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BOOK REVIEW

The Flip Side of Free: Understanding the Economics of the Internet

Michael Kende
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MIT Press: Cambridge, Massachusetts, USA
272 pages, including acknowledgements, notes, bibliography and index
US$ 29.95
Hardcover, ISBN: 9780262045650

This volume describes the challenges that users face with access to free Internet services. The book covers economic, technical and policy-related aspects, explaining in a detailed and very didactic way the risks associated with the employment of Internet-based applications and software. Particular emphasis is placed on clarifying the economics of the Internet and how it affects end-users’ behaviour. The author is a consultant, experienced in the economic aspects of telecommunications networks and services; he also has several years’ experience of academia, having worked with the United States telecommunications regulator and in institutions that promote the use of Internet and digital services.

The book is organized into 10 chapters which are divided into the following three parts: the “Upside of Free”, the “Downside of Free” and the “Future of Free”. Each chapter ends with a conclusion. Any reader with basic knowledge of the telecommunications industry or information technology (IT) industry will be able to understand the complex economic and policy issues covered in the volume. The author describes key ideas with a few examples (some of which are taken from his own experience), to help the reader understand the complexities of certain situations.

Part I (the “Upside of Free”) contains four chapters dedicated to the historic and commercial aspects that explain why the Internet is free. Chapter 1, the introduction, begins with an example of the author in a Starbucks coffee shop. Accepting the Starbucks smartphone app terms (when making a purchase) made the author think about privacy and security issues. The book focuses on various questions: Why is the Internet free and what are the consequent economic implications? Moreover, several policy solutions to address key challenges are presented in the book. A few fundamental concepts related to the Internet are described in this chapter. The role of Internet Service Providers (ISPs) in internetworking is presented. The author applies economics to the Internet and explains how supply

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and demand curves are used to set prices for Internet services. A distinction is made between two concepts related to Internet governance: governance of the Internet and governance on the Internet.

Chapter 2 explains how Internet standards are defined. The concept of network effects is introduced: direct network effects and indirect network effects are explained. Different types of proprietary systems are presented: *de facto* and *de jure*. The philosophy of the Internet regarding employment of open standards is explained, and a brief history of the Internet is described. The author describes with an example a situation where some devices, and the corresponding standards, have not always been permitted: when the author lived in France in 1994, a modem that he had brought from the United States was confiscated by customs; the reason was that it was not on the list of modems allowed by France Telecom at that time. The author argues that there is no flip side to open standards. The Internet is a good example of this.

Chapter 3 describes different historic and economic reasons that explain why access to the Internet is free. The chapter addresses the history of telephony and how telephony prices are set. Internet pricing is also discussed, which is different from that of telephony. A positive aspect of this chapter is that it gives readers elegant explanations of key engineering concepts relating to the Internet and telephony infrastructure, such that even those who might not have a technological background will understand. Kende explains how the introduction of broadband changed the basis for pricing. A problematic issue in developing countries is shown, i.e., the practice of having data centres abroad, making access to them costly. Development costs associated with Internet services in these countries are, therefore, much higher than in developed countries.

Chapter 4 is devoted to the role of advertising in Internet pricing. Early online business models and the dot-com bubble between 1995 and 2000 are described. During the Internet boom in this period, there were no questions about revenue or profit. The metrics were traffic, growth and the number of customers. Later in the chapter, the growth of the online economy is explained. The role of online content and search advertising is described. The conclusion of this chapter is that many Internet services are available to us at no cost, in return for data that can be used to sell advertising, which pays for the service.

Part II (the "Downside of Free") consists of four chapters that examine the challenges faced when employing Internet services. Several aspects regarding privacy are addressed in Chapter 5. The privacy paradox is explained, i.e., that even though our data are employed by Internet-based companies, we still use the Internet. The two pillars of the economics of privacy, namely information economics and behavioural economics, are described. Three aspects regarding information economics are

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mentioned: privacy policies may have unforeseen outcomes; it is hard to control intangible data; and people are targeted without their knowledge. One example is given, i.e., that it would take a user around nine hours to read the user agreement for the Amazon Kindle e-reader. With regard to behavioural economics, the author explains that even though people understand that there is a level of risk, they continue to use smartphones, apps and online services. The author advocates the need for technologies that provide privacy by design. For example, authentication can move from passwords to fingerprints and facial recognition. Governments could also incorporate privacy issues into educational curricula for children, e.g., teaching online safety to all children in schools.

Chapter 6 addresses the topic of digital security. Two main causes of breaches are mentioned: users not installing relevant software updates and phishing attacks. The author explains the economics of cybersecurity. The nature of public goods is described, i.e., that they are typically facilitated or financed by governments, even if provided by private companies. Kende explains that Internet-related standards have all the characteristics of a public good. The car industry is given as an example that could be useful for illustrating the case with regard to the Internet industry. The car industry has evolved in terms of security over the last 50 years; several tests, with ratings, are used in this industry. In the case of the Internet, tests with ratings could also be helpful. The author proposes that third parties could develop more security-related standards, conduct tests and provide safety ratings.

The topic of platform power is explained in Chapter 7. In this chapter, Kende describes how several content platforms have important market power, and also identifies the barriers facing new online platforms when entering the market. The companies that host content do not usually have to create it, but they obtain revenues from such content. Laws governing platform content (and responsibility for content) have been passed in the United States and Europe. Some services provided by important Internet companies such as Facebook and YouTube are free. Free services lead to a virtuous circle for data gathering. Content platforms with enough resources invest in data centres that are close to the user, which leads to economies of scale. For a newcomer, the sunk costs can be very high. The economies of scale for content platforms are difficult to contend with, and it is hard to compete with the costs of large platforms.

The economics of the Internet in developing countries and the digital divide are analysed in Chapter 8. The importance of mobile networks for developing countries is described. With mobile networks, everyone in the neighbourhood gets the mobile signal and access to telecommunications services, which is not economically feasible with fixed networks. In developing countries, the demand for Internet services is high, but it is costly. The ITU and UNESCO state that entry-level broadband packages should be less than 2% of average income by the year 2025. However, in several countries,

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it is a double-digit figure. Two of the challenges that developing countries face are that websites are usually in English, and there is often a lack of digital skills in the country. The case of "tromboning" is explained, which corresponds to a situation where local traffic is exchanged abroad and not in the same country. In some cases, the cost of wholesale Internet access can be quite high. Transmission of 1 Mbps can cost US $200 or more per month in some developing countries, whereas the corresponding cost is US $0.30 in Europe and the United States if purchased in bulk. The author argues that content should be locally relevant in order to attract new users and increase usage.

Part III (the "Future of Free) looks ahead, presenting some thoughts about what could be done to improve certain situations relating to the flip side of the Internet. In Chapter 9, the author presents some reflections on trust in the Internet. The trust paradox is explained, with people continuing to use Internet services despite data breaches. Trust is needed for services on the Internet to be effective: trust in the data provider, trust in the users of data and trust that the results will deliver the corresponding benefits. The author analyses some potential solutions to the problems of ensuring privacy and security, and the issues associated with access to big data. According to Kende, a clear solution to the problem of the digital divide, with developing countries having too little data, has yet to be found. The reader may well get the impression that in some respects, there are still no solutions, and there is considerable room for improvement.

Some reflections on the need for change are described in Chapter 10. Kende explains the need for the regulation of Internet-related markets. However, governments should not employ the same type of regulations for digital services as those used for classical telecommunications services. The author argues that some of the issues appearing in the digital age could be anticipated and regulated before they arise, thereby making them easier to resolve.

The book is well written. It contains clear and interesting examples, which aptly illustrate different situations. The volume gives a comprehensive overview of the state of the art regarding the economics of the Internet. Moreover, the author is humble enough to acknowledge the existence of unresolved, open challenges. The chapter on the digital divide (Chapter 8) gives the book a new dimension that is not usually addressed in literature about the economics of the Internet, which tends to focus mainly on problems in developed regions.

The solutions presented in the book regarding the problems of privacy and security are not entirely clear. The author advocates in Chapter 9 trust in the Internet in the future. However, some of the solutions addressed in this chapter are not entirely convincing. Just pointing out that end-users should trust the Internet in the future is – by itself – not a solution. The title of Chapter 3 could be misleading:

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"Why is Wi-Fi free?" In the United States and other countries, the term Wi-Fi is synonymous with the Internet. Perhaps the title should be "Why is the Internet free?"

To summarize, this book is recommended for anyone aiming to understand the economics of the Internet, the corresponding ongoing debates about privacy and security, and the challenges faced by developing countries in the Internet industry. The thoughts of the author invite the reader – irrespective of whether the reader is an expert or new to the topic of Internet economics – to reflect on daily issues that affect all of us as users of the Internet.

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