

December 2004

Open Source Software And Open Content As Models For eBusiness

Roger Clarke

Department of Computer Science, Australian National University

Follow this and additional works at: <http://aisel.aisnet.org/bled2004>

Recommended Citation

Clarke, Roger, "Open Source Software And Open Content As Models For eBusiness" (2004). *BLED 2004 Proceedings*. 32.
<http://aisel.aisnet.org/bled2004/32>

This material is brought to you by the BLED Proceedings at AIS Electronic Library (AISeL). It has been accepted for inclusion in BLED 2004 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

17th Bled eCommerce Conference

eGlobal

Bled, Slovenia, June 21 - 23, 2004

Open Source Software And Open Content As Models For eBusiness

Roger Clarke

Principal, Xamax Consultancy Pty Ltd, Canberra, Australia
Visiting Professor, Baker & McKenzie Cyberspace Law & Policy Centre,
University of N.S.W., Sydney, Australia
Visiting Professor, E-Commerce Programme, University of Hong Kong
Visiting Fellow, Department of Computer Science, Australian National University, Australia
Roger.Clarke@xamax.com.au

Abstract

The search for viable eBusiness models continues. But important information is being overlooked. Discussions of open source software all too often focus on the limited context of Microsoft appearing to feel threatened by what it portrays as unbusinesslike competition from Linux and OpenOffice.org; whereas that debate is merely one small facet of the whole. Moreover, in addition to software, a great deal of text, image and sound content is readily available, rather than being constrained by tight copyright clauses. Because discussions have been too superficial, too little of the business world has grasped how open models are working in those organisations that have adopted them. Their experiences draw attention to several key assumptions that are inherent in conventional economic models, but that are not applicable in these new markets. Rather than being merely unworldly and communitarian, open source and open content herald a new wave of business activity that transcends naive economic rationalism, and embody implications for business models that deserve serious study by eBusiness leaders.

1 Introduction

The dot.com era has come and gone. The notion of a brave, new world in which market-share matters, but revenue does not, has been shown for what it was. Yet still the suspicion lingers that the world has changed, just not in the way that over-enthusiastic entrepreneurs thought that it had.

Many case studies have been prepared of eBusinesses that have variously been successful and unsuccessful, or for which the jury remains out. An improved understanding is emerging. Proposals have been made for taxonomies of eBusiness models that encompass both old and new ideas.

Slowly some contingency theories are appearing that seek to explain which models are applicable in which circumstances, and even to predict success and failure.

The purpose of this paper is to make good what appears to be a gap in the literature. The 'open source' movement has attracted a great deal of attention, and histories, business analyses, and economic analyses have appeared. The idea of 'open content' is also now becoming more mainstream, as publishers discover advantages in achieving a balance between closedness and accessibility. There is a need for these two movements to be assessed not only as phenomena in their own right, but also for the contributions that they may be able to make to the development of a comprehensive body of theory relating to eBusiness models.

The paper commences by reviewing recent literature on business models, and explaining the interpretation of the term that is used in the remainder of the paper. It then provides historical perspective on the open source movement and the open content movement, identifying the characteristics that distinguish them from conventional business patterns. These differences are then examined from an economic perspective. Four major distinctions are drawn between the economic models that served well in pre-Internet contexts, and those that need to be applied in the new context of ubiquitous networking, digital content, and cyberculture. Implications for eBusiness models are drawn, and a framework presented.

2. Business Models

There is a considerable variety of interpretations of the term 'business model' in the context of eBusiness. It can be used in a narrow sense, to refer to a model of business processes, either within a single organisation or between closely-linked business partners. This focusses on actors, relationships, and information flows among the actors (e.g. Papakiriakopoulos et al. 2001). Somewhat broader is the notion that a business model describes the logic of the value-creating business system that lies behind the business processes (Petrovic et al. 2001).

A much broader interpretation is that a business model is the architecture of products, services, actors and information flows as perceived by a particular business enterprise (Timmers 1998). The term 'business architecture' might be more descriptive of Timmers' concept.

Similarly broad is the interpretation by Osterwalder & Pigneur (2002) that "three elements ... make up a business model: revenue and product aspects, business actor and network aspects, and finally, marketing specific aspects". They also declare a business model to be "a description of the value a company offers to one or several segments of customers and the architecture of the firm and its network of partners for creating, marketing and delivering this value and relationship capital, in order to generate profitable and sustainable revenue streams". To them, a business model is "the missing link between strategy and business processes".

Somewhat similar but focussed more on external markets is the definition of a business model as "the integration of business rules (revenue models, etc.), a viable trading mechanism (auction, exchange, online retail, etc.) and associated trading protocols (HTML, ASP, EBXML, EDI, etc.) into a business approach that leverages the open network (Internet) as its medium of transaction" (McGann & Lyytinen 2002). Another definition, intermediate among the others, is that a business model is "the method of doing business by which a company can sustain itself -- that is, generate revenue" (Rappa 2001-2003).

Many of these ideas lead to a search for a taxonomy of alternative models, and preferably a contingency theory to explain the circumstances under which each is appropriate. To be useful to

businesspeople, a taxonomy would need to encompass all of: direct procurement and distribution; intermediated channels from suppliers and to the ultimate consumers of the organisation's output; franchising; and various means of extracting shares of revenue generated by other organisations.

An early analysis is in Bambury (1998). Rappa (2001-2003) proposes the categories Brokerage, Advertising, Infomediary, Merchant, Manufacturer (Direct), Affiliate, Community, Subscription and Utility, and provides descriptions and examples of each. Osterwalder & Pigneur (2002) present a more formal taxonomy. Their framework is presented in graphical form in Exhibit 1.

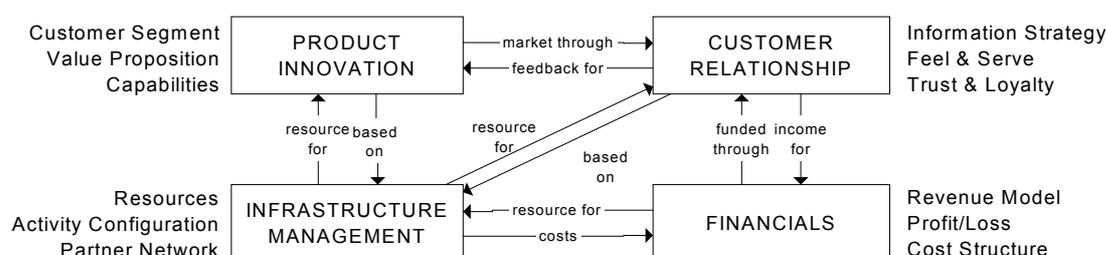


Figure 1: The 4 Pillars Of The Business Model Ontology (From Osterwalder & Pigneur, 2002)

Most authors examine the concept from the perspective of a single (usually for-profit) business enterprise. There are advantages in instead adopting as the unit of analysis a set of strategic partnerships, an industry value-chain, an industry segment, or an industry sector. This ensures that the discussion is not unduly constrained to a narrow or a myopic view. An example of the broader notion is in Timmers (1998), who mentions 'virtual communities' as one possible business model. This is examined in Lechner & Hummel (2002).

A critical issue is the manner in which revenue is derived and distributed. Since the dot.com implosion, there is considerable scepticism about the proposition that eBusiness is intrinsically different from pre-e business, and especially about the specific proposition that the primary focus must be on market-share in a new market. Would-be eBusiness entrepreneurs are asked 'But what's your business model?'

A useful interpretation of **the term 'business model'** is therefore that it **is the answer to the question 'Who pays what, to whom, and why?'** (Clarke 1997, 1999a).

To Osterwalder & Pigneur, this would be primarily the 'Revenue Model': "the ability of a firm to translate the value it offers its customers into money and therefore generate incoming revenue streams" (p. 85). Depending on whether the unit of analysis is a single organisation, a dyad, or the sector as a whole, it might also correspond with their 'Value Proposition' component: "the value the form offers to a specific target customer segment" (p. 81). But these are only two of the 12 components of Osterwalder & Pigneur's framework, so this conception is one of the less broad conceptions of 'business model'. Nonetheless it offers an appropriate basis for the analysis conducted in this paper.

This paper examines a particular, virile movement, which has been attracting increasing attention during recent years. Communitarian and alternative-economics approaches have been considered in the literature before, although they are somewhat marginalised. See, for example, Hagel & Armstrong (1997), Levine et al. (1999) and Lechner & Hummel (2002). There is a considerable and expanding literature on open source, and to a lesser extent open content. But there does not, or not yet, appear to be a literature examining open source and open content as a basis for business

models in eBusiness more generally. This paper's purpose is to lay the foundations for such a literature.

The following sections provide brief overviews of those two movements, in order to extract potential lessons for the many other segments of eBusiness.

3 Open Source

Originally, almost all systems software was developed by the computer-manufacturer and came bundled with the computer. Application software, from the 1950s until about the mid-1970s, was custom-built to fit each organisation's specific needs. Subsequently, 'packaged' applications proliferated, developed for profit by specialist software houses. Hence, during the early years of what has become known as the information technology industry, both systems and application software was closed and proprietary.

The tradition within academic departments was very different: "The scientific programming community has always tended to 'give away' its source code – hoping that others would use, build, and improve on it; just as scientists publish, or give away, their research results" (Applebe 2003). This attitude was prevalent among researchers and developers in leading organisations such as the computer science departments and computer centres of MIT and UC Berkeley, and leading private sector research laboratories such as Bell Labs and Xerox's Palo Alto Research Centre (PARC).

From the 1960s until the 1990s, this attitude has been in conflict with the conventional commercial view. Following the creation of Unix in 1969-71, many copies of the code were shared around the world, and an annotated source-listing (Lions 1976) was a critical element of the explosion in Unix's availability and use. Copyright was later asserted by AT&T, but to a considerable extent the genie was already out of the bottle.

In 1978, the TeX typesetting system was published as free software. The public profile increased substantially in late 1983, when Richard Stallman started the GNU Project, in an attempt to build an entirely free operating system. As part of that project, Stallman created the GNU General Public License (GPL), which has been highly influential in establishing the legal mechanics of open software. Many more products followed, including the Perl scripting language (1987); the Linux kernel of the Unix operating system (1991); the PGP (now OpenPGP) code-library for Pretty Good Privacy for digital signatures (1991); the FreeBSD version of the Unix operating system (1993); the Apache web-server (1995); SSLey/OpenSSL (1996); MySQL (1996); PHP (1997); the Mailman email list-server (1997); the Mozilla web-browser (1998); and the OpenOffice.org alternative to the Microsoft Office suite (1999). See Gonzalez et al. (1999), Comerford (1999), Hars & Ou (2002) and Applebe (2003).

The argument for openness is that software should not be thought of as being a fixed product. It needs to evolve. The only efficient way for evolution to occur is by enabling copies to mutate. That requires free availability of not only the executable code but also the source-code from which the executable is derived. Open source software is readily subjected to peer review. Bugs and insecurities are more likely to be discovered, because there are 'more eyes' looking at it (Raymond 1998). Cumulative progress is therefore more likely. Hars & Ou (2002) examined the motivations for participating in open source projects, and concluded that there were many factors involved, ranging from altruism, through communitarianism, to strong profit-orientation.

The closed, proprietary approach to software involves the copyright owners using copyright law to prevent their software from being copied, adapted, or re-distributed (either in the original or an

adapted form). If those actions are permitted at all, then they are likely to be subject to tight limitations and high fees.

One alternative to the closed, proprietary approach is to release the work into the public domain. If the aim is to ensure that it is freely available, however, this is not an effective approach. The better alternative is the open source software approach. This works within conventional copyright law, but uses it in order to achieve openness. Ownership of the software is asserted and exercised, but the owner makes it available under relatively very liberal licence terms.

It is fundamental to the concept of open source that there be ready availability of the copyright licence, the executable-code, and the source-code from which the executable was derived. The licences need to provide a number of permissions, but may then impose a number of constraints.

Within these broad parameters, there are two major flavours:

- 'Free Software' movement, which has been active since 1984. Driven by Richard Stallman, the movement is strongly ideological. The word 'free' does not mean 'gratis', but rather refers to 'freely available for exploitation': "think of 'free' as in 'free speech', not as in 'free beer'" (Stallman 1996-); and
- the related but somewhat different 'Open Source' movement, which has been active since 1998. Its orientation is less socially motivated and more commercial. The word 'open' means 'openly accessible', enabling it at least to be read, to be executed, to be copied, to be re-distributed, to be adapted. There may, however, be constraints on the re-distribution of adaptations.

A key difference between the two is that 'open source' software can be used to create 'closed source', proprietary software; whereas the 'free software' philosophy precludes that. The Free Software Foundation provides an explanation of the distinctions between the two. The Open Source movement distances itself from Stallman, claiming to be "a pitch for 'free software' on solid pragmatic grounds rather than ideological tub-thumping". An alternative interpretation is that the Open Source prefers a different ideology, which is less socialist and more attuned to conventional business values.

Contrary to the impression many people have, the use of open source software does require a licence. Moreover, an open source software licence may be gratis; but it may require the payment of a fee, and possibly a high fee. In any case, value-adding goods and services associated with open source software very probably do cost money, e.g. the media on which it is stored, installation advice, customisation, and maintenance services.

For further information and resources, see Clarke (2003b). For more detailed information, see FSF (1985-) and Open Source (1997). The economics of open source has been the subject of a great deal of debate, scholarly and otherwise. For careful analyses, see Green (1997-), Ghosh (1998), Pal & Madanmohan (2001), Gabriel & Goldman (2002) and Iannacci (2002).

4 Open Content

The term 'content' is used here to refer to digital works other than software, including text, image, sound, video, and combinations of them ('multi-media').

Such works are subject to copyright law. For almost all of its 300 years, the function of copyright law has been to grant a set of limited monopoly rights to originators of literary and similar works.

The purpose has been to encourage the production of new works, by assisting originators to extract revenue from their efforts by granting licences or selling the rights. Contrary to popular mythology, the motivation was not moral but economic, and the purpose was not to reward innovators.

During the second half of the twentieth century, however, control over collections of copyright works has been accumulated by powerful corporations, particularly works that comprise images, and music. These corporations have lobbied governments, particularly the U.S. government, for substantial strengthening of copyright law, so that it more closely resembles the kinds of property law that apply to real estate and chattels. Despite the nominal dislike by governments of monopolies, the large publishing houses have been granted many of their wishes (e.g. Samuelson 1996).

The key legal powers granted to a copyright owner are a small collection of exclusive rights in relation to the work, and the capacity to license other parties to do them. The rights are:

- to reproduce the work (i.e. make copies of it, or of part of it);
- to adapt the work (i.e. to change it, or some part of it, in some manner, including translations of language and presentation format); and
- to republish the work (i.e. to make available to third parties the original, part of the original, or some adapted version of all or part of the original). This notion has recently been extended to incorporate the rights 'to communicate the work' and 'to make the work available'.

In addition, a licensee may or may not be authorised to grant copyright licences on to others, and qualifications may be imposed in relation to such matters as the territory in which the licence applies, the duration for which it applies, and ownership of adaptations.

Copyright law is built on the assumption that copyright-owners want other parties to use their work, and will charge whatever the market will bear. Some owners want to earn money from every licensee. Others want to earn money from some kinds of use (e.g. by companies, for marketing, or in rich countries), but are happy to make it available gratis for other kinds of use (e.g. for education, for research, or in poor countries). Some charge differently, depending on who the user is, or whether the use is for-profit or not-for-profit. Others want to ensure that it isn't modified, or that it isn't used in conjunction with the promotion of, for example, sex or drugs.

A fundamental tension exists between openness and closedness of content. This is nicely captured by the expression 'Information wants to be free ...', whose origins and interpretations are examined in Clarke (1999b). The increased monopoly powers that have been granted to copyright-owners have had their natural result of high prices. That has combined with new technological protections that inhibit access (e.g. Clarke & Nees 2000). These changes are resulting in a serious backlash by consumers. The concept of 'open content' is part of that revolt.

'Open content' involves the claiming of copyright, and the granting of relatively very liberal copyright licences. Although the concept has long existed, the term is relatively new, and the literature is still emergent. Foundation works include Barlow (1994), Dyson (1995) and Lessig (2001). A definition and resources are provided by open content provider Wikipedia (2001-). Useful analyses are provided by Newmarch (2000) and (2001), and Cedergren (2003). Open content appears likely to continue to be especially critical in those parts of the education sector that cannot afford highly-priced materials (Fripp et al. 2003).

There are actually many options available to a copyright-owner who wishes to make a work available as 'open content'. The dimensions are analysed in Clarke (2003a). Some examples of

simplified standard-form licences are at Open Content (1998), Gnu (2000-), Creative Commons (2002-), and AShareNet (2004).

5 The New, Old Economics

There has been a tendency, at least among the more conservative parts of the business community, to assume that the cyberculture ethos is antithetical to business, and rooted in communitarian thinking that is at least socialist, and probably communist – in short, idealistic, unworldly, and even a danger to the free world.

Convincing renditions of the tenets of cyberculture ethos are difficult to find. One interpretation is that strong weight is placed by netizens on inter-personal communications, internationalism / universalism, egalitarianism, openness, participation, mutual service, community, freedoms, and gratis services (Clarke 2001). Some of these beliefs are indisputably communitarian in nature, and some are clearly different from the assumptions made by most businesspeople.

On the other hand, subscribers to the cyberculture ethos recognise that all of those tenets have to be compromised to some degree, because they are internally inconsistent. Moreover, there is ample scope for accommodation between these tenets and those of business, provided that businesspeople recognise that the digital era and the Internet context are sufficiently different that business tenets must show flexibility too.

Authors initially suggested that the reason that cyberspace behaviour was significantly different from real-world behaviour was either that it was altruistic, or was socially rather than economically motivated. Subsequently, other authors proposed that much of the behaviour was economic in nature, but required the formulation of new economic models. Some authors, however, argued that appropriate economic models already existed, but were being overlooked (e.g. Shapiro & Varian 1999). Two primary approaches to economics have been argued to be vital to a proper understanding of cyberspace behaviour. These are outlined below, followed by two further factors that have gained far too little attention to date.

5.1 Information Economics

The first alternative approach is commonly referred to as 'information economics' (e.g. Lamberton 1971, 1996). This body of analytical tools avoids the assumption of scarcity of resources, and hence reflects the reality of the digital era that digital copies can be created, transmitted, received and manipulated, for infinitesimal incremental cost.

5.2 Network Economics

The other established body of theory is 'network economics' (e.g. Economides 1996). In conventional markets, the exchange-value of a tradable item is forced downwards as the number of such items available for purchase increases (e.g. land, iron ore, umbrellas). For some categories of tradable item, on the other hand, the exchange-value instead rises as they become more common,

because the benefits to owners increase (e.g. fax machines, mobile/cell-phones). In such circumstances, the basis of value is not relative scarcity, but critical mass.

5.3 The Nature Of The Reciprocity

Two further conventions need to be re-visited. One is the assumption that value-exchange is necessarily immediate and reciprocal. That is clearly the case in many forms of market, e.g. those in which the consideration provided by one party is cash and that provided by the other is the transfer of ownership and possession of real estate or a chattel. There are, however, many circumstances in which value-exchange is not direct and/or is not reciprocal; and these patterns occur frequently in Internet transactions.

Rheingold (1993) drew attention to the difference between conventional 'horse-trading' and equally conventional but less-studied 'barn-raising'. On the prairies, a newcomer or a longstanding member of the community who has suffered adversity such as a fire, may be incapable of paying for the materials and labour to build a barn. Winter is approaching, the unprotected hay will quickly deteriorate, and by mid-winter the animals will have starved to death.

When neighbours gather on a Saturday to build the much-needed barn, they may be acting out of altruism (which is disparaged by conventional economics as evidence of a 'gift economy'). But they may be participating in a market describable by an appropriate economics. They may be relying on deferred reciprocity, knowing that one day they'll be in a similar position (or, indeed, if they enjoyed similar support at some time in the past, that they're repaying an old debt). Or they may perceive it to be a transaction in 'community economics', with the reciprocity existing in the form of an indirect benefit that will be received in a different form, at a future time, from someone else in the community. The 'cooking pot' metaphor (Ghosh 1998) is another attempt to explain indirect reciprocity.

With the advantage of a new, or an old, but in either case an alternative, economics, other mainstream, non-cyberspace examples of deferred and indirect reciprocity are easy to find, such as loans, subscriptions, advertising and sponsorship.

5.4 The Economics Of Innovation

A fourth aspect of an economics of cyberspace is concerned with innovation. Conventional, rationalist, neo-classical economics assumes that imitators contribute little or nothing to progress, and that they are 'free riders' on the creativity and investment of the prior innovator. Careful examination of innovation processes in the information industries generally, and cyberspace and eBusiness services in particular, shows that innovation seldom occurs in a 'big bang', but instead is mostly incremental and cumulative (Clarke & Dempsey 2004).

Innovation is not the work of a single person or organisation, but rather occurs in a context involving many actors, and is dependent on interactions among the actors, and contributions by many of them. Most of these interactions are informal; whereas standards development involves relatively formalised processes that are created expressly to facilitate collaboration, and are tolerated by regulators because they shift competition up to a higher plane.

Moreover, imitators seldom add no value. They experiment in various ways, and hence are actually part of the context that delivers the mature form of the innovation (e.g. Dempsey 1999, Gabriel & Goldman 2002). Hence copyright in software and content, and patents that create monopoly power

over elements of innovation (and in recent years even over business processes), are seriously detrimental to innovation, rather than being supportive of it.

Open source and open content are bringing into sharp relief the need for a body of cyberspace economics to be consolidated. That body of theory will be very different from the rationalist, neo-classical economics that is applied to scarcity-driven markets for pre-digital goods and services.

6 Implications For eBusiness Models

The definition of 'business model' adopted in section 2 was "the answer to the question 'Who pays what, to whom, and why?'". The open source and open content movements demonstrate that there is a far wider array of possible answers to the question than conventional business thinking recognises. Exhibit 2 combines conventional approaches with those apparent from the above analysis of open source and open content.

- **Who pays?**
 - the consumer
 - direct and immediate reciprocation
 - deferred reciprocation
 - conditional deferred reciprocation
 - indirect reciprocation
 - the producer
 - services as per mission statement
 - legal obligation
 - cross-subsidisation, loss-leaders and network-effect generators
 - for indirect reciprocation
 - for deferred reciprocation
 - third parties
 - advertisers or sponsors
- **What for?**
 - goods and/or services
 - value-add to goods and/or services
 - complementary goods and/or services
 - expertise in applying the goods and/or services
 - assurance of quality and security
- **To Whom?**
 - directly to the business enterprise
 - directly, through value-add along the value-chain
 - indirectly, along the value-chain
 - bundlers of goods and/or services
 - bundlers of payment services (transaction aggregator, invoice consolidator)
- **Why?**
 - necessity / lock-in
 - value
 - cost
 - quality and security

Figure 2: A Framework for eBusiness Models

The answer to '**Who pays?**' includes of course the ultimate consumer of the goods or services. But there are circumstances in which the producer pays, e.g. government agencies delivering services in accordance with their mission statement, and business enterprises under a legal obligation to disclose information.

A critical and often overlooked possibility is for the selling organisation to subsidise one set of goods and services from revenue obtained from other goods and services. One category is where the company is seeking network effects. For example "Apple's goal with iTunes — which has yet to make a profit despite sales of more than 15 million songs — is not to sell music but to sell its music player, the iPod" (Andrews 2003). Open source thinking draws attention to such network effects.

There are other forms of indirect reciprocation as well. In particular, gratis content provision (e.g. tutorials and white papers) can generate a perception that a business enterprise (or an individual consultant) has high standing in a particular domain. This gives rise to referrals, to the network of perceptions that constitute reputation, and thence to the further perception that the business is worth not only hiring, but hiring at a relatively high rate. This form of indirect reciprocation is usefully referred to as 'revenue from a complementary activity'.

In addition to being indirect, the payback may be deferred. In an open-source project, the provision of source code to the community is "reciprocated by suggestions, bug reports, debugging, hard work, praise, and more source code" (Gabriel & Goldman 2002). Another application of the same principle of deferred reciprocation is to reward early adopters of goods and services with discounted prices or gratis provision (cf. 'beta-testers').

The answer to 'Who pays?' may alternatively be third parties, such as advertisers or sponsors, who perceive sufficient benefit in exposure, brand-building or referrals of customers, to pay for the goods or services in question. Even where the 'Who?' is answered by 'the customer', there are multiple ways in which the revenue may be collected, e.g. fee-for-service (direct and immediate reciprocation), but also subscription fee (deferred reciprocation); gratis for limited time or functionality but thereafter for-fee (conditional deferred reciprocation); and bundled (indirect reciprocation).

Open source also provides additional insights into the range of answers to the question '**for what do they pay?**'. The conventional answers are 'goods and services' and 'value-added goods and services'. Open source draws attention to the scope for 'complementary goods and services', and to the importance of expertise in applying the goods and services to achieve particular objectives. The open source movement has also established the reputation that open products have greater integrity and security than closed, proprietary products, because many more eyes are looking at the code and correlating behaviour and performance against the code. In some markets, integrity and quality attract a higher premium.

The question '**to whom is revenue paid?**' is conventionally answered by 'directly to the business enterprise', or 'to an organisation further along the value-chain, which has a contract with that business enterprise which requires some of the revenue to be remitted to it' (e.g. an agent, wholesaler, retailer or franchisee). The open source and open content movements draw attention to the existence of value-adders down the value-chain, and to organisations that may bundle goods and services from several providers into a package that is of interest to some category of consumers. The bundling may be of payment services, in which case such terms as 'transaction aggregator' and 'invoice consolidator' may be relevant.

The final sub-question that has to be answered is '**why do they pay?**'. The conventional answers are 'necessity' (where the customer has been successfully locked in to a sole source of supply), and 'perceived value'. Open source draws attention to the scope for the cost and quality advantages that

arise when lock-in is avoided. It also offers the prospects of better integrity and quality, because problems are watched out for by many people rather than a few, and because those people have sufficient information available to them to be able to investigate the problems they discover, and to explain to the supplier how to rectify the problem, or even to rectify the problem themselves.

7 Implications For Researchers And Practitioners

Further work is required, in order to fill out the many cells within the suggested framework with examples and case studies. One approach to this would be to integrate the material provided in pragmatic taxonomies, particularly that of Rappa (2001-2003). This would enable the identification of characteristics of industry sectors and segments, and of categories of goods and services, that are amenable to the various kinds of innovative thinking associated with open source software and open content.

Practitioners can reflect on existing uses of these ideas in their own contexts. In defensive mode, this can assist in gaining an appreciation of how the organisation's more nimble competitors are exploiting contemporary thinking to gain market-share, or to re-define markets. In more positive vein, it can support the search for ways of leveraging existing operations, and for integrating 'clicks' with 'mortar'.

8 Conclusions

Despite the ravages on investor confidence wrought by the excesses of the dot.com era, it is commonly assumed that there are indeed differences in the manner in which eBusiness needs to be done in comparison with the world of atoms and analogue formats. A number of approaches have been adopted in the search for new forms of business model, and for a taxonomy that encompasses both the well-established and the new.

Open source, and increasingly also open content, are approaches that are gaining recognition as being beneficial alternatives to closed, proprietary approaches. Many large corporations are entrenched in old patterns, and have a great deal to lose from change, nomatter how beneficial that change might be for the economy and society. New technologies and methods enable small business enterprises to enter into established markets with new advantages, and, through innovation, to introduce substitute products and services that redefine marketplaces and marketspaces. On the other hand, even very large business may be able to adapt quickly, and even to be early movers, as IBM has sought to do in relation to Linux on servers, and is now considering on desktop and portable machines (Shankland 2004).

Open source and open content are not naïve 'gift economies'. They are describable by economic models, and are harbingers of a new wave of business activity that leaves naïve economic rationalism in its sidewash. This paper has identified a number of ways in which the open source and open content movements have something to contribute to the search for more, better, and better-understood eBusiness models.

References

- AEShareNet (2004) 'The FfE (Free for Education) Copyright Licence' AEShareNet Limited, 2004, at <http://www.aesharenet.com.au/FfE>
- Afuah A. & C. Tucci (2001) 'Internet Business Models and Strategies' McGraw Hill, 2001
- Andrews P. (2003) 'Apple singing a new song with iTunes' The Seattle Times, 27 October 2003, at http://seattletimes.nwsourc.com/html/businesstechnology/2001775613_paul27.html
- Applebe B. (2003) 'The Future of Open Source Software' J. Research and Practice in Infor. Techno., 35, 4 (November 2003) 227-236, at <http://www.acs.org.au/JRPITVolumes/JRPIT35/JRPIT35.4.227.pdf>
- Bambury P. (1998) 'A Taxonomy of Internet Commerce' First Monday 3,10 (October 5,1998), at http://www.firstmonday.dk/issues/issue3_10/bambury/index.html
- Barlow J.P. (1994) 'The Economy of Ideas: A framework for patents and copyrights in the Digital Age' Wired 2.03 (March 1994), at http://www.wired.com/wired/archive/2.03/economy.ideas_pr.html
- Cedergren M. (2003) 'Open content and value creation' First Monday 8, 8 (August 2003), at http://firstmonday.org/issues/issue8_8/cedergren/index.html
- Clarke R. (1997) 'Electronic Publishing: A Specialised Form of Electronic Commerce' Proc. 10th Int'l Bled Electronic Commerce Conf., June 1997, at <http://www.anu.edu.au/people/Roger.Clarke/EC/Bled97.html>
- Clarke R. (1999) 'Electronic Services Delivery: From Brochure-Ware to Entry Points' Proc. 12th Int'l Bled Electronic Commerce Conf., June 1999, at <http://www.anu.edu.au/people/Roger.Clarke/EC/ESD.html>
- Clarke R. (1999b) "'Information Wants to be Free'" Xamax Consultancy Pty Ltd, August 1999, rev. 28 August 2001, at <http://www.anu.edu.au/people/Roger.Clarke/II/IWtbF.html>
- Clarke R. (2001) 'Paradise Gained, Paradise Re-lost: How the Internet is being Changed from a Means of Liberation to a Tool of Authoritarianism' Mots Pluriels 18 (August 2001), at <http://www.anu.edu.au/people/Roger.Clarke/II/PGPR01.html>
- Clarke R. (2003a) 'Copyright: The Spectrum of Content Licensing' Xamax Consultancy Pty Ltd, July 2003, at <http://www.anu.edu.au/people/Roger.Clarke/EC/CCLic.html>
- Clarke R. (2003b) 'Open Source Licensing' Xamax Consultancy Pty Ltd, September 2003, at <http://www.anu.edu.au/people/Roger.Clarke/EC/OSLic.html>
- Clarke R. & Dempsey G. (2004) 'The Economics of Innovation in the Information Industries' Xamax Consultancy Pty Ltd, April 2004, at <http://www.anu.edu.au/people/Roger.Clarke/EC/EcInnInfInd.html>
- Clarke R., Higgs P.L. & Dempsey G. (2000) 'Key Design Issues in Marketspaces for Intellectual Property Rights', Proc. 13th Int'l ECommerce Conf., Bled, Slovenia, 19-21 June 2000, at <http://www.anu.edu.au/people/Roger.Clarke/EC/Bled2K.html>
- Clarke R. & Nees S. (2000) 'Technological Protections for Digital Copyright Objects' Proc. ECIS 2000 Conf., Vienna, 3-5 July 2000, pp. 745-752, at <http://www.anu.edu.au/people/Roger.Clarke/II/TPDCO.html>
- Comerford R. (1999) 'The Path to Open-Source Systems' IEEE Spectrum 36, 5 (May 1999) 25-31

- Creative Commons (2002-) 'Licenses Explained' at <http://creativecommons.org/learn/licenses/>
- Dempsey G.C. (1999) 'Revisiting Intellectual Property Policy: Information Economics for the Information Age' *Prometheus* 17, 1 (1999) 33-40
- Dyson E. (1995) 'Intellectual Value' *Wired* 3.07 (July 1995), at http://www.wired.com/wired/archive/3.07/dyson_pr.html
- Economides N. (1996) 'The Economics of Networks' *International Journal of Industrial Organization*, October 1996, at <http://www.stern.nyu.edu/networks/top.html>
- Fripp C., Blakeley J. & Macnamara D. (2003) 'Collaboration, a business imperative for education' *Proc. ODLAA*, September 2003, at http://www.aesharenet.com.au/resources/references/147odlaa_presentation.pdf
- FSF (1985-) 'Philosophy of the GNU Project' Free Software Foundation, 1985-, at <http://www.gnu.org/philosophy/>
- Gabriel R.P. & Goldman R. (2002) 'Open Source: Beyond the Fairytales' August 2002, at <http://opensource.mit.edu/papers/gabrielgoldman.pdf>
- Ghosh R.A. (1998) 'Cooking pot markets: an economic model for the trade in free goods and services on the Internet' *First Monday* 3 3 (March 1998), at http://www.firstmonday.dk/issues/issue3_3/ghosh/index.html
- Gnu (2000-) 'GNU Free Documentation License', 2000, rev. November 2002', at <http://www.gnu.org/copyleft/fdl.html#SEC1>
- Gonzalez B.J., Heras Q.P. & Bollinger T.A. (1999) 'A Brief History of Free Software and Open Source' *IEEE Software* 16, 1 (January 1999) 32-33
- Green E.L. (1997-) 'Economics of Open Source Software', rev. December 2002, at <http://badtux.org/home/eric/editorial/economics.php>
- Hagel J. III & Armstrong A. (1997) 'Net Gain: Expanding Markets Through Virtual Communities' Harvard Business School Press, 1997
- Hars A. & Ou S. (2002) 'Working for Free? Motivations for Participating in Open-Source Projects' *Int'l J. of Electronic Commerce* 6, 3 (Spring 2002) 25
- Iannacci F. (2002) 'The Economics of Open-Source Networks', October 2002, at <http://opensource.mit.edu/papers/iannacci.pdf>
- Lamberton D.M. (Ed.) (1971) 'The Economics of Information and Knowledge' Penguin 1971
- Lamberton D.M. (Ed.) (1996) 'The Economics of Communication and Information' Edward Elgar, 1996
- Lechner U. & Hummel J. (2002) 'Business Models and System Architectures of Virtual Communities: From a Sociological Phenomenon to Peer-to-Peer Architectures' *Int'l J. of Electronic Commerce* 6, 3 (Spring 2002) 4
- Lessig L. (2001) 'The future of ideas: The fate of the commons in a connected world' Random House, 2001
- Levine R., Locke C., Searls D. & Weinberger D. (1999) 'The Cluetrain Manifesto: The End of Business As Usual' Perseus Books, 1999
- Lions J. (1976) 'Commentary on UNIX' UNSW, 1976

- McGann A.T. & Lyytinen K. (2002) 'Capturing the Dynamics of eBusiness Models: The eBusiness Analysis Framework and the Electronic Trading Infrastructure' Proc. 15th Bled Electronic Commerce Conf., June 17 - 19, 2002
- Newmarch J. (2000) 'Open Content Licences', June 2000, at <http://jan.netcomp.monash.edu.au/opendoc/paper.html>
- Newmarch J. (2001) 'Lessons from Open Source: Intellectual Property and Courseware' First Monday 6, 6 (June 2001), at http://firstmonday.org/issues/issue6_6/newmarch/
- Open Content (1998) 'OpenContent License (OPL)', July 1998, at <http://opencontent.org/opl.shtml>
- Open Source (1997) 'The Open Source Definition', Open Source Organisation, at <http://www.opensource.org/osd.html>
- Osterwalder A. & Pigneur Y. (2002) 'An e-Business Model Ontology for Modeling e-Business' Proc. 15th Bled Electronic Commerce Conf., June 17 - 19, 2002
- Pal N. & Madanmohan T.R. (2001) 'Competing on Open Source: Strategies and Practise' January 2002, at <http://opensource.mit.edu/papers/madanmohan.pdf>
- Papakiriakopoulos D.A., Poylumenakou A.K. & Doukidis G.J. (2001) 'Building e-Business Models: An Analytical Framework and Development Guidelines' Proc. 14th Bled Electronic Commerce Conf., 25-26 June 2001
- Petrovic O., Kittl C. & Teksten R.D. (2001) 'Developing Business Models for eBusiness' Proc. International Conf. on Electronic Commerce, Vienna, October 31 – November 4 2001
- Rappa M. (2001-2003) 'Business Models on the Web', 2003, at <http://digitalenterprise.org/models/models.html>
- Raymond E.S. (1998) 'The Cathedral and the Bazaar' First Monday 3, 3 (March 1998), at http://www.firstmonday.dk/issues/issue3_3/raymond/index.html
- Rheingold H. (1993) 'The Virtual Community: Homesteading on the Electronic Frontier' Reading, Mass.: Addison-Wesley. 1993, at <http://www.rheingold.com/vc/book/>
- Samuelson P. (1996) 'The Copyright Grab' Wired 4.01 (January 1996), at http://www.wired.com/wired/archive/4.01/white.paper_pr.html
- Shankland S. (2004) 'IBM turns inward with Linux desktop project' news.com, 8 January 2004, at http://news.com.com/2100-7344_3-5137815.html
- Shapiro C. & Varian H.R. (1999) 'Information Rules: A Strategic Guide to the Network Economy' Harvard Business School Press, 1999
- Stallman R. (1996-) 'The Free Software Definition', Version of February 2003, at <http://www.gnu.org/philosophy/free-sw.html>
- Timmers P. (1998) 'Business Models for Electronic Markets' Electronic Markets, 8, 2 (July 1998), at <http://www.electronicmarkets.org/modules/pub/view.php/electronicmarkets-183>
- Timmers P. & Timmers J.J. (2000) 'Electronic Commerce : Strategies and Models for Business to Business Trading' Wiley, 2000
- Wikipedia (2001-) 'Open Content', at http://en2.wikipedia.org/wiki/Open_content