

Unit 2: Markets for information goods

1.4. Foundation of information economy

An information economy is where the productivity and competitiveness of units or agents in the economy (be they firms, regions or nations) depend mainly on their capacity to generate, process, and apply efficiently knowledge-based information. It is also described as an economy where information is both the currency and the product.

While we have always relied on information exchange to do our jobs and run our lives, the information economy is different in that it can collect more relevant information at the appropriate time. Consequently, production in the information economy can be fine-tuned in ways heretofore undreamed of. What makes information plentiful in this economy is the pervasive use of information and communications technology.

Basically there are three foundation of information economy:

- communication
- technology
- information

1.5. Introduction to information economy

Information economics is the discipline of modeling the role of information in an economic system. Information is a strange good that is easy to create, difficult to validate, easy to share but difficult to unshared. Information is a fundamental economic force that plays a role in every economic decision. Many economic models make naive assumptions about information such as the assumption that all economic agents have perfect information. As such, where economic models fail it is common for information economics to be used to explain the gaps. Information economics or the economics of information is a branch of microeconomic theory that studies how information and information systems affect an economy and economic decisions. Information has special characteristics:

1. It is easy to create but hard to trust.
2. It is easy to spread but hard to control.
3. It influences many decisions.
4. These special characteristics (as compared with other types of goods) complicate many standard economic theories.
5. The information economy is global.

6. The information economy is that it is highly productive.
7. The information economy is the change in the manner of obtaining profits.

1.5.1. Definition of information goods:

An information good is a good whose value comes from the information it contains. Information good in economics and law is a type commodity whose market value is derived from information it contains. Examples include CDs containing pieces of music, DVDs containing movie content, and books containing short stories. Information goods are in contrast to material goods such as clothes, food, and cars. These can exist in either digitized form or analog format.

There is no sharp line dividing information goods from other goods. A computer file is clearly information good, but conventional goods also contain information; for example, the value of a piece of furniture is partly the result of the knowledge of the furniture-maker, embodied in its form. But although almost all recordings sold these days are in digital form and can be sent over the Internet, many people still prefer a physical CD to a downloadable file. By any definition, however, the importance of information goods in the economy has clearly been increasing.

1.5.2. The cost of producing information

Digital or information goods are becoming the norm across a wide variety of industries including books, music, entertainment, gaming and education. Due to the fact that the marginal cost of producing or reproducing information goods is very low, it is much easier to customize and personalize them for individual users. Furthermore, sellers of these information goods are increasingly using bundling and versioning strategies to appropriate a greater share of the surplus.

1.5.3. Pricing strategies for information goods

A sound (and creative) pricing/price-discrimination strategy is critical for sellers of information goods, since they have to recover their high fixed costs while ensuring that competition does not force their prices close to variable costs. Moreover, the pricing strategies available to each seller can be a critical determinant of equilibrium market structure. A unique advantage that sellers in technology markets often have is that these variable costs are in fact almost zero, and this feature underlies many of the popular and successful pricing strategies:

Bundling: Many 'small' information goods (like individual items of web content, individual digital music streams) are sold in extremely large bundles. This is feasible largely because their variable costs of production are zero.

Versioning: This is a form of second-degree price discrimination based on product quality, and is especially useful if degrading one's information good to create one or more lower quality versions is not expensive.

Fixed-fee pricing: Sellers of information goods often give customers unlimited usage for a flat (periodic) fee. Again, this pricing strategy is feasible because of their zero variable costs of production.

Other strategies: Electronic commerce increases the viability of using first-degree price discrimination for information goods, using dynamic pricing software and agent-based technologies.

1.5.4. Managing intellectual property

Intellectual property (IP) is a term for any intangible asset -- something proprietary that doesn't exist as a physical object but has value. Examples of **intellectual property** include designs, concepts, software, inventions, trade secrets, formulas and brand names, as well as works of art.

Securing and enforcing patents, trademarks, copyrights, and trade secrets builds value in your business and helps you stay ahead of the competition. To remain competitive, your business cannot afford to leave its intellectual assets unprotected or to forego enforcing its intellectual property rights.

Regardless of your industry, all organizations hold mission-critical knowledge-based resources and brands in one form or another. Whether your company is regional, national, or multinational, it is operating in a global economy. Proprietary information moves instantaneously throughout your company's network and valuable intellectual property is created every day in your business.

Your company needs experienced attorneys whose insights and knowledge can help encourage innovation in your organization and fully protect the assets you've developed, while also maximizing their market value. Your business also requires the assurance that its IP and IT systems are secure in all corners of the world and that contracts for critical information technology infrastructure and e-commerce solutions are negotiated and managed so your business is fully protected.

Patent law areas of focus

- Negotiation of patent-related transactions and drafting of licensing, consulting, and confidentiality agreements
- Preparation and prosecution of utility and design patent applications
- Prosecution and oppositions before international patent offices
- Interference, reissue, and re-examination proceedings
- Preparation of patentability, infringement, freedom to operate use, and validity opinions
- Patent infringement litigation and administrative proceedings

Trademark & copyright law areas of focus

- Preparation and prosecution of trademark, service mark, and copyright applications
- Preparation of availability, registrability, infringement, and non-infringement opinions
- Negotiation of trademark and copyright-related transactions, such as licensing and confidentiality agreements
- Trademark and copyright monitoring and enforcement
- Trademark and copyright infringement litigation, administrative proceedings, and preparation of entertainment contracts

Trade secrets law areas of focus

- Advising on trade secret protection programs
- Litigating trade secret misappropriation cases

Information technology & computer law areas of focus

- Drafting and negotiating complex information technology and telecommunicating contracts
- Advising in the creation and maintenance of websites
- Protecting and licensing copyrighted content on the Internet
- Counseling on issues such as privacy, defamation, electronic commerce, security, and encryption

1.5.4. Economic and public goods:

An **economic good** will have some degree of scarcity in relation to demand. It is the scarcity that creates a value people become willing to pay for. It is the scarcity which creates opportunity cost. – For example, if we pick apples from a tree, it means that other people will not be able to enjoy them.

An economic good is a good or service that has a benefit (utility) to society. Also economic goods have a degree of scarcity and therefore an opportunity cost.

A pure **public good** is both nonrival and nonexcludable. Nonrival means that one person's consumption doesn't diminish the amount available to other people, while nonexcludable means that one person cannot exclude another person from consuming the good in question. Classic examples of pure public goods are goods like national defense, lighthouses, TV broadcasts, and so on. The two properties of a public good are quite different. Nonrivalness is a property of the good itself: the same amount of defense, lighthouse services and TV broadcasts are available to everyone in the region served by the very nature of the good. Excludability is a bit different since it depends, at least in part, on the legal regime. For example, TV broadcasts in England are supported by a tax on TVs; those who don't pay the tax are legally (but not technologically) excluded from watching the broadcasts. Similarly, in the US cable TV broadcasts may be encrypted and special devices are required to decode them. For that matter, it is "merely" a legal convention that ordinarily private goods are excludable. If I want others to be prevented from consuming my car for example, I either have to use technology (such as locks) or legal authority (such as police) to prevent them. Even such classic examples as street lights could be made excludable if one really wanted to do so. For example, suppose that the lights broadcast only in infrared, and special goggles were required to take advantage of their services. Or, if this seems like too much trouble, cities could offer "streetlight licenses," the purchase of which would be required to use streetlight services. Those who don't go out after dark, don't need to buy. This isn't as farfetched as it seems. Coase [1988] describes how the English authorities collected payment for lighthouse services based on the routes followed by ocean-going vessels. Exclusion is not an inherent property of goods, public or private, but is rather a social choice. In many cases it is cheaper to make a good such as streetlights universally available rather than make them excludable, either via technology or by law. These observations have bearing on information goods. Information goods are inherently nonrival, due to the tiny cost of reproduction. However, whether they are excludable or not depends on the legal regime. Most countries recognize intellectual property laws that allow information goods to be excludable

Gravelle and Rees: "The defining characteristic of a public good is that consumption of it by one individual does not actually or potentially reduce the amount available to be consumed by another individual."

1.5.5 Economics of attention/ Information Overload

The basic ideas behind the Attention Economy are simple. Such an economy facilitates a marketplace where consumers agree to receive services in exchange for their attention. The ultimate purpose is of course to sell something to the consumer, but the selling does not need to be direct and does not need to be instant. For example news feeds illustrate the point well, since they ask for consumers attention in exchange for the opportunity to show him/her advertising. The Search engines are similar in that respect, because they show ads in exchange for helping users find answers online.

A world in which economic activity is driven by the need to capture the attention of the public in the face of ever-increasing competition. The economics of attention seen as a ramification of information theory conveys two conflicting rationales for economic agents, depending on whether it focuses on the user or the provider of information: on one side we find models that analyze how it is possible for firms to compete to capture the attention of customers or audiences in order to make money from it; on the other side there are analyses that focus on the overload of information from the viewpoint of consumers and provide solutions in order to protect the attention of users from information overload and pollution.

Herbert Simon once said that a ``wealth of information creates a poverty of attention." This has become painfully obvious with the advent of the World Wide Web. Despite the hype, the Web just isn't all that impressive as an information resource. The value of the Web lies not in the quantity of information but rather its accessibility. Digital information can be indexed, organized, and hyperlinked relatively easily compared to textual information. A text is just a click away rather than a drive across town and an hour in the library. The information on the Web is highly accessible ...once you know where to look.

Pool (1984) noted that the supply of information (in virtually every medium) grows exponentially whereas the amount that is consumed grows at best linearly. This is ultimately due to the fact that our mental powers and time available to process information is constrained.

Also, Gresham said that bad money drives out good. Well, bad information crowds out good. Cheap, low quality information on the Internet can cause problems for providers of high-quality information. Bad information should sell at a discount. Good information-- relevant, timely, high-quality, focused, and useful information--like the Britannica--should sell at a premium, when publishing was expensive.

Now publishing is cheap: anyone can put up an homepage on the Web. The scarce factor is attention. The 0-1 decision of ``publish-or-not" no longer makes sense--what we need are new institutional and technological tools to determine where it is worthwhile to focus our

attention. Systems like FireFly and GroupLens--what we're calling ``recommender systems" or ``collaborative filtering systems"--allow you to ``collaborate" with others who have common interests, and thus reduce your own search costs. In FireFly you are presented with a list of old movie titles and you indicate which ones you like and dislike. The computer then finds people who have similar tastes to yours and shows you recent movie titles that they liked--with the implication that you might like them too. The internet, a hybrid between a broadcast medium and a point to point medium offer exciting new potentials for matching up customers and suppliers.

The Net allows information vendors to move from the conventional broadcast to one to one marketing. Eg. Nielsen collects information on viewing habits of few thousands of consumers, which is then used to design TV shows or other product.

Hence, due to this one to one marketing has been possible, the advertiser reaches exactly the market it wants to reach and target and consumers need to give attention to the ads they are likely of their interest.

1.6. Technology

So far we discussed about the information side, but the Technology side deals with the infrastructure that makes it possible to store, search, retrieve, copy, filter, manipulate, view, transmit and receive information. The technology is the packaging that allows the information, to be delivered to end customers. A single copy of a film would be of little value without a distribution technology. Likewise, computer software is of value because computer hardware and network technology are now so powerful and inexpensive. The value of the Web lies in its capacity to provide immediate access to information. Using the Web information, suppliers can distribute up to date information dynamically from databases and other repositories Wine bottle with easier, quicker and cheaper access to its wine. The bottle is only infrastructure but infrastructure that can reduce cost and increase value is tremendously important. Improved information infrastructure has vastly increased our ability to store, retrieve, sort, filter and distribute information, there by greatly enhancing the value of the information itself. Lands' End is an American clothing retailer that specializes in casual clothing, luggage, and home furnishings has been using technology to do more with the same information. It can easily use data on customers, their purchase behavior and engage in targeted marketing. Furthermore it can also use telecommunications and banking infrastructure to conduct transactions in real time over phone and online.

1.6.1. System competition

Systems show up everywhere in information technology like operating systems, CPUs, chips, disk drives, video cassettes recorders and videotapes. Hence, one firm cannot offer all the pieces that make up an information system. Traditional rule of competitive strategy though focus on competition but in information economy, companies selling complementary goods cannot compete with the rest of the system. Many of our strategic principles are specifically designed to help companies selling one component of an information system.

The dependence of information technology systems means that firms must focus not only on their competitors but also on their collaborator. Forming alliances, cultivating partners, and ensuring compatibility (or lack of compatibility) are critical business decisions. Eg, Microsoft-Intel partnership. Microsoft focused exclusively on software while Intel focused exclusively on hardware. Further they both focused on their core strengths, eg, Intel focused on video cards, sound cards, and hard drives as well as assembly and distribution of personal computers. But Apple perusing the different strategy by producing a highly integrated product consisting of both hardware platform and the software ran on it was expensive and made them weak in market.

From the newest consumer gadgets to the explosion in communications capability that is driving global economic growth; technological innovation enhances our lives and provides us with new tools to perform everyday tasks. The Federal Trade Commission promotes competition in technology industries (like computers, software, communications, and biotechnology) as the best way to reduce costs, encourage innovation, and expand choices for consumers. Because the stakes are high in these fast-paced markets and the benefits to

consumers and to the economy substantial, the FTC's work in these areas is all the more important.

Technology markets can present some unique issues and challenges for policy makers, manufacturers, distributors, and consumers. Innovation is a central aspect of rivalries among technology firms, and the markets are dynamic: new ideas topple formerly dominant technologies and consumers line up to buy products that are smaller, faster, and better. But the fundamental principles of antitrust law and economics are equally applicable to even the newest industries.

This Web site has information about FTC activities to protect and promote competition in technology markets. Here you will find information on hearings and workshops, enforcement actions, and testimony by FTC Commissioners, as well as important consumer information on staying safe online.

Competition In Technology Is More Vibrant Than It Looks

The clamor is rising for Big Tech firms to be broken up. With Amazon and Alphabet, Google's parent company, reporting record profits, voices from both the political left and the right have called for the firms to be broken up using antitrust law. Both sides claim these companies use data they collect from customers to keep themselves big and powerful.

At first glance, digital markets do seem fairly concentrated in just a few companies. Facebook owns the top three social media apps: Facebook, WhatsApp, and Messenger, all of which exceed 1 billion unique monthly active users. The company captures 20.9% of total U.S. digital ad revenue, putting it only behind Alphabet's 42.2%. And given the fast growth rate of Amazon, this looks like it is only a matter of time before the three control the entire market.

Viewing these numbers in perspective, however, makes **the picture a lot more complicated.**

Apple's native iMessage service, which does not show up in social media download statistics, shows much higher user engagement than Facebook Messenger, especially among younger demographics. Facebook is actually competing in messaging with a company whose interface it depends upon to gain access — and Facebook is losing. This reveals one of the difficulties in seeing who is competing against whom online. Facebook competes not only against other social media sites like Snap, but also against the likes of Google, Apple, and Microsoft in various domains. Online competition requires the firm to provide for a variety of user demands — or cede ground to rival startups. Unless a firm like Apple can provide a

messaging service that its users enjoy, it would allow Facebook to gain ground, which weakens the long-term prospects of Apple's business.

These "platform wars" mean that competition between tech giants takes place over many different products and services, at various tiers. To understand the level of concentration properly, one cannot specify the market too narrowly. While Snapchat has less than one third of Instagram's users, those under the age of 25 use Snapchat much more heavily.

Taking a snapshot of one moment does not tell you about how demographics will affect market position in the next. The competition is fierce. Today's startups are tomorrow's giants, just like Facebook and Amazon once were — and not very long ago.

That means the current market positions of Big Tech firms are inherently unstable, despite the best efforts of these firms to prepare for the future. Facebook's attempt to kill off Snapchat with its Camera app is now regarded as a failure, as is Google's attempt to kill Facebook with Google Plus, and Amazon's attempt to branch into mobile with the Fire phone.

Having lots of data and users is not enough for these companies to branch out into new territories. If platforms fail to develop ecosystems that adapt to user demands, they can fall from seemingly dominant positions rapidly — as recent history amply demonstrates.

When the competitive pressure on these firms is put into perspective, they look less dominant. Amazon currently makes 2.5% of U.S. digital ad revenue compared to Alphabet and Facebook's near 70%, but looking at total U.S. ad revenue shows these firms together make only 20%.

Just consider that if tech giants are increasing their revenues to the detriment of newspapers, it still exaggerates the concentration to neglect newspapers' print ads entirely. It is also possible that some recent decisions, such as Facebook's news feed changes, will drive away users in the long-term. This is a dynamic market.

One thing, however, is perfectly clear. Consumers are by and large happy with their services. None of the Big 5 tech companies (Alphabet, Amazon, Microsoft, Apple, and Facebook) have below a 60% approval rating. The companies may be large, but competition among

them is as fierce as ever, allowing them to consistently innovate and provide consumers with new and better services.

Breaking up big technology companies in an attempt to force "competition" (according to a model developed in the pre-tech, 20th Century economy), without a clear understanding of the current market dynamics and the impact on consumers themselves, would leave their users worse off. And these days, that means all of us.

1.6.2. Lock in and switching costs:

Lock in:

A strategy in which the customer is so dependent on a vendor for products and services that the customer cannot move to another vendor without substantial switching costs, real and/or perceived.

Switching costs

The costs incurred when a customer changes from one supplier or marketplace to another.

The higher these costs are, the more difficult it is to execute the switch.

A great product isn't enough to bring a flock of customers to your door. You must design a superior business model to attract and retain customers into your ecosystem. Switching costs have enabled industry leaders such as Adobe, Sales force, Microsoft or Rolls Royce to lock customers in and outcompete other players

1.6.3. Positive feedback, network externalities, standards



Positive feedback

Technological evolution has impacted our lives positively over the last two decades, so we should expect the same or similar outcomes from the future. Technological advancements have had effects in all areas Health, Advertisement, Finance, Entertainment, and Transportation, just anything you can think about. So the best shot at the future won't be far-fetched as far as technology is concerned. One thing technology has done which is the most important thing is giving us the fastest way to perform day 2 day activities very efficiently, imagine more of that in the future. The future of technology is bright to those who are optimistic and less paranoid about it.



Network externalities

Network externalities are the effects a product or service has on a user while others are using the same or compatible products or services. Positive network externalities exist if the benefits (or, more technically, marginal utility) are an increasing function of the number of other users. Negative network externalities exist if the benefits are a decreasing function of the number of other users.

For example, Facebook likely confers positive network externalities since it is more useful to a user if more people are using it as well. Conversely, a road can confer negative network externalities since a driver on the road creates traffic for other drivers of the road.

- The network effect is a phenomenon whereby an increasing number of people or participants who are exposed to a company, good, or service can increase the value of the company, good, or service.
- E-commerce sites, such as Etsy and eBay, grew in popularity by accessing online networks and attracting consumers to their services and products.
- Some companies cannot achieve critical mass—the number of users needed for the network effect to take hold—even with access to online and offline networks.
- Congestion is a negative network effect whereby too many users can cause the network to slow down reducing its utility and frustrating network members.

Standards:

This describes the international IT management models and standards applied in the development of the IT Standard.

- ITIL
- CMMI
- COBIT
- PMBOK
- PRINCE2
- ISO/IEC 20000
- ISO 21500
- ISO/IEC 38500
- TOGAF

ITIL

ITIL, formerly known as Information Technology Infrastructure Library, is a set of guidelines and best practices for IT service management (ITSM). ITIL focuses on aligning IT services to the needs of business and supports its core processes. It is structured and published in five core volumes: Service Strategy, Service Design, Service Transition, Service Operation and Continual Service Improvement.

CMMI

CMMI®, Capability Maturity Model® Integration, is an internationally known reference model developed through best practices that provide guidance for improving processes that meet the business goals of an organization. It was developed by industry experts, governments, and the Software Engineering Institute (SEI).

CMMI improves processes for an organization to show measurable benefits for their business objectives and vision. An organization can organize and prioritize its methodologies, people, and business activities through the framework provided by CMMI. The framework supports coordination of multi-disciplinary activities and systematic thinking.

COBIT

COBIT 5 (launched in 2012), The Control Objectives for Information and Related Technology, is owned and supported by ISACA. It was originally released in 1996 as COBIT. The current version 5.0 consists of COBIT 4.1, VAL IT 2.0, and Risk IT frameworks.

COBIT 5 helps to create optimal value using IT by maintaining a balance among benefit realization, risk optimization, and resource usage. The framework covers both business and IT units in the whole organisation. It provides metrics and maturity models to measure whether or not the IT organization has achieved its objectives. In addition, it also balances the needs of internal and external stakeholders.

PMBOK

PMBOK, a Guide to the Project Management Body of Knowledge, is a guide to the internationally recognized project management methods by the Project Management Institute (PMI). PMBOK is a standard that is widely accepted and acknowledged as basis for most project management methods.

PMBOK provides an in-depth description of the required content and fundamentals of a project, but does not focus on giving hands-on implementation advice. Practical guidance is offered by other models such as PRINCE2. It is based on five basic processes: Initiating, Planning, Executing, Controlling and Monitoring, and Closing.

PRINCE2

PRINCE2, Projects IN a Controlled Environment, is a de facto standard project management method owned by the UK Cabinet Office. PRINCE2 complements the PMBOK model by providing a process-based and practical guidance with ready-to-use templates for Project Managers and Project Steering Groups in the different phases of a project. PRINCE2 ensures greater control of resources and effective management of business and project risks.

For example, the seven principles of PRINCE2 state how a project should be run throughout its life-cycle: a project must have a business justification, clearly defined roles and responsibilities in all phases and processes, managed by stages to provide detailed and timely planning, defined tolerances for management by exception, product focused delivery where project methods are tailored to fit this particular project's needs, and learning from experience to continuously improve organization's project culture.

ISO/IEC 20000

ISO/IEC 20000 is a service management system (SMS) and the first international standard for IT service management. It is owned by The International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). It is broadly aligned with ITIL.

The ISO/IEC 20000 has two parts. The first part defines the formal requirements for high-quality production of IT services to the business. IT includes criteria for planning, service management, and service production as well as for customer / supplier management. The second part describes the processes of service production largely in the same way as the ITIL processes while focusing, however, more closely on customer/supplier management processes.

ISO 21500

ISO 21500 is a standard that provides —generic guidance on the concepts and projects of project managementll which are important in the realization of successful projects. It can be

used by any type of organization and applied to any type of project – irrespective of size, complexity or duration.

ISO 21500 is an informative standard, that is rather a general guideline than a certified methodology. It provides high-level description of concepts and processes that are considered to form good practice in project management and places projects in the context of programs and project portfolios. PMBOK is very much in line with ISO 21500 and vice versa.

ISO/IEC 38500

ISO/IEC 38500 is a standard providing general principles on the role and IT governance of management with business responsibility (for example, Board of Directors and Management Team). It can be widely applied to all kinds and sizes of organizations for example public and private companies and non-profit organizations.

The standard supports business management in their supervision of the IT organization and helps them ensure that IT has a positive impact on the company's performance. The standard consists of six principles:

1. Responsibility
2. Strategy
3. Acquisition
4. Performance
5. Conformance
6. Human behaviour

Adherence to the ISO/IEC 38500 standard can assure management of conformance with good governance

TOGAF

TOGAF is an Open Group Standard enterprise architecture framework that allows organizations to have a structured approach for governing the implementation of technology, in particular the software technology design, development, and maintenance. It was first published in 1995 and was based on the US Department of Defence Technical Architecture Framework for Information Management (TAFIM). It has been since developed by The Open Group Architecture Forum and released in regular intervals on the Open Group public website.

TOGAF improves business efficiency by ensuring consistent methods, communication, and efficient usage of resources. It ensures industry credibility with a common language among enterprise architecture professionals.

1.7. Policy

Information economics and policy concerns the production, distribution and use of information and associated policies. Areas of research include; e-commerce, the —bundling‖ and —valuation‖ of information goods and services, how information and information technology systems affect an economy and economic decisions, personal and organizational privacy, and the —right to be forgotten‖. Aspects of information economics are related to game theory concepts such as on-line auctions, dynamic automated resource allocation, intelligent agents, and other concepts.