Future Internet Markets and Business Strategies: An Analysis and a Proposal

Man-Sze Li

IC Focus, 42 Clifton Road, London N8 8JA, UK
`msli@icfocus.co.uk`

Abstract. The Internet as a market does not comprise a single, linear value chain of actors. Companies are in the business to win, to outperform their competitors and to make profits. Developments of the Internet technology supply market to date suggest that there are six areas of focus for supplier companies' business strategies, leading to different approaches to out performing competitors and making money. The new business strategies arising from the Internet market re-define the relationships between the provider and the user. These relationships are not based solely on the calculus of economic inputs and outputs. There is a distinction between the value proposition of what is offer to the user and the value proposition of what is on offer to the provider. The business strategies aligned with the open source models, the long tail and the power of free exploit the economic fact of the margin cost of software production and delivery approaching zero. A utility approach to Future Internet markets could contribute to greater and even better choice for users.

Keywords: Future Internet, Internet markets, market competition, business strategies, business models, universal service, utility.

1   Introduction

The Internet was born of a research initiative commissioned by the US Department of Defense in 1969. Historically, it was a research spin-off. Also historically, it was a technical construct. But with the commercialisation of the Internet in the 1990s, the Internet also became a global business opportunity, arguably on a scale unparalleled in history. Today, the Internet as a maturing, worldwide, universal network of information and communications, is also becoming a social machine. Technologically, the network is beginning to resemble a global computer, a global database and a global virtualised resource. It is also increasingly wireless based, and is starting to fuse the virtual with the physical world. In business terms, the network is becoming a business system. In social terms, the network is the people and the collective intelligence of the people. The Internet has become a critical part of an economy's infrastructure, indeed a critical infrastructure for the overall society in the developed world and an embodiment of aspirations for the least developed countries. Some argue that the Internet is becoming a public utility (see, for example, [1]).

Whatever one might think the Internet is (or *should* be), one thing is certain: whatever is happening in the world, we can see at least fragments of that on the Internet. But does the Internet simply mirror what is going on in the world? This paper seeks to provide an answer in relation to development of the Internet market(s).

The paper discusses the structure and dynamics of this market, with a view towards the Internet of the future. New developments are on the horizon, in the marketplace as well as in research and development. The "Future Internet" will be much faster and smarter, more secure, embracing not just information and content but also services and real world objects ("things") [2]. If history is a guide, the potential of the Future Internet will be primarily driven by innovative services and applications. The tussle between the different actors is reflected in the business strategies of those who seek to exploit the Internet as a commercial opportunity in competitive markets.

Six areas of focus for business strategies for Internet technology market supply are presented below. The paper calls for fresh thinking on the service infrastructure of the Internet, and proposes a utility-based approach to Future Internet markets.

The approach of the paper is business-oriented. It is based on experiences in the field, supplemented by academic and policy literature. Key literature is referenced to support the arguments presented. It is noted that while there is huge market and policy interest in the business strategies and models that tap into the Internet's commercial potentials, the volume of papers from the research community is relatively small.

2   Internet Market(s)

When the Internet was first conceived, communication over the wire was provided by "the telephone company" of individual countries, overseen by or being part of the government. Commercialisation of the Internet formally began in 1995, when NSFNET was switched off as "the Internet" and the backbone traffic was routed instead through interconnected networks of (by then) commercial network providers, who had added data to their core telephony business. At the same time, independent Internet service providers (ISPs) sprang up to offer, to the general public, Internet access as well as some online content behind their "walled garden". Therefore, the basic shape of the Internet as we know it today was already in place. It was a landscape comprising, on the supply side, commercial network providers, ISPs, content providers and equipment providers; and on the demand side, users, or individual consumers taking out contracts with the ISPs.

2.1   The "New" Landscape

Today, to this landscape has been added a new category: a wide variety of service providers exploiting the Internet as a communications platform. These include notably those dealing with computing or information technology, and those offering intermediary facilities for content creation and dissemination. In the meantime, the businesses, business models, identity and balance of power of the original groups of players have fundamentally changed. Network providers are no longer just shifting traffic around, and the telecommunications industry now also includes cable, satellite and mobile communications. The ISPs as an independent, distinct group of providers has largely

been eroded, while Internet access has become a line of business rather than the business of ISPs. Content providers can be said to be everyone, thanks to the Web which enables all with access to the Internet to publish. Equipment providers have expanded in range and scope beyond recognition. The "traditional" network equipment and customer premises equipment providers are joined by vendors of all kinds of devices hooked onto the Internet, including several billion mobile devices.

In short, while the supply side of the Internet market can be broken down into five broad segments, that segmentation masks a vastly complex constellation of actors with different focus, speciality and target customers.

On the demand side, "users" are not only vastly more numerous, they are also far more diverse and complicated than before. Depending on the context of use, people can access the Internet as a private individual, a consumer of goods and services, an employee, a citizen, or a member of any community to which the user belongs.

Moreover, in the long chain of communication conducted on the Internet, there are now three broad classes of intermediary users, again depending on context. These include the entities to which users belong (organisations and communities), the different kinds of communicating devices and things, and the different kinds of software-based or software-enabled services making use of other software-based or software-enabled services. The inter-relations between all of these, and with the end-user, are linked to the inter-relations between the providers on the supply side.

2.2 Market Dynamics

The above shows that the Internet as a market does not comprise a single, linear value chain of actors. The Internet of course does not replace the economy. However, it fuels the dynamics of the market. It offers new opportunities for market actors, existing as well as new, actual as well as potential. It also offers a new location – a new *marketplace* – for the exchange of some goods and services.

As a communications medium, the Internet facilitates market (in the sense of a generic, globalised market) or markets (in the sense that the global market comprises many different markets). It is useful and indeed important to distinguish between the Internet technology market and the many markets that are facilitated by Internet technologies; e.g. the failure to make such a distinction fuelled the dotcom bubble.

It is true that communications and information technologies are now indispensable to the operation of all big businesses and entire industry sectors; for many businesses, they are also accepted as a vital tool for gaining competitive advantage. However, an enabler, no matter how essential, is not core business. Not does it necessarily add value. A flourishing technology market does not automatically create prosperity in other markets it facilitates, let alone the economy as a whole.

A more fruitful line of enquiry on market dynamics and the Internet is to establish how the exploitation of Internet technologies impact on market mechanisms and structures relative to what was the norm before the pervasiveness of the Internet. It is here that technologies have a disruptive impact in the sense of radical innovation. It is also here that the business strategies of the Internet technology providers are crucial for the development of a new mode of exchange available solely on the Internet – the "Internet-based markets". Such markets could, and may, in due course change the practice of business, break down the boundary between work and other forms of activity, and deeply influence the way in which we approach and interpret what is going on in the world.

3   Business Strategies

Economic textbooks typically tell us that technology is an important (even the) determinant of production cost. Improvements in technology make it possible to increase productivity. Technology contributes to economic growth. However, in a free market economy, commercial companies do not generally exist for this purpose. On the whole, companies are in the business to win, to outperform their competitors and to make profits. That is the essence of business. Simply defined, a business model spells out how the company makes money[1] [3]. In practice, the *what* of a business (business model) is inextricably linked to the *how* (business strategy). The tussle among providers and consumers in a competitive landscape is the most basic attribute of a marketplace [4]. In a competitive marketplace, business strategies, rather than business models per se, ultimately determine winners and losers.

During the dotcom era, there was a fashionable belief that the Internet renders business strategy obsolete. After the market crash, Michael Porter published an article arguing that the opposite is true [5]. Because the Internet tends to weaken industry profitability without providing proprietary operational advantages, it is more important than ever for companies to distinguish themselves through strategy. According to Porter, the winners will be those that view the Internet as a complement to, not a cannibal of, traditional ways of competing.

Developments of the Internet technology supply market to date suggest that there are six areas of focus for supplier companies' business strategies, leading to different approaches to out performing competitors and making money.

1. *Business strategy involving protection of intellectual property*. Owners of intellectual property acquire market power and reap competitive advantage by being legally granted exclusive rights to a variety of intangible assets. Among the common types of intellectual property, most relevant for Internet technologies are trade secrets and patents. The source code of a lot of commercial software available is a trade secret, e.g. Microsoft's Windows operating system, Apple's Mac OS X and iPhone operating system. Other ideas and inventions implemented into software could also be a trade secret, e.g. Google's search algorithm. The essence of a trade secret is that the economic benefit to its holder derives specifically from the secrecy (and not necessarily from the value of the asset being protected). In contrast, patents provide the right, within the time limit of the patent, to exclude others from making use of the invention, subject to compensation to the patent holder (usually in the form of fee-based licenses). Many technology companies assiduously build up a patents "vault" for purely defensive purposes, with no intention of putting the patents to use.

2. *Business strategy involving the bundling of technologies*. By aggregating several technologies into a single offering, a company may achieve one or several of the following which would not have been possible (or would have been less likely) if the technologies were made available separately: a greater - even dominant - market share, a bigger market, lower cost, higher price. Proponents of technology bundling

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[1] Of course making money is not necessarily the same as generating or creating value, on which some definitions of business model focus instead. This distinction is illustrated by new business strategies in the Internet landscape – the subject of this section.

usually point to a superior market offering through bundling, in the sense that the overall offering is greater than the sum of its parts, and provides a more consistent experience to the user.

Probably the most famous example of technology bundling in the Internet technology field is the case brought against Microsoft first by the US Government (settled in 2001) and then by the European Commission (ongoing). The latest charge brought by the European Commission rests upon the claim that the company's bundling of the Internet Explorer (Web browser) with Windows (operating system) is an "abuse" of its dominant position in the computer market. According to the Commission, the bundling distorts competition on the merits between competing Web browsers, undermines innovation in the provision of browser-based services to consumers, and ultimately harms consumer choice. The merits or otherwise of the Microsoft case aside, the specific details show the complex inter-relations between different technologies in a particular market, and the thin line between technology inter-relations and technological inter-dependencies[2].

3. *Business strategy involving standardisation*. Put it simply, a standard is an agreed, repeatable way of doing something. The Internet as a technical construct was founded upon standards, originally technical protocols to interconnect existing networks. However, as the Internet develops, what to standardise, how to standardise, when to standardise and who (are best placed to) standardise, are questions that have no easy answers, or answers that can be readily agreed upon by the stakeholders.

Claims to standards and various perceived attributes of standards – notably openness and interoperability – are a hallmark of the Internet technology supply market. However, such claims are derogated by the practical difficulty of verifying standards conformance and compliance in an objective and authoritative manner.

Compared with the early days of the Internet, there is now a general reluctance among market actors to standardise technology "early", for fear of upsetting the existing market dynamics and a given market structure. In the Internet technology field, standardisation has become increasingly defensive, ad hoc, fragmented and short term. Often, it is no more than rubber stamping the status quo, i.e. the dominant technology. In addition, the process has proved to be useful for rallying an ecosystem of business partners and expediting the market momentum of the technology in question. The more general point is that standards are "leveraged" in support of specific commercial interests. But standards may not be "open". "The market" may not be the best arbiter of competing standards. In this respect, standardisation is at risk of losing its purpose and value of creating a stable foundation, or a level playing field, for facilitating innovation and ultimately delivering choice. Standardisation may even become an instrument of the market incumbents to create road blocks to innovation.

There is a further business strategy in respect of standardisation: ignore the rest and pursue own goal via publishing APIs as open technical specifications. This has been

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[2] By way of example, complementarity between technologies, which could be argued to improve users' experience and therefore constitute an added value, might also create lock-in and erode choice. This applies especially to bottleneck asset or key technical interfaces between software programs (application programming interfaces or APIs). Function placement as defined by interfaces is highly non-trivial. It defines market structures [4].

successfully practised by the prominent Web 2.0 companies in building up their individual ecosystems[3].

4. *Business strategy involving open source*. The term "open source" originates from "open source software" [6]. As a focus for business strategy in general, open source may be broadly understood as the peer development and production of the "source" of an artefact through open – typically public – collaboration. Also, the output of the collaboration process resides in the public domain, so that it is in principle available to all to exploit. The contrast is the closed, centralised and centrally controlled model of development, typically within the confines of a single company. The Internet (in the sense of a technical construct overall) could be considered as a manifestation of the open source model.

The business strategy involving open source relies on several key attributes. First, tapping into the collective intelligence of an army of volunteers for the "source" offering. Second, providing added value to the typically free source offering as a value proposition for the company's own offering. Third, developing the distribution channel for the company offering. Fourth, managing the process of change in the source offering, including compatibility between its offering and the source offering and associated licensing. Fifth, managing the relationship with the volunteers. Sixth, ensuring the viability of the source offering development process. The business strategy can be divided into three main subclasses, in terms of added value to the functionality of the offering, added value in the form of customer service, and added value in the delivery of the offering. The first includes providing a commercial version of the source offering (with extensions/modules/plugins/add-ons), and complementary products to the source offering which may be bundled together into a single commercial offering. The second includes technical support and consultancy services. The third includes making the source offering available in an alternative way, notably software as a service. These possibilities are not mutually exclusive.

5. *Business strategy involving the "long tail"*. The term the "long tail" was coined by Chris Andersen, originally with reference to the emerging digital entertainment economy [7]. The long tail business strategy focuses on market niches of specialised and individual preferences, as opposed to the mainstream market of blockbusters; in other words, mass customisation as an alternative to mass-market fare. Examples include the online retailers such as Amazon, Netflix and Rhapsody, as well as Google, who makes most of its money from small advertisers, and eBay, who built its business based on auctioning niche and one-off products.

By catering to niches and creating micro markets, long tail companies expand the overall range and scope of the market. They also threaten the established market players whose business is built and concentrated on hits. Intrinsic to the long tail argument is the notion that the digital world is characterised by abundance, as opposed to the physical world of scarcity. The marginal cost of producing digital goods is close to and even equivalent to zero. Over a long time frame, the total average cost of producing digital goods similarly declines towards zero.

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[3] By tapping into their established position in a particular market, these companies reap the benefit of positive feedback to their published specifications, and further cement their market dominance by acting as a de facto standardisation hub.

As a business strategy for Internet-based markets, the long tail is particularly powerful in its focus on the smaller customer, customisation and choice. It challenges technology providers' traditional pre-occupation with large customers (in the business market) and the mass product (in the consumer market). It is also particularly significant for those technologies or software that may be delivered as services.

6. *Business strategy and the power of "free".* Internet technology and applications started as free. Commercialisation of the Internet changed a lot of that. But commercialisation spawns its own counter culture. It appears that somebody somewhere inevitably starts offering alternatives or entirely new ways of doing things for free on the Internet. Because of the Internet, such offerings quickly spread (i.e. viral in marketing terms). Also because of the network effect of the Internet (i.e. things become more valuable to the user as there are more users), the offerings can pose a significant challenge to the established commercial products or services. Moreover, Google, one of the most valuable companies in the world in terms of market capitalisation, has demonstrated that gratis can be good business, by creating an entirely new market through the function of search.

On its own, free is not a business model - what is free by definition does not make money. Free however can be leveraged in a business strategy in a number of ways. What is free tends to attract users, often huge numbers of them, constituting a potential customer base. Things, both physical and virtual, can then be sold to them. However, in order to be viable as a business proposition, these things must be somehow "relevant" to the user. Better still is if these things are "valuable" to the user. The distinction between what is relevant and what is valuable is important. Advertising is about monetising relevance to the free. Up-selling is about monetising added value on top of what is free. Because advertising offers no intrinsic value to the user, it is unlikely to be a sustainable business proposition in the long run. Research suggests that consumers do not trust advertising, do not want to view advertising, and do not need advertising [8]. This is reflected in the price of online ads and click-through rates, which has been falling regardless of the general state of the economy.

When it comes to creating value on top of what's free, the business strategy associated with the open source model, discussed above, applies. There is however a key difference – what is offered for free in the present type of business strategy is provided directly by the company, who is moreover *the* intermediary for accessing the free offering. Even if the provider company does not own the actual content as much as it does not own the user community, it controls the channel to access. There is, therefore, another business possibility to leverage what is free – monetising access[4].

The power of the free can be the glue for a new kind of voluntary lock-in. The site can become so useful to the user and its services can become so integrated with the user's daily activity that the user has no incentive to leave. Internet technology has a key role in making a site useful and the experience of the site uniquely compelling; free applications can provide the launch pad for entire ecosystems.

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[4] This could relate to participation in the site (which is problematic because it contradicts with building a vast base of users), or to referral, where the user is directed elsewhere on the sole basis of what he does on the site, appropriately contextualised. The greater is the user engagement (e.g. evaluation, recommendation, feedback), the more fine-tuned is the contextualisation, and the more useful the referral becomes for the user.

4   A Utility-Based Approach to Future Internet Markets

Since the 1980s, basic telephony as a universal service [9] has been widely enshrined in telecommunications legislation in US, Europe, and other parts of the world. The attributes of a universal service in telecoms typically involve affordability, accessibility, availability and quality. Fundamental to the universal service, which justifies its regulation in a market economy requiring legally binding obligations of the provider and in some cases arguments for government subsidy, is the notion that such services are a utility. Simply stated, a utility is essential for the basic conditions of living in society; therefore, the individual has the *right* to the service in question.

In classical economics, the doctrine of utilitarianism prescribes maximisation of utility as a moral criterion for the organisation of society[5]. Morality aside, the concern about the provision of universal or utility services is whether market efficiency alone can produce the optimal utility from the standpoint of society, and ensuring that rights are fulfilled as in "nobody is left behind". There may not be sufficient economic incentives for providers to provide for adequate availability, provide access to all, hold the price down, and/or meet certain criteria for quality.

An important consideration is that a utility is subject to the scarcity principle of the resources in question, either by nature (as in natural resources) and/or by infrastructure limitations (as in the power plant for energy or the network infrastructure for telecommunications, which takes time and costs a lot to build). For all these reasons, a utility provider enjoys considerable market power: a large degree of control over the inputs (including the infrastructure as a capital investment) and economies of scale for the output (increasing returns which are disproportionate to the inputs once the infrastructure is built, and the capital outlay is compensated for over time). Because the resource in question is "essential", it cannot be readily substituted for. In other words, its demand is not elastic – consumers cannot switch to substitutes even when confronted with large increases in prices, or artificial high prices not justified by the cost of provision. The lock-in effect of utility explains why concerns about market power and competition have been a driving force for regulation.

At the time of writing, the European Union is putting forward the argument to extend universal service to broadband communication services, which would require network providers to extend broadband coverage to all geographic areas of the EU, regardless of whether it makes economic sense or not from the viewpoint of the provider. However, if the Internet is seen as part of the fabric of economy and society (a view held by governments of the developed world [10]), then there is a case for carefully considering whether the utility argument might not apply also to additional Internet services other than broadband. For example, if basic business functions are migrated to the Internet, and those who can afford such services enjoy – for the market as a whole – uncompetitive advantages over their typically smaller rivals, basic functions could be regarded as utility services. The new Internet-based markets show

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[5] This could entail, for example, the greatest benefit for the greatest number (Jeremy Bentham and John Stuart Mill), the greatest benefit of the least advantaged (John Rawls), or just the greatest benefit (Derek Parfit). Other theorists focus on the starting position, rather than the outcome, as in free exchange from a just starting position (Robert Nozick), which also echoes Rawls' supplementary view of fair equality of opportunity.

that the overall pie of aggregated demand could be larger where utility is a stimulus for innovation. If broadband communications are regarded as a utility, then a similar argument may be applied to essential IT services that both businesses and consumers must rely upon in order to make use of and make use out of broadband. These essential services may include basic security, identity management, search and discovery, electronic payment, ease of access, ease of use and ease of management. Users should have the genuine freedom to switch between providers of all these services, and combine services available from different providers. This freedom goes beyond "plug and play" and "open access".

The basic cost of putting an "IT infrastructure" (or software platform) in place is intrinsically far lower than that of say a power plant or the railway network or the next generation fibre optics telecommunications network. Business strategies aligned with the open source models, the long tail and the power of free clearly exploit the economic fact of the margin cost of software production and delivery approaching zero. The processes involved in moving information around is becoming as much a "commodity" as the mechanisms for moving communication network traffic around; in the latter case causing telecommunications providers to re-invent their business models and re-brand themselves. Moreover, the value of information is generated not by the provider of the processing systems or by the provider of the communication networks, but by the end user of the Internet. Users should therefore have a greater control over what, how and even why they are being charged.

Research work in developing the Interoperability Service Utility (ISU) [11] under the auspices of the European Commission's research framework programme, is addressing these concerns. An Internet that is fit for future business requires a transformation of the Internet infrastructure beyond today's basic network connectivity to encompass utility services on top of which new value could be created [12]. Competition in open markets is best advanced by a level playing field. The Internet has demonstrated that technology can have a democratising effect not only to open up the boundary of the field, but also to continuously challenge and enrich the scope of the "levelers" in the field.

5   Conclusions

The history of the Internet has already shown the pivotal, gate-keeping role of the ISPs – they control access to the networks. The ISPs have declined as power players not because that gate-keeping role has disappeared; it simply means that the battleground for services has moved elsewhere - away from basic network services, which are increasingly seen as a "commodity", and "up the stack" to the application-oriented software-based services. The economics of the Internet has changed.

In his recent work [13], Jonathan Zittrain argues that the "generative" power of the Internet is largely responsible for its spectacular growth. Zittrain defines the generative power as the ability for lots of people to build on a technology platform, and share what they do with others, without the permission of the platform-maker. The views associated with the Internet market as a collection of ecosystems have concentrated minds on the role of generic technologies in creating markets; the need to collaborate with a wider range of partners including third party developers, consultants

and channels; and a new type of market and mode of exchange brought forth by Internet-based companies.

The above views are supported by the new business strategies which re-define the relationships between the provider and the user, and relationships which are not based solely on the calculus of economic inputs and outputs. There is a distinction between the value proposition of what is offer to the user and the value proposition of what is on offer to the provider. The two value propositions should not automatically be assumed to be in alignment. Importantly, Internet services, as digital goods, are not subject to the fundamental economic premise of scarcity. With an in principle abundance of market supply, the pricing of such services should arguably reflect the basic production and distribution cost of services being almost nothing.

With changing market structures, market dynamics and economic premises, the utility approach to Future Internet Markets is one proposal which calls for fresh thinking on the service infrastructure of the Internet, and how that infrastructure may be better leveraged in order to deliver greater and even better choice for users.

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