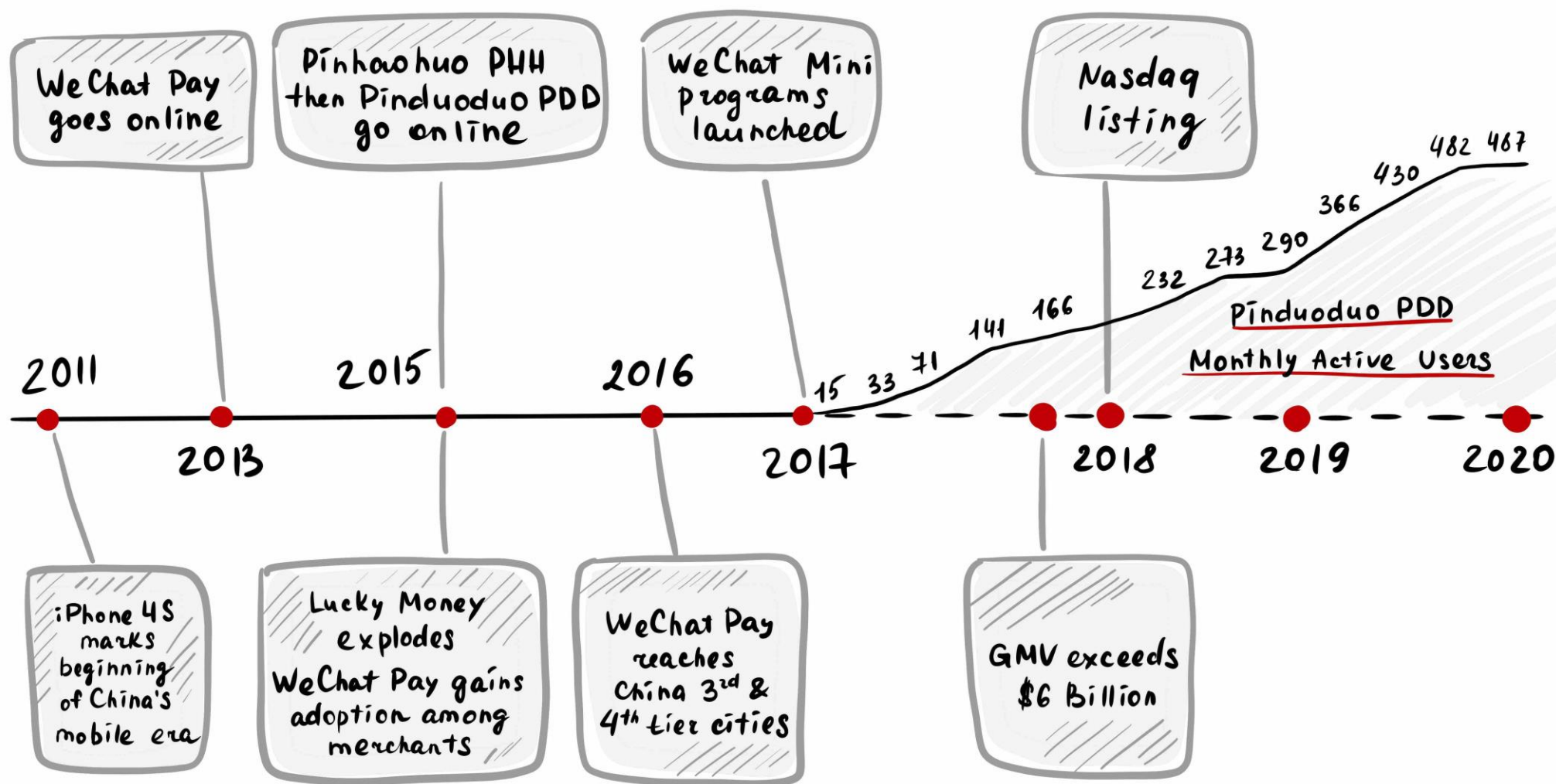
Pinduoduo is not a conventional success story. Founded long after many of the world's top e-commerce players had already established dominance in the space, few expected a latecomer to achieve such a meteoric rise.

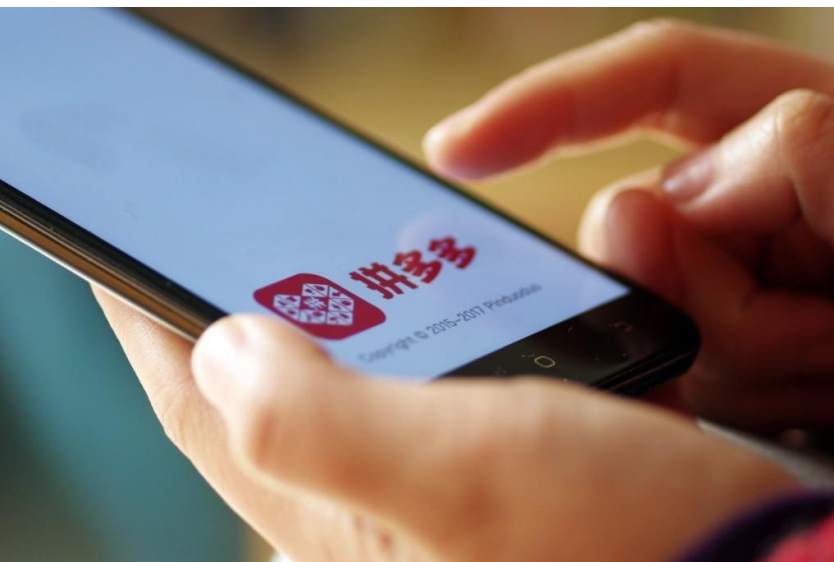
The company's ascent can be attributed not only to the circumstances within which it came to be, but also by a competitive and strategic philosophy that is at once both user-obsessed and somewhat paranoid. As

Huang stated in the company's 2018 IPO prospectus:

"Pinduoduo's survival depends on the value it creates for its users; I hope our team wakes up feeling anxious every day, never because of share price volatilities, but because of their constant fear of users departing if we are unable to anticipate and meet users' changing needs."







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Huang and his team envisioned what they described as a **"combination of Costco and Disneyland"** in its compounding of value-for-money and entertainment, driven by a distributed network which not only matches

information efficiently but also integrates social interaction, making the entire experience more enjoyable.

Through the pursuit of this vision within its context, Pinduoduo has developed a platform and suite of features which illustrate the effectiveness of the interactive e-commerce model.

Team purchase

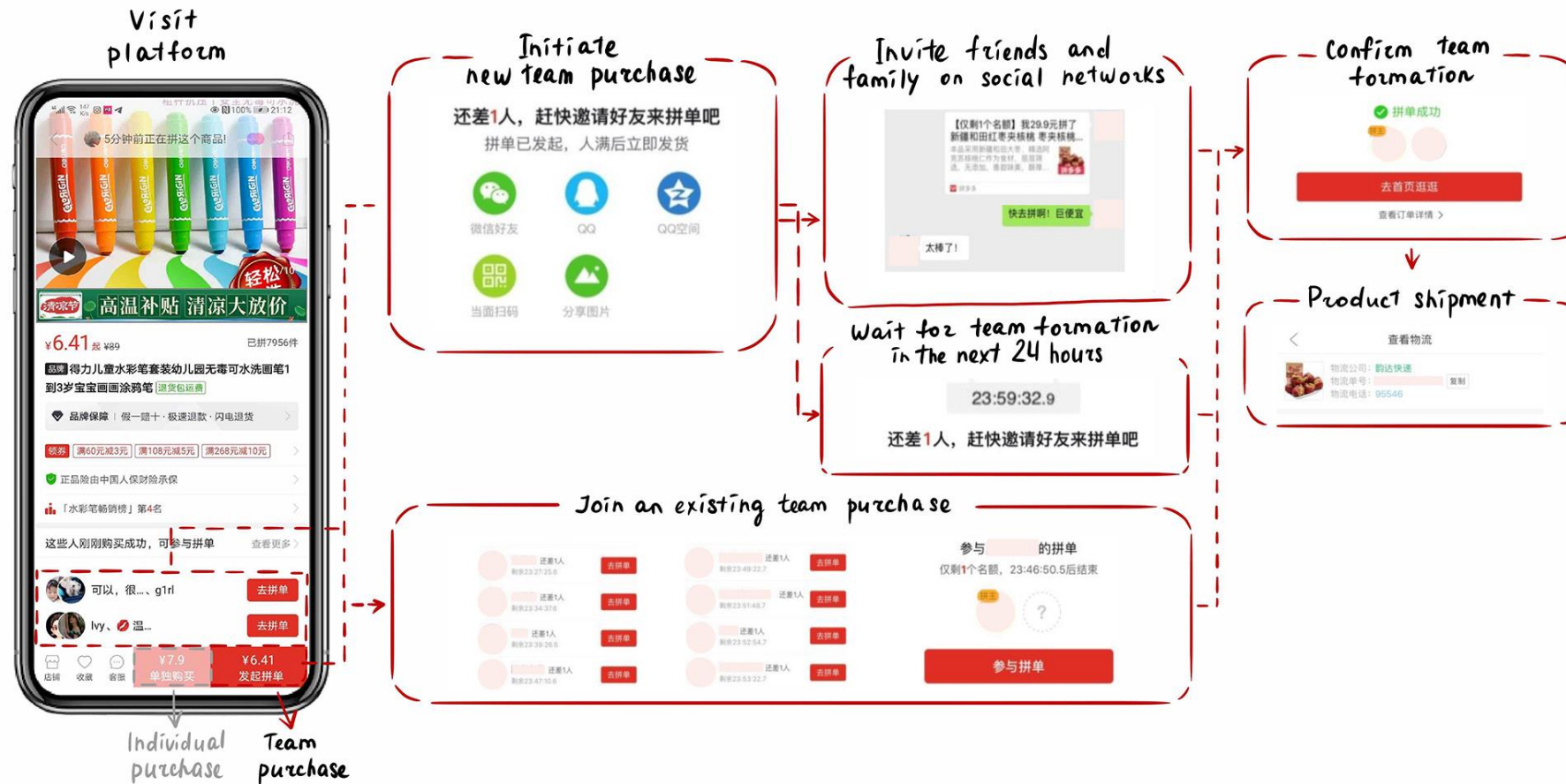
The single feature most frequently credited with Pinduoduo's early-stage success is team purchase, a group-buying feature that quickly became synonymous with the company's brand itself, as Pinduoduo's official English-language slogan emphasizes,

"Together, More Savings,
More Fun."

Team purchase was based on the simple concept of group buying but designed in a way uniquely suited to Pinduoduo's market conditions and overall vision. The process was straightforward:

1. A user is offered two prices for an item on Pinduoduo's platform: one for an individual purchase, another, discounted price for a team purchase.
2. The user can either choose to join an existing team purchase or initiate a new one themselves.
3. The user either invites friends and family to join via social networks such as WeChat or waits for a team formation within the next 24 hours.
4. The team formation is confirmed, the product is shipped, and the user can review their purchase.



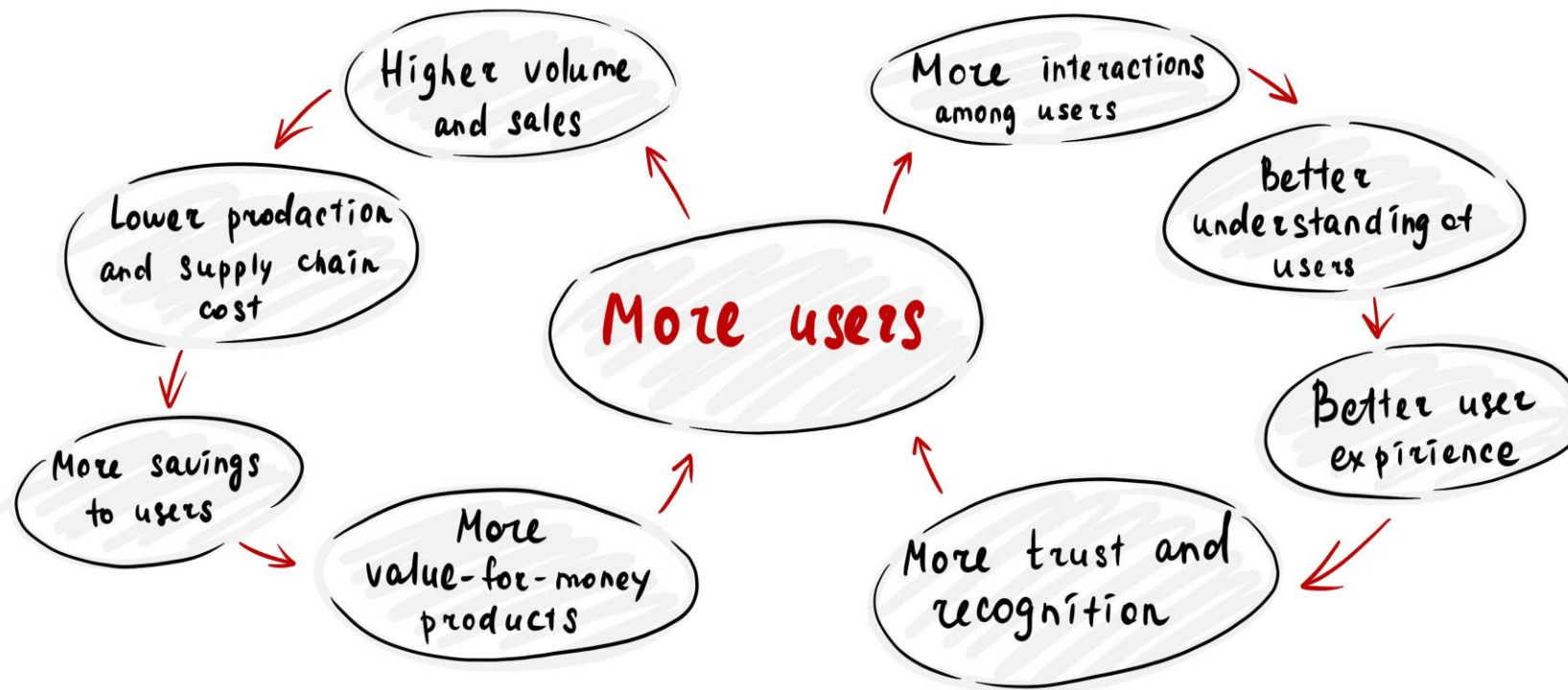


While the group buying process bears some resemblance to long-standing group-buying models, it was placed within conditions where its impact was greatly enhanced both

for the platform and the consumer. Rather than focusing on taking existing market share from its established e-commerce competitors, Pinduoduo oriented its early-stage

growth strategy on attracting down-market users, those who had only recently begun using smartphones and not yet become habituated to e-commerce.

TEAM PURCHASE



The team purchase function succeeded by understanding and addressing the needs of the often-ignored down-market Chinese consumer. Team purchase deals centered around low-cost necessities such as household staples and food, which contain universal appeal across age and income demographics.

What's more, the deals on regularly and frequently-purchased basic items meant that users were more likely to return to the Pinduoduo platform routinely, especially if they could save money by doing so.



Likewise, the utilization of WeChat as a tool for team-creation offered numerous benefits. Firstly, as the most essential and widely-used communication app in China, WeChat was able to penetrate the country's market of digital newcomers faster than any e-commerce app. By using the team purchase feature, Pinduoduo created for itself a gateway into a user base the size of which was over twice that of China's total e-commerce users at the time.

Team purchase information also offered valuable insights as to the online shopping habits of users and their social networks, thereby enhancing Pinduoduo's recommendation algorithm.

This growth strategy created efficiencies of scale, which enabled Pinduoduo to present a consistently improving value proposition. As one Pinduoduo executive explained:

"Our "team purchase" model encourages our buyers to introduce us to even more people through social networks. As our buyer base grows bigger, the scale of our sales volume also grows bigger. Huge sales volume provides merchants more space for supply chain optimization and enables them to offer even more competitive pricing and comprehensive products, which in turn helps attract more users."

Barriers to partaking in e-commerce

Interactive e-commerce, together with the technologies which facilitated its arrival, makes e-commerce more widely accessible. It's worth considering for a moment the barriers that would prevent people from partaking in e-commerce and how interactive e-commerce addresses these. We've broken the barriers down into three broad categories.

Traditional search
E-commerce

High
High
High

Interactive
E-commerce

Low
Low
Low

Barriers



- Motivation Barriers
- Practical Barriers
- Technical Barriers

Technical barriers

- **Internet** - the spread of cheap mobile internet meant that everyone could be online every day.
- **A way to pay** - the prevalence of mobile payment solutions in China meant people were familiar and comfortable with paying on mobile.

Practical barriers

- **Download an app** - this may sound trivial but can actually be a significant obstacle for less savvy mobile users unfamiliar with app stores. Mini programs helped in reducing this issue by removing the need for an app download.
- **Find a compelling product for me** - PDD's team purchase model harnesses the power of social product recommendations to solve this issue, as friends will find the product for you.

Motivational barriers

- **Try something new and unfamiliar** - through the team purchase model current customers recruit new ones, educating and explaining the benefits are natural parts of the process.
- **Overcome fears of wasting money** - low price, high value and accessible products reduce these concerns.

The Feed - Recommendation

A way to conceptualize the core difference between traditional search driven e-commerce and the new interactive model is one of “people looking for products” vs. “products looking for people.”

The interactive e-commerce model follows the logic of “products looking for people,” which is a more suitable model for the small screen and fragmented time of mobile internet use. The platform learns from the behavior of its users, which reveals their preferences and facilitates personalization of the e-commerce experience.

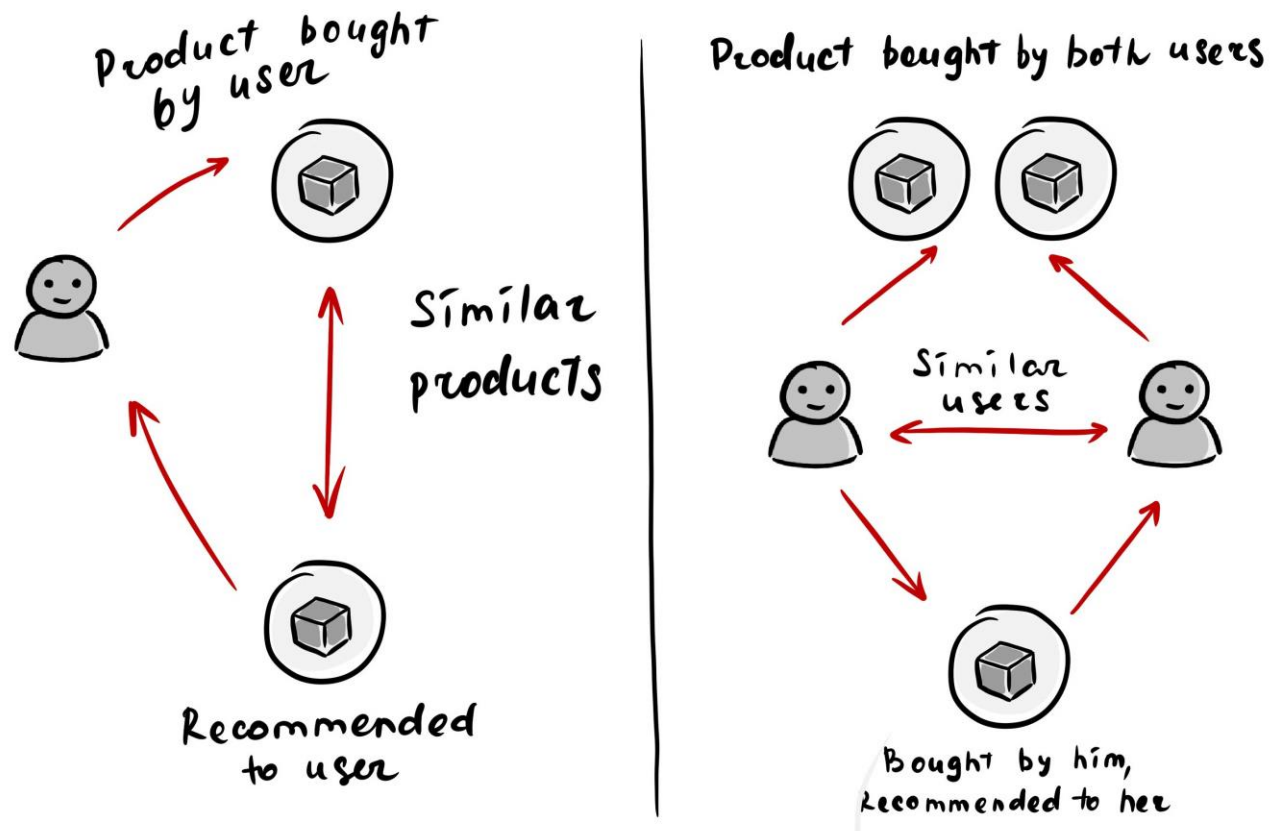
Pull model: “people looking for products”



Push model: “products looking for people”



Below: (left) e-commerce item to item filtering, vs. (right) collaborative filtering



The behaviors can be explicit such as making a purchase or sharing an item to friends, but are also just as likely to be implicit, such as watching a product demo video or spending more time browsing certain categories.

The technology empowering this recommendation process is known as machine learning⁶. Two of the principles behind the application of machine learning to recommendation within e-commerce are known as "item to item filtering" and "collaborative filtering."

An item to item filtering system will recommend products to a user similar to that which they already like to purchase. If the user buys dog food and has been tagged as 'dog owner,' then the system will recommend more dog related items.

⁶ Towards Data Science: AI, Machine Learning, Deep Learning Explained Simply, Jun Wu
<https://towardsdatascience.com/ai-machine-learning-deep-learning-explained-simply-7b553da5b960>

A collaborative filtering system will base their recommendations on finding groups of users who enjoy similar products. Say Jane and Tracey do not know each other but their interests are highly correlated. If Jane purchases a certain new type of cosmetics, then the system will also recommend those cosmetics to Tracey.

Modern e-commerce "recommender systems" will combine both methods with other factors. These systems have increased in sophistication greatly over the past decade and use sophisticated, constantly updated algorithms to determine the optimal mix of personalized products to surface to each user.



Entertainment, leisure, and gamification: make shopping fun again

Through team purchase of everyday items, Pinduoduo provided users with a fun, social, and cost-saving experience that kept them coming back. To build on that, the company added more features to be consistent with that ethos.

This aim led to what can be described as a “digital carnival,” full of relentlessly stimulating games and entertainment, yet anchored to the platform’s e-commerce focus. A popular feature of this is its Duo Duo Orchard mini game, in which users nurture a virtual “tree,” for which they can earn “water droplets” by participating in other functions on the platform. To sweeten the deal for the users, once the “tree” reaches maturity, a real box of fruit will be shipped to the user’s address for them to enjoy.



Through playing Duo Duo Orchard, users could feel rewarded, incentivizing them to return to the platform and reinforcing the virtuous cycle that propels Pinduoduo's success. As one product manager put it:

"Fresh produce is one of the most popular categories on our platform. By introducing a game of planting and caring for a virtual fruit tree, we allowed users to have fun while earning a reward (by gaining water droplets for the plant). They also feel good because when they receive a box of real fruit for free when their virtual tree bears fruit, they know that the

real fruit comes from a farm in China as part of a poverty alleviation project by PDD."

The focus on entertainment is not limited to gamification, however. Duo Duo Live, the platform's live streaming feature, integrates both the entertainment and community components of the interactive e-commerce model. Users can follow live streamers selling goods, interact with them through a chat feature, receive special offers and discounts, and share them with friends.

"I will often open Pinduoduo in my spare moments," explains a

mother of two surnamed Lin from China's Inner Mongolia province. "It is a habit for me. I will open the app, and see something I want, or a game, or an interesting live streamer. I have already received several boxes of fruit playing Duo Duo Orchard."

Considerable media attention has been paid to celebrity live streamers who delight massive audiences with their charisma and headline-grabbing showmanship, such as the notable "lipstick king" Li Jiaqi.⁷

Yet with Pinduoduo the live-stream experience is altogether more down to earth. More

similar to a typical interaction with an offline store's customer service associate than watching a stand-up comedy special. Lower on glamour but higher on engagement and authenticity, a typical Pinduoduo live stream consists of store owners displaying products and answering questions from shoppers.

"Live stream is about enabling a direct connection between merchants and buyers, recreating the two-way communication present with physical shopping,"

explained one Pinduoduo executive.

⁷ China Morning Post: Who is millionaire Li Jiaqi, China's 'Lipstick King' who raised more than US\$145 million in sales on Singles' Day? , Alice Huang <https://www.scmp.com/magazines/style/news-trends/article/3074253/who-millionaire-li-jiaqi-chinas-lipstick-king-who>

Live streaming case study: “couch tourism” amidst a pandemic



As much of the world has found their travel options in 2020 limited by COVID-19, live streaming has offered an opportunity for those stuck at home to satiate their wanderlust, and for retailers and tourism businesses to reach tourist shoppers from afar.

For the town of Furong⁸, a popular historic location in Hunan Province known for its Tu ethnic traditions, they found live streaming offered one solution to the tourism slowdown. As the subject of a seven-hour live streaming session on PDD on

April 26, the town reached out to the platform's many users. Wu Xiao, the town mayor, dressed in his ethnic costume, taught viewers the basic steps of their traditional dance. He also played tour guide and took the viewers to visit the town's famous waterfall and other sights, such as Baishou Hall and the street where the famous movie, Furong Town, was filmed 30 years ago.

By leveraging e-commerce options, Furong was able to promote and sell its regional specialty products to the live stream's millions of viewers.

PDD & interactive e-commerce: results, potential, and limitations



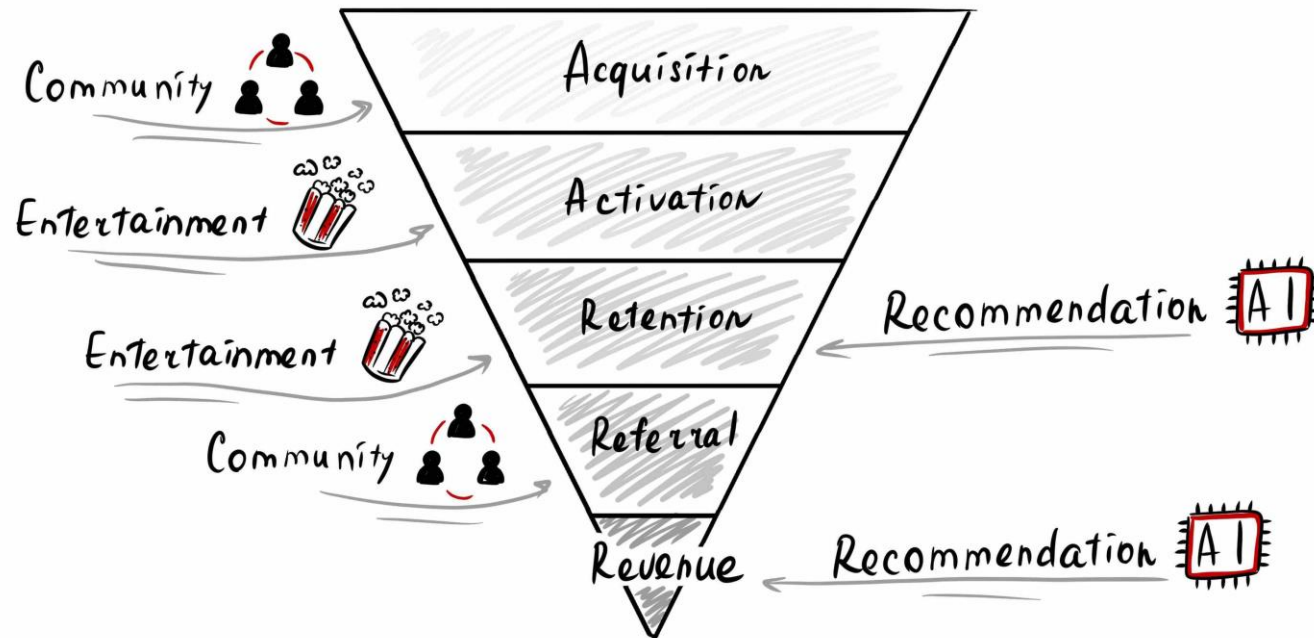
The case of Pinduoduo is perhaps the most comprehensive example of the business results that the interactive e-commerce model can achieve if applied appropriately. In only its fourth full year of existence, the company recorded a total gross merchandise volume equivalent to US\$144.6 billion and boasted over 585 million active buyers on the platform.

Interactive e-commerce has fostered a more mobile friendly lighter way of shopping for consumers, has cultivated improved supply chain efficiency through C2M and provides a role model for the global e-commerce industry.

The themes of value-for-money, entertainment and community are universal, not specific to just China.

The application of these parts in concert with one another has proven effective at addressing the five metrics that compose the “AARRR, pirate funnel.”⁹

The framework whose name is drawn from its 5-letter acronym reminiscent of the sound of a cinematic buccaneer, depicts the process of value creation in the digital economy:



Acquisition: The transition when a “person” becomes a “user,” engaging with the platform or business for the first time, registering, or downloading an app.

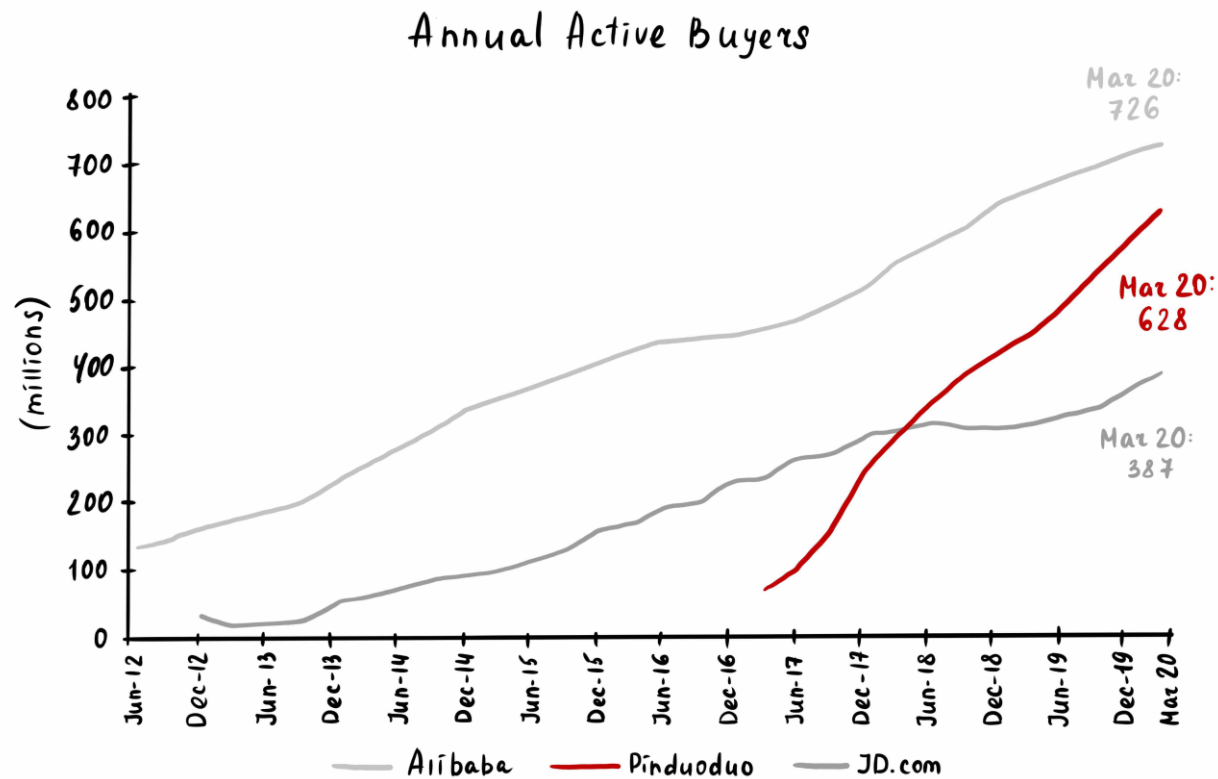
Activation: The “AHA” point at which a customer goes from simply trying a product to regularly using and enjoying the product.

Retention: Ensuring that a customer continues to use the platform or product regularly and frequently.

Referral: Leveraging the social networks of users for low-cost, potentially exponential growth of user acquisition.

Revenue: Monetizing the value of users to bring revenue into the business.

⁹ Inc.com: AARRR! Dave McClure's Pirate Metrics; And The Only Five Numbers That Matter, Walter Chen
<https://www.inc.com/walter-chen/aarr-dave-mcclure-s-pirate-metrics-and-the-only-five-numbers-that-matter.html>



In the case of Pinduoduo, the interactive e-commerce model has addressed each of the five aspects of the pirate funnel by integrating features not often associated with e-commerce platforms. Its team purchase feature engages the communities and social networks of their users, powering a virtuous cycle of acquisition and referral. The social involvement, games, live streaming, and constant stimulation and excitement on the platform activate and retain the users they

acquire. The insights gathered from the social and highly engaging nature of the platform can power a recommendation engine which both draws monetary value from the user while providing an experience that keeps them activated and retained.

Through that flywheel, they can optimize recommendation and scale that offers value for money to their users, which further incentivizes them to continue using the platform.

DAU/MAU: The magic metric of interactive e-commerce

China e-commerce firms DAU/MAU, Jan-May 2020¹⁰

	Jan	Feb	March	April	May
Pinduoduo	39.1%	42.1%	49.0%	48.3%	49.9%
Taobao	35.9%	36.4%	42.9%	42.4%	44.9%
JD	18.7%	21.3%	22.9%	21.9%	22.0%
VIP Shop	16.8%	16.7%	19.4%	19.5%	19.8%
Suning	9.9%	11.6%	11.0%	10.4%	10.8%

Quantitatively, the implementation of interactive e-commerce principles can perhaps best be observed through an e-commerce app's number of daily active users (DAU) compared to monthly active users (MAU).

The reasoning for this is fairly straightforward. Most frequently used to measure the “stickiness” of an app, this metric has not traditionally been a leading method to evaluate the success of an e-commerce platform, as the conventional search-base may prioritize a series of efficient and economical transactions to a more leisurely shopping experience.

Traditional e-commerce is in-and-out, while interactive e-commerce seeks to create a digital space in which leisure and shopping are intertwined.

This is a reality that is gaining recognition, being tested and applied throughout the digital economy. Social media and content-sharing sites have moved progressively deeper into e-commerce, powered by socially-driven recommendation algorithms. Gamified elements have been applied with varying results from travel platforms to chat apps. And especially in China, live streaming has erupted as a central component of online shopping. The traditional category barriers are falling.

In the case of Facebook, for example, the world's biggest social media company appears to be gradually applying elements of interactive e-commerce to its platforms. Built around the very concept of "community," it has

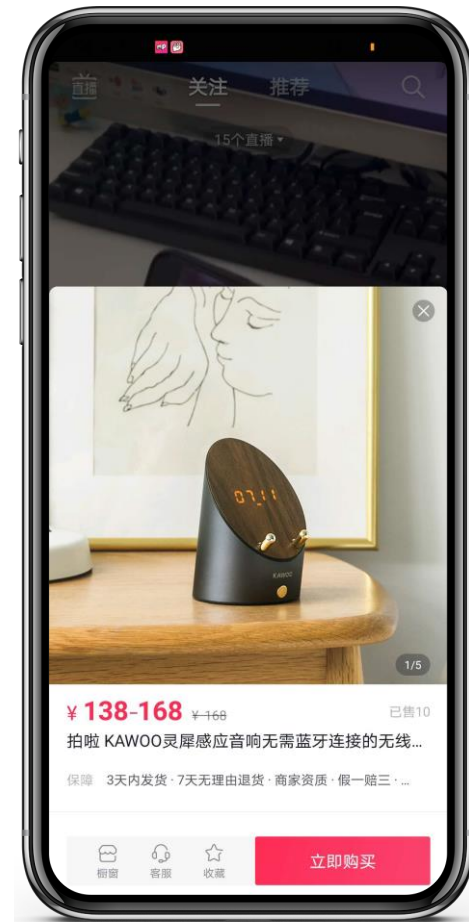
also seen itself expand in entertainment as well, with its Facebook Live product exploding in popularity¹¹ since its launch in 2016. In May of 2020, the company took a major step into e-commerce with the introduction of Facebook Shop, enabling businesses to set up a single online store for customers to access on both Facebook and Instagram. In Facebook's announcement of the feature¹², it articulated a philosophy very much aligned with that of interactive e-commerce:

"We want to give people a place to experience the joy of shopping versus the chore of buying. And we want to help small businesses adapt and make it easier for people to discover and shop for things they love."



¹¹ 99firms.com: Facebook Live Statistics
<https://99firms.com/blog/facebook-live-stats/#gref>

¹² Facebook: Introducing Facebook Shops: Helping Small Businesses Sell Online
<https://about.fb.com/news/2020/05/introducing-facebook-shops/>



This echoes the sentiment of Pinduoduo and other interactive e-commerce platforms: recreate the enjoyment and recreation of the shopping experience and apply it to the digital space.

Facebook's integration of e-commerce functionality into its social media apps follows many of its largest competitors in doing so. As early as 2018, TikTok parent company ByteDance introduced "Douyin Store"¹³ into the Chinese version of its popular short-video app.

The native e-commerce system allowed influencers and creators to capitalize on the platform's high level of user engagement and convert it to revenue, while also improving the value proposition of Douyin's ad sales.

Just as Pinduoduo applied entertainment and community components to its e-commerce platform to enhance the acquisition, activation, and retention stages of the "pirate funnel," so entertainment and social media platforms have integrated e-commerce components to enhance their revenue stage.

Pictured: Ecommerce stores on Instagram and Douyin

¹³ Walkthechat: A simple guide to Douyin Store – Case studies and how to create one, Tingyi Chen
<https://walkthechat.com/simple-guide-to-douyin-store-case-studies-and-how-to-create-one/>

Conclusion



Interactive e-commerce has made progress digitalizing several human aspects of offline retail, but there is still much that remains elusive. Multiple aspects of shopping in the real world remain stubbornly "undigitalizable" - impossible to replicate through a small screen in our pockets. It may take a fundamental breakthrough in technology, such as the mobile revolution of the past decade, for truly new models to flourish.

What is abundantly evident through the case of Pinduoduo is that humans crave more from the shopping experience than the cold and impersonal experience that e-commerce has traditionally offered.

Through the integration of advanced recommendation features, entertainment, and community involvement, interactive e-commerce is able to encapsulate many of the most enjoyable aspects of shopping in the physical world.

Interactive e-commerce will not stand still, and its progressive growth and success stand testament to the continual evolution of online interactivity.

Defining **Interactive** e-commerce

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