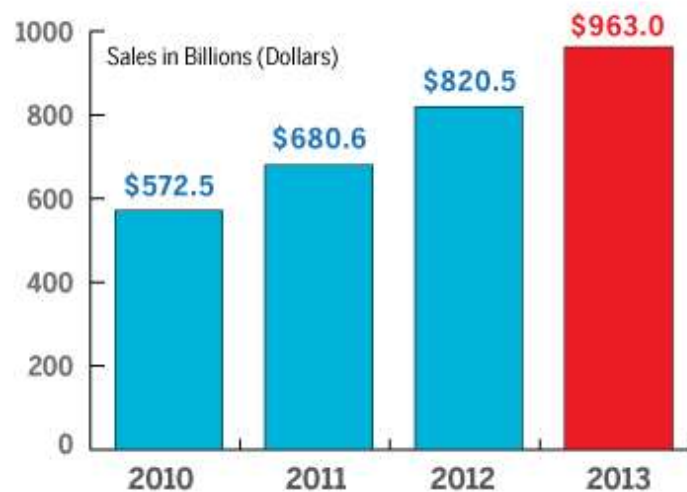


Internet Economics



Global e-commerce sales are growing at more than 19% a year

Worldwide retail web sales will reach nearly \$1 trillion by 2013, predicts Goldman Sachs. E-commerce is growing at 19.4%, the investment bank says.

Source: Goldman Sachs, Sales in billions of dollars.

Contents

Evolution

Technology

Access, Pricing and Competition in ISP market

Information and the Internet Economy

Taxonomy

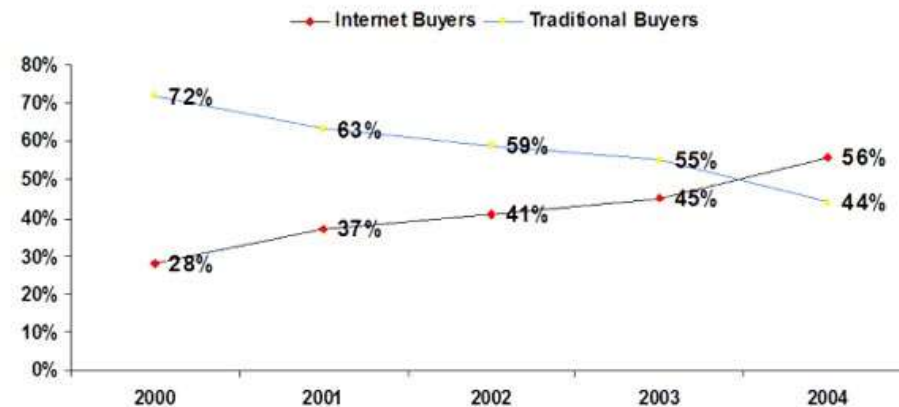
1. Introduction

Internet Economy

“The study of how **society** allocates its scarce Internet resources among needs and preferences”

Internet Buyers Vs. Traditional Buyers

Proportion of All Homebuyers Surveyed

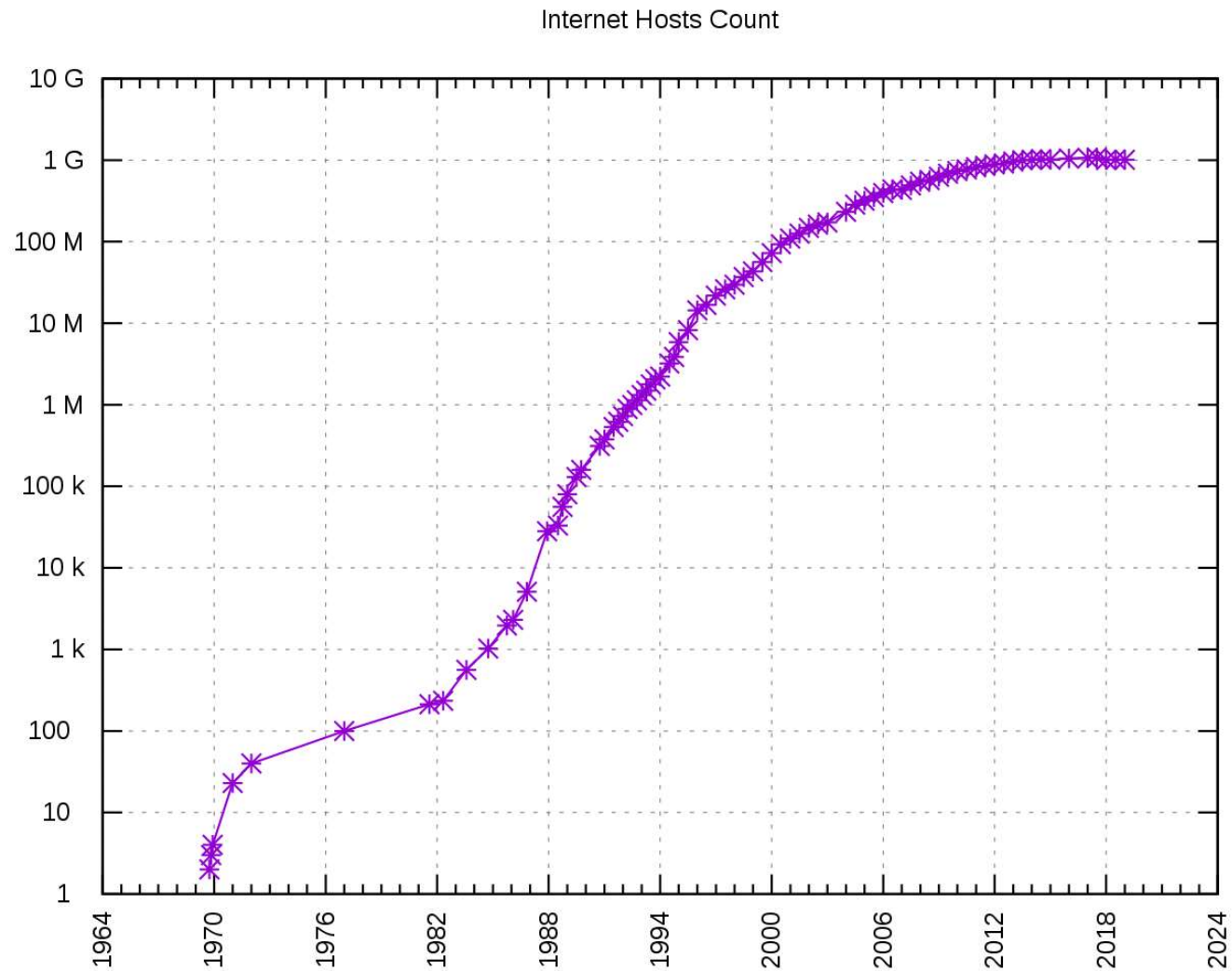


Q: Did you use the Internet as an important part of your home-buying and selection process?

California Association of REALTORS®



2. Evolution of the Internet



**WORLD INTERNET USAGE AND POPULATION STATISTICS
2023 Year Estimates**

| World Regions | Population (2022 Est.) | Population % of World | Internet Users 31 Dec 2021 | Penetration Rate (% Pop.) | Growth 2000-2023 | Internet World % |
|---|------------------------------------|----------------------------------|---------------------------------------|--------------------------------------|-----------------------------|-----------------------------|
| <u>Africa</u> | 1,394,588,547 | 17.6 % | 601,940,784 | 43.2 % | 13,233 % | 11.2 % |
| <u>Asia</u> | 4,352,169,960 | 54.9 % | 2,916,890,209 | 67.0 % | 2,452 % | 54.2 % |
| <u>Europe</u> | 837,472,045 | 10.6 % | 747,214,734 | 89.2 % | 611 % | 13.9 % |
| <u>Latin America / Carib.</u> | 664,099,841 | 8.4 % | 534,526,057 | 80.5 % | 2,858 % | 9.9 % |
| <u>North America</u> | 372,555,585 | 4.7 % | 347,916,694 | 93.4 % | 222 % | 6.5 % |
| <u>Middle East</u> | 268,302,801 | 3.4 % | 206,760,743 | 77.1 % | 6,194 % | 3.8 % |
| <u>Oceania / Australia</u> | 43,602,955 | 0.5 % | 30,549,185 | 70.1 % | 301 % | 0.6 % |
| <u>WORLD TOTAL</u> | 7,932,791,734 | 100.0 % | 5,385,798,406 | 67.9 % | 1,392 % | 100.0 % |

3. Internet Technology

Circuit and packet switching is important for access pricing

Circuit switching

- End-to-end dedicated connection

- Guarantees quality

- Easy to meter and account (bill) for calls

Packet Switching

- Shared capacity

- Efficient use of network

- Problems with delay, metering and billing

4. Access, Usage, Pricing and Competition

(i) Access and usage

Unique

Service not consumed in isolation (network)

Must have access to the network before use

Historically access through employment and
education organizations

Commercialization allowed home access through
ISPs

4. Access, Usage, Pricing and Competition

(ii) ISP pricing

Flat rate: fixed price for unlimited usage

Usage sensitive

Combination of flat and usage sensitive rate

Flat rate is popular

- Easy to administer

- Attracts customers (search the www freely)

- Encourages congestion

4. Access, Usage, Pricing and Competition

(iii) Competition

Low entry barriers prevent monopolization

100s ISPs in a country

Must look at market **concentration**

Regulations must be vigilant

Monitor structure and performance

e.g., # of ISPs in concentration

pricing, productivity, profits, QoS, ...

Maximize network effects

5. Information and the Internet Economy

(i) Information goods = digital Goods

Can be digitized

Large FCs, low MCs

Cost based pricing not appropriate?

Use value-based pricing

5. Information and the Internet Economy

(ii) Value-based pricing

Extract value (CS) from buyer

Dynamic pricing

Personalized pricing

Group pricing

Versioning

Use Internet and IT to sort buyers according to the
WTP

Charge different prices according to the WTP

ex: Amazon

5. Information and the Internet Economy

(iii) Information, Digital and Internet Economy
Information Economy refers to the broad long-term trend toward the expansion of information and knowledge based assets and values relative to tangible assets and goods associated with the traditional agriculture, mining and manufacture sectors

Digital Economy refers specifically to the recent and still largely unrealized transformation of all sectors of the economy by the computer-enabled digitization of information

5. Information and the Internet Economy

Internet Economy \subseteq Digital Economy

Comprises of individuals and companies that generates all or some of their goods and/or services from the Internet or Internet related goods and services

E-commerce is the production, advertising, sale and distribution of goods and services online over the Internet

5. Information and the Internet Economy

(iv) Taxonomy of the Internet Economy

Infrastructure

- a. Internet infrastructure
- b. Applications infrastructure

Economic Activity

- c. Intermediaries
- d. e-commerce

5. Information and the Internet Economy

- a) Internet infrastructure
 - Free-to-Air (Broadcast TV) and Cable TV
 - Wireless and Satellite networks
 - Internet backbone providers (MCI)
 - ISPs (AOL)
 - Network equip providers (Cisco, Lucent)
 - Server and client hardware (Dell, Compac, HP)

5. Information and the Internet Economy

- b) Applications infrastructure
 - Consultant and providers of e-commerce and multimedia applications (Microsoft, Sun, IBM)
 - Web development and search engine software (Adobe, Google, Yahoo)
 - Web-enabled database (Oracle)

5. Information and the Internet Economy

- c) Intermediaries
 - Online brokers (Travelocity, E*trade, Enron?)
 - Online auctions (eBay)
 - Peer-to-peer online music sites (Napster)
 - Portals, virtual malls (Yahoo, Excite, Lycos shopping)
- d) e-commerce
 - e-tailers (Amazon.com)
 - Transport and shipping (Fedex, Southwest)
 - Manufacturers direct to customers (Dell)

5. Information and the Internet Economy

Vertical alliance among a), b), c) and d)

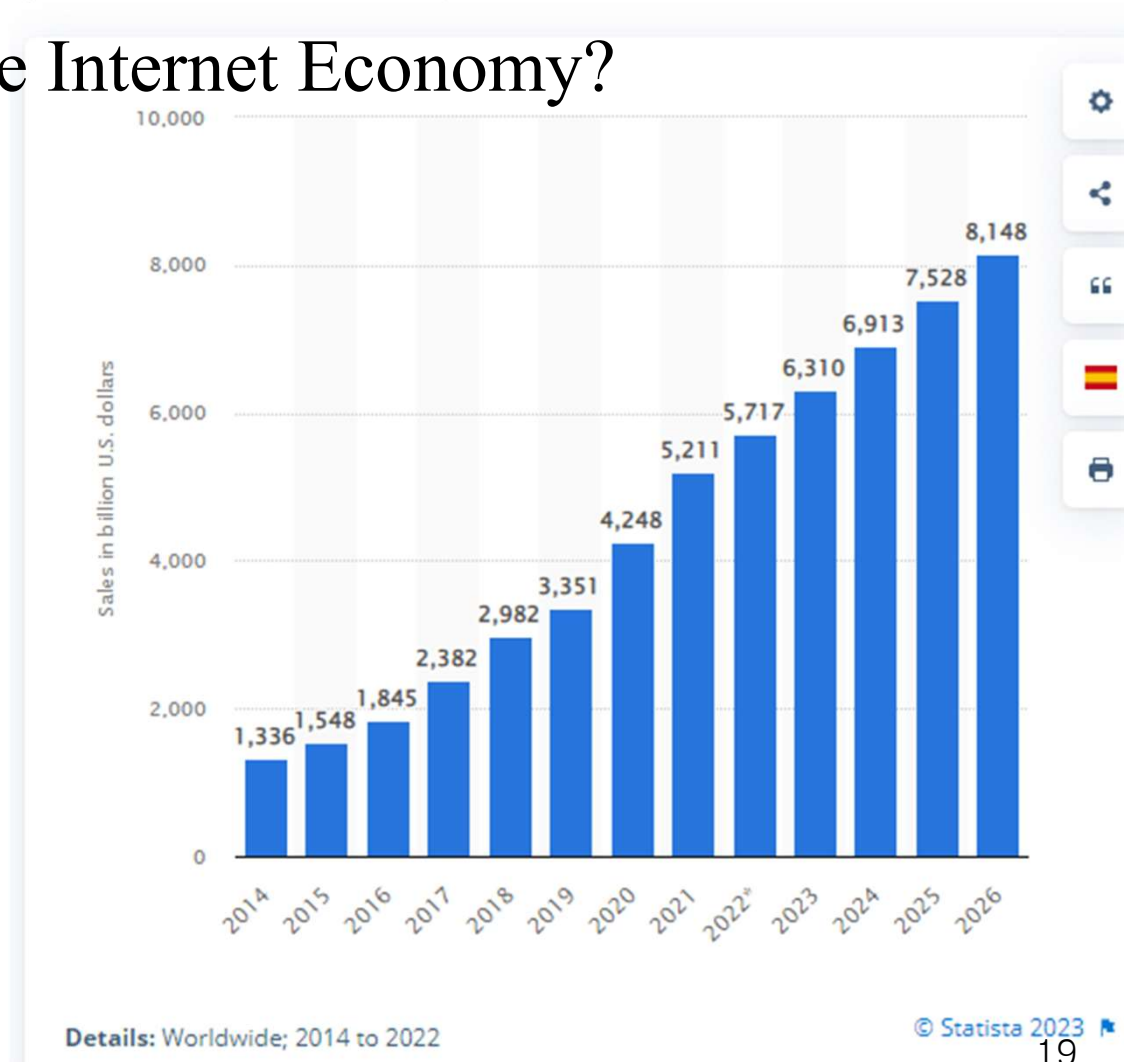
Why?

1. Reduce cost
2. Gain large market
3. Opportunity to bundle service and goods together

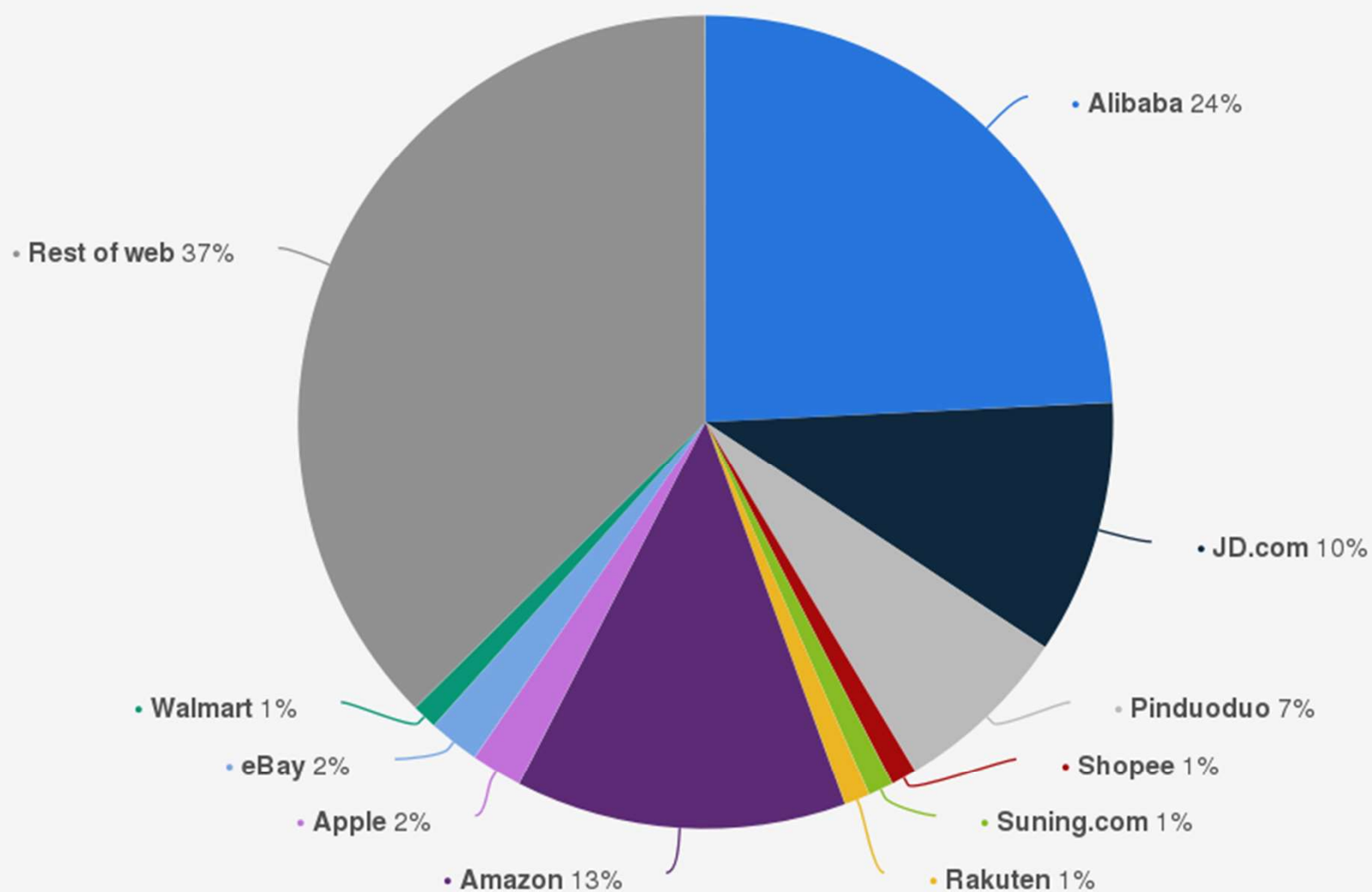
5. Information

Retail e-commerce sales worldwide from 2014 to 2026
(in billion U.S. dollars)

(v) How big is the Internet Economy?



E-commerce market share of leading e-retailers worldwide in 2021, based on GMV



Sources

Activate; eMarketer; Digital Commerce 360; Internal Revenue Service; Various sources (Company data)
© Statista 2022

Additional Information:

Worldwide; Activate; eMarketer; Digital Commerce 360; Internal Revenue Service; Various sources (Company data); 2021 volume (GMV)

5. Information and the Internet Economy

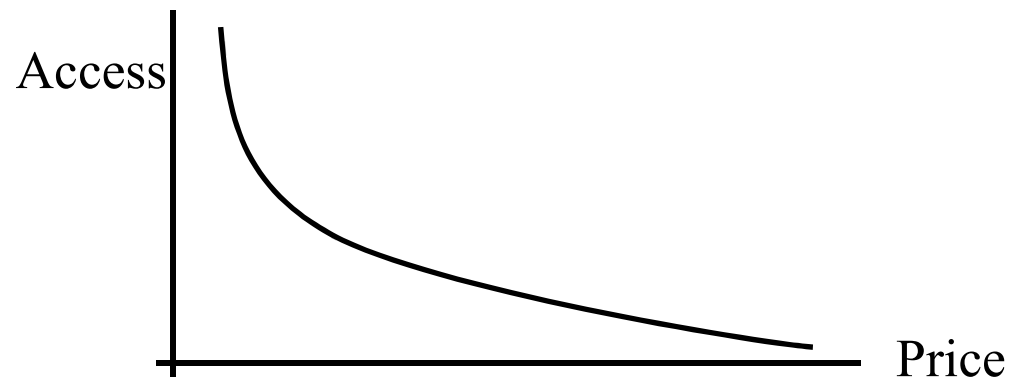
(vi) Internet demand primer

Internet access drives e-commerce

What drives access

prices, income, technology, contents, externality,
competition, regulation

Internet Demand Curve



Summary

Access, Pricing and Competition in ISP market

- Flat rate ISP pricing

- ISP competition by market concentration

Internet Economy

- Internet infrastructure

- Applications infrastructure

- Intermediaries

- e-commerce

Vertical Alliance