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# *The Reference Wars:*
# *Encyclopædia Britannica's* Decline and Encarta's Emergence

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**Abstract**

The experience of *Encyclopædia Britannica* provides the canonical example of the decline of an established firm at the outset of the digital age. Competition from Microsoft's Encarta in 1993 led to sharp declines in the sales of books, which led to the distressed sale of the firm in 1996. This essay offers new source material about the actions at both Encarta and *Britannica,* and it offers a novel interpretation of events. *Britannica's* management did not misperceive the opportunities and threats, and *Britannica* did not lack technical prowess. This narrative stresses that *Britannica's* management faced organizational diseconomies of scope between supporting lines of business in the old and new markets, which generated internal conflicts. These conflicts hindered the commercialization of new technology and hastened its decline.

# Introduction

The rapid decline of the venerable *Encyclopædia Britannica* provides the canonical example of the decline of an established firm from digital technology. The firm reached its peak revenue in 1990 and 1991 (see Table 1), and had not experienced an unprofitable year since the 1930s.[2] Yet, revenues declined rapidly after Microsoft launched Encarta in 1993, a new CD-ROM encyclopedia. *Britannica* book sales fell by 50% in three years, which led it to put itself up for sale in 1995. More than a year later it sold to a new owner for $130 million. *Britannica's* rapid decline startled contemporaries, and the reference wars became a focal example for demonstrating how digital technology could visit major trauma on established firms.

This study analyzes *Britannica's* strategic investments and commercialization activities in the first half of the 1990s. Enough time has passed to revisit these events and infer the general lessons. Were contemporaries correct to treat *Britannica's* experience as a harbinger of broader patterns in the transformation brought about by digital technology? As this essay stresses, additional source material has become available, and this is the first study to use it.[3] A deeper fact base supports a different theoretical understanding of what happened, as well as leads to distinct conclusions about why *Britannica* declined.

A long-standing puzzle lies at the core of any analysis of *Britannica*'s experience. An established and leading firm would seem to have enormous advantages over its competitors in a new market. Established and leading firms bring refined processes, existing distribution and production, and favorable branding. Why would a successful firm come to have severe difficulties organizing for a new market?

Of particular importance for explaining *Britannica's* decline are theories that stress its inherited capabilities, especially inherited technological (in)abilities and inherited (mis)perceptions about the potential for new market opportunities.[4] Prior to their competition, Microsoft and *Britannica* focused on very different markets – Personal Computer software and

[2] The statement about peak sales and uninterrupted growth is the shared understanding among every person interviewed for this article, which included several high level executives who would have been familiar with general trends at the organization. However, there is little public data available about Britannica's sales in the 1980s, as it was a private firm. Only after it encountered market difficulties did its finances receive some public exposure, which is summarized in Table 1. See, e.g., Melcher, 1997.

[3] This source material includes several subsequent public accounts by participants in events, especially after Encarta folded. This essay also includes original source material based on interviews conducted by the author.

[4] A large literature stresses the importance of these gaps. For work on gaps in technical capabilities, see Foster, R., 1986, Henderson. R. And K. Clark, 1990, Henderson, 1993, or Teece, et al. 1997. For work on their evolution, see e.g. Dosi, G., and R. R. Nelson. 2010, Adner and Zemsky, 2005, Cassiman and Ueda, 2006, Stein 1997, Klepper, 1997, Jovanovic, 1982. For work on changing perceptions in the context of a theory of disruption, see Clayton Christensen, 1997, Joseph Bower and Clayton Christensen, 1997, Gavetti and Tripsas, 2000. For broad overview, see Tushman and Anderson, 2004.

reference book publishing— and managed very different commercial challenges, so such heterogeneity in inheritance appears to be a good candidate for interpreting events in encyclopedias on CD-ROMs. Testing such theories requires extensive information, however, and underlies another motivation for the essay. A new – indeed, recently increased – fact base provides an opportunity to revisit these hypotheses and question the prevailing view.

To illustrate the prevailing view, consider *Blown to Bits,* written by Evans and Wurster (2000), two consultants from the Boston Consulting Group. *Britannica's* decline plays a prominent role in the book. They devote the opening pages (p 2-5) to it, and they stress that inherited misperception and technical inabilities as reasons for Britannica's decline.

Their writing portrays *Britannica's* management as myopic and ill-prepared. At the outset they stress, "The CD-ROM came from nowhere and destroyed the printed encyclopedia business." (p 2) They also state, "Judging from their inaction, *Britannica's* executives at first seemed to have viewed the CD-ROM encyclopedia as an irrelevance…" (p 2-3), and "*Britannica* executives reluctantly considered creating they own CD-ROM…"(p 3). The authors conclude that events are "more than a parable about dangers of complacency" and "*Britannica's* executives initially scoffed at Encarta" (p 4). Their words and tone also illustrates that they viewed *Britannica* as technically inept. One discussion contrasts the different approaches at Microsoft and *Britannica* to storage issues, stating "Encarta… could fit easily onto a CD-ROM…," while *Britannica* faced problems putting its 40 million words on a CD-ROM. While other books examined these events, no other addressed these assertions about perception and technical ability.[5]

This study will come to a contrasting conclusion. The narrative shows that *Britannica's* management faced challenges, accurately perceived the opportunities and threats, and took action that did succeed in addressing many of the technical challenges. The narrative shows, in particular, that for several years the "skunk works" at Britannica and Microsoft had similar technical prowess. A skunk works is a divisional home for creative researchers, housed away from the main operations of the organization.[6] Moreover, the above remarks about storage is a misleading comparison because the phrase, "could easily fit onto a CD-ROM" is inaccurate. In fact, as discussed below, storage constraints also limited Microsoft's ability to include recordings, pictures, and video clips. The narrative stresses that both firms faced these storage

[5] Shapiro and Varian (1999) also use *Britannica* as an example, but for different purposes, to illustrate properties of the costs of information goods and to illustrate several principles for pricing information goods, focusing on pricing issues in 1995 and 1996. Their discussion does not focus on the factors shaping *Britannica's* decline.

[6] The projects in a skunks work involve something of value to the future of the organization but are not directly connected to its present operational or service missions. The phrase, *skunk works,* originated from the aeronautics industry.

constraints, and Microsoft made a different set of choices than *Britannica*. A more interesting question has escaped attention: why did Microsoft make different choices than *Britannica*?

The narrative directs attention at commercialization activity around new products using new technologies. The phrase 'commercialization of technology' means the embodying of technology in the design of sellable products and services, and the development of accompanying branding, distribution, and production required to operationalize the flow of physical goods into users hands so that it generates revenue. Stating the paper's core hypothesis succinctly, commercialization of technology created a new business, and that required integrating the divisions for an established market and a new market together, and integrating those two businesses generated many conflicts that ultimately interfered with an effective response to the new market. These difficulties arose because the shared assets possessed attributes well suited to the old market, and sharing assets across the old and new created problems for efforts in both lines of business.

The narrative also shows that (in)capabilities and (mis)perceptions did not play a major role. Instead, internal conflicts emerged after *Britannica* experienced technical success and attempted to integrate new business lines based on digital technology into the existing organization. Notably, a technical gap in the final product emerged endogenously, as the firm commercialized technology, and as *Britannica* executives attempted to manage the costs of conflict.

This study of *Britannica* builds on the analysis in Bresnahan, Greenstein, and Henderson (2012), hereafter *BGH,* which argues that organizational diseconomies of scope can play a key role in fostering disadvantages for incumbent firms facing competition from new technology. Organizational diseconomies of scope arise from conflict between two lines of business. One line is an established market, while the other is an innovative market. The latter is associated with the firm's response to new technical possibilities. In BGH, organizational diseconomies of scope play a crucial role in the moment when the old still thrives and the new first appears. If established firms hold assets that are *necessarily* shared across all market activities, such assets may be well-suited to an old market and may not be well-suited to the new market without modification. That premise employs a broad conception of a firm's necessarily shared assets, and includes such assets as the firm's reputation and branding with users and business partners, its relational contracts with its own employees or others in a supply chain or distributional channel, its credit rating with lenders, and, as with a publisher with a long history, also its content. BGH hypothesizes that sharing assets causes conflict, and conflict can cause behavior that leads established firms to react ineffectively to a competitive episode.

As BGH stresses, standard principles in organizational economics lie behind conflicts sharing those assets: Effective innovations involve both effort that cannot be easily monitored

and outcomes that cannot be specified in such a way that top management could write enforceable contracts around them. Hence, under many circumstances executives cannot give perfect high-powered incentives to everyone in an organization at once. Those standard principles do not imply that firms should give up on all innovative opportunities, even in the face of potential conflict. Rather, for a wide set of plausible circumstances, firms should rationally attempt to innovate "inside their boundaries," and in ways that do not impose costs on existing practices for creating value from those assets. This further implies that divisional managers must make choices as to how much effort to invest in activities complementary to the firm's assets. Such investments are necessarily sub-optimal because senior managers cannot write perfect contracts to optimize effort across two divisions. For example, when there are two divisions, senior managers cannot give the division manager of either division "whole-firm" incentives.[7] Lack of whole-firm incentives may lead to conflict between divisions assigned to two lines of business.

BGH extensively analyzes two case studies to illustrate the role of organizational diseconomies of scope. BGH focuses on IBM's response to the introduction of the personal computer (PC) and on Microsoft's response to the introduction of the browser. In each episode, the incumbent firm encountered challenges caused by the creation of a new potential market and, to avoid conflicts, first attempted to develop a response outside of normal operational practice. The incumbent firm formed a skunk works. The skunk works addressed the technical challenges and succeeded, and the commercialization of the new product raised additional challenges around integrating the new product.

In addition to adding a new fact base and interpretation of events, this article adds an additional example to illustrate the BGH framework. The events behind *Britannica's* decline have many parallels to the cases in BGH. This article shows that *Britannica's* skunk works achieved many of its technical goals, and the management correctly perceived the general market opportunities and threats. Once again, the locus of challenges for the established firm arose from the commercialization of the new technology, and the integration of the commercialization efforts into the organization, and, once again, the challenges emerged because the organization must necessarily share the same assets across all its businesses.

Events around *Britannica* display a key difference. Unlike the examples in BGH, the connections between diseconomies and firm failure occur with less delay and with such speed that it could not support any illusion about the durability of the old market. In both the cases of

[7] There rarely are contractual instruments to resolve all incentive issues, because employees maneuver to control key assets with retaining rights of residual control. This is taken for granted in many papers. See e.g., Baker, Gibbons, Murphy (2002), Anand and Galetovic (2000), and Anton and Yao (1995). BGH also discuss these issues at length.

PC and the browser, the established firm considers all options and settles into the comfortable profitability of the old, while it retreats from the new market, ceding the fast growing and highly profitable markets to others. Only later does it lose out in the old. In *Britannica*'s case, however, even the best outcome in the new market would have been a decline in sales and profitability, so it has to choose among the best of (what appear to be) bad options in both old and new markets. As executives begin to manage this uncomfortable situation, the situation goes from bad to worse in the old market. The demand for the old falls at almost the same time that *Britannica* fails to succeed in the new. As it happens, even with a much close connection between action and results – when no rational manager could maintain an illusion about the prospects for growth in the old market – management still chose to not favor the new market. That sequence of events highlights the key role of commercialization.

Though events at *Britannica* have received attention from business and strategy scholars, this narrative is the first major revision of the prevailing analysis. There have been period news articles about *Britannica's* decline: when *Britannica* went up for sale in 1995[8]; after the new ownership put in place a strategy in 1997[9]; and periodically thereafter as the organization struggled with new initiatives, as well as after the organization ceased publication of books in 2012.[10] None of these news articles altered the prevailing view. For analysis of competition, the most extensive analysis can be found in two high-selling and well-known strategy books published in the late 1990s, *Blown to Bits: How the New of Information Transforms Strategy* (Evans and Wurster 2000), and *Information Rules: A Strategic Guide to the Network Economy* (Shapiro and Varian 1999). More extensive studies of Encarta tend to focus on Microsoft's strengths rather than *Britannica's* actions (e.g., Stross, 1996, 2009), and do not use additional information that has become available since Encarta's shuttering (see numerous footnotes below). To the knowledge of the author, there has not been any additional research of *Britannica's* decline, except for one business school case in which the author participated.[11]

The narrative begins by explaining how *Britannica* was organized, and then it explains how Microsoft came to be interested in the market for CD-ROM encyclopedias. It then analyzes the choices faced by both firms as they commercialized new technology. The narrative uses theoretical implications of diseconomies of scope to inform its analysis. The narrative ends with a short epilogue that reinforces the main points.

[8] Among several, articles appears in the Landler (1995).
[9] Among many, the best known appears in Business Week in October, 1997 (Melcher, 1997).
[10] Among many, consider, for example, Bosman (2012).
[11] Greenstein, Shane, and Michelle Devereux (2009). During the writing of the first draft of that case study in 2006 the present author's curiosity was piqued to investigate further. The present article uses some material from the update in 2009.

## When Microsoft met Britannica[12]

This story begins in 1985, soon after Microsoft announced the development and release of Windows 1.0, and Bill Gates likened a possible high-price high-demand CD-ROM encyclopedia as similar to the highly successful Word product for Apple's PC.[13] Gates was eager to diversify Microsoft's businesses, innovate, and invest in new projects. At that point Microsoft was an ambitious entrepreneurial upstart with $140 million in revenue. After being told to find a suitable partner, Microsoft executive Min Lee approached *Britannica* to suggest a partnership on a multimedia CD-ROM version of the esteemed encyclopedia, while offering to pay a royalty for nonexclusive rights to use the encyclopedia's contents.[14]

*Britannica* quickly refused Lee's overture. Looking back with uncharitable hindsight and with no examination of alternative views, Evans and Wurster (2000) interpret this refusal as evidence of management's myopia. Their reasoning? A decade later, after *Britannica*'s first sales decline in competition with Encarta, the deal is a symbol of "what might have been."[15] Taken out of context, that pejorative conclusion is flawed on multiple levels. Twenty-twenty hindsight conveniently forgets the circumstances and outlook at the time of the decision.

There was a fundamental asymmetry to the offer from Microsoft. Microsoft stood to gain a great deal from a partnership, while *Britannica* stood to gain very little in the short run from a partnership with Microsoft. Larry Grinnell, *Britannica*'s director of public relations, said, "The *Encyclopædia Britannica* has no plans to be on a home computer. And since the market is so small, only 4 or 5 percent of households have computers, we would not want to hurt our traditional way of selling."[16]

There also was not any obvious benefit to *Britannica*'s business. It involved a traditional way of selling aimed to support a full-time, rather than part-time, work force.[17] A full time workforce was viewed as a competitive advantage, making *Britannica* better at sales and distribution than other firms. *Britannica*'s approximately 2,000 sales representatives were trained to pitch the *Encyclopedia* during house calls. These were not cold call sales to homes.

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[12] This section begins with Microsoft's first inquiries into the encyclopedia business. For more background on the state of the market, and the operations at *Britannica* see Greenstein and Devereux (2009).
[13] Stross, 1996.
[14] Stross, 1996, 80. Also confirmed during interview of Craig Bartholomew, July 18, 2009.
[15] Evans and Wurster, 2000, 2.
[16] The quote comes from Auchter, 1999. After a period of growth affiliated with improving computers for a hobbyist market, the personal computer market exploded with the introduction of the IBM PC, which was aimed at business users. Much of the initial demand for personal computers in the 1980s arose in business applications (Bresnahan and Greenstein, 1999, Bresnahan, Greenstein, and Henderson, 2012). US government surveys about home use of personal computers showed that only 8% of US households had a personal computer in 1984, while 15% did so in 1989, and almost 23% did by 1993 (Newburger, 2001).
[17] This contrast to World Book, for example, which was largely sold by school teachers during their summer break.

Instead, all sales calls were generated by leads designed to select potential buyers with a high probability of making a purchase.[18] *Britannica* believed that customers valued the privacy and convenience of having a knowledgeable encyclopedia representative come to their homes to explain how *Britannica* could contribute to their children's' education. *Britannica* hired people it viewed as well-suited to the task, trained them with talking points and scripts, and provided them with strong incentives. An effective salesman could expect to convert a third or more of its leads.

Said simply, *Britannica* feared the reaction of its valuable asset, namely, its sales organization. Said simply, its managers reasoned that if its sales force learned that the company was going to market a new encyclopedia product in a different form and with another firm, they would desert in due time, resulting in sharply falling sales for *Britannica*.[19] "The company was driven by the sales organization, and the notion of selling just the information without the books at a cheaper price was abhorrent to them," said a *Britannica* former vice president for research and development.[20]

In addition, *Britannica* executives also could anticipate some obvious dangers that would require attention, should such a partnership go forward, and these dangers provided another reason to avoid partnering with another firm. It suspected that sales of a less expensive CD-ROM version of its contents could not come close to the current premium that *Britannica* commanded with the print version, reducing the company's strong profit margins. In the 1980s *Britannica's* encyclopedias commanded a price point of $1500–$2,000 versus $5–$75 for a dictionary and $5–$40 for an almanac. According to a 1989 internal strategy memo at Microsoft, "No other broad-appeal content product in any category in any medium has a well-established single-user price point anywhere close to this."[21]

There was also a potential inconsistency with brand. A multimedia CD-ROM encyclopedia could easily be no better than a child's toy, something just one step above a video game.[22] Such a product would not fit with *Britannica*'s serious, intellectual image. *Britannica* had a large educational unit, and pursued many projects with that unit, such as books and

[18] These leads would be generated at a variety of channels, including such varied media as television and magazine commercials, and representatives at professional meetings. The former would display a telephone number that a potential buyer would call, and then a visit would be arranged.
[19] Stross, 1996, 80.
[20] Barth, 2006.
[21] Randall E. Stross, 1996. The cost of printing was approximately $250, and the sales commission tended to be $500 to $600. Treating the commissions as variable expense, that means the variable profits were quite high. The remainder went to headquarters for editors and other staff.
[22] Evans and Wurster, 2000, 2.

movies for schools. It did so in a way that preserved implied authority of the *Britannica* name above that of its younger, less prestigious, competitors.

Finally, *Britannica* executives in 1985 expected that a multimedia reference source would require years to gain popularity, and the home PC was far from a household staple in 1985. The home market had not shown strong adoption, and forecasts for PC diffusion to homes widely varied. With such an uncertain forecast, a deal with Microsoft or any firm appeared premature.

*Britannica*'s decision also was not out of line with the view of any of its competitors. Unsurprisingly, therefore, after being rebuffed by *Britannica*, Microsoft approached others, and met with similar resistance. The second-largest producer, World Book, also turned down Microsoft, and so did Collier's. Microsoft worked its way down the ranks of the encyclopedia world, and received the same response everywhere. Encyclopedia publishers were not persuaded by pitches that the product would be a "valuable addition to [buyers'] regular encyclopedia and not a replacement for it . . . [and that] 50 percent of purchasers of a new computer would buy a CD-ROM encyclopedia."[23]

As will be described later, only one existing player chose the partnership, and it was years later, and this partner was in dire financial condition. Microsoft finally settled on a deal in 1989 with the nearly defunct Funk & Wagnall's, a brand that had survived as a "periodic promotional item in the aisles of supermarkets."[24] To get the only deal available, Microsoft even negotiated to rewrite the encyclopedia text if necessary, though it had not wanted to take on this task. [25]

Hindsight also conveniently underspecifies the counter-factual scenario, and presumes a deal between Microsoft and any encyclopedia company would have worked extremely well for all the parties involved. Such a scenario is Panglossian at best, especially in light of the numerous challenges such partners would have faced and the deeply different experiences both organizations brought to the situation. Any partnership would have required frequent renegotiation, and would have been filled with tension. On simple theoretical grounds it seems optimistic, therefore, to believe such a partnership between Microsoft and *Britannica* would have sailed along smoothly in a jointly profitable arrangement.[26]

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[23] Stross, 1996, 83.
[24] Evans and Wurster, 2000, 2.
[25] Stross, 1996, 81.
[26] Moreover, as further evidence for this pessimism, the narrative below describes an actual partnership between the two companies (in the early 1990s). Microsoft found it unsatisfying, and it did not last. As a result of this dissatisfaction, in the future Microsoft decided to go its own way without any partnership. It is easy to conclude that an arrangement in 1985 would not have gone any better.

A retrospective also look mischaracterizes the choices available to *Britannica's* management, giving the impression that executives had to partner with Microsoft or do nothing. In fact, it had an additional option, namely, develop a CD-ROM encyclopedia under its own control and not in partnership with any other organization. This was, in fact, the choice made by management only a couple short years later.

The appeal of this option is not difficult to understand. Management retained rights over all content, over its framing, over its branding, over many aspects of the business. That permitted management to fund the investment entirely, keeping both the upsides and downsides, and it allowed management the option to control actions that mitigated potential downsides of the initiative. In light of the numerous uncertainties in the near term, it is not surprising it would choose to internalize the risks rather than partner with a young software firm from the Seattle area, or partner with any other computer firm at the time.

Summarizing, Evans and Wurster (2000) interpret this refusal as evidence of management's myopia, and the interpretation flies in the face of the evidence. Every other leading firm made the same choice. Moreover, *Britannica's* management eventually did develop a CD-ROM, and invest heavily in developing it, so it is not possible to conclude the management was asleep.

## Alternative Formats for Encyclopedias

Despite the initial decision at *Britannica* in 1985, concerns about alternative formats for encyclopedias were never far from the minds of top management. Customers frequently asked about it in the 1980s. From 1983 onwards, the *Britannica* sales promotion department made a set of talking points available to the field salespeople if a potential customer indicated they would wait for an electronic version and, thus, delay purchasing books at that moment.[27] (See Exhibit 1) For example, a key talking point was the following: "The main reason most people give for wanting a computerized Encyclopedia is to be able to find things quickly. A computer does, indeed, search and sort information very well. But most systems available today use the *key word* search. For example, if a person wants to look up *orange*, the result will be a listing of every place the word appears, whether or not it is a significant entry and regardless of whether it refers to the color orange; Orange County, California; the fruit; or William of Orange. It is then the user's responsibility to determine which, if any of these, refers to the item being sought."

[27] Robert McHenry, "The Building of Britannica Online," http://www.howtoknow.com/BOL1.html (accessed July 26, 2006). See the sidebar at http://www.howtoknow.com/sidebar1.html.

The sales department and editorial department took different actions. The management of the editorial department began investing in CD-ROM development a few years after Lee's overture. *Britannica* executives started building a multimedia encyclopedia and eventually launched the first multimedia CD-ROM encyclopedia.

In an unsurprising choice, to avoid taking commercial risks with *Encyclopædia Britannica*, the management chose to issue the CD-ROM under the Compton name. This brand was owned by the *Britannica* organization, but was less expensive and less prestigious. *Britannica* demonstrated the NewMedia version of *Compton's Encyclopedia* in April 1989, with graphics and sound bites from famous narrators such as Patrick Stewart, who was at that time known for his role as Captain Jean-Luc Picard on *Star Trek: The Next Generation*.

This was not the myopic investment supported by an incompetent executive team. It comes very early in the history of CD-ROM encyclopedias.[28] In a year-end wrap-up, *BusinessWeek* dubbed the Compton Multi-Media Encyclopedia one of the top ten new products of the year. A DOS and MAC version became available in 1991, which will be subsequently discussed.[29]

The beginnings of strategic conflict between old and new are most apparent in the decision to price the CD-ROM. *Britannica* gave the disk away to purchasers of a print *Encyclopedia*, but stand-alone buyers paid a hefty $895.[30] The pricing decision followed the general strategy for the CD-ROM: Management and the sales force viewed the disk as a "sales closer," not as an investment into a new medium, and certainly not as a stand-alone commercial market. Such an approach limited the internal tensions with the sales force's concern about cannibalizing book revenue.

The sales force had other difficulties: It had been hired for selling books, not for supporting an application on PCs. The change required costly training. Many employees could not, or did not, know how to support the disk: "I conducted over a year of training with the sales force and taught them step by step how to use the demo on it; they didn't know how to operate the computers in the potential buyers' homes," said Deline, a former employee at *Encyclopædia Britannica* Educational Corporation.[31]

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[28] A reader of *Blown to Bits* (2000) would never know that, in fact, *Britannica* was one of the earliest entrants among established encyclopedia firms. Such facts are simply missing from the one-sided analysis in the book.
[29] Robert McHenry, "The Building of *Britannica* Online," http://www.howtoknow.com/BOL1.html (accessed July 26, 2006). See the sidebar at http://www.howtoknow.com/sidebar1.html.
[30] Stross, 2000, 86. The price came down relatively quickly for schools, which received discounted sets in the range of $295–$395. Craig Bartholomew, discussion, July 18, 2009.
[31] Suzy Deline, July 12, 2006.

Ultimately, the pricing decision was unsuccessful for several reasons. First, at the price point offered to stand-alone buyers, the CD-ROM by itself was feasible only for the high end of the market, but Compton's did not have the reputation to appeal to that market. Second, the book-buying customers did not view the disk as a valuable freebie. Compton's did not have the reputation for providing the breadth and depth of information that its more expensive counterpart did. Third and important, the CD-ROM proved costlier to develop and execute than the core product. "When you're working in a new medium, you can't expect to get things produced cheaply. *Britannica* was not prepared for that," said Suzy Deline.[32]

This example begins to illustrate how organizational diseconomies of scope at *Britannica* shaped its production and distributional activities in the new market. As an early entrant, the company had a variety of options for how it commercialized the new technology. Initially it *chose* features for the new that avoided the costs of conflict, and that made exploration consistent with the existing business. These features of the choice were most apparent in the branding, distribution, and pricing choices: For branding, it chose not to risk its primary and most valuable brand, Britannica, and chose to use its secondary brand, Compton's. For distribution, it chose to use existing distribution channels—not a third party or PC retailer, as was common for most PC software. This choice necessitated additional expenses to train its workforce. For pricing, *Britannica* initially chose a price point that did not suit the new market—attempting to sell the product as a complement to the books and not a substitute for them.

By October, when Compton's officially launched the Multimedia PC, *Britannica*'s management changed parts of its approach, taking on a business partner for some aspects of the distribution and marketing. This launch was a large coordinated attempt to advance the technology of both hardware and software, with many firms involved. Indeed, Compton's launch partner was Microsoft, and at that time Microsoft's only offerings were Multimedia Bookshelf (a reference shelf with the much slimmer *Columbia Concise Encyclopedia*), Cinemania (a movie guide), and Multimedia Beethoven (focused on the Ninth Symphony). Compton's was cheaper and available as a stand-alone product by then, but the price remained high, between $395 and $595.[33]

Once again, conflict inside *Britannica* shaped decisions. *Britannica* did change the distribution channel, reflecting industry norms. Yet, it did not change the price enough to make it appeal to consumers. Even though one in six US households had a PC by this point, and these households disproportionately possessed desirable traits, such as high income and high

[32] Suzy Deline, July 12, 2006.
[33] Craig Bartholomew, discussion, July 18, 2009.

education, with the benefit of hindsight it is not surprising management's choices did not sell very much.[34]

More to the point, the managers at *Britannica* encountered difficulties from maintaining two sales organizations who used different channel strategies. Electronic formats, CDs in this illustration, did not easily fit into this existing sales channel, despite the managers' attempts to do so. Perhaps most striking, management grappled with the pricing of the CD and its bundling with other products. These compromises did not work very effectively for the new market.

Was the resistance of the sales division myopic? This was the most profitable division of the organization. Their resistance arises from the need to maintain present commissions, retain their positive outlook, which is necessary for continuing success under any environment. At most, such a short-term outlook can illustrate a particular form of myopia at one division, because it does not consider the consequences this behavior has for experiments that will shape the future of the entire organization. Nonetheless, those concerns are also quite understandable, since the sales organization generated a substantial amount of revenue and profit, and the future was uncertain. More to the point, this distribution channel supported a set of business processes for profiting from *Britannica's* reputation, and required a relational contract with the personnel who carried it out. Varying from prior understandings risked those relational understandings, and *Britannica's* actions also can be interpreted as symptoms of a key trade-off, of giving one of two divisions the proper incentives to consider the returns of the other.

Step back from the detail to reflect on what the narrative has revealed about the role of inherited perceptions of *Britannica's* management. When events in the 1980s are examined out of context it is possible to explain *Britannica's* decisions as arising from misperceptions about the prospects for the CD-ROM business. This explanation becomes much more implausible when examined in light of many other factors within *Britannica* and in the market environment. It also appears inconsistent with the action of an executive team, who acted in ways consistent with strategic considerations and operations of a profitable business. Moreover, many actions taken by the same team appear to arise from those same strategic considerations, and would lead the team to eventually enter the CD-ROM market.

In summary, while the above discussion cannot rule out misperceptions as an explanation, it becomes far less likely in the face of a simple alternative explanation, which is grounded in the organization's historical strengths, and features of the setting. This discussion also began the steps towards an explanation that stresses the role of commercialization in

[34] After a few years, *Britannica* decided not to make a long-term investment in the CD-ROM, selling the NewMedia unit to the *Chicago Tribune* for $57 million in 1993. See Auchter, 1999, for a brief description.

shaping management's views. That is also the spirit of the next section, which discusses the role of inherited technical (in)abilities.

## Technical gaps

Technical gaps between the products from Microsoft and *Britannica* eventually did play a role in sales. How should they be understood, as inherited, or as something that arose endogenously, shaped by conflict in commercial objectives and strategic goals? This section examines this question.

One technical limit was clearly inherited, and placed *Britannica* at a disadvantage. Its text was so large it challenged the capacity of most PCs in the early 1990s.[35] In addition, there were many problems related to finding the right search technology, as well as the appropriate structure for the text, photographs, and graphics. Many technical issues had never been addressed before, and not on this scale. As recounted by retired editor-in-chief, Robert McHenry, about the (later) 1993–1994 efforts,

> *"Britannica* text included a great many 'special characters,' including letter forms and diacritics used in non-English words (often proper names), mathematical symbols, and scientific notation. Translating raw *Britannica* text into ASCII or into the larger—but still limited—character sets used in Windows and other platforms was difficult and error-prone, and the results were judged unsatisfactory by the *Britannica* editors."[36]

Many other technical capabilities were endogenous, and arose from investments by the organization. For example, *Britannica*'s management changed the assignment of its skunk works over time. In April 1993 the Advanced Technology Group was formally organized, providing structure for informal initiatives that had been going on for some time within the Compton group. It included personnel who were veterans of the Compton group, as well as others, and shared space in Compton's Carlsbad, California, office. In August of 1993 it moved to La Jolla, California, near the University of California at San Diego.

The group enjoyed considerable freedom in its endeavors for the next year, due mainly to its physical distance from Chicago and senior management's immediate and pressing interest

[35] Robert McHenry, "The Building of *Britannica* Online," http://www.howtoknow.com/BOL1.html (accessed July 26, 2006). See the sidebar at http://www.howtoknow.com/sidebar1.html.
[36] Robert McHenry, "The Building of *Britannica* Online," http://www.howtoknow.com/BOL1.html (accessed July 26, 2006). See the sidebar at http://www.howtoknow.com/sidebar1.html.

in direct sales. It was kept distant from the sales organization and received excited feedback from its own staff, the Chicago technical staff, and the editors.[37]

Experiments continued, particularly with formats consistent with the Internet. For some time the members of this group debated a variety of potential ways to make *Britannica* available in a networking format. There were a daunting set of technical choices related to hardware and software. Through the initiatives of this group, eb.com was registered on April 13, 1993, which is a symptom of how this group addressed frontier issues with a forward-looking approach.[38]

The Advanced Technology Group achieved a notable technical milestone at an early turning point, when employee John Dimm, saw a pre-alpha version of the National Center for Supercomputing Applications' (NCSA) Mosaic browser in June 1993 at a bookseller's convention in Miami. By September, Mosaic was formally released. By December, the Advanced Technology Group had the whole article database up and running in HTML (viewable at *www.eb.com/eb.htm*).

In January 1994 *Britannica* Online was demonstrated in the Chicago office and at a computer science class at the University of California San Diego. On February 8, John Markoff published an article on the front page of the *New York Times'* business section entitled, "*Britannica*'s 44 Million Words Are Going On Line." This article generated many hits to the Web site and numerous leads for beta testers. More development work continued, refining the search and display capabilities of the site. On September 1994, *Britannica* Online 1.0 was formally released.

The accomplishments of *Britannica* Online came very early in the history of the Web, and should be understood as one of the earliest such technical successes in the online world. By comparison, Netscape did not release a beta version of its browser until November 1994, and Netscape's first official release was later still, in February 1995. Microsoft released its first browser (a repackaged licensed version of Mosaic) with its launch of Windows95 in August of 1995 and did not announce its Internet strategy until December of 1995. *Britannica*'s Advanced Technology Group had accomplished an enormous achievement ahead of almost every other potential content provider and commercial application. From a technical standpoint *Britannica* Online was well positioned to take advantage of the Web's growth.

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[37] Robert McHenry, "The Building of *Britannica* Online," http://www.howtoknow.com/BOL1.html (accessed July 26, 2006). See the sidebar at http://www.howtoknow.com/sidebar1.html.

[38] April 1993 is quite early for an online experiment. For example, the National Science Foundation (NSF) would not fully privatize the Internet backbone until the middle of 1995, and Netscape was not founded until spring of 1994.

These technical milestones also should be understood in context. The skunk works accomplished what it had been set up to do for the online environment. It anticipated the future and built prototypes to address it.

Once again, while the technical issues were non-trivial, these events suggest that a technological gap was not the most salient reason why *Britannica* declined. Moreover, the technical group was not "complacent" in any common sense meaning of the term.

Rather, the key issues lay elsewhere, in the commercialization of the new technology at *Britannica*. As it would turn out, commercializing the online channel did not face such issues, but simply did not generate anywhere near as much revenue as the decline in book sales.

Before turning to this detail, however, it is useful to contrast the technical developments at *Britannica* with those at Microsoft. This will reinforce the observations about the endogeneity of the product features.

## Sleepless in Seattle

Microsoft took a distinct approach to developing an encyclopedia on a CD-ROM. While differences in technical capabilities between Microsoft and *Britannica* played a role in those choices, the organizational conflicts and commercial interests of the firms played a far greater role.

As had already been illustrated, Microsoft never considered developing its own encyclopedia content. Finding high quality of contributors would have been far too expensive and taken far too long.

Signing with Funk & Wagnall's had not been part of the original plan. Once Microsoft had done so, several challenges became more salient for Min Lee's development group. First they decided that there was not enough value in the text to simply reformat it on a CD and resell it.

For what happened next it is important to understand that an online encyclopedia was a pet project for the CEO, Bill Gates, and as such, it possessed different qualities and goals than the skunk works at *Britannica*. At *Britannica,* the skunk works division aspired to translate the core product, encyclopedias, into a new technical format affiliated with CD-ROMs. The skunk works at Microsoft, in contrast, aspired to develop an encyclopedia for CD-ROMs to complement their other businesses, namely, PC operating systems and PC applications.

Despite being a pet project of the CEO (or, perhaps, because it was one), Encarta also did not escape scrutiny. Min Lee's efforts were not well regarded by Microsoft's board. The board cancelled funding for project in November 1990 and removed Lee from responsibility for the project. He would never again be affiliated with it. Once again, these are not the actions of an irrational company hell-bent on entering the online encyclopedia market in spite of the costs. Every step was calculated, trading off potential risks, costs, and returns; poor early results, combined with the absence of a clear strategy, almost pulled the plug on the entire effort.

As it happened, the cancellation had not yet been carried out when Craig Bartholomew wrote a short memo in February 1991 proposing a new approach to building the project. Bartholomew had come from the publishing industry before joining Microsoft, and had a distinct take on the possibilities and the appropriate positioning for a CD-ROM encyclopedia.[39] This memo eventually found its way to the desk of Bill Gates, and after reading Bartholomew's suggestions, Gates successfully sought the board's approval to re-fund the effort. As a reward for his initiative and innovative ideas, in April 1991, Craig Bartholomew was appointed the new head of the development team, reporting to Tom Corddry, who was in charge of multimedia publishing.[40] Bartholomew ended up heading Encarta for its entire life as a product – until Microsoft shuttered it in 2009.

The online encyclopedia project was not a priority for Microsoft, and so, without much controversy, Gates did not invest a great deal of resources in it. For the first six months, until October 1991, Encarta's staff consisted of four and a half full-time positions.[41] As a benchmark for how small this was, recognize that Windows 3.0 had hundreds of full-time employees dedicated to it.

Two main challenges framed the explorations by the group thereafter: Branding and value creation. For branding, the group eventually decided to drop the Funk & Wagnall's name, given its poor brand cachet, and replace it with a new name, *Encarta.*[42] The group also reaffirmed that there was not enough value in the text simply to reformat it on a CD and resell

[39] Bartholomew's path to the head of the Encarta project was unlikely. In 1988, after six years in the book publishing industry, he joined Microsoft and first worked on the developer network for the CD-ROM consumer division, which explored developing applications for the CD-ROM, part of a program at Microsoft to enhance PC sales and help change the dominant form of PC software (i.e., substitute CD-ROM for floppy disks).
[40] Craig Bartholomew, discussion, July 18, 2009.
[41] Stross, 1996, 86.
[42] The renaming occurred in fall 1992, after Lee had departed and Bartholomew was in charge. The name was chosen through a process of elimination. There was no enthusiasm for "Encarta," but Bartholomew recalled that "the other choices were just worse—Fountia, FountX, and Cyclus . . . The early incarnations were called the MME [MS Multimedia Encyclopedia]." Craig Bartholomew, discussion, July 18, 2009.

it; something had to be added or changed. Under Bartholomew's leadership, the group pursued a new direction for creating value beyond merely putting existing text on a CD-ROM.

Bartholomew was aware that Compton did not act as a "pull-through," and this was part of the motivation for continuing to fund Encarta in 1991.[43] A "pull-through" for PCs motivates customers who otherwise might have hesitated to make the purchase. Families were targeted, as they wanted to give their children an advantage in school, but a PC purchase often stretched their budgets. The model for this conception was Grolier's CD-ROM, which came bundled with the purchase of an Apple Mac. The IBM PC had no equivalent match other than the offering from Compton's, which the Microsoft team regarded as inadequate to the task. Importantly, they viewed it as priced too high to serve as a pull-through.[44]

Compton's failures motivated the direction of Microsoft's innovative efforts with Encarta. The Encarta team decided to do more than build a lower-priced version of Compton's product, in order to differentiate Encarta from the traditional encyclopedias currently on the market.[45] This was making a virtue of necessity, since they believed Funk & Wagnall's text was not as good as Compton's, and they would not be able to match it on that dimension of quality. The team aimed to stress Microsoft's core competency above all else—multimedia software presentation. In other words, Encarta could invest in choice graphics and sound to build something different.

After settling on this broad approach, the team explored further and concluded that they had been unexpectedly fortunate. They concluded that the reading level of *Britannica* was well beyond the capabilities of a typical school child; "it was written by experts for experts."[46] They thought World Book better met its target audience, as did Funk & Wagnall's text.

The group conducted lead-user studies, which showed that intensive users of encyclopedias rarely stuck to one entry. Instead users sought a deeper understanding of a topic by moving among different entries. That observation motivated developing better search technologies, references with hyperlinking, and content that facilitated searching multiple entries.[47]

As the team further developed its plans to develop links and cross-references, it concluded that the text might turn out to be an advantage for Encarta's purposes. As explained by Corddry many years later,

[43] Craig Bartholomew, discussion, July 18, 2009.
[44] Craig Bartholomew, discussion, July 18, 2009.
[45] Stross, 1996, 81.
[46] Craig Bartholomew, discussion, July 18, 2009.
[47] Craig Bartholomew, discussion, July 18, 2009.

> "The text from Funk and Wagnall's was far superior to *Britannica*'s as a starting point for a digital encyclopedia because it was much more nearly "structured data," meaning that the architecture of the text was very consistent from one article to the next. This allowed us to add a lot of "contextual" value—to compute the relatedness of every article to every other article, and build what was at the time a uniquely useful set of links and navigational tools across the entire content."[48]

Encarta's team set off on a course designed to highlight the computer's capabilities at that time.[49] To create an attractive reference source, Microsoft stressed ease of use and included search capability; functionality for hyperlinks across articles; and embedded (though gritty) video, voice, and graphics that the team anticipated would grab users' attention.

The team acquired short videos and recordings of other extraordinary sounds. Consistent with their approach to marketing the product, the Encarta team decided to include multimedia that helped grab attention in, and drive sales at, third party outlets, where they expected users to take no more than a few minutes to examine the product. It chose to put priority on video and sound which made for an impressive demonstration at the store. For example, Neil Armstrong's first steps on the moon was thought to be a video that would grab attention. Similar reasoning favored recordings of Einstein's voice and some of the earliest recordings of Thomas Edison.

The team also aspired to differentiate by including less static information. Steve Ballmer, COO of Microsoft, stressed that the information in a traditional encyclopedia did not change frequently. The team became familiar with his mantra for this point, "Ducks are still ducks. Lincoln is still dead."[50] To meet this goal Encarta's team sought to stretch the definition of an encyclopedia, principally by including two categories of topics that tended to be underrepresented in mainstream encyclopedias—popular culture and business events. This was where the Encarta designers sought to take advantage of a known competitive weakness in traditional encyclopedias.

These choices illustrate an important observation about the distinct priorities of Microsoft in comparison to *Britannica*. Faced with issues over its relevancy and newness,

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[48] Comments by Tom Corddry, March 31, 2009, http://bits.blogs.nytimes.com/2009/03/30/microsoft-encarta-dies-after-long-battle-with-wikipedia (accessed July 28, 2009).
[49] Craig Bartholomew, discussion, July 18, 2009.
[50] Craig Bartholomew, discussion, July 18, 2009.

*Britannica* published a "book of the year."[51] It did not conceive of the topics within the CD-ROM as flexible, as Bartholomew's team would do. *Britannica* also already presumed it had branded appeal to users. It did not conceive of reimagining the content of an encyclopedia to make it appealing in a different way. Microsoft's design arose endogenously out of the need to compete with a leading product, and because Microsoft viewed direct competition with the leader (by replicating the appealing attributes of the leader) as a failing strategy. The new technical features served to differentiate the new entrant from the leader.

These new directions brought the Microsoft team up against storage capacity limits, and led them to a different solution than the one *Britannica* had taken. Consider the observations of Jon Kertzer, one of the earliest employees in the team to face the challenges of how to encode music in a CD-ROM. The storage capacity of a CD-ROM imposed limits: "We only had a limited amount of space. A CD-ROM is 700–750 megabytes, and there was always a fight between different parts of the project about how much disk space you would get. And maybe we got 200 megabytes, and there was limited good quality compression back then. This was before the era of MP3."[52]

How did the Encarta team deal with these capacity limits? Their choices built on a different set of priorities about how to design a product, which had evolved as the team pursued this new direction. Priorities had to be consistent with Encarta's marketing plan, which would build on Microsoft's experience in selling software. For example, they limited pictures and videos to those they assessed would help display the product.

Once again, notice the contrast with *Britannica.* Microsoft chose to face the risks of launching in spite of storage limits, while *Britannica* chose to experiment with another brand it owned, where the storage issues were not as severe as it faced with its flagship product. Those different decisions do not illustrate that both firms faced different technical constraints. In fact, they were similar, and their capabilities in their skunk works were also similar. Rather, they reached distinct outcomes due to something fundamental about the two firms' strategies and willingness to incur risks in commercial markets.

By 1992 Microsoft was no longer the small upstart it had been in 1985. Personal computers would be in 23% of U.S. households by the next year[53], and all forecasters predicted more use in more households over the next few years. With the success of Windows 3.0 and

[51] The book of the year was explicitly designed to address user's perception that encyclopedias became dated. User questions to staff about topics not included in the encyclopedias gave editorial staff a good sense about which current events elicited the most interest from users. Discussion with former head of South American Sales, Lanny Passaro, and former head librarian, Terry Passaro, August 6, 2008.

[52] Museum of History and Industry, "Speaking of Seattle," Interview with Jon Kertzer, July 31, 2002, pp. 17–18, http://www.seattlehistory.org/include/techpdfs/Jon%20Kertzer%20FINAL.pdf (accessed July 28, 2009).

[53] Newburger, 2001.

Office, Microsoft was now the largest applications provider for the IBM PC architecture, as well as for the Apple architecture.

The Encarta team chose to sell its product much like other successful application software did, through third-party retailers such as Egghead and CompUSA, the largest retailers at the time. Marketing received only a small budget, in keeping with standard practice at Microsoft. Namely, marketing was done through public relations, in-store promotions, Sunday circulars, magazine reviews, and occasionally newspaper reviews. Once again, this was a very different channel strategy than any encyclopedia had ever used. Encarta expected to start with this standard pragmatic approach and learn from experience.

Microsoft was finally ready to release Encarta in March 1993, after it missed the first proposed release date of September 1992. Despite all the planning, it was a disastrous launch. The first version of Encarta sold less than 10,000 copies. Only an eternal optimist could have interpreted these events as positive signs that a CD-ROM would become a successful product. According to Bartholomew, this first version "failed fast."[54]

Quick failure turned out to be important. The Encarta team learned from its experience, and the failure did not interfere with its ability to put those lessons to use on the next launch. Encarta team members realized why the release could not and would not generate high sales. Errors had resulted from their own naïve misunderstanding of the market. First, the timing was poor. Encarta had missed the holiday retailing season in October, November, and December, when the bulk of sales occur. Second, at $295, the price was simply too high to attract much interest. The price point had to be lower. Third, some technical issues needed attention. In some areas Encarta delivered some of its information unnecessarily slowly.

In retrospect, concluded Bartholomew and his team, Encarta had been lucky. The failure was so fast, most reviewers and potential users did not notice. The brand had not acquired any (negative) reputation.[55] That gave the team time to take corrective actions without attracting wide attention. Also the team was fortunate to have the support of the CEO. In many organizations, such failure would preclude a second try. Gates continued to have an appetite for the project, for the costs and risks, and encouraged the team to learn from its experience.

The next release came in October 1993, just before the holiday shopping season. This release sold for $99 and included faster capabilities. The price was ostensibly a temporary "holiday promotion," but, once lowered, it stayed there.[56] As with many of its other multi-media choices, the team continued to pay additional attention to promotional aspects, such as

[54] Craig Bartholomew, discussion, July 18, 2009.
[55] Craig Bartholomew, discussion, July 18, 2009.
[56] Stross, 1996, 103–104.

demonstrations in stores. This time it paid off handsomely with a video of the Rabin/Arafat signing ceremony for the Olso Accords from September 13, 1993, only a month earlier. Bartholomew recalled that it took great effort to include such a recent event, and it was regarded as "revolutionary to get it in there."[57] As it turned out, such current events grabbed the attention of potential buyers, as had been hoped.

While standard technical reviewers of software were not "wowed,"[58] potential buyers were. Buyers noticed the songs, movies, bright pictures, and the current events. The linking between entries also received kudos. Entries were presented in plain and easy-to-use formats. Moreover, the use of text from Funk & Wagnall's never seemed to bother the target customer, families with school-age children. The multimedia parts of Encarta appealed to users in this category, as did the lower price.

In the 1993 holiday season alone, Encarta sold 120,000 copies. Production could not keep up with initial demand.[59] It sold 350,000 copies in its first year, and 1 million the following year.[60] By the norms of encyclopedias, this was extraordinary fast growth, and, in terms of unit volume, it was an unprecedented scale of sales. With just under a quarter of an estimated 95 million households owning a PC, these sales figures translate into approximate one in twenty of household PC users owning Encarta after that first full year of sales. By the norms of new software, this was fast.

After the success of 1993, Encarta set on a path to grow from its shoestring origins. It would operate differently than any encyclopedia that had come before. Explained Corddry,

> "By the standards of the print encyclopedia world, Microsoft invested heavily in expanding and updating the content of Encarta right from the beginning. We consciously invested in the contextual value . . . in expanding the core content, in creating the world's first truly global encyclopedia, and in an efficient update cycle. We had enough "multimedia" in the original product to keep the reviewers happy, but focused on the overall usefulness of the whole product much more than on the relative handful of video clips, etc."[61]

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[57] Craig Bartholomew, discussion, July 18, 2009.
[58] Walt Mossberg, the well-known IT reviewer for the *Wall Street Journal*, was not impressed. Stross, 1996, 90.
[59] Craig Bartholomew, discussion, July 18, 2009.
[60] Stross, 2009. "Digital Domain: Encyclopedic Knowledge, Then vs. Now," *New York Times*, May 3, 2009.
[61] Comments by Tom Corddry, http://bits.blogs.nytimes.com/2009/03/30/microsoft-encarta-dies-after-long-battle-with-wikipedia.

The organization grew into a unique business. Similar to an encyclopedia, the variable costs were low while the fixed costs were high.[62] However, the *level* of those costs supported a very different price point for the end product because the low price point supported high volumes. The cost of materials for the CD and packaging was quite low, sometimes $5 a box. The fixed expenses arose from editorial staff, programmers, and additional staff needed to update the content, as well as to tailor the product to different languages and countries.[63] Much like in traditional encyclopedia businesses, therefore, the business strategy became oriented toward generating sufficient sales volume to support revenue that covered the fixed costs of the operation—again, with one key difference, the unit volumes were in the millions instead of the low hundreds of thousands.

The technical needs of Encarta shaped personnel hiring practices, and made these distinct from the hiring of editors at *Britannica*. Once again, the endogeneity of technical capabilities played a role. Many encyclopedia editors had learned habits and processes that did not translate well into the PC setting. They had learned to *edit to fit,* that is, edit the text to fit into proscribed length (regarded as non-value-added work in the quote below). While Encarta faced constraints fitting its multimedia content—photos and videos—on a CD-ROM, it faced a very different set of editorial trade-offs. As explained by Corddry,

> "The senior editors at [print encyclopedias] estimated that at least half of the total editorial effort was devoted to this sort of non-value-adding work. At Encarta, by contrast, nearly all the editorial work added value—writing new articles, updating, expanding and improving existing articles, and, of course, adding the sorts of elements that computers could support that were truly valuable: the sound of a bassoon, the way gravity works in orbital models, and so forth."[64]

Bartholomew and Corddry sought editors possessing skills consistent with the differentiating factors behind Encarta. Bartholomew and Corddry aspired to hire employees with skills in creative editing. That facilitated new thinking about adding topics and material

[62] Shapiro and Varian (1999) stress this aspect of the business, stating, "The first copy of information is costly to produce but cheap to reproduce"(p 20-21). They further assert that the dominant component of *Britannica's* fixed costs are sunk, and the variable costs face few capacity limits, so marginal costs generally do not increase with volume (p 21).

[63] At its peak, Encarta would employ 225 regular employees. Craig Bartholomew, discussion, July 18, 2009.

[64] Comments by Tom Corddry, http://bits.blogs.nytimes.com/2009/03/30/microsoft-encarta-dies-after-long-battle-with-wikipedia.

that had never before been added to an encyclopedia, such as pieces of pop culture and any other material that would be attractive to users.[65]

## Interpreting events in light of theories

It is useful to step back and assess once again. It should be readily apparent that *Britannica* was not a monolithic company, but one with distinct divisions, each of which contained different points of view, and who conflicted with each other. The company's management did invest and develop some frontier technical skills. Its skunk works successfully developed a CD-ROM for Compton's at an early moment, before almost any other participant in the industry. It also did develop an online presentation of its flagship product, again at a very early moment in the development of such format. More to the point, both of these are laudable technical achievements, and in spite of them, the organization had a difficult commercial experience.

Most actions do not fit the standard model of myopic managerial decision making. While it is not possible to gain records into what management believed, their actions, complemented with interview, provide sufficient evidence to reject simplistic assessments. For instance, there was no period of time in which the entrant served a differentiated customer that *Britannica* ignored, nor was there a period of time that Britannica did not work on its product while Microsoft grew and improved Encarta. There also was no myopia at *Britannica* about which customers the entrant and new product was trying to serve or about the threat posed by the CD-ROM in the near term. It is simply impossible to sustain a view that the key executives maintained beliefs about its customers that later turned out to be false.

Rather, actions reveal that tolerance for commercial risk differed at the two firms, and so did the orientation towards launching a product for the new commercial opportunity. Microsoft canceled the project, then relaunched the product with a different strategy, and after its first fail, it learned from its experience. That shows a tolerance for risk, albeit not an infinite tolerance, as illustrated by the unwillingness to devote more than a four people to the project initially. Then Microsoft found a successful formula and built on it, immediately gaining prominence in the market by selling large volumes. There also was tolerance for some risks at *Britannica*. Its Advanced Technology Group also launched and learned, but with one key difference. Britannica's management trimmed the set of actions it took during commercialization, trying to avoid exploring commercial actions that raised conflicts with the

[65] Craig Bartholomew, discussion, July 18, 2009.

division of its own profitable product. That demonstrates an unwillingness to tolerate risking current (and sometimes profitable) operations to the needs of a new product.

As discussed, *Britannica*'s team conceived of the product design in terms that did not lead it to explore what became Microsoft's successful design. The importance of that conceptual difference is only apparent in retrospect, and at the outset even Microsoft's executives did not perceive it. They too sought partnerships with the leading encyclopedias and conceived of their differentiation strategy only after making a deal with one that was perceived to be of lower quality. At that point the different motivations of the two organizations played a key role, motivating different risk-taking commercialization behavior and different strategies for exploring new designs and new pricing models.

What about the role of inherited technical prowess? Both *Britannica* and Microsoft developed the ability to embed sound and video. Microsoft put that skill into the service of exploring a product that was not highest in quality, just as *Britannica* had done with Compton's.

And, yet, events do suggest unique technical prowess eventually helped Microsoft launch its product. How should this be interpreted? Overall, this is best thought of as an endogenous response to the needs of Microsoft's commercialization strategy, not an inherited capability. As the narrative showed, what mattered was the difference in strategic priorities for the use of that technical skill. Microsoft oriented its efforts toward developing a pull-through product for PCs, and that did play a role in in the design and launch of the product. Microsoft focused on using multi-media to demonstrate the product to buyers in third-party outlets. Those priorities also led Microsoft to a lower price more readily than *Britannica* did for Compton's (or for a CD-ROM with the flagship content, as discussed below). Another difference became salient in personnel decisions once Microsoft began scaling production at Encarta.

Where does this discussion leave us? Rather than stressing inherited technical (in)abilities, the analysis has drawn a sharp conceptual distinction between exploration during *invention* and *commercialization*. Microsoft invested in technologies, to be sure, but the salient differences with *Britannica* did not arise with the technical skills of its talent, who did not appreciably differ in core inventing skills from those at *Britannica.* Instead, note how Microsoft took risks to further its commercial aims, commercializing their product to help the company's other businesses, and requiring invention to be consistent with the commercial approach. Also notice that the conflicts inside *Britannica* did not deter it from investing in *inventing* new media, but it did prevent them from taking risks with its flagship product, and it did lead to difficulties integrating the results from its inventive skunk works as it tried to commercialize the inventions. It led to a distribution strategy designed to fit internal demands of another line of business. Rather, that inadequate response is consistent with organizational diseconomies of scope imposing costs on the new product during commercialization.

We have reviewed the inherited perceptions and technical abilities at *Britannica,* and concluded that inadequacies and shortcoming of both do not provide satisfactory explanation for the organization's decline. The narrative turns to the events after the launch of Encarta, and shows how diseconomies of scope provides a more satisfactory explanation for events.

## Competitive Crisis

*Britannica*'s growth had flattened during the recession of 1991 and 1992. Encarta turned that flattening into a dive. The entire *Encyclopædia Britannica* could not fit on one CD-ROM, but a moderately modified set of entries could.[66] In 1994, as sales at *Britannica* declined, executives finally decided to release a CD-ROM version of the *Encyclopædia Britannica.*

This action highlights an important internal conflict. It shows an increasing tolerance for risk at the editorial side of the firm. However, *Britannica* sales force balked, and in ways that limited how the firm executed the launch. To say it succinctly, organizational diseconomies of scope played a role in the pricing and distribution.

The resistance of the sale force was understandable. The CD-ROM version could not possibly generate the sales commission levels that the print version could, so the sales force would dislike it in any format. What was the point of releasing a product the sales force would not sell enthusiastically? The sales force still supported a profitable product and the biggest advantage *Britannica* had over its competitors.

Management also faced an issue with the attitude of its sales force, who had been taught to foster *Encyclopædia Britannica's* reputation for achieving the highest quality. Encarta used text from Funk & Wagnall's, which everyone in the industry believed was less authoritative. Many doubted that Encarta had anything to do with the decline in sales. An attitude that had been a strength for the sales force now made it hesitant to see the urgency of pushing a CD offering *Britannica.* Stated simply, an attribute fostered for the old product became a hindrance when it was shared with the new.

Here, as elsewhere, management faced two costly choices: make investments to dramatically change attributes for the existing organization, or make investments consistent with the organization supporting the established product, which imposes costs on the new. This is the essence of the choice of an executive facing organizational diseconomies of scope. Interpreted through this lens, in retrospect it is apparent that management faced no good option. By this point, it would not have been possible to maintain the illusion that sales for the old product could still grow.

[66] Evans and Wurster, 2000, 2.

Once again, however, consistency with the old won out over the needs of the new. The management of *Britannica* adopted a policy whose ineffectiveness should not come as a surprise with the benefit of hindsight. It decided to gain the full cooperation of their sales force by releasing the *Encyclopædia Britannica* CD-ROM as a free add-on to the print version. If potential buyers wanted the CD-ROM on its own, they could purchase it for a mere $1,200.[67]

After a short trial, it was clear that this plan would not gain any market traction, and executives reconsidered. *Britannica* dropped the price of the CD-ROM to $995 in 1995 and to $200 in 1996. By then, however, it had become too late: Microsoft had now hired a large team of editors and was rapidly improving the content.[68] It was one step ahead of others in the multimedia encyclopedia market and had begun segmenting the market with standard (inexpensive) and deluxe (on two CDs) editions. Later, it would also offer a reference library.

The pricing of *Britannica's* CD in 1995 deservers some scrutiny, as it could be interpreted as evidence that the management did not properly perceive the market situation. To assess whether these were pricing decisions emerging from a rational calculation, the decisive question is whether *Britannica* had any better alternative, which management missed. Even with the benefit of hindsight, this is a challenging question, because sales had declined but not dropped to nothing. In other words, selling *Britannica's* books were still generating positive variable profits, albeit, the level of sales could support only a smaller sales force.

To illustrate the issues, consider lowering the price of *Britannica's* CD-ROM to, say, $100. Under what circumstances would that have yielded a better outcome? For this illustration, presume it was sold through third party retailers, and presume the margin on such a product to be as high as $90 or more. Such a low price would have had two direct effects. Encarta already was taking sales from *Britannica's* books, so a low price for *Britannica's* CD-ROM would have taken away some Encarta sales, which is the intended effect, and, necessarily, it would have taken away more Britannica book sales, which is an undesirable effect. In other words, lowering the price set up a trade-off of one profitable product for another. *Britannica* would have had to sell many CDs to make up for every book sale it took away, arguably, seven or eight CDs for every book they used to sell.[69] While this was within the realm of plausible, in the face of competition from Encarta, this would have been a difficult goal to reach.[70]

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[67] Melcher, 1997.

[68] Craig Bartholomew, discussion, July 18, 2009.

[69] Because books were priced at $1500, and the cost of production was $250, and sales margins were between $500 and $600, headquarters received between $650 and $750 on every book sale. At a $90 margin, then seven books would yield $630 and eight would yield $720.

[70] A back of the envelope calculation shows why this was a challenging bar to meet. For the sake of illustration, consider if Britannica lost all fifty thousand book sales due to the one million copies of Encarta sold. That suggested a substitution of (1,000,000/50,000) twenty CDs for every book. If Encarta and *Britannica* split those evenly, then

The above strategic alternative has another implicit organizational cost. It would have generated defections among the sales force, as it pits the new division of Britannica in direct competition with the old. Defections would have hastened the abandonment of door-to-door sales altogether, potentially taking even more book sales with the exit of employees. More to the point, this was a risky path for management, because once the sales force left it became very costly to reassemble from scratch. Irreversibility damaging the most valuable asset of the organization, and reducing its distributional advantages, was a very big risk.

In summary, it is not surprising management hesitated to go down an alternative path that would have led it to reduce its profitable old division sooner. Instead, it chose to minimize the costs of organizational scope diseconomies in the short run, which imposed a cost on its efforts in the new market. It is not hard to see why this could have appeared to be the best of a set of bad options, at least at first, before experience demonstrated its futility.

This discussion about pricing also highlights one of the key features of the circumstances. Whether oriented towards the old or the new market, all circumstances were less profitable for *Britannica's* management than those it had enjoyed only a few years earlier. In all directions it faced a set of bad options in which it had to reorganize the sale and distribution of its books. Even a marginal change in this organization potentially altered the relational contract between employees and executives – i.e., questioned a series of understandings about how the operation worked. In this sense it is an analytical error to blithely observe that the costs of books were fixed and sunk, as a static economic analysis might do, and presume that this is the only relevant factors in decision making.[71] The variable costs of distributional assets were high, and any change potentially made these variable costs higher.

Another potential illustration of scope diseconomies arose in the online market, and this example offers an important contrast. Conflict played a much smaller role, and, accordingly, the team faced fewer problems meeting market needs, just as would be expected of a managerial team deploying technology to meet a new market opportunity. In this new online market, the first releases of the product aimed at libraries, both in universities and businesses. The product created little conflict with the existing lines of business, and so created little internal conflict.[72]

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*Britannica* could expect to sell ten CDs for every book it failed to sell. If *Britannica* was the least bit pessimistic, since it did not match Encarta's use of multi-media, then a smaller ratio was possible and likely. Hence, it was easy to conclude that lowering the price to $99 would not yield sufficient CD sales to make up for the losses in books.

[71] This is the sense in which the discussion in Shapiro and Varian (1999), page 20-21, is incomplete. For example, Shapiro and Varian do not analyze how the costs of developing and distributing each distinct format for *Britannica* – on books, on CD ROMs, and online – shape the cost of designing and distributing the other. In short, they do not consider (dis)economies of scope.

[72] Libraries were a mature market for the books. Many libraries already had encyclopedias, and they were unlikely to be repeat customers. Libraries without encyclopedias – and there were many – usually did not have the budget for a full set of books, and that situation was unlikely to change.

Accordingly, the experience with the online *Britannica* went well on many levels. Initially the online site aimed at institutions that were previous *Britannica* subscribers, such as libraries at universities. The release in September 1994 was an immediate success, and even generated more sales from previous non-subscribers at universities that heard about the service. In short, these events illustrate that *Britannica* was capable of producing and distributing a new product at the frontier of digital technology when it was consistent with existing lines of business.

Unfortunately for *Britannica*'s future, in the fall of 1995 *Britannica Online* was made available to individual subscribers, but the outcome – in terms of total revenue – never matched the company's high hopes. There was little home demand for the online product, and it did not act as a pull-product for home Internet access. Like many others who entered the commercial web with name brands and well-made plans, *Britannica* became one of many firms who failed to generate a large volume of subscription home service for its product. Altogether, the total revenues from sales to institutions never became large in comparison to home sales, and the success within this market segment did not approach levels of revenue compensating for the decline in home book sales.

In retrospect, it is easy to take pity on those at the Advanced Technology Group. Almost from its formal founding, the team at the Advanced Technology Group forecast the growth of the Internet and the Web and made ambitious plans for improvements. After its success in the Fall of 1994, the group sketched an ambitious plan for evolving the online site. These involved advances in the search capability, organization of information, and updating of articles in response to news events, among many other technical and functional improvements. As it turned out, most of these were not realized in part due to *Britannica*'s growing financial difficulties.

Though the members of this group anticipated the future, and had developed leading prototypes for it, they had the misfortune to be affiliated with an organization whose core funding base eroded rapidly. They never got to implement their aspirations. When a strategy finally did emerge much later, it lay in a different direction than those devised by the Advanced Technology Group.[73]

By 1995, sales at *Britannica* was well on its way to falling by 50% from its peak in 1990 (see Table 1),[74] and its lenders expressed an unwillingness to finance the organization with more working capital.[75] The unusual ownership arrangement for Britannica also played a role at

[73] The story of the path not taken is told by Robert McHenry, "The Building of *Britannica* Online," http://www.howtoknow.com/BOL7.html, http://www.howtoknow.com/BOL8.html, and http://www.howtoknow.com/BOL9.html (accessed July 26, 2006).
[74] *Britannica's* sales had already plunged to 51,000 in 1994, more than half of their peak in 1990. Landler (1995).
[75] The company lost $4.6 million in 1992, $15m in 1993, and $2.8m in 1994 (on revenue of $453m). Landler (1995).

this stage. William Benton, its powerful and former owner, had set up full ownership for *Britannica* as part of the William Benton Foundation. The sole beneficiary of the foundation was the University of Chicago, which willingly accepted the donations when times were good, but did not want to invest further in the unprofitable organization as it encountered these troubles.[76]

When *Britannica* went up for sale, Microsoft was invited to consider making an offer, but declined.[77] It took more than a year to find a buyer, and *Britannica* eventually was sold for $135 million in 1996. To an observer who had not watched the buildup to this point, this was a shockingly low value for an organization that had been profitable five years earlier.

## Diseconomies of scope in retrospect

For market drama, there were few launches as successful as Encarta's in the fall of 1993 and throughout 1994, a sudden success that gives it an air of inevitability in retrospect. Popular reports at the time fostered a misleading conclusion by omitting any but contemporary detail. Reporters even omitted the most recent history. Had they done so, they could have informed readers about the pervasive uncertainty within Microsoft prior to the eventually successful project, the altering of strategy in response to learning, and the endogenous determination of Encarta's key attributes in response to the competitive position of the firms. Instead, many of these aspects remained hidden to the general public until Stross (1996) described some of them. An additional set of details – such as Encarta's technical struggles, and its first failed launch – have never been disclosed until this narrative.[78]

Analysis with the benefit of hindsight should not follow the errors and omissions of contemporary reporters. Moreover, it is intellectually lazy to simply assume that Microsoft's success arose due to inadequate actions at *Britannica*. That assumes *Britannica's* actions caused Microsoft's success, which provides an excuse for not look deeper into the facts of the situation. It leads down a misleading path.

Popular portrayals also omit organizational diseconomies of scope at *Britannica*. Such organizational diseconomies made the firm vulnerable for a more decisive entrant that was better aligned to the market. *Britannica* could not avoid these issues because the organization

[76] As part of this arrangement, employees at *Britannica* had complete access to the University of Chicago library system. Over time the donations accumulated, and *Britannica* became one of the largest total donors to the university. The University received $125 million in donations from this arrangement. See Landler (1995).
[77] Craig Bartholomew, discussion, July 18, 2009.
[78] Special thanks goes to Craig Bartholomew, who shared many of his observations.

*necessarily* shared assets across all its market activities. These assets were well-suited to book publishing and door-to-door sales, but were not well-suited to the new market without modification. Conceived broadly, the firm's assets suited the old and not the new, and included such assets as the firm's reputation and branding with users and business partners, its relational contracts with its own employees or others in their established distributional channel, and also the tone and substance of the content of the firm's product.

Stated simply, the established business imposed extra costs on developing the CD-ROM encyclopedia. It led *Britannica*'s management to commercialize it in a way that altered the new business to suit the established one. Even though managing the challenges was already difficult, the organization added the cost of coordinating its actions with a profitable division in the rest of the firm. Although this approach was not doomed to failure, it did make decline in sales more likely if the marketplace did not value the benefits of increased coordination, which is what happened. Said succinctly, despite inheriting many seemingly valuable assets from the existing organization, coordinating the new with the old – while preserving the aspects of the assets that supported the old – put *Britannica* at a disadvantage in the new.

Informed of this broader context, it would be impossible to explain *Britannica*'s actions without understanding the role such diseconomies played. Those diseconomies arose because all businesses within *Britannica* shared several assets. *Britannica's* organization contained skills that were appropriate for its leading position, so it developed new capabilities for the new product away from the old, in a skunk works. Meanwhile, the company maintained a compensation system with its full-time employees on its most profitable product line, and the management tried to work with that system instead of altering it.

The study also illustrates that technical achievement, by itself, is often not sufficient for success in a new market place. In this case, *Britannica's* skunk works could have been valuable if there had been sufficient time to integrate the online content back into the product line of the parent company. As it turned out, Encarta grew so quickly that it made it impossible for *Britannica* to integrate the old with the new in a single organization. Would *Encyclopædia Britannica* have succeeded at selling its online product to households had Encarta not come along? There is no way to know.

This analysis yields one other insight. Focusing on diseconomies of scope generates an explanation for why *Britannica* lost half its sales, which starts in 1993 with Encarta's entry. Armed with this explanation, it is also possible to understand how other portrayals err by highlighting later events, by which point the key events have already occurred.

Evans and Wurster (2000), for example, start with a premise – about technical inability and misperception – that takes them down a misleading path of analysis. Later in their analysis,

it is not surprising they state that lower distribution costs for information can destroy value by accident, which is true as a general statement. Then the authors become specific and state that events in Encyclopedias can be viewed "as a casual byproduct of promotion economics in the computer industry" (p 138). Once again, this statement is very misleading. Encarta (eventually) did become included in PC sales as a promotional item, but this practice became common after the largest decline in *Britannica's* sales, suggesting it was not the key factor in *Britannica's* decline.

Shapiro and Varian (1999) also focus on later events, and as a result, develop an incomplete explanation. They characterize *Britannica's* pricing of subscription services and CD-ROMs in 1995 and 1996 (p 20).[79] They use prices at Microsoft's Encarta to illustrate how Microsoft bet on its distribution skills, marketing expertise, and channel control (p 27-28). These observations accurately portray challenging pricing issues from 1995 to 1996 (when Encarta was priced somewhere between $49.95 and $99.00[80], and when *Britannica's* online and CD-ROM pricing were under severe downward pressure). Though this is accurate, their discussion is quiet about *Britannica's* earlier experience, and does not explain why *Britannica* already had lost half of its sales by 1995. In this sense, it overlooks a large number of crucial earlier decisions that created the experience of 1995.

# Epilogue

It is worthwhile to examine a few select events outside the window of the narrative. These later events illustrate and reinforce the main point about the role of diseconomies of scope. These cover both Encarta and *Britannica.*

After 1995, and almost in concert, as *Britannica*'s troubles multiplied, Encarta thrived. Encarta's line of business grew into a large international operation during the next few years, supporting multiple languages in a global production and distribution chain. Eventually, more than half of Encarta's sales came from outside the United States.[81] Microsoft also quickly

[79] They argue that *Britannica's* experience illustrates several lessons: Pricing strategies should reflect the lower creation and distribution costs of digital versions of information (p 30); *Britannica* attempted to differentiate from rivals, based on high quality content (p 26); Personalized pricing of information is a smart approach (p 40); High quality high price goods do not always compete effectively against low quality low price (p 50); It can be futile to engage in "survival pricing," namely, cutting price to spur sales when a firm already is on the losing end of a direct fight with another rival (p 288).

[80] Shapiro and Varian quote a price of $49.95, and Landler (1995) states that Encarta was available for $99. The latter was the official price, and also the price for the second version of Encarta in the fall of 1993. Discussion with Craig Bartholomew, July 18, 2009.

[81] Craig Bartholomew, discussion, July 18, 2009.

expanded it range of offerings of multi-media software products. These pull-products became organized under the umbrella of Microsoft Home, encompassing a range of titles in reference, entertainment, education (for kids), and productivity home software.

Encarta enjoyed prosperity for many years. Eventually the Internet and its abundance of information induced changes in Encarta's model. Microsoft developed a hybrid version that allowed users to update the encyclopedia's contents monthly by downloading content through the Internet. Eventually, the whole product went online. Ironically, many of Encarta's actions mirrored the type of plans *Britannica's* Advanced Technology Group had outlined, when it had anticipated a more prosperous future for its online offering.

While there had been benefits to developing the new product inside of Microsoft, it eventually became a burden for Encarta. The PC distribution channel increasingly moved to a direct sale to consumers. Encarta became part of a standard purchase of an original equipment manufacturer, which helped increase sales volumes but placed pressure on pricing.[82] Moreover, while it was a popular site for many years, Encarta did not generate a large amount of advertising revenue for Microsoft in its online format. In time, Encarta lost its leading place among online reference sites to Wikipedia, and many other sources on the Web. In 2009 Microsoft discontinued the product and online site, and the entire division was shuttered. At that point Craig Bartholomew left Microsoft.

Finally, in one last irony for Microsoft, only a few years after Encarta's entry, it found itself on the receiving end of an unexpected entry into its home market. Organizational diseconomies of scope between the old (operating systems and applications) and the new (Internet browsers and applications) played a major role in Microsoft's behavior during the browser wars and during its aftermath. Once it became an established firm, Microsoft could not escape the very factors that it had exploited as entrant.[83]

This is more than just an irony. It illustrates a generality: organizational diseconomies of scope arises from the combination of (a) an established firm's competitive position and (b) the interaction of the features of its necessarily shared assets with the new potential market.

Meanwhile, despite losing half its sales in half a decade and another major fraction after selling to a new owner, *Encyclopædia Britannica* did not declare bankruptcy, nor disappear. The new owner took over, and in a bid to free the new strategic direction from the constraints of

[82] Craig Bartholomew, discussion, July 18, 2009.
[83] These events are covered extensively in Bresnahan, Greenstein, and Henderson, 2012.

the old organization, the new owner quickly let go of most of the door-to-door sales force. As expected, this reduced sales further (by more than 80% of sales at peak[84]).

The new directions pursued by *Britannica*'s new owners never made much additional revenue, suggesting the cautionary approach of prior management had had its merits. Nonetheless, the organization continued to operate: Its book sales stayed at a fraction of their prior peak, and both Compton's and *Encyclopædia Britannica* continued to be viable businesses, even in printed form. By 2012, revenues were 10% of its former peak.

The reason for continuing to sell books with a skeleton sales force is exactly as Shapiro and Varian's analysis would predict: The cost of maintaining and updating an already existing set of text is small. *Britannica* could cover these types of costs with a small volume of sales.

Eventually book revenue dipped too low. On March 13, 2012, *Britannica* announced it would cease publishing its encyclopedia in book format, ending production after 244 continuous years, and henceforth make its services available only in digital format.[85] Yet again, contemporary observers attributed the decline to the inexorable rise of the Internet, and the popularity of Wikipedia. At the same time, *Britannica* did not close altogether: Even today *Britannica* continues supporting digital formats for its content, licensing its online product, as well as selling a CD-ROM.

The contrasting fates of Encarta after 2009 and *Britannica*'s after 2012 shed some light on their earlier circumstances. It shows that the causes of decline at low volumes are distinct from those at high volumes of sales. It also shows that the business calculations about whether to go forward also differ at high and low volumes of sales.

Perhaps a little more philosophically, events in 2012, like those twenty years earlier, illustrate how most managers do the best they can with what they have at their doorstep – and that does not stop merely because unenviable circumstances visit their business. Sometimes that is enough, and sometimes not, even when managers have foreseen the potential for difficulties, and have had a full array of technical tools at their disposal. Moreover, excellent foresight and frontier technical capabilities may not be sufficient to overcome the challenges posed by diseconomies of scope, which can interfere with executing a coherent strategy at moments when decisive market-oriented actions are most required.

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[84] Melcher, 1997.

[85] See the company's announcement, at http://www.*Britannica*.com/blogs/2012/03/change/, accessed May, 2014, or Bosman (2012). Online licensing accounted for 15% of revenue and educational curriculum accounted for most of the other 85%, with books accounting for less than 1% of revenue for the organization.

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**Table 1:** Encyclopædia *Britannica* Revenue and Sales

| Year | Annual Revenue ($ in millions) | Hard Copy Encyclopædia Sales |
|---|---|---|
| 1990 | 650 | 117,000 |
| 1991 | 650 | |
| 1992 | 586 | |
| 1993 | 540 | |
| 1994 | 453 | 51,000 |
| 1995 | 400 | |
| 1996 | 325 | |

*Source:* Landler, 1995; Melcher, 1997; *Hoovers Online*, Encyclopædia *Britannica* (accessed July 2006).

## **Exhibit 1:** Talking Points from the Sales Promotion Department, 1983

### ENCYCLOPÆDIA *BRITANNICA* VS. THE COMPUTER

One of the questions we are most frequently asked, by both our own people and outsiders, is "When will *Britannica* be available on a computer?" The answer we give is "Not for a long time." Here's why:

1. In spite of the many rapid technological advances in the field of home computers, none of the popular models available now have a large enough memory to store all of *Britannica*. We did a calculation recently that showed that we would need 100–200 floppy disks just to hold our Index.
2. You could put the encyclopedia on a large mainframe computer and allow the home computer user to access it via telephone. This is very expensive. In addition, most systems of this sort that are available today are very cumbersome and difficult to use. They are "menu-driven" and are tricky to manipulate. It is easy to lose your place. You need to know a great deal about the specific system in order to be able to use it. A book is a lot easier to use and is more cost effective at this time.
3. Because of limitations of the screen, you can read only a few words at a time on each screen. Trying to read an article is difficult and disjointed.
4. The main reason most people give for wanting a computerized encyclopedia is to be able to find things quickly. A computer does, indeed, search and sort information very well. But most systems available today use the "key word" search. For example, if you want to look up "orange," you will get back a listing of every place the word appears, whether or not it is a significant entry, and regardless of whether it refers to the color orange; Orange County, California; the fruit; or William of Orange. It is then your responsibility to determine which, if any of these, refers to the item you are seeking.
5. *Britannica* has already done all that work for you. Our indexers have read every article, analyzed what they read, and have determined exactly which entries should be in the Index. They have separated the colors from the fruits, etc., and have grouped the references accordingly. They have eliminated trivial references, so that when you follow an entry you can be sure you'll find a piece of relevant and significant information.
6. The technology to provide this kind of Index in the home today is too expensive. Until new ways are developed, we can provide a better, easier-to-use encyclopedia in printed form than in any computerized version. We will not change our delivery method from the printed page to the electronic form until we are sure that it is the most efficient way for our readers to receive it.

*Source:* Robert McHenry, "The Building of *Britannica* Online," http://www.howtoknow.com/BOL1.html (accessed July 26, 2009).