

Chapter 3

Social and economic purposes of Internet intermediaries

This chapter looks at Internet intermediaries in light of their role in ICT-related growth and productivity, in managing network infrastructure and in providing access to new applications and to an expanding base of users. It discusses their contributions to entrepreneurship, employment and innovation and their important role in developing users' trust in the online environment.

Introduction

A fundamental feature of the Internet is that it is open and decentralised at the level of its architecture, which means that any Internet service provider (ISP) can interconnect. Many of the underlying standards were developed in a bottom-up manner, mainly by technical developers, providers and users from the early days of the Internet. This model contrasts with that of the telecommunication and broadcasting industries, for which top-down national government regulation often guided and structured the design of the media. The Internet's resource management is decentralised, but requires close co-ordination among actors. Most of the protocols at the core of the Internet are based on open standards. Therefore, anyone can implement protocol specifications (with little or no licensing restrictions). This considerably reduces barriers to entry and has facilitated entry in Internet intermediary sectors such as Internet service provision, web hosting, or search-engines and portals.

Wider ICT-related growth and productivity

The most significant impact on economic growth of advances in information and communication technologies (ICTs), including the Internet enabled by intermediaries, is the increased productivity that is the long-term outcome of investment in ICT.

- First, ICT-producing industries contribute directly to productivity and growth through their rapid technological progress. A rough estimate indicates for example that in the United States in 2008, Internet intermediaries contributed at least 1.4% of GDP value added.
- Second, ICT use improves the productivity of other factors of production.
- Third, there are spillover effects to the rest of the economy as ICT diffusion leads to innovation and efficiency gains in other sectors. The largest productivity gains increasingly come from the use, rather than the production, of networked ICTs, including the Internet.
- Fourth, the Internet has qualitatively changed the amount and type of information available to users, including consumers, and has cut the cost of accessing information. In economies that increasingly rely on knowledge, this is having an important positive impact.

Intermediaries create significant market efficiencies by bringing supply and demand closer together, thus decreasing transaction costs such as the cost of searching for a buyer or a seller. They ensure that markets work better, create more competition and allow for a greater internationalisation of markets. Indeed, Internet intermediaries facilitate trade by allowing the expansion, aggregation and globalisation of markets as well as the customisation of goods and services.

Investment in infrastructure

The Internet is widely viewed as both a critical infrastructure and a key component of other forms of critical infrastructure that underpin economic and social activity at the global level. Intermediaries such as ISPs and web hosting companies play a vital role in managing network infrastructure, providing access to end users and ensuring continued sufficient investment in infrastructure to meet the network capacity demands of new applications and of an expanding base of users.

To date, private-sector initiatives in competitive markets, enabled by regulatory reform of telecommunications, have by and large driven the widespread development of Internet infrastructure. The private sector has largely built and operates and maintains most of the Internet infrastructure. It has also been heavily involved in developing predictable, transparent rules, including rules relative to interconnection of ISPs (OECD, 2006).¹ Developed in a competitive environment, the Internet has spurred research and development and innovations in applications and technologies and in services.

These innovations have helped to provide network operators, equipment suppliers and service providers with low-cost, sophisticated and high-quality ways to expand their networks, products and services offers. For businesses and consumers, innovation and competition among suppliers have served to increase service offers and the affordability and accessibility of the Internet. The market is helping to meet traditional public interest goals in infrastructure provision, such as universal access.

Sustainable business models are needed to support infrastructure development, particularly in the transition to next-generation networks and mobile broadband. However, it is sometimes difficult in an evolving environment to recognise the service recipient as well as the beneficiary of value and therefore to determine the party to bill and how. At the same time, new synergies are being discovered between telecommunication network operators, equipment manufacturers and content providers. Although there are currently limitations in terms of full substitutability between wireless and terrestrial communications facilities, wireless is creating considerable new opportunities.

ISPs play an important part in extending infrastructure, notably through investments in next-generation access networks (NGN). In these networks, copper is increasingly being replaced by fibre in the local loop while packet-based technology using the Internet Protocol is replacing existing circuit-based switching technologies. Development of NGN infrastructure is dependent on the regulatory frameworks in place and the extent to which these frameworks have moved from service-level competition to infrastructure-level competition (OECD, 2008a).

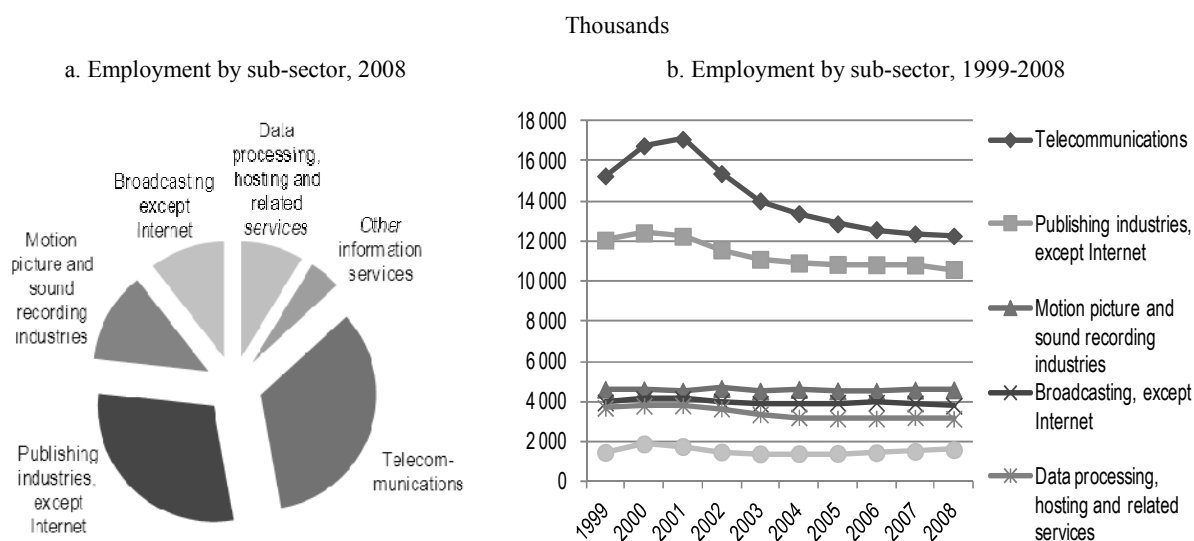
Developments in fixed and mobile telecommunication infrastructure are essentially financed by network operators (horizontal co-operation). Companies are co-operating to share investment costs, entering into long-term agreements on the use of networks, and providing mutual assistance for the marketing of products. Infrastructure sharing is viewed as a possibility for improving coverage less expensively, particularly in the current economic context, in which operators are facing decreasing revenue and financing difficulties. For example, in March 2009, Telefonica and Vodafone agreed to share their 3G mobile phone infrastructure in Germany, Spain, Ireland and the United Kingdom. This agreement allows mobile providers to expand coverage while minimising expenditure on masts and their sites; the companies expect to save hundreds of millions of dollars over the next decade (OECD, 2009a).

In addition, new forms of vertical co-operation between network operators and equipment producers are emerging. In Germany, for example, Ericsson, a Swedish equipment producer, has purchased microwave radio relay links from Deutsche Telekom. Ericsson operates the radio relay links, leasing them to others, including Deutsche Telekom. Also in Germany, the mobile network “e-plus” is operated by Alcatel-Lucent, an equipment producer. This trend is associated with a parallel trend in which network operators increasingly rely on research and development by equipment suppliers and hence effectively outsource part of this development.

Entrepreneurship and employment

Internet intermediary sectors are large employers and contribute significantly to employment in the information sector. In 2008 in the United States, the overall information sector represented 47.6 million jobs (Figure 3.1a), led by the telecommunications sub-sector (Figure 3.1b). In the beginning of 2009, the top ten pure-play Internet firms employed more than 94 000 people.

Figure 3.1. Employment in the “information” sector in the United States



Note: Total employment in the information sector in 2008 was 47.6 million. Other information services includes Internet publishing and broadcasting.

Source: Bureau of Labor Statistics (2009).

In addition to being direct employers, Internet intermediaries lower the barriers to starting and operating businesses, particularly small businesses, and help spur innovation in small and medium-sized enterprises (SMEs):

- First, they aggregate demand to provide many SMEs with less complex and less costly services, such as IT and IT-enabled accounting and managed services provided by cloud computing platforms. Cloud computing, *i.e.* the provision of scalable and often virtualised resources as a service over the Internet, encompasses Internet intermediaries such as application service providers and software as a

service providers in the data processing and web hosting sector. Cloud computing intermediary services of various sizes and shapes host specialised applications, and are creating new opportunities for business efficiency and also new challenges, notably in the areas of security and privacy.² For example, Google estimates that using cloud-based applications via Google's cloud computing platform saves an average of 50% to 70% compared to “on-premise” equipment.³ Some leading technologists have forecast that within five to ten years more than half of the world's computing and data storage will occur “in the cloud” (OECD, 2009b).

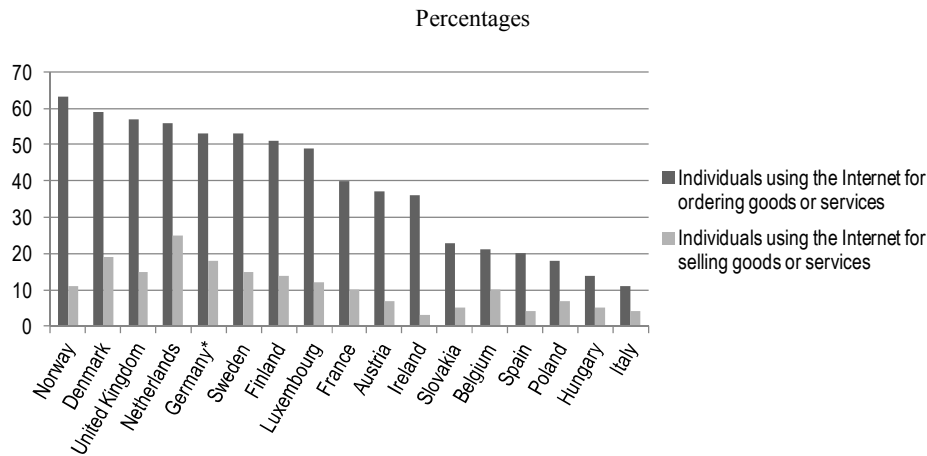
- A related consideration is that ad servers and Internet search engines and portals allow SMEs to advertise their goods and services with lower advertising budgets.
- Internet intermediaries, in particular e-commerce platforms and search platforms, are considered enablers of the creation of micro-enterprises. A report by the Interactive Advertising Bureau estimated that over a million people ran one-person firms online in the United States in mid-2009. The report estimated that 120 000 people sell full-time on eBay, 500 000 do so part-time, and 500 000 earn advertising revenues from blogs, mostly through the revenue-sharing schemes of advertising platforms (IAB, 2009).

Facilitating the market entry and operation of SMEs is critical to the economy, as these firms provide a significant source of jobs and economic growth. The ability of new and small firms to innovate is considered crucial to long-term and sustainable growth, since SMEs tend to harness technological or commercial opportunities that have been neglected by established companies and bring them to market (OECD, 2009c). In this context, platforms that help new firms to become established and grow are crucial to the innovation performance of an economy. Empirical evidence also shows that entrepreneurship, and specifically business turbulence in terms of market entry and exit, positively contributes to economic growth through greater efficiency in the allocation of resources (OECD, 2003).

Electronic commerce platforms on the Internet also create many opportunities for transactions that do not occur in the marketplace. In the so-called “long-tail” economic model proposed by Chris Anderson in 2004, entertainment products that are in low demand or have low sales volume can collectively make up a market share that rivals or exceeds the relatively few current bestsellers and blockbusters, if the store or distribution channel is large enough (Anderson, 2004). The reason is that online platforms are more efficient at matching supply and demand than their offline counterparts. They can track patterns in buying behaviour and make suggestions to help people find goods they might be interested in (*e.g.* Amazon). They can also offer a nearly unlimited selection since they do not have the space constraints of physical stores (*e.g.* DVDs at Netflix). Finally, in contrast to broadcasting, communications on the Internet are often point-to-point, which removes the need to aggregate very large audiences in order to broadcast digital entertainment.

It is noteworthy that not only do individuals buy on line, they also increasingly sell on line, through platforms such as eBay. For example, in the Netherlands in 2008, not only had 55% of individuals bought on line in the past three months, 25% had sold on line (Figure 3.2).

Figure 3.2. Individuals aged 16 to 74 using the Internet to buy or sell goods or services, selected European countries, 2008



Individuals using the Internet to buy or sell goods or services for private use, for instance via auctions, within the three months before the survey.

Source: Eurostat, i2010 Benchmarking indicators.

Innovation

Innovation – the introduction of a new or significantly improved product (good or service), process, or method – has long been viewed as central to economic performance and social welfare. Innovation requires platforms that support the creation and diffusion of knowledge. Part of the work of the OECD’s innovation strategy on the changing nature of innovation examines the importance of trends such as collaboration on Internet platforms, changing business approaches to innovation, the use of knowledge markets, for example for intellectual property rights, organisational innovation, user-driven innovation, and the rise of new actors such as private foundations for funding innovation. This strand of work finds that the ICT sector exceeds all other industries by a large margin in terms of research and development expenditures, patents, venture capital, and innovative new products.

Internet intermediaries, both those at the core and at the edges of the network, are viewed as innovators themselves, as well as enablers of innovation, creativity and collaboration. In particular, firms co-operating “at the edge” of the Internet (*e.g.* search engines, news delivery, voice over IP) are innovating successfully through commercial and institutional arrangements that permit experimentation and novel re-use of these service platforms by others. Additionally, the pace of innovation is increasing and may originate from any part of the world. The importance of interoperability for enabling the connection of large amounts of heterogeneous machines and networks and for furthering an environment of innovation and cross-fertilisation should not be underestimated (Kahin, 2007).

Google is a very creative intermediary and announces new innovations regularly (recent products include Fast Flip, which lets users scroll through the contents of an online newspaper in a way similar to reading print pages, or Google Wave, a new online collaboration tool). Out of the overall top 250 ICT firms, Google, Yahoo! and e-Bay (Internet industry) have had high growth in R&D spending since 2000 (Table 3.1).

Table 3.1. Top ICT R&D spenders: expenditure growth, 2000-07

Percentage, CAGR, based on current USD

	Company	Country	Industry	Growth % 2000-07
1.	Google	United States	Internet	113.5
7.	Yahoo	United States	Internet	38.5
8.	e-bay inc	United States	Internet	35.2

Source: OECD Information Technology Outlook database.

The use of services linked to participative networks, which provide value at little or no monetary cost, has proliferated on both the supply and demand sides. Facilitated by low barriers to participation, new models of commercial and non-commercial collaborative work have emerged. Illustrations include the development of Wikipedia, the user-created encyclopaedia, which aims to harness the collective intelligence of Internet users. Other examples of “web 2.0” include open application programming interfaces (API), mash-ups merging several services, such as online maps and location data. Users are increasingly part of the creative flow of content and processes, and this offers much promise for a more participatory, active and innovative content society.

Firms also increasingly use participative networks to reach out to customers and partners to improve their product and innovation cycle (user-centric innovation). Some have termed this economic and business trend “Enterprise 2.0”, and have highlighted its significance in raising standards of living, wealth creation and competitiveness in global markets. Users and consumers who play a growing role in the innovation process often drive demand for new products and services, helping to orient the innovation effort towards the needs of society. The Internet has, for example, played a significant role in obtaining rapid consumer feedback to improve new products on the market, allowing firms to adjust quality and features on products/services (OECD, 2010).

Trust and user privacy

One of the main roles of Internet intermediaries is to establish trust. In e-commerce for example, this is crucial as buyer and seller may never meet and accountability may be difficult. Retail e-commerce platforms provide trust to consumers with an established brand name, associated consumer familiarity and a number of consumer safeguards. Safeguards may include prior histories of consumer ratings (“reputation”) and in some cases, pay-back guarantees. These platforms play an essential role because the relative ease of becoming an e-commerce merchant can lead to an overwhelming number of offerings. In addition, for sellers, it can be less expensive to use an intermediary than to set up and advertise an e-commerce platform.

Internet payment systems such as MasterCard and Visa use techniques such as digital certificates to protect the use of credit cards in e-commerce transactions because the openness, global reach and lack of physical clues that are inherent to the Internet also make it vulnerable to fraud (OECD, 2000). Some consider user authentication an important associated role of Internet intermediaries for providing some assurance as to whether the other party is who or what it claims to be, for addressing issues of unauthorised access to personal data, identity theft and data breaches. For example, to

promote electronic business based on electronic documents, Korea has introduced e-signatures (an electronic authentication method). Korea has mandated the use of e-signatures issued by accredited certificate providers for the use of Internet banking since 2002. As of July 2009, Korea had more than 20 million accredited certificate users, *i.e.* two-fifths of its total population.

Intermediaries can also arguably be in a good position to provide mechanisms and assurance to protect user privacy, as parties with only an indirect connection to marketers. They certainly play a major role in shaping how Internet users perceive, and manage, their personal information. For example, by providing accessible and understandable privacy options, backed up by privacy-friendly default settings, and by minimising and anonymising the collection of personal information, Internet intermediaries can help users to control their personal data.

At the same time, however, many Internet intermediaries' business models, such as those of social networking sites, rely on users' willingness to share their personal information. "Targeted" marketing, based on the information an Internet user has previously accessed or searched for, requires the collection of web browsing and search habits, both of which involve the collection of personal information. Some business models (such as pay per view, which must record what is being viewed by whom) are more invasive than others (such as charging a monthly subscription fee with no need to record what is being viewed by a particular user). A balance is needed between business incentives and the need for Internet intermediaries to protect privacy.

User/consumer empowerment and choice

Over the last decade, increased competition and the development of a range of new products have transformed the communication services sector. They have brought significant benefits to consumers and other users, including falling prices, higher-quality services, wider choice of service providers, and access to new services. These trends are likely to continue, and even intensify, as next-generation communication infrastructures and services are put in place. These changes have, however, created challenges. As communication services have become more complex, it is increasingly difficult for consumers to evaluate and compare alternatives. Pricing structures may not be clear and contracts may limit consumers' ability to switch providers or terminate a contract easily. Yet, it is increasingly recognised that communication services markets can be strengthened by consumers who can, through well-informed choices, help stimulate price competition, innovation and improvements in quality. By making well-informed choices among suppliers, consumers and users not only benefit from competition, they help drive and sustain it (OECD, 2008b).

User empowerment and choice are important and positive social side effects of the access to information that Internet intermediaries provide. Internet intermediaries such as search engines and e-commerce platforms provide value to consumers in terms of product or service information and varied choice, and decrease transaction costs associated with economic and social activity, including:

- *Costs of searching* (for example, the time and effort spent to determine whether a good is available on a given market, its price level and the most competitive supplier). Internet intermediaries reduce the importance of time as a factor in the structure of economic and social activity, raising the potential for saving time as consumers shop and find information more efficiently. However, some point out

risks to consumers in the form of distorted comparisons, depending on who pays, on price comparison sites or placements/sponsored links up front in search engines.

- *Bargaining costs* are the cost of coming to an acceptable agreement with the other party. Consumers are empowered through greater access to information and platforms that facilitate price comparisons, increase competition and create downward pressure on prices.
- *Policy costs* include the costs to supervise whether the other party fulfils the agreed terms of the contract. Consumer ratings and reviews are seen as a healthy and transparent channel to empower consumers and to help them to make informed e-commerce decisions (OECD, 2009d). Increasingly, before purchasing a product on line or in a store, shoppers will consider online product reviews; consumers report that in a majority of cases reviews very much affect their buying intentions (they either become more determined to buy the product or change their minds and buy a different product).⁴ There are, however, concerns over misleading consumer ratings linked to non-disclosed compensation for the promotion of products (including free items, gifts, or cash).⁵
- *Costs of enforcement* include the cost of legal action if the other party does not fulfil the contract in the context of electronic commerce platforms. Internet payment providers have a particular role to play with regard to costs of enforcement.

Individuality, self-expression, democracy and social relationships

Participative networked platforms bring together features such as citizen journalism, artistic/cultural creation and user ratings. The significance of participative networked platforms is clear in that never before have so many people introduced so many kinds of content, on such a broad scale, and potentially with such wide-ranging impact. Changes in the way users produce, distribute, access and re-use information, knowledge and entertainment are likely to continue to have structural impacts in the cultural, social and political spheres (OECD, 2008c).

In Korea, for example, participative networked platforms are considered to have an impact on democratic processes and the political debate, with real political consequences. Some political analysts claim that the 2002 presidential election was influenced by participatory networks on the Internet. A particularly noteworthy platform, in terms of facilitating new forms of citizen participation in public life, the free flow of information and freedom of expression, is the online newspaper website OhmyNews. OhmyNews enables any individual, rather than only professional reporters, to contribute to, edit and publish news articles. It was established in 2000 as the first company of this type with the motto, “every citizen is a reporter.” In addition, with the company’s “news alliance of news guerrillas” programme, anyone can post articles on any topic, and content is monitored by other users of the platform.

More generally, evolving social structures can be likened to new patterns of organisation that speak to values of individuality and self-expression. In this context, some stress the need to monitor possible threats to freedom of expression and democratic dialogue and point to examples of what they consider to be instances of overbroad copyright enforcement initiatives that may afford little or no due process.⁶

Most Internet users have a positive perception of the impact of the Internet, enabled by Internet intermediaries, on everyday life and in particular on their resource-enhancing capabilities (learning, culture, health-related information and work). In Europe, more than half of users feel that the Internet has improved their relationship with family and friends while less than half say that the Internet has added opportunities to meet new people (Box 3.1).

**Box 3.1. The impact of the Internet:
Percentage of users agreeing that the Internet has improved aspects of their lives**

Your capability to be informed about current issues	87%
Your opportunity to learn	74%
Your opportunity to share views/access culture	70%
The way you get health-related information	67%
The way you perform your job	66%
Your relationships with family members and friends	57%
The way you manage your finances	51%
The way you pursue your hobbies	51%
The way you shop	50%
The way you deal with public authorities	48%
Your opportunity to meet new people	44%

Source: EC study on the Social Impact of IT, based on the Flash Eurobarometer – Information society seen by citizens (2008).

Notes

1. OECD (2006), “Internet Traffic Exchange: Market Developments and Measurement of Growth”, April, OECD, Paris, www.oecd.org/dataoecd/25/54/36462170.pdf.
2. ICCP Foresight Forum on Cloud Computing, October 2009.
3. Presentation at the ICCP Foresight Forum on Cloud Computing of 14 October 2009 by Kai Gutzeit, Head of Google Enterprise DACH & Nordics, Google.
4. According to a 2007 study by Deloitte & Touche (United States) for eMarketer, 62% of Internet users read product reviews written by other consumers. Additionally, some online retailers report higher sales conversion rates as a result of customers’ product reviews on their sites.
5. The report refers to a revision of the US Guidelines Concerning the Use of Endorsements and Testimonials in Advertising that is being considered by the US Federal Trade Commission. It would hold bloggers and companies benefiting from the review liable for untrue statements about the products and for a lack of information disclosure to consumers about any relationship between the blogger and the company, and would face sanctions.
6. Civil Society Information Society Advisory Council to the OECD (CSISAC), citing analysis on the US presidential election by the Electronic Frontier Foundation, www.eff.org/deeplinks/2008/10/mccain-campaign-feels-dmca-sting and www.pcworld.com/article/130222/obama_video_not_funny_says_1984_owner.html.

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