

The Long Tail: Theory and Applications

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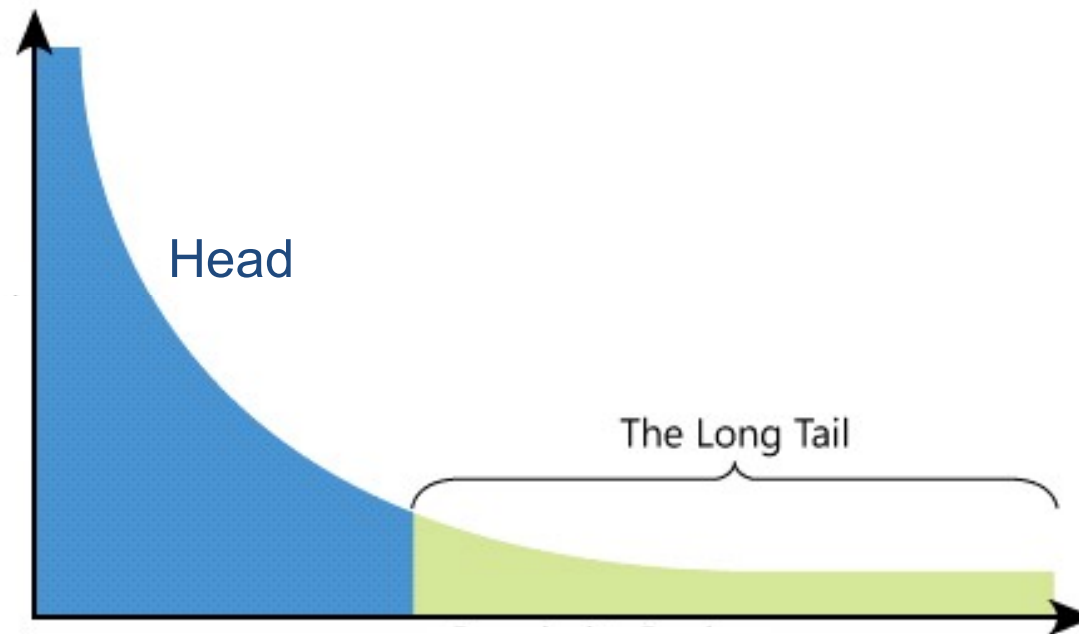


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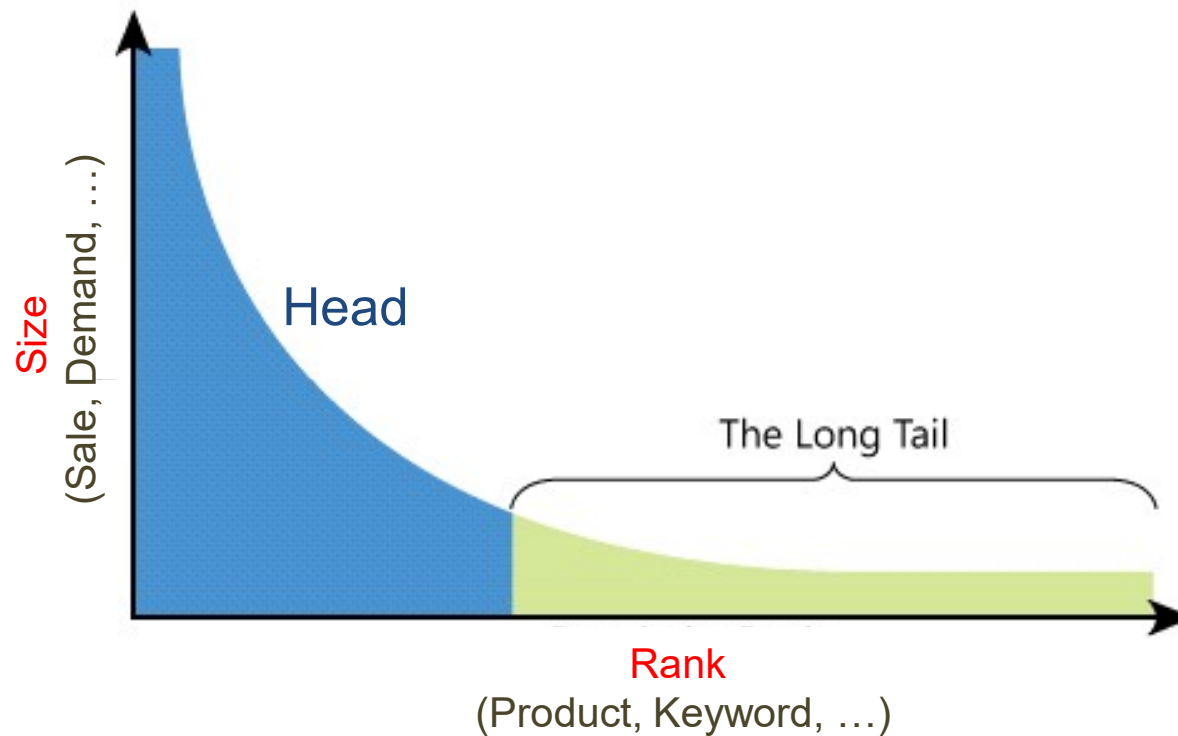
What is Long Tail?

- Long tail is a concept in **statistics**, describing the distributions with **heavy tails**, i.e., those having a large number of occurrences (“long tail”) far from the “head” of the distribution.
 - Example: Power Law Distribution, Pareto Distribution
 - ~~Normal Distribution, Exponential Distribution~~



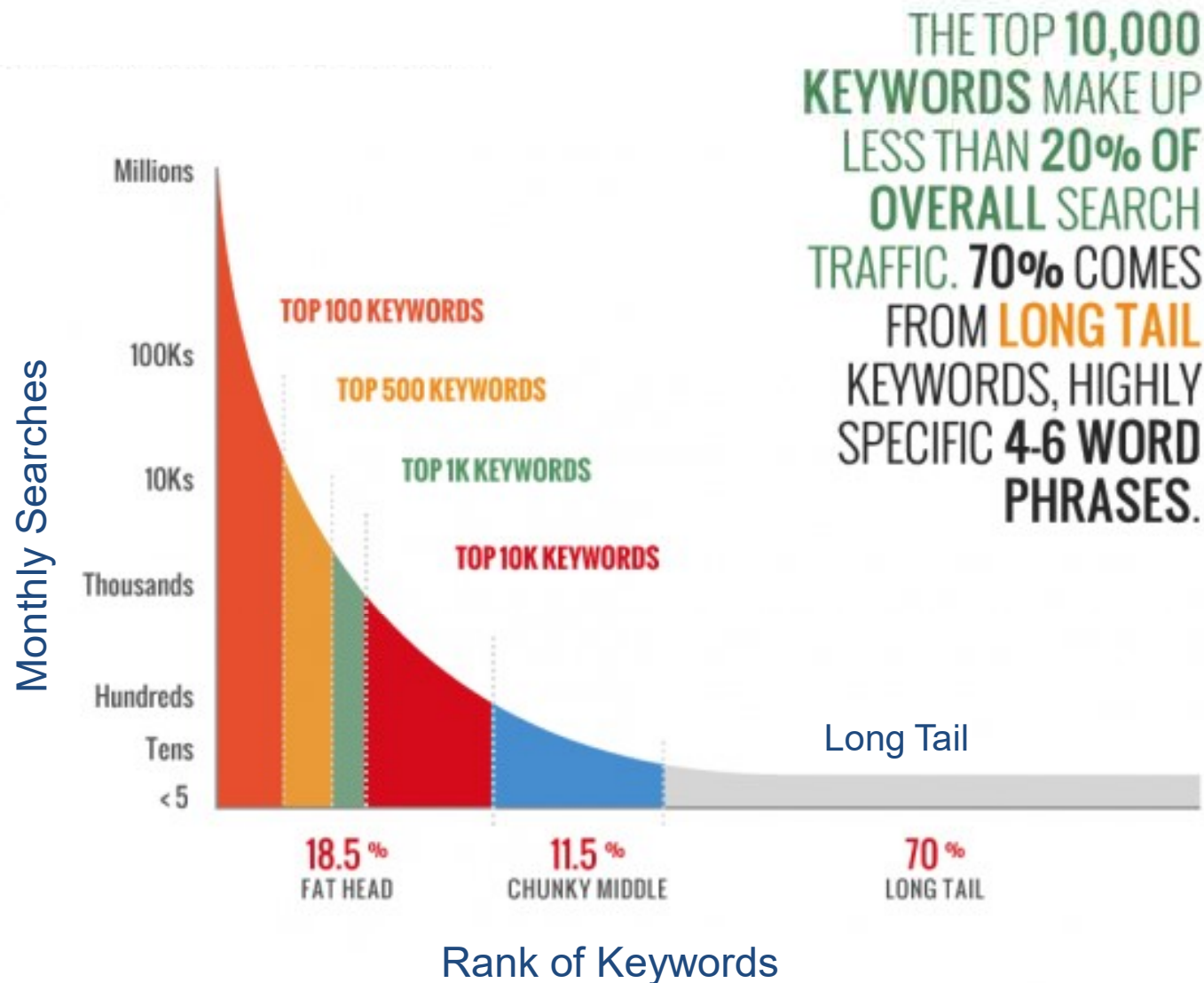
What is Long Tail?

- In business, the term **long tail** is applied to a type of important distribution/function in the market: **Rank-Size** function or **Rank-Frequency** function.
 - Example: Demand across Product, Sale across Product



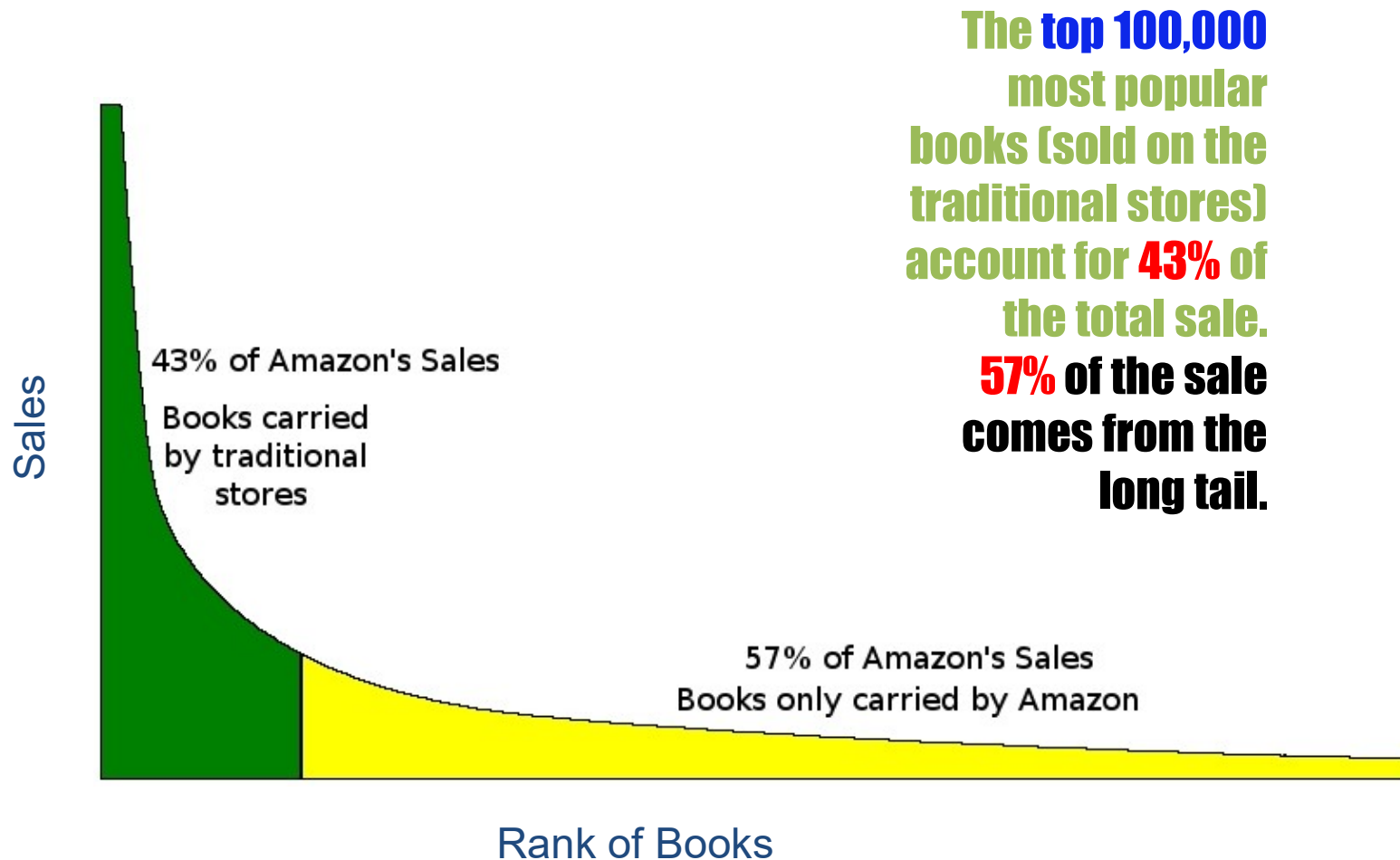
Example of Long Tail

- A Famous Example: [Searches of Keywords in Google](#) in Google



Example of Long Tail

- Another Example: [Sales of Books](#) in Amazon.com



Example of Long Tail

- Other Examples

- Downloads of Apps in Apple Store, Google Play
- Downloads of musics in iTunes
- Plays of movies in Netflix, Youtube, ...
- Visits of websites on Internet
- Sales of goods in Amazon, Taobao, Jingdong
-

Internet

- Key Observations: *The summation of the long tail is comparable to and even larger than that of the head.*

➡ **The Long Tail Market**

Outline

- **Long Tail Theory**

- **Case Study**

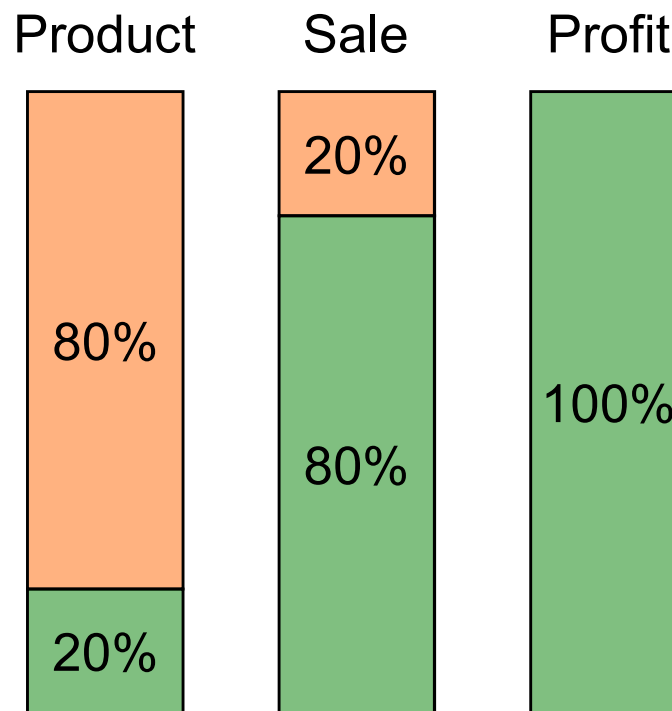
- Online Marketplace: Taobao, Jingdong

- **Our Future Research**

- Crowdsourced Delivery

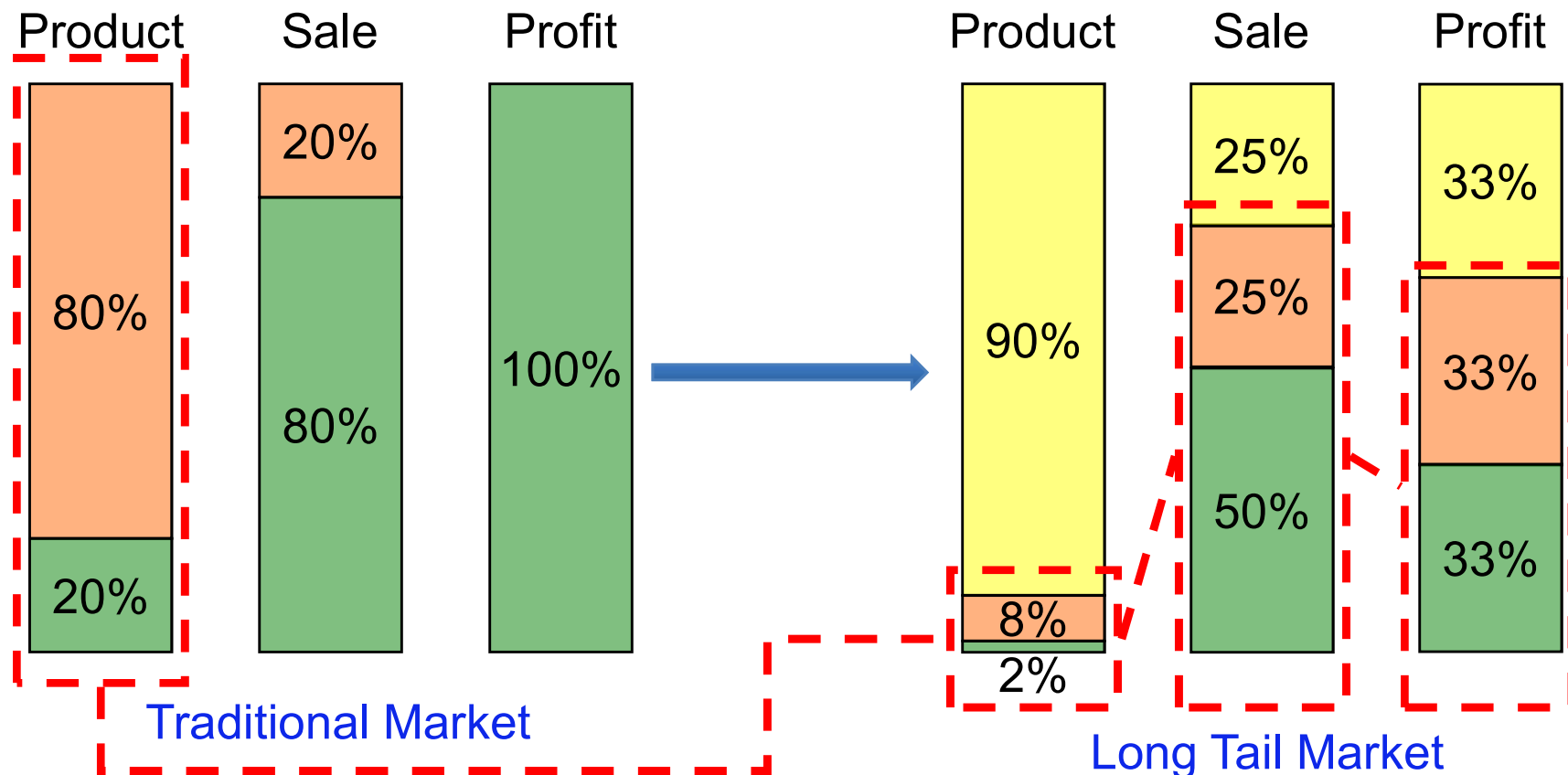
The Pareto 80/20 Rule

- **Traditional Market:** 20% of the most popular products generates 80% of the total sale, and 100% of the total profit.
 - The retailer makes the majority of the profit by selling more from a minority of popular products.



The Long Tail Theory

- **Long Tail Market:** 10% of most popular products (sold in traditional markets) generates $\frac{2}{3}$ of the total profit; 90% of long tail products (not sold in traditional markets) generate $\frac{1}{3}$ of the total profit.



The Long Tail Market

- Long Tail Theory vs Pareto 80/20 Rule
 - Observations from different market angles
 - Not conflict with each other

The Long Tail Market

- Long Tail Theory vs Pareto 80/20 Rule

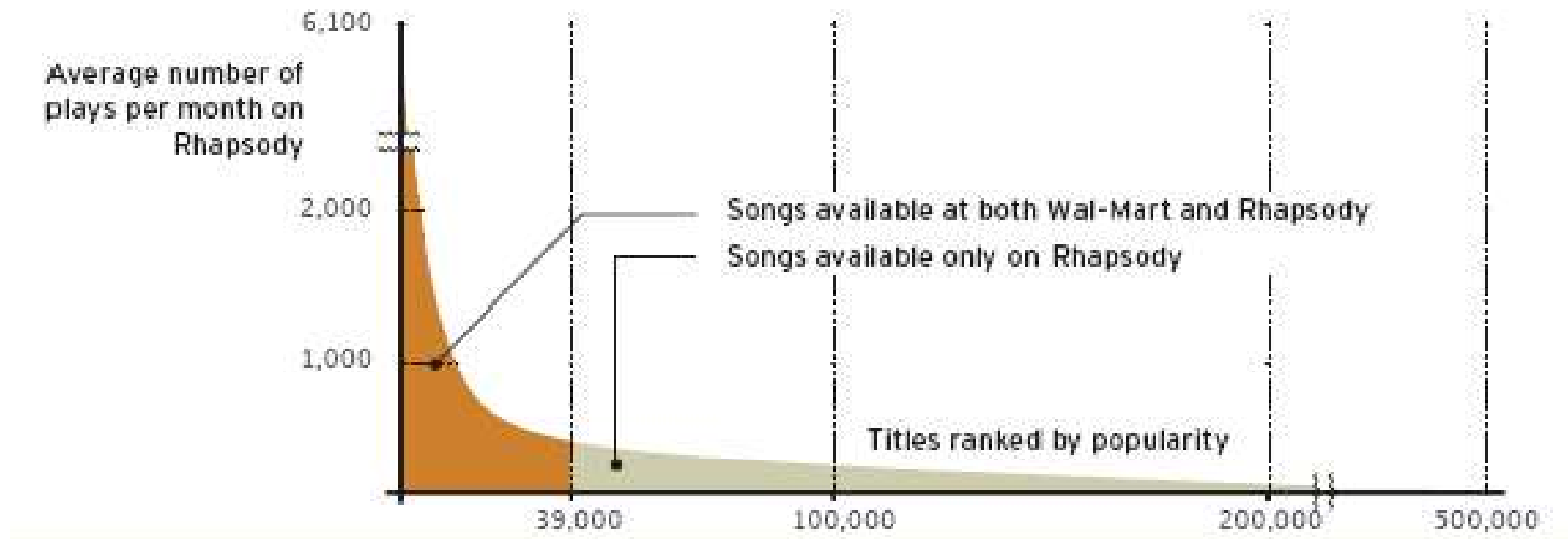
- Observations from different market angles
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- Long Tail Market vs Traditional Market

- Products are much more abundant;
 - Long tail products (not sold in the traditional market) can be tens to hundreds of times of products in the traditional market;
- There is a right-shift of sale and profit, from the most popular products to less popular and long tail products;
- Long tail products generate a non-negligible portion of sale and profit.

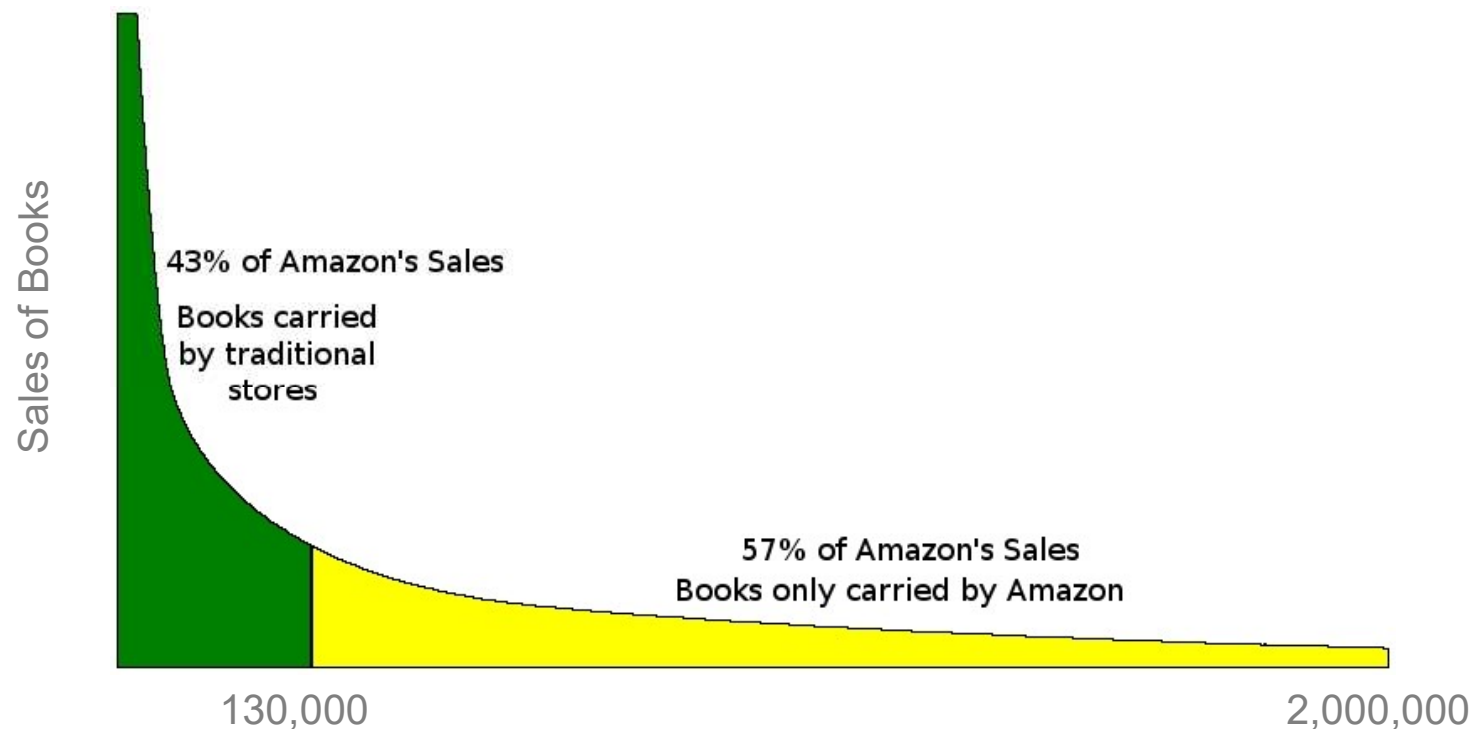
The Long Tail Market

- Example of Long Tail Market: [Rhapsody](#) (online music)
 - More than 500,000 songs vs 39,000 songs in Wal-Mart
 - Long tail songs generates more than **22%** of the total plays



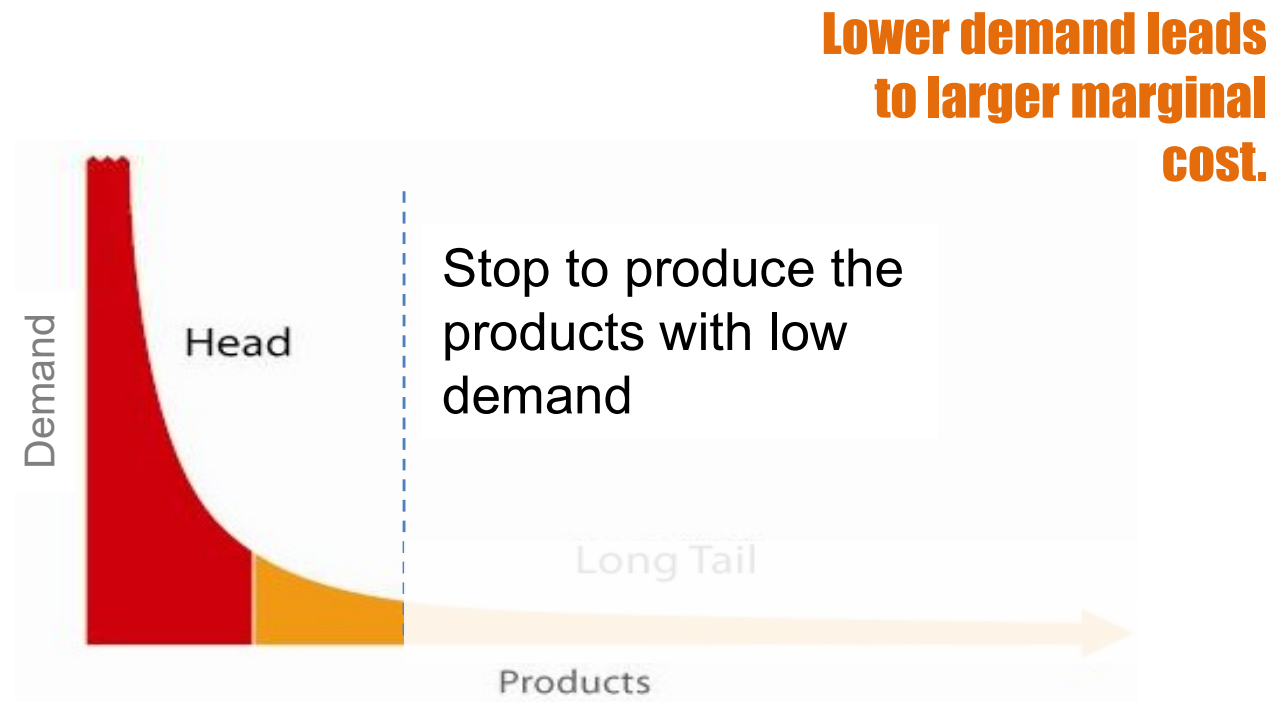
The Long Tail Market

- Example of Long Tail Market: [Amazon.com](https://www.amazon.com) (online book)
 - More than 2,000,000 books vs 130,000 books in traditional stores
 - Long tail books generates more than **57%** of the total sale



The Long Tail Market

- Why **no Long Tail** in a traditional market?
 - (i) Production cost and Transaction cost;
 - (ii) Information asymmetry between producers and consumers;



The Long Tail Market

- How to create a Long Tail in a market?
 - Reduce **production cost** and **transaction cost**;
 - *Increase products (long tail) and demands in the market;*
 - Reduce **information asymmetry** (connect demand and supply).
 - *Shift the demand from the “head” to the “tail” (bold tail).*



Implementation of Long Tail Theory

● Online Marketplace

- E.g., Amazon, Taobao, Jingdong
- Aggregate a large amount of individual sellers (and produces)

● App Store

- E.g., Apple Store, Google Play
- Aggregate a large amount of individual developers (and apps)

● Crowdsourcing

- E.g., Wiki, BBS, Crowdfunding
- Aggregate a large amount of individual contributors (and resources)

Outline

- Long Tail Theory

- **Case Study**

 - Online Marketplace: Taobao, Jingdong

- Our Future Research

 - Crowdsourced Delivery

Online Marketplace

● B2C

- The platform reserves the item first, and then resells to the buyers;
- E.g., Amazon, Jingdong, Suning

● C2C

- The platform serves as an agent connecting the buyers and sellers;
- E.g., Amazon, Jingdong, Taobao

● O2O

- The platform connects the buyers and sellers online, and provides the service offline.
- E.g., ELE (online takeout), Waimai.Baidu

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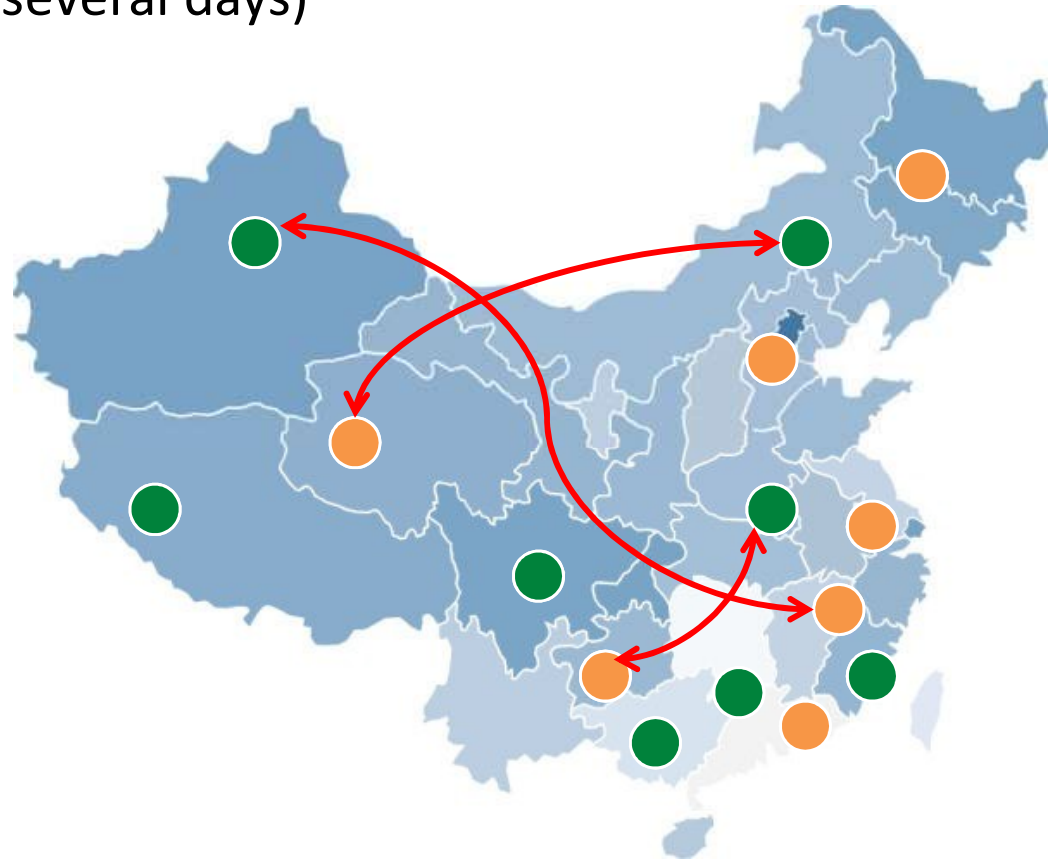
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Global C2C – Taobao

● Global C2C Platform

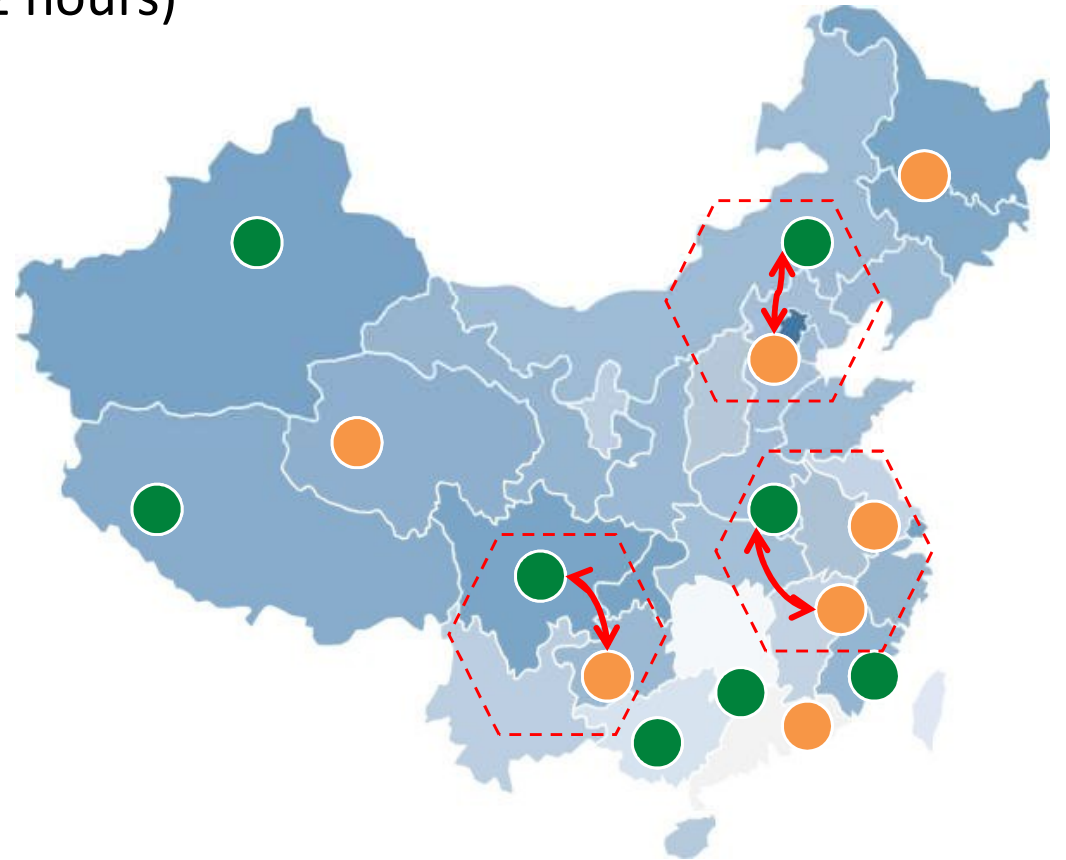
- Connecting buyers and sellers globally;
- Globally optimal matching between buyers and sellers;
- Slow delivery (e.g., one or several days)



Local C2C – Jingdong.Daojia

● Local C2C Platform

- Connecting buyers and sellers locally (e.g., within 3km);
- Locally optimal matching between buyers and sellers;
- Fast delivery (e.g., within 2 hours)



Global vs Local C2C

Global C2C

Globally optimal matching

High searching/matching cost

Slow delivery (e.g., days)

Products without location restrict
(e.g., smartphone, book)

Local C2C

Locally optimal matching

Low searching/matching cost

Fast delivery (e.g., hours)

Products with location restrict (e.g.,
fresh seafood, flower)

Delivery

- In both global C2C and local C2C, **delivery** is one of the important problems.
 - Reliability
 - Timeliness
 - Efficiency
- Delivery in Global C2C: **the last mile** problem
- Delivery in Local C2C: **the local delivery** restriction
- Our Solution: **Crowdsourced Delivery**

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Crowdsourced Delivery

- Motivation: Solve the **last mile** problem in global C2C and the **local delivery** restriction in local C2C.
- Key Idea: Instead of relying on traditional large delivery company, we rely on *the idle users locally to delivery items at the last mile*.
 - Know local environment better
 - Work more efficiently (from a social perspective)

Crowdsourced Delivery

- Key Problems

- **Efficiency**: How to efficiently match the delivery tasks.
- **Incentive**: How to incentivize users joining the system.
- **Information Asymmetry**: How to motivate users report the truthful information.

Crowdsourced Delivery

- Real world Example: [Jingdong.Zhongbao](#)

- Step 1. Register as a “deliverer”;
- Step 2. Once there is a transaction in the Jingdong.Daojia online marketplace (local), the platform will announce a delivery task, showing the locations of the seller and the buyer;
- Step 3. The deliverers within 3km will receive the task, and the one who chooses the task goes to the seller to take the item, and then send it to the buyer;
- Step 4. The deliverer earns 6 RMB for each successful delivery.

- Video

http://yuntv.letv.com/bcloud.html?uu=82abd5491f&vu=d5179e32fc&auto_play=1&gpcflag=1&width=640&height=360

Conclusion

- We review the **long tail** theory in business, and present a case study of long tail theory: online marketplace.
- We present our future research motivated by the online marketplace: **crowdsourced delivery**, which is also an application of long tail theory.

Thank You