

FROM (OLD) INDUSTRIAL ECONOMY TO (NEW) INFORMATION ECONOMY



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Essentially, anything that can be digitized – encoded
as a stream of bit – is INFORMATION

Shapiro and Varian, 1999

The Information Economy



Encyclopedia Britannica vs Encarta



- ❑ Menghentikan edisi cetaknya setelah 244 tahun (1768-2012)
- ❑ Dekade 1980an premium price \$1600
- ❑ 2010 – 2012 memproduksi dalam bentuk digital (keping CD)
- ❑ Sejak 2012 berubah menjadi internet encyclopedia
- ❑ 1995 menawarkan secara online dengan biaya \$120 (subscription)
- ❑ 1996 sales \$325 juta menurun 50% dari tahun 1990
- ❑ 1996 menurunkan biaya subscription menjadi \$85
- ❑ 1996 dalam bentuk CD dengan harga \$85



- ❑ Tahun 1992 merupakan encyclopedia bussines yang dikembangkan oleh Funk 6 Wagnalls dan Microsoft dijual dalam bentuk CD - \$49.95
- ❑ 1996 dikembangkan menjadi ensiklopedia umum oleh Microsoft dijual dalam bentuk OEM CD - \$89.99
- ❑ 2009 menjadi internet encyclopedia

Revolusi Industri 4.0

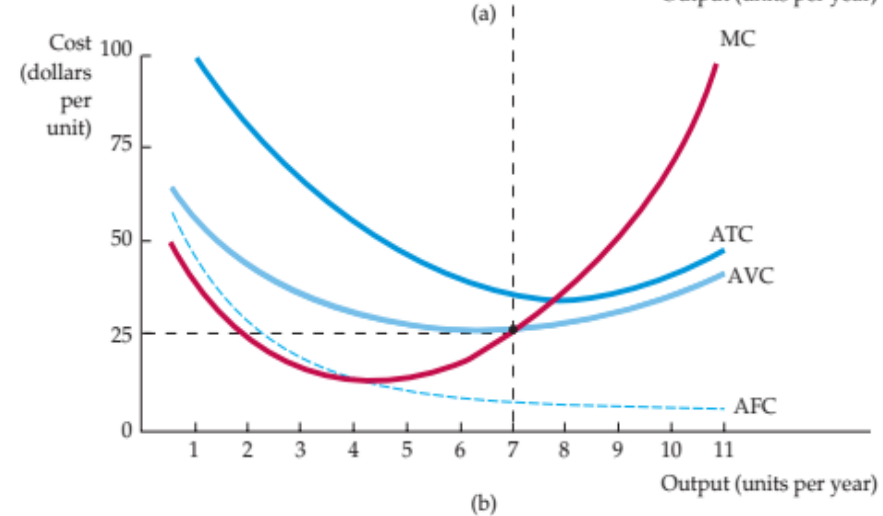
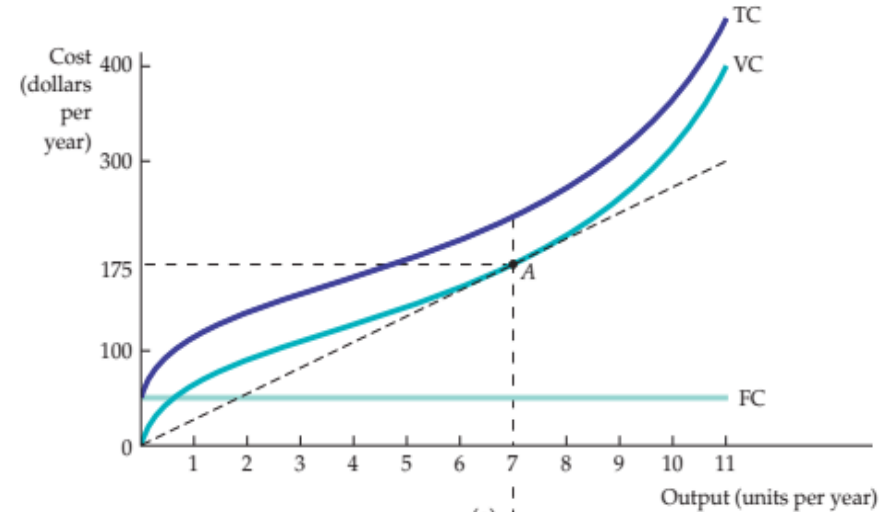
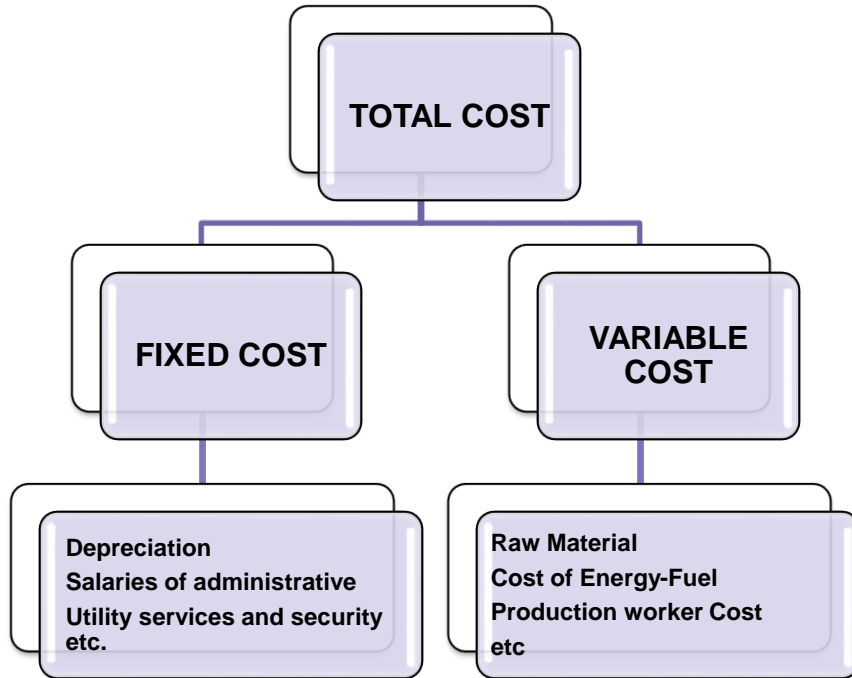
4 prinsip dalam Revolusi Industri 4.0 yang membantu perusahaan mengidentifikasi dan mengimplementasikan skenario-skenario dalam revolusi Industri 4.0

1. **Inter-operabilitas (kesesuaian):** Kemampuan mesin, perangkat, sensor, dan manusia untuk berhubungan dan berkomunikasi dengan satu sama lain lewat *Internet of Things* (IoT) atau *Internet of People* (IoP).
2. **Transparansi informasi:** Kemampuan sistem informasi untuk menciptakan salinan dunia fisik secara virtual dengan memperkaya model pabrik digital dengan data sensor. Prinsip ini membutuhkan pengumpulan data sensor mentah agar menghasilkan informasi konteks bernilai tinggi.
3. **Bantuan teknis:** Pertama, kemampuan sistem bantuan untuk mengumpulkan dan membuat visualisasi informasi secara menyeluruh agar bisa membuat keputusan bijak dan menyelesaikan masalah genting yang mendadak. Kedua, kemampuan sistem siber-fisik untuk melakukan serangkaian tugas yang tidak menyenangkan, terlalu berat, atau tidak aman bagi manusia.
4. **Keputusan mandiri:** Kemampuan sistem siber-fisik untuk membuat keputusan sendiri



□ **Technical Efficiency**
□ **Economical Efficiency**

Cost of Producing Information



Cost of Producing Information

Kasus Britannica Encyclopedia:

- Biaya produksi didominasi oleh ***first-copy cost***
- Biaya produksi berikutnya akan menjadi sangat murah

“ Information is costly to produce but cheap to reproduce ”

Atau

“Fixed Cost of Production are large but Variable Cost of Production are small”

This cost structured leads to substantial Economies of scale: the more you produce the lower average cost of production

Large Fixed Cost and Small Incremental Cost –that is, substantial economies of scale- are hardly unique to information goods



Cost of Producing Information

Cost of Producing Information – Special Structure (or **Unique Structure?**):

- Komponen Fixed Cost yang mendominasi struktur biaya (**Sunk Cost**), sehingga menghentikan produksi tidak akan mengembalikan biaya yang sudah dikeluarkan (**Kapan perusahaan informasi melakukan *Shutting Down?***)
- Variable Cost cenderung tidak mengalami peningkatan (**Bagaimana dengan *the law of Inceasing Marginal Cost?***)

Information is Experience Goods, you have to experience it to know what it is

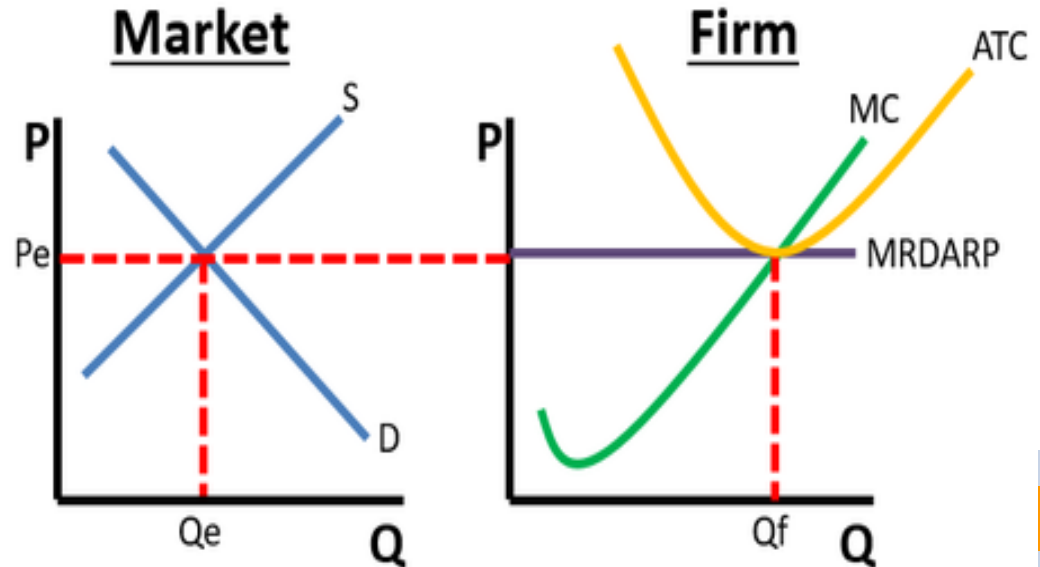
So,

Price information according to its value, not its cost

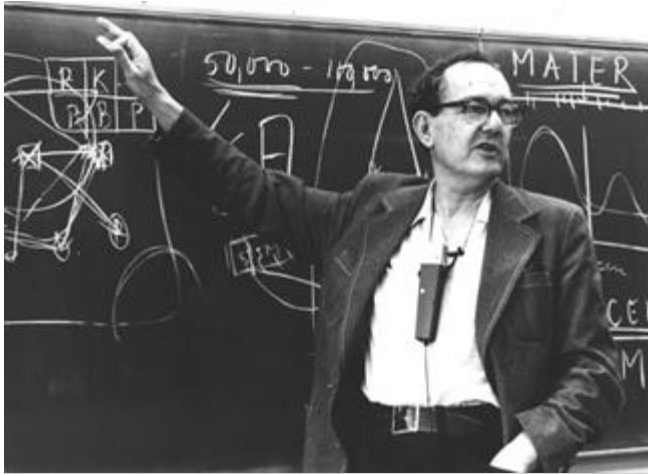
Cost and Competition

- Information is costly to produce but cheap to reproduce
- Once the first copy of an information goods has been produced, most costs are sunk and cannot be recovered
- Multiple copies can be produced at roughly constant per-unit cost
- There are no natural capacity limits for additional copies

Market for information, will not, and cannot, look like text-book Perfect Competition



When Information is Commoditized ?



Herbert Simon:

“A wealth of information creates a poverty of attention

Persoalan saat ini:

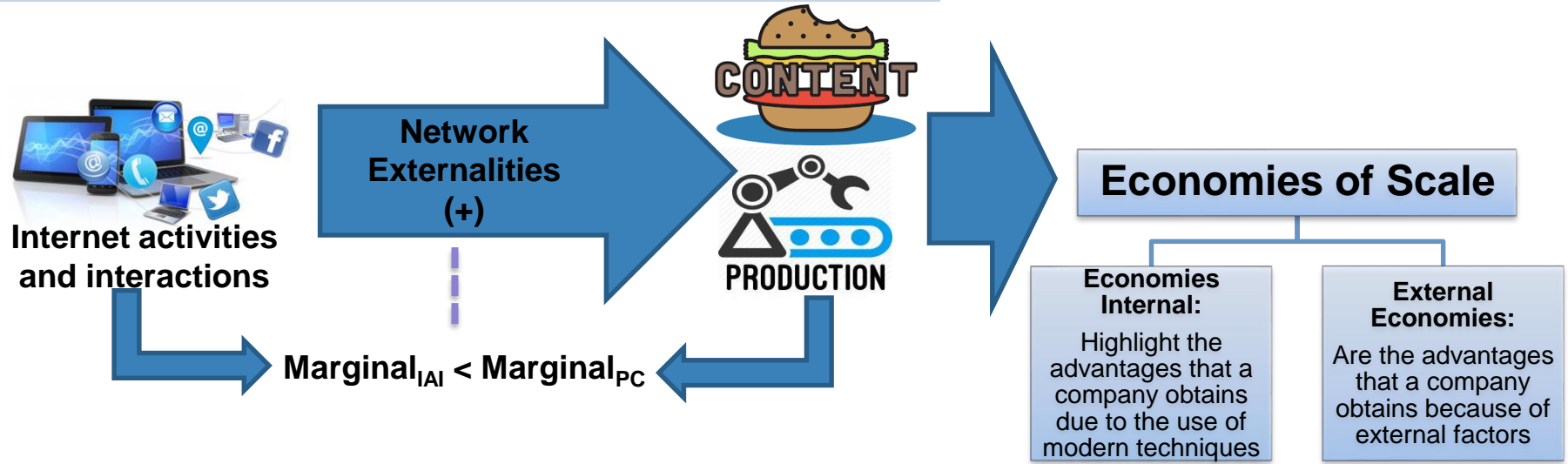
- Bukan terletak pada ketiadaan informasi tapi pada melimpahnya aliran informasi.
- The real value produced by an information provider comes in locating, filtering, and communicating what is usefull to the consumer

Market Structure for Information Goods

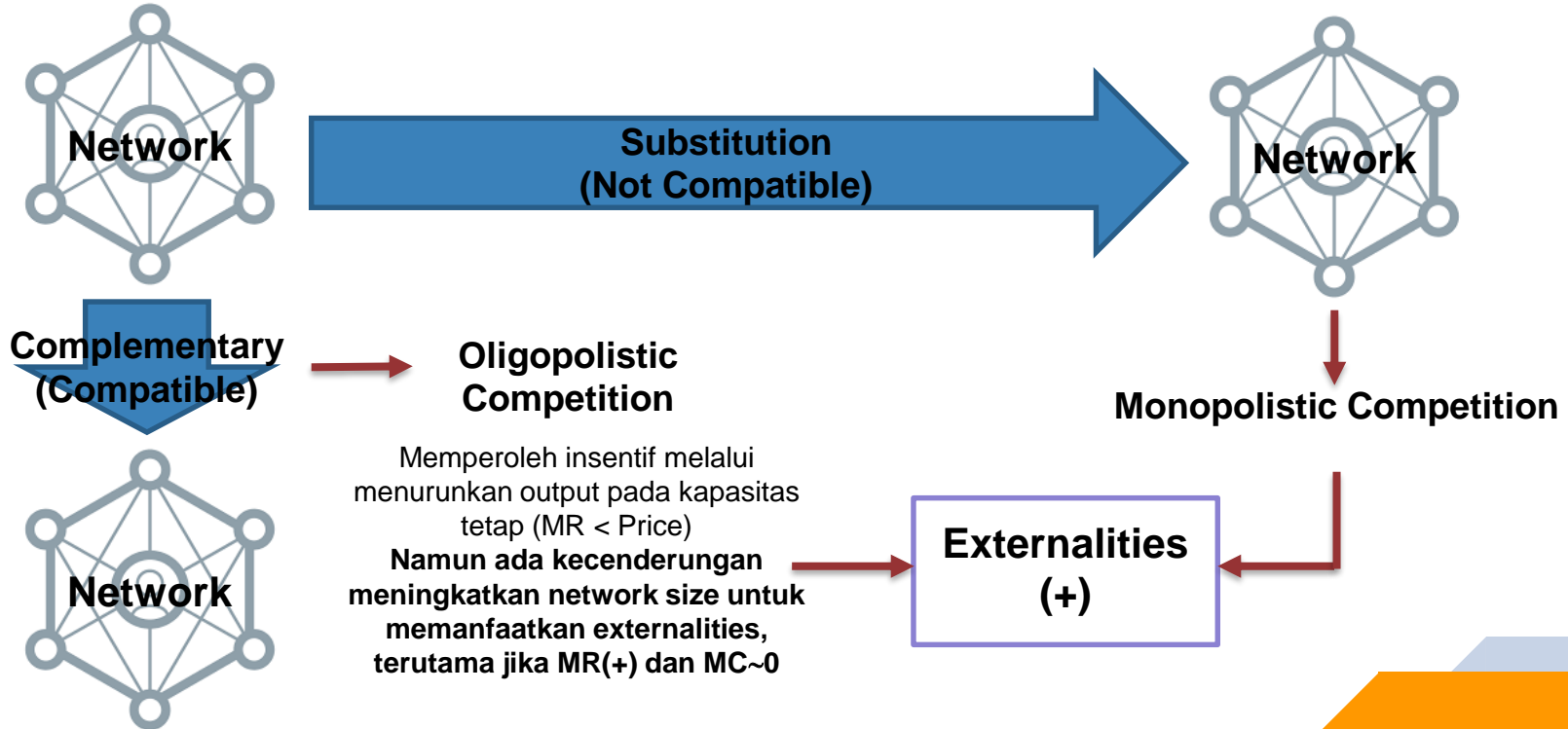
There are two sustainable structures for information market:

- **Dominant Firm (i.e. Microsoft):** may, or may not, produce the best product, but by virtue of its size and economies of scale it enjoys a cost advantage over its smaller rivals
- **Differentiated Product Market** we have number of firms producing the same kind of information, but with many different varieties

Basics of Network Economy



Basics of Network Economies



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**Technologies
Changes..Economics
Laws Do Not?**



Nobel Prizes for Work Central to the Economics of Information



Kenneth Arrow (1972):

- Information as a public Goods
- General Equilibrium Theory and Welfare Theory



George Stigler (1982):

- Industrial Structures, functioning of markets, causes & effects of public regulation



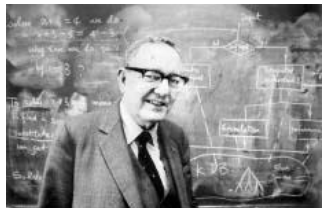
G. Myrdal & F.von Hayek (1974):

- Penetrating analysis of the interdependence of economic, social and institutional phenomena



Robert Solow (1987):

- Theory of Economic of Growth



Herbert Simon (1978):

- Decision making process within economic organization

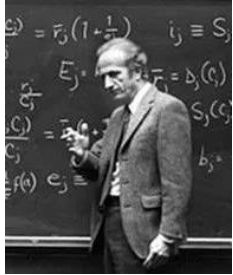


Ronald Coase (1991):

- Transaction Cost and Property Rights for the institutional Structure and Functioning of the economy



Nobel Prizes for Work Central to the Economics of Information



Gary Becker (1992):

- Human Behavior and Interaction, Including non-market Behavior



George Akerlof, Michael Spence & Joseph Stiglitz (2001):

- Analysis of Market with Asymmetric Information



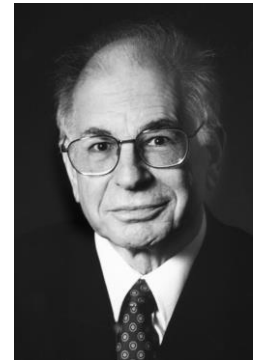
James A. Mirrlees & William Vickrey (1996):

- Incentive under Asymmetric Information



Daniel Kahneman (2002):

- Integrated insights from psychological Research into Economic Science, esp. Human Judgement and Decision Making under Uncertainty



Information and Micro-Structure



Robert Solow (1987):
“You can see the
computer age
everywhere except in
productivity statistics”

- Pertumbuhan investasi yang mencapai beberapa ratus persen tidak mampu meningkatkan output yang sebanding dengan pertumbuhan investasi di perekonomian USA pada periode 1977 – 1989.
- Hasil yang serupa diumumkan oleh Wall Street Journal pada 2016.
 - USA mengalami kemerosotan inovasi sejak 1950-an, sekitar rata-rata 0.5% per-tahun
 - Ide-ide para ilmuwan banyak yang gagal berubah menjadi sesuatu yang produktif karena regulasi, sekalipun investasi tumbuh pesat
 - Dampak inovasi yang nyata terhadap perekonomian hanya terlihat pada aktivitas ekonomi yang terkait dengan internet (Menurut JP. morgan: Amazon mampu meningkatkan output ritel per-jam 3% pada 2016 dibandingkan dengan keseluruhan sektor yang hanya 0.8%)

“ *Economic techniques focus on the relatively observable aspects of investment, such price and quantity of computer hardware in the economy, but neglect intangible investment in developing complementary new products, services, markets and business process The World Bank Development Report (2016) three keys factors for growth on macro economy: (1) Inclusion through international trade; (2) efficiency through capital utilization, and (3) innovation through competition*

“ Current statistics typically treat the accumulation of intangible capital assets, new production systems, and new skills as expenses rather than as investments. This leads to lower levels of measured outputs in periods of net capital accumulation. Output statistics miss many of the gains of IT brought to consumers such as variety, speed, and convenience....US productivity figures used do not take account of quality changes, in particular, in services industries; (a) financial services sector –ATM; (b) health care-diagnosis, medical decision making; (c) legal services-online information and legal advice.



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