

VERTICAL INTEGRATION AND THE RELATIONSHIP BETWEEN PUBLISHERS AND CREATORS

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ABSTRACT

The authors analyze the creator-publisher relationship in the book and software industries, which can benefit from digital distribution. This can be called pure electronic commerce, which refers to a transaction that uses information systems to avoid physical exchange and occurs entirely in a digital form. Using coordination and transaction cost theories as a theoretical framework, the authors posit that in spite of cost reductions in these areas vertical integration remains important in these two industries. The authors analyze the industries in the areas of compatibility standards, complexity of product development, after-sales support, intellectual property, development funding and marketing risks, and brand. The analysis of these factors shows why software tends to be more vertically integrated than books. They find that even with technological advances, the role of the publisher remains valuable. Reduction of transaction and coordination costs are two of many factors affecting the transition towards digital distribution of software and books.

Keywords: vertical integration, digital distribution, coordination, books, software

1. Introduction

One of the key issues in electronic commerce is how it transforms traditional relationships between different stages in the process of moving a product from its source inputs to its final customer. This paper compares two industries, book and software publishing, with the goal of understanding how they will be transformed by electronic distribution. The transformation could involve the replacement or elimination of traditional intermediaries. There are, however, significant barriers to electronic distribution that could preserve the positions of intermediaries such as publishers, manufacturers, distributors, and retailers for many years.¹

Electronic distribution is part of a process that can be called pure electronic commerce. Choi, Stahl, and Whinston [1997] defined pure EC as a digital exchange across three dimensions, agent, product, and process. It is a transaction that uses information systems to avoid a physical exchange. The transaction occurs entirely in a digital form, from payment to delivery of the product. This often involves transforming an item that once was sold in a physical form into a digital format. For example, to accomplish its tasks software simply has to exist on a computer. There is no need for a separate physical box, such as a CD or a diskette, for the software to run. Similarly books can be downloaded onto a display device via the Internet rather than sold on bound paper in stores.

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Pure electronic commerce is important because the benefits in terms of lower cost of selling over the Internet are particularly clear. Instead of manufacturing a product and distributing it to a physical retailer (or directly to the customer), the producer can eliminate manufacturing costs and physical distribution costs while no longer having to carry inventories. At the same time many intermediaries that were previously required, including manufacturers, distributors, retailers, and delivery services, are no longer necessary. There should thus be savings in physical costs and mark-ups that would result in higher profitability per unit, higher volumes, and lower prices [Wigand and Benjamin, 1995]. This paper concludes that even with the introduction of these technologies, the publisher's role remains valuable in both industries. Coordination costs are a key determinant of vertical integration and intermediary tasks and help explain why the transition to pure electronic commerce has been slow. The fact that coordination costs are higher in software than in books explains why vertical integration is more common in that industry.

2. Research Question

This research is guided by the following questions. What are the factors that have contributed to the current structure of these industries? How will the structures of the book and software industries change if pure electronic commerce becomes viable? How are these structures likely to change as technology reduces both coordination and transaction costs? In order to explore the potential evolution of distribution channels for pure information goods, we have elected to use a comparative case study methodology. We compared two distinct information goods industries: the book publishing industry and the consumer computer software industry.

These two industries were selected based on the theoretical sampling criterion suggested by Yin [1984]. When sampling cases theoretically, Yin advises researchers to select cases for study based on similarities or differences that are expected to be of theoretical interest. Following Yin, this constitutes an explanatory case study that uses coordination and transaction costs theories as the basis for examining two industries. The purpose is to determine if these two types of theory are able to explain how the industry is evolving in light of the rapid IT developments that support electronic transactions. The case study design initially consisted of collection of data from trade magazines and personal interviews. In the process of gathering the data it was clear that many factors had been investigated on an individual basis but there was a lack of integration of these findings to present a picture of the two industries. For this reason, we decided to emphasize secondary scholarly research that analyzed individual factors in depth. Because these studies focused on individual elements they did not provide an industry level analysis about the transformation of these two segments. The contribution of this study, which differs from single factor analysis, is that it brings together that evidence to analyze the effects of these factors on two industries. The objective is to determine how the combination of these individual elements limits or contributes to the vertical integration of the book and software industries.

While there have been several articles written about the impact of the Internet on books and software these have been focused primarily on the relationship between the sellers and the users [Harrison, 2000; Adams, 2002; Kaarst-Brown and Evaristo, 2001] or the way e-books will affect libraries [Hutley, 2002] or education [Simon, 2002; Schick 2001]. With few exceptions [Ronte, 2001], little has been written about the relationship between the authors and the publishers and how this relationship is likely to change through electronic commerce. Similar studies for the software industry are almost nonexistent even though they have been covered in the trade press. This is a gap that this paper tries to fill.

Based on this combination of secondary and primary data, our first step was to build a rich descriptive model of each industry. These constructs are presented in the section that describes the industries. The second step was to analyze the two industries by comparing and contrasting them on approximately ten dimensions. These dimensions were extracted from a review of literature on electronic commerce, marketing channels, book publishing, and software development. We discovered and incorporated dimensions and removed others in the process of our analysis. Finally, we synthesized the similarities and differences identified during the analysis in order to identify the forces that will have the greatest impact on the evolution of the channels of distribution for pure information goods. We eventually decided that six factors were substantially more important than others and these are outlined below.

The cases examined here are directly relevant to content industries such as music, newspapers, broadcasting, movies, libraries, and education. Furthermore, an understanding of the pure cases of electronic commerce, the ones for which the greatest potential financial benefit of electronic transactions can be realized, can cast light on what has been a difficult transition to electronic commerce in many industries.

3. Theoretical Foundations

Our analysis of the relationship between creators and publishers led us to the explanatory factor of coordination costs. We thus relied on coordination and transaction cost theory as a theoretical framework for analyzing the book publishing and software industries. There is an extensive literature on coordination. These works are based on perspectives from economic theory, organization theory, and the parallel processes of computer science. Malone and Crowston [1994] examine the tasks and processes of coordination. They define coordination as “managing dependencies between activities” and suggested that progress should be made by characterizing different kinds of dependencies and identifying the coordination processes that can be used to manage them. Examples of dependencies are shared resources, task assignments, and simultaneity constraints (such as scheduling and synchronization).

Here we choose to review the works pertaining to the focus of our research. Williamson [1975] as well as Picot and Kirchner [1987] explain two basic mechanisms for coordinating the flow of materials or services to add value: markets and hierarchies [see also Coase, 1937]. Williamson [1981] categorizes exchanges into market and hierarchy transactions. The first are transactions that support coordination between multiple buyers and sellers. The latter are transactions that support coordination within firms as well as industry value chains [see also Wigand and Benjamin, 1995].

According to Malone, Yate, and Benjamin [1987, p. 485], “[m]arkets coordinate the flow through supply and demand forces and external transactions between different individuals and firms” while “[h]ierarchies coordinate the flow of materials through adjacent steps by controlling and directing it at a higher level in the managerial hierarchy.” Hierarchies are structures of governance that reduce transaction costs because a high number of transactions, which implies high coordination costs, leads to failure of the coordination mechanism within a market [Coase, 1937; Williamson, 1975; Ouchi, 1980].

Malone et al. [1987] also discuss the tradeoffs between markets and hierarchies in terms of transaction costs. As new information technologies allow closer integration of adjacent steps in the value chain, the costs of coordination will be reduced. As a result, Malone et al. posit that information technology would lead to a shift toward greater use of markets rather than hierarchies, meaning a decline in vertical integration and an increase in contractual relationships. This notion is also supported by an empirical analysis of the relationship between information technology and firm size by Brynjolfsson, Malone, Gurbaxani, and Kambil [1994]. Their findings show that investment in IT is associated with subsequent decreases in the average size of firms.

In spite of these predictions and the benefits that can be derived from pure electronic transactions, the book and software industries still rely on intermediation with publishers. Why is this? Why has IT not made electronic distribution from creators more broadly used? An analysis of these industries shows that although IT has reduced transaction and coordination costs, there are still several factors that have impeded disintermediation in these two industries.

4. The Traditional Book Publishing and Software Industries

The book publishing and software industries share a number of similarities and differ in several ways. Before conducting an analysis of these two industries, this section will describe each industry in terms of its general characteristics, traditional industry structure, and the tasks performed in each industry value chain.

4.1 Book publishing industry

Book publishing is a small, relatively diffuse industry with low barriers to entry [Epstein, 2001]. The growth of the industry has been steady as seen from the compound annual growth rate of 4.7% in the last 10 years [AAP Industry Statistics Annual 2002] and 7.18% over the period from 1970 to 2002 [AAP Industry Statistics Annual, 1998, 2002; BISG, Book Industry Trends 1995].

The traditional book publishing industry is similar to other industries in that it consists of producers (authors and publishers), intermediaries (wholesalers, distributors, jobbers, and retailers), and consumers (buyers and end users). It is also possible that book retailers or consumers will directly connect to publishers, although this is not a common strategy in the book business due to the effect of time and variety [Lindsley, Blackburn, and Elrod, 1991]. Intermediaries are usually capable of offering a greater variety of titles shipped in smaller quantities in a more timely fashion. The structure of the book publishing industry is illustrated in Figure 1.

Book production starts when authors submit their works to publishers, either directly or through an agent. An author has three possible ways of having a book published: “over the transom,” direct referral, or through an agent, which performs “a gatekeeping function” for book publishers and generally charges an author about 15% of the author’s royalty. [Greco, 1997]. An author’s cut ranges from 5% for new authors to 50% for top sellers with the average being 10-15% of a book’s net revenue off the list price on those sold [Zeitchik, 1999].

The main task of publishers is to publish books. The production costs they bear are royalties/advances, editorial, marketing, fulfillment, administration, depreciation, and manufacturing, known as paper, print, and binding (PPB) [Greco, 1997]. Self-publishing costs, for example, can run from a few thousand dollars to \$50,000 depending on the length of the book, art, editing, illustrations, and press run. This does not account for marketing and distribution costs [Manning 2000].

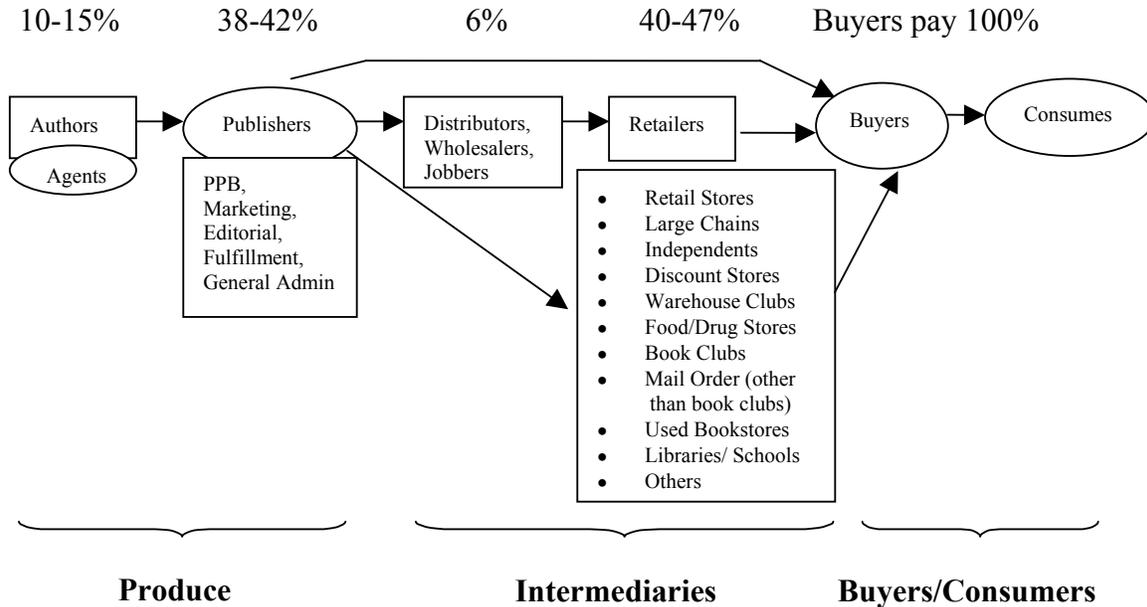


Figure 1: Book industry structure

Wholesalers, distributors, or jobbers put together books from various publishers, carry their own inventories, and distribute the books locally, regionally, or sometimes nationally to retail accounts. However, the network of wholesaling in the book publishing industry is weak. They receive only about 6% of a book's revenue [Compaine, 1978]. While large retailers usually act as their own wholesaler, dealing with publishers directly, other small retailers, including libraries and schools, view a distributor or jobber as a facilitator in their book purchases. Publishers usually do not give them as high a discount as a distributor does nor are they willing to accept handling a number of orders for small quantities of books [Compaine, 1978; Woll, 1988]. The majority of books are distributed to retailers where individual buyers purchase their books. Also, the emergence of Internet-based electronic commerce in the mid-1990s brought about a new distribution channel, online bookstores such as Amazon.com (now teamed with Borders.com) and Barnesandnoble.com.

An outstanding feature of the book publishing industry is the concentration in the three major segments of the book publishing value chain: authors, publishers, and retailers. Although there are a great number of authors producing books, a small number of brand-name authors accounted for more than half of total book sales [Epstein, 2001]. There are the same phenomena in both the publisher and retailer segments. Book publishing in the US is dominated by five groups: Bertelsmann, Holtzbrinck, Longman, News Corporation, and Viacom [Epstein, 2001]. In 1999 the top five sellers in book publishing had 62% of the book sales in North America (Publishers' Profits Had Solid Gains in 1999, 2000). In 1992 the twenty largest US publishers had 62% of domestic and export book sales of all types [Bekken, 1997/1998]. The five dominant book retailers are Barnes and Noble, Borders, Crown Books, Books-a-million, and Lauriat's/Encore [Top book retailers, 2002; Bekken, 1997/1998].

4.2 Software industry

The software industry is one of the fastest growing sectors in the US economy. [Office of Information Technologies, 2000]. It is almost six times bigger than the book publishing industry in terms of market size even though it was established long afterward. The total book sales in 2002 were \$26.87 billion [AAP Industry Statistics Annual, 2002]. Approximately 6% of book industry sales are from electronic non-printed materials online (Publishers Weekly, 2002). IDC estimated that 2002 global software sales were \$172.3 billion [Chu, 2003]. Growth rates for software have varied widely: from 11% in the mid-1990s to 20% during the Internet boom, and a 1% increase in 2002 [Chu, 2003; NTIA Telecommunications Industry Statistics, 1998].

Software by nature is a digital good. However, it is manufactured and distributed in a very similar way as other physical products, including books. Its value chain includes producers (developers, publishers, and manufacturers), intermediaries (wholesalers, distributors, and retailers), and consumers (buyers and end users). Figure 2 shows the traditional structure of the software industry.

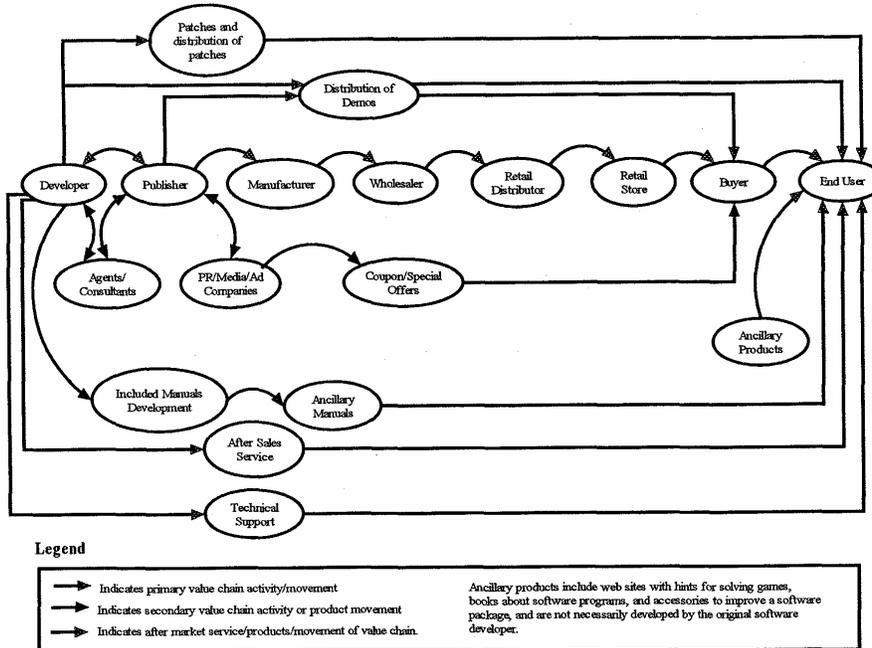


Figure 2: Software industry structure

As shown in the figure, software goes through many hands before it reaches its end user. Software developers create programs but, like book authors, they usually do not sell their output directly to end users because it is difficult to attract the attention of a large number of potential users and then distribute products directly to them. They therefore have to attract interest from publishers and then negotiate with them for marketing and development support. In software development, the product is usually complete before it is sent to the publisher.

The publisher may wish to contribute to the making the product such as providing feedback on design, analyzing focus groups of consumers, and testing the product for bugs. However, the main function of the publisher is to market the product after the developer completes the intellectual task. Publishers often have internal development teams and occasionally developers try to publish titles on their own. This vertical integration between the development and publishing functions is common with software but uncommon with books.

Once the publisher decides the product is ready, it arranges to have the software sent to manufacturing, where it is transferred to CD-ROMs that are boxed and shrink-wrapped. Manufacturing may be internal or outsourced. The product is then sent to the warehouse of a wholesaler or distributor who arranges product deliveries to retailers.

Prior to receiving the finished product, the publisher develops and implements a marketing strategy that can include advertising in appropriate media outlets. The retailers then determine how to place the product in their stores such that the combination of all choices and special deals with publishers maximizes the overall profit level of the store. The retail channels of the software industry are specialty stores (such as BestBuy and CompUSA), general stores (such as Wal-Mart and Kmart), software specific stores (such as Electronic Boutique and Babbages), small independent shops, and Internet stores (such as Amazon.com and arms of traditional retailers).

Like the book publishing industry model, the key problem with this traditional software industry model from the developer's perspective is that the minimal gains that can be negotiated with a major publisher are risky compared with the more secure and steady revenue that can be obtained working simply as a programmer for a major corporation. Unlike book writers, software developers write programs because they need to solve a problem, they belong to a research community, or they are entrepreneurs that believe that they can found a company with specialized software. Additionally professional software development involves increasingly larger teams and fewer single person operations. For hire options are generally more common than royalty based ones. An example of a

firm working for this type of arrangement is Mastech, a company that specializes in finding programmers for companies that need such skills [Baker, 1997]. Teams of programmers that have developed software with potential mass-market appeal usually want the support of a publisher for marketing and distribution. They generally receive only a small portion of the final consumer purchase price, typically 10 to 12%. Many developers consider self-publishing but this is uncommon due to the importance of experience with distribution channels.

The growth of the Internet has enabled experimentation with different revenue models. Microsoft's dot-net strategy is based on network distribution and ongoing payment for software as a service. Subscription models for games have had greater success than in other areas of Internet content with software such as Everquest and Ultima Online profitable. There are also many companies using the applications service provider model. Digital methods of software distribution remain, however, relatively small compared to market sales, particularly for consumers.

5. Transformation of the Developer-Publisher Relationship

If pure electronic commerce becomes viable the software and book industries will be transformed in different ways. These are listed in Table 1. The differences can be illustrated through contrasting relationships between the creator and the publisher for each industry. Relationships are typically tighter and more likely to be integrated in the software industry

5.1 Compatibility standards

The need for compatibility standards is one of the factors that limit market coordination in the software industry and thus leads to vertical integration. The book industry in contrast does not require compatibility. Network externalities drive markets toward compatibility standards. Shapiro and Varian [1999] point out that standards change the nature of competition in various ways: expanded network externalities, reduced technology risk faced by consumers, reduced consumer lock-in, competition for the market versus competition in the market, competition on price versus features, competition to offer proprietary extensions, component versus system competition. Tiwana et al. [2001] also stress the importance of interoperability, pointing out that interoperability among systems and platforms is critical for business success. Conflicts among multiple systems can undermine the survival of the business [Shapiro and Varian, 1999].

Having multiple standards increases the complexity of customers' adoption decisions. Product complexity can be characterized by four dimensions: 1) the number of alternative products available to the buyer [Campbell, 1988], 2) the extent of differentiation among these alternatives [Kutschker, 1985], 3) the difficulty in understanding the alternatives [Ghingold and Wilson, 1985; Grashof, 1979], and 4) the complexity in comparing alternatives. [Ghingold and Wilson, 1985; Kutschker, 1985]. As complexity increases, it is likely that experts and specialists will be required to form an interdisciplinary team to help in the purchasing decisions of large companies [Abratt, 1986; Kotteaku, Laois, and Moschoris, 1995; Grashof, 1979; Jennings and Plank, 1995].

Compatibility standards matter for software while traditional books face no such issue. Software producers thus have to adapt to different platforms but will prioritize the most profitable ones based on the resources available to them. The closest analogue for the book industry is translation into other languages but the process is much more straightforward. Authors and small developers are likely to have limited resources to support multiple platforms. Software, though, is likely to have more viable platforms than electronic books once the battle among Adobe, Microsoft, Gemstar, and Palm, among others, is resolved.

Compatibility standards lead to greater vertical integration in software because the complexity associated with the support of multiple platforms leads the publisher to be concerned with these compatibilities. An individual software developer could not do this task on its own because it is unlikely to have expertise in all of the different platforms and to be able to code software for all of them. Software often is ported to new platforms. There has been, nonetheless, a trend by which some companies have decided to use other firms to make ports to other platforms. This has been facilitated by the lower costs associated with coordinating the work of the firms involved.

The purchasing process for software is quite different than that for books. The existence of multiple platforms makes the purchase decision more complex, particularly when buying software for a business. In most cases, book buyers are purchasing for themselves or for a gift and do not have to consider a wider organization. With the exception of the educational market, books are consumed individually. In contrast, software often has collaborative consumption. Data produced with a program is exchanged between users while some games are designed for multiple players. As a result there is an interdependence of users that does not usually exist in the book industry. Network externalities exist for software and thus users will pay close attention to the purchase choices of others. This requires software companies to provide technical advice in the purchasing process, which is more likely to result in vertical integration.

Table 1: Degree of vertical integration in the software and book industries

Attributes	Previous research on attribute	Books	Software	Degree of vertical integration
Compatibility standards	Shapiro and Varian, 1999; Tiwana et al, Campbell, 1988; Kutschker, 1985; Ghingold and Wilson, 1985; Grashof, 1979.	○	●	The need to address the complex issue of compatibility standards applies to software and electronic books but not to traditional books. Authors and small developers are likely to have limited resources to support multiple platforms. Software, though, is likely to have more viable platforms than electronic books.
Product complexity	Gatignon and Robertson, 1991; Rogers, 1962; Lovelock and Weinberg, 1984.	○	●	Software is systemically complex whereas books are systemically simple.
After sales support	Kelly, 1988; Fornell and Wernerfelt, 1987; Kelly, Hoffman, and David, 1993; McCollough and Bharadwaj, 1992; Reichheld, 1993; Tax et al., 1998.	○	●	Software requires more support than books because of repeated use and complexity of installation.
Intellectual property	Levin, Klevorick, Nelson, and Winter, 1987; Zahra and Bochner, 1999.	○	●	Software has valuable elements such as new versions and engines whereas books can have sequels but follow-on products tend to be less valuable than in the case of software.
Development funding and marketing risk	Varian, 1997; Shapiro and Varian, 1998; Tiwana et al., 2001; Mullins, 1998; Tiwana et al., 2001; Ashby, 1960.	○	●	Most entertainment software titles lose money but this is offset by a small number of blockbusters. Since development cost for books is low, there is much lower risk and thus less need to offset risk through degrees of vertical integration.
Brand	Farquhar, 1989; Kotler, 1997 in Randall et al., 1998.	○	●	Publisher brands mean little to book and entertainment software buyers but are more meaningful for productivity software

Code:

●: leads to high level of vertical integration

●: leads to medium level of vertical integration

○: leads to low level of vertical integration

5.2 Complexity of product development

Software is a dynamic product that evolves and is used many times. Books, in contrast, are sometimes updated but there are not different technological platforms for which to adapt different versions of books. The complexity of software development compared to books leads to greater vertical integration of that industry. The software product consumed by end users is also more complex than books. Readers have passive interaction while software users interact with programs. The use of software is ongoing whereas individual readers use most books only once. Software developers are concerned with the way that their products are used and attempt to develop programs that meet peoples' expectations. As a result, software requires better design, architecture, and engineering that will withstand the continuing use of the product. Because software is more complex it generally requires multiple versions.

Tiwana et al. [2001] define versioning as the ability to produce multiple instantiations of the same basic products for different consumer segments and sell them at different price points. Varian [1997] finds that consumers with high willingness to pay choose one version while customers with lower willingness to pay choose another. According to Shapiro and Varian [1999], functional versioning of physical products can be expensive whereas the

relative costs of versioning information products to create artificial differentiation is much lower. They also suggest versioning of information products into several dimensions.

Because of the complexity of software development, versioning accomplishes several things. First it solves the problems of earlier versions in a process known as debugging. Additionally, as stated by Varian [1997], it allows companies to take advantage of peoples' willingness to pay by adding more features that some users will purchase. The challenge for publishers is thus the ongoing testing and maintenance. This, therefore, leads software developers to find self-publishing less viable. Individual programmers will find it difficult to provide new versions while still supporting earlier ones. Coordinating the work of outside firms to fix bugs in a program or to upgrade for additional features implies giving away control over product development. This is why it is rare to see bug fixes and upgrades outsourced.

One phenomenon that breaks away from the traditional structure in the software industry is open source development. While use of these programs has been growing steadily, it remains unclear whether the model will be implemented for mass markets or if it will remain as a niche. There are several differences between the traditional structure and open source. It is a completely market coordinated effort. Developers from around the world collaborate on a project by writing pieces of it. These are entirely voluntary efforts for which programmers do not receive remuneration. Their main motivation is to obtain experience and contacts that could later be tapped for jobs. The software is freely distributed directly to users via the Internet. Because developers do not provide support on the programs they develop, there have been companies such as Red Hat that are able to receive revenue from installation and maintenance of the systems that use open source programs.

The most well known example of open source development is Linux but it has only 2% of the PC market and 13.7% of the server market [Kerstetter, 2003]. In spite of this small market share, the growth of Linux in some important sectors has been low. According to TowerGroup forecast percent growth of Linux in the financial services sector from 2000-2004 is only 4% [Wall Street & Technology, 2002]. Other experiences in the history of software suggest that these types of collaborative efforts do not last. In the 1960s and 1970s mainframe software was also free and developed on a voluntary basis by users. The cost of this later led developers to copyright and patent these programs [Garcia-Murillo 1998]. More recently the openness of Unix led to a propagation of Unix programs that were not compatible with each other. These types of efforts have yet to succeed in the mass market.

Books in contrast are much simpler to create. Reference and instructional books are among the few that have multiple editions. Thus, maintaining continuity is much easier with books. The greater complexity of business software compared to books leads the former to be more vertically integrated. Vertical integration in consumer software is less than that for business software but more than for books. The reason for this is that consumer software is less complex because it has fewer versions.

5.3 After sales support

In marketing literature, after sales support or customer service is an element of product strategy. A company's offer to consumers usually includes some services, which can be a major or minor part of the total offer. Companies usually set up call centers to field consumer complaints and requests for information. It costs less to keep existing customers than to attract new customers or recover lost customers [Thomas, 2001]. Customer services should be used as tools in creating customer satisfaction and loyalty [Kelly, 1988]. The literature confirms that after sales support is valuable [Fornell and Wernerfelt, 1987; Kelly, Hoffman, and David, 1993; McCollough and Bharadwaj, 1992; Reichheld, 1993; Tax et al., 1998]. However, empirical work associated with the question of why after sales support is more valuable for some types of information products than others is scarce. This is an important determinant of vertical integration because the more coordination required with the creator for the publisher to provide support the more likely that the developer will be brought in-house.

In our research we determined that products with repeated use and complex installation process such as software require more after sales support than products with low repeated use such as books. This leads to a greater tendency toward vertical integration because a publisher is less likely to have the in-house competency to provide technical support. Having the support in-house will provide developers with information regarding the deficiencies of the program and desires of consumers. Alternatively, information technology costs have decreased to such an extent that it is feasible to coordinate this type of support with other companies that can do it less expensively. Because of these forces the extent to which vertical integration will prevail is unclear with respect to after sales support. In contrast, after sales support is not necessary at all in the book industry.

5.4 Intellectual property

Intellectual property laws are used to protect a venture's interests by reducing a rival's ability to copy its products and control the environment in which competitors gain access to its technologies. Having intellectual property rights, such as copyrights or patents, can give a venture a temporary monopoly [Levin, Klevorick, Nelson,

and Winter, 1987] and increase the venture's ability to introduce and make profits from exploiting its new technology [Zahra and Bochner, 1999].

There are more opportunities for deriving long term value from software than there are for books. This is due to their greater potential for reuse in future products. The value of a franchise, for example, is high because it means that new versions or sequels of a product can come out and benefit from an installed base of users. Occasionally the book industry will develop a successful series such as "... For Dummies," Nancy Drew, or Harry Potter but the general rule is fragmentation, whereas series such as Quicken or Final Fantasy are much more common in the software industry. Publishers will often buy out developers of a successful series such as when Microsoft bought Ensemble Studios, creators of Age of Empires. In this way they can use engines and expertise developed in one title in several others. Unlike books, software development involves reuse of code and features from previous releases. This means that having ownership over this intellectual property is valuable. The coordination process will become too expensive if negotiations for licensing fees have to occur every time a piece of code or a feature is reused. This makes vertical integration more likely in software rather than books.

5.5 Development funding and marketing risk

The fixed costs associated with information products are high, while the variable costs, or the economic costs of reproduction, are relatively low [Varian, 1997; Shapiro and Varian, 1999; Tiwana et al., 2001]. The market for information related products changes rapidly. Mullins [1998] holds that organizations involved in information product development have to cope with a high degree of uncertainty during the process of development. Examples are the appropriateness of a certain technology standard over another, the nature and extent of customer needs, the level of resources invested, and the timing of commitment [Mullins, 1998; Tiwana et al., 2001]. Firms have to encounter high organizational and financial costs if they are "to develop structures that incorporate as much complexity as the processes they manage." [Mitchell and Singh, 1996; citing Ashby, 1960]. In other words, the more complex the product, the higher the challenges and costs of maintaining efficient business practices.

One of the key roles of software publishers is the financing of development. Software projects that require investments of millions of dollars and involve teams are rarely self-financed. Thus publishers often negotiate advances and royalty terms prior to product development. Finance is usually provided in stages once milestones are completed to the publisher's satisfaction. While book publishers also provide advances to some authors this is seen as an incentive in the face of competition for established writers. The cost of book development is primarily the opportunity cost of the author's time. This also means that there is little incentive to vertically integrate because there is little investment needed prior to completion of the work.

The software publisher has an incentive to vertically integrate to ensure a steady stream of titles that will make efficient use of their marketing infrastructure. Book publishers, in contrast, have greater numbers of independent authors to work with because development costs are much lower for books. Software publishers must make substantial marketing investments to have any opportunity to recover development budgets. Much of the production and marketing infrastructure, such as employees and retail space forged by channel relationships, is either used through a constant stream of new products or wasted. When publishers incorporate development in-house they are better able to provide a steady flow of products thus smoothing out the usage of their infrastructure by controlling the development process and release dates. Book publishers, in contrast, have less need to have in-house development because they usually have more titles and less investment in each of them, which results in a steadier flow of new releases and lower risk.

Although publisher tasks are valuable, self publishing by book authors has grown because many authors, especially first time ones, are dissatisfied with the terms and conditions of the relationship with a publisher, and on many occasions, they cannot obtain a contract at all [Zeitchik, 1999]. Because the barriers to entry, such as the need for development financing, are lower in the book industry than in software, technological advances make disintermediation easier in the book industry. While it is easier it is not likely to grow beyond a small niche until eBook readers become widely used.

As Epstein [2001] points out, book publishers provide value in terms of editorial selection, design, and marketing. It is inefficient for authors to try to take on these tasks. An exception can be made, perhaps, for authors who are already well known. Stephen King, for example, made at least \$450,000 from downloads of his short novel, "Riding the Bullet" in 2001. His next best alternative would have been a payment of \$10,000 to publish it in a magazine such as Playboy or The New Yorker [King on the Net, 2000]. This experiment may not be a good indicator of future success however. There was clearly a novelty aspect of being the first well-known author to offer a book online. The display methods and ease of use of downloading should increase in the future though, which may result in successful electronic book downloading. Some segments will, however, take much longer to develop online. For example, the Internet sales of children's books have been tracked since 1997 and still remain at only 1% of all distribution channels [Youth Markets Alert, 2003].

5.5 Brand

A brand is an identifier for a set of products offered for sale by the same organizational entity [Kotler and Armstrong, 1997]. If a brand's product offers consistency regarding attributes that are difficult to observe before purchase, then consumers can use the brand label as a surrogate for performance [Farquhar, 1989; Randall, Ulrich, and Reibstein, 1998].

Publisher brands are of little importance to consumers. They do not usually gravitate to Signet books or Eidos software but rather to star authors such as Tom Clancy or entertainment licenses such as Star Wars. Brand, however, has some impact in the field of productivity software. Publishers such as Microsoft and Lotus developed reputations sufficient to foster sales of new products. The value of the brand reputation can encourage some publishers to develop in-house to improve quality control. However, compatibility and features are more important. Publisher brand rarely matters to book buyers with the notable exception of academic press. The lack of importance of publisher brand increases the probability of publishers being disintermediated in the distribution process.

6. Coordination and the Future of Pure Electronic Commerce

Software tends to be more vertically integrated than books. In the book industry authors are usually separate from the publisher whereas software publishers more commonly have in-house developers. As illustrated above, the higher the coordination costs the more likely that integration will occur. A software publisher will be more likely to have in-house development, for example, when it needs to support multiple generations of a program. Table 1 shows that, for every category, software has a higher level of vertical integration than books.

We have identified an important factor that affects how the distribution value chain for pure information goods will evolve: the nature of the coordination requirements that exist in the creation process. In general, greater coordination requirements in the development process for software will lead to several tendencies:

- There will be more vertical integration between developers and publishers. That is, developers are more likely to become employees of the publisher rather than independent contractors.
- There will be fewer, larger publishers. That is, the publishing industries will become more concentrated as only the larger players have the resources necessary to engage in large-scale development processes.
- Publishers will gain relative market power over their suppliers (i.e. developers).

The tasks of software and book publishers will remain important for the foreseeable future. These two industries share some things in common. Marketing costs of both are similarly high. This will remain true even as it becomes possible to distribute digitally. While distribution costs decline in this scenario, promotion costs increase because items are no longer displayed on shelves and thus consumers would need to be made aware of their existence through increased promotion.

Only star authors who are skilled at self-promotion may be able to overcome this marketing difficulty to sell directly to readers. For these authors to earn sufficient revenue through digital distribution to offset those they would earn through the publisher two changes would have to occur. First, there would have to be an eBook reader that satisfies a substantial proportion of book buyers. Second, Internet demographics would have to more closely resemble mass markets than they currently do.

Software developers are unlikely to overcome the financial burden of operating without a publisher. It is very uncommon for a software developer to gain a similar recognition and built in demand that a star author would have. Even though they do not face the eBook device barrier they would still need to invest substantially in promotion. They would also need to self-finance development costs, which are often in the millions of dollars. Development represents only a relatively small opportunity cost for a star author.

While coordination costs are generally lowered by information technology, the trend toward ever more complex software results in a greater need for vertical integration in the software industry as compared to book publishing. This trend is likely to continue, thus making vertical integration in software even more common. In the long term, however, the demands imposed by increasing coordination requirements at either end of the value chain may cause the nature of the two products to become more alike. This may happen as devices and distribution channels evolve. Books will develop more active functionality as novels become more like web pages and textbooks become more like computer-based training. Ultimately, the genres of information goods that we recognize today—books, software, records, movies—may disappear, and new forms, beyond what we can imagine, will evolve.

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