

## DIGITAL HYBRIDS

A “Thought-Piece” in the Corporate Innovation Series from  
The Farrell Center for Corporate Innovation and Entrepreneurship<sup>+</sup> with  
The Center for Digital Transformation<sup>++</sup>  
Smeal College of Business, Penn State University

Dr. John M. Jordan, Director<sup>++</sup>  
Dr. Anthony C. Warren, Director<sup>+</sup>

**Introduction.** This paper follows on from the themes developed in an earlier white paper in this series entitled: “**Adding Services to Products – An Innovation Challenge**”<sup>1</sup>. Here we explore more specifically the complex role that a proprietary digital platform can play in the design and implementation of novel and sustainable business models – we refer to these generally as “digital hybrids”. We begin with a well-known, perhaps over-analyzed, yet nevertheless illustrative case before exploring possible opportunities in B2B markets.

**Apple's iPod Platform.** The iPod platform blends products and services in an unprecedented way. Originally released in April, 2003, the fifth-generation iPod has transcended its hardware category - MP3 player - and become a highly profitable element of a three-legged platform. In addition to the hardware, Apple offers content in the form of downloadable music and video files for which users pay 99 cents and up, depending on any particular licensing arrangement. These transactions are conducted via Apple's virtual iTunes Music Store, launched concurrently. The final leg of the platform consists of interlinked software for managing the device, its relationship to a host computer, and the user's rights to purchased content.

Successful commercial management of this complex platform requires that Apple must execute well in several respects. First, Apple's *continuous* innovation has led rather than followed both its competitors and its user community; new products/services are launched before old ones get tired. Second, product releases (and shutdowns) are precisely performed; old models are removed from channels quickly rather than showing up at reduced prices, and new models are usually available in ample supply. Third, Apple manages its suppliers expertly, negotiating not only the rights to an extensive music catalog but locking up a large percentage of the market for various components; in mid-2005 Apple reportedly bought 40% of Samsung's total output of flash memory, which both cut supply and raised prices for competitors. That deal later came under investigation, so Apple prepaid \$1.25 billion for future purchases of flash memory from five suppliers in late 2005. Such long-term planning translates into lower component prices and therefore higher margins at the same time that it avoids product shortages.

The iPod's success has produced impressive numbers. In less than three years, over a billion songs had been downloaded from the iTunes Music Store; a billion were sold in

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<sup>1</sup> This paper is available at [www.smeal.psu.edu/fcfe](http://www.smeal.psu.edu/fcfe)

2006 alone. After 21 million iPods were sold in the fourth quarter of 2006, the installed base is approaching 100 million units. Another way of valuing the platform derives from market capitalization. At the end of calendar 2002 and thus about a fiscal quarter before the hybrid's launch, Apple stock sold at a split-adjusted price of just over \$7 a share. By January 13, 2006, Apple's share price had peaked at \$85.59. With over 800 million shares outstanding, the iPod era coincided with a growth in market capitalization of approximately \$60 billion. For a brief time, Apple as a company was more valuable than Dell even though the former reported about three times Apple's revenues for 2005.

The iPod platform breaks many of the standard business concepts in managing products and services. Conventional literature analyzing the computer industry asserts that hardware components and software elements define a platform. A typical discussion states that "Computer systems are comprised of many components. . . ." The contours of these products – what is included or excluded from the bundle of components – are determined by business and design decisions.<sup>1</sup> Little attention has been paid to *services* as an element of a platform strategy, however.<sup>2</sup> Accordingly, numerous case studies of the iPod fail to note the powerful complementarity between product and service, as opposed to "hard" product plus software product.

By contrast, Apple's downloadable songs are functionally nearly<sup>3</sup> equivalent to the files pressed on music CDs, but as a service they have important distinctions which make them fail the usual product definition and perform more like a service. For example:

- They are not held in inventory.
- They are intangible in that there is no physical medium of exchange.
- They can be moved to the point of purchase almost anywhere in the world in seconds.

A further factor driving iPod's success is the creation of a content-distribution platform for non-music material. Anyone with a microphone and PC can enter a communications market formerly built by capital-intensive broadcasters. Talking books and later audio broadcasts created with mobile, time-shifted listening in mind – "podcasts" – help fill the devices and thus spur more demand. It's difficult to view a podcast, whether professional or otherwise, as anything but a service, but once again it's neither perishable nor inseparable. As for heterogeneity, the wide variety of topics and perspectives is not a shortcoming with regard to traditional broadcast media, but their complement.<sup>4</sup> For all these emergent signs of market robustness, however, little experience or theory explains such a model of customer participation in a technology platform.

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<sup>1</sup> An important exception can be found in Michael Cusumano, Steve Kahl, and Fernando Suarez, "Product, Process, and Service: A New Industry Lifecycle Model," Center for eBusiness at MIT, working paper 228.

<sup>2</sup> For a similar argument, see K. Douglas Hoffman, "Marketing + MIS + E-service," *Communications of the ACM*, June 2003, Volume 46 Number 6, p. 54-5.

<sup>3</sup> The downloads are searchable and more portable; CDs are not compressed in the same way so the larger files translate to higher audio quality.

<sup>4</sup> For an excellent overview of podcasts, blogs, et al., see "Among the Audience: A Survey of New Media", *The Economist*, April 22, 2006.

As we discussed in the earlier paper, the four traditional shortcomings of services relative to products, namely inseparability, heterogeneity, perishability, and intangibility are often seen as disadvantages. However, in the iPod digital hybrid case these constitute points of *advantage* rather than a liability.

Standard notions of complementarity that have applied to product scenarios fail to explain a digital hybrids' value. Apple makes its profit on the devices rather than the song downloads. The standard business model, from the days of King Gillette to HP's inkjet printers, of selling devices near cost to make annuity profits on replenishment supplies, the so-called razor/razor blade model, does not fit in this instance. Neither does the iPod appear to fit notions of servicization as exhibited by the transition of aircraft engine transaction structures or other linkages of physical products and services.<sup>1</sup>

Even given all of these advantages, the digital hybrid model raises questions. In such a complicated set of relationships (among hardware manufacturers, users, performers, content companies, and network carriers for starters), a change in any party's role could change the balance of competitive advantage. A given firm's ability to maintain such a broad, delicate network over time cannot be assumed. Proprietary barriers to entry could fall, either to government anti-trust pressure or to technology innovation. Finally, the competitive environment will continue to evolve. Apple has sold over 90 million iPods, which is a huge number of units in the computer industry. The consumer electronics world, however, operates at a different scale: Nokia alone sold about 88 million cell phone handsets in the fourth quarter of 2006. For Apple to compete with Dell and Microsoft is one thing; confronting Samsung, Motorola, Vodaphone, and other global giants in a what is rapidly becoming a mature market will require more resources and new capabilities.

**“Conventional” Hybrids.** Hybrid business models, in which products are combined with services are not new<sup>1</sup>. GM builds cars and trucks but makes most of its profit on the leasing and financing of those vehicles. Something as basic as office furniture can be structured into complex financial instruments such as leasebacks as customers seek to exploit interest rates, tax treatment, or a line of credit. GE, another hybrid company, has responded to customer demand by selling not only jet engines but, in essence, thrust as a service<sup>2</sup>. Defense ministries and departments in multiple nations are contracting for capabilities rather than assets in their new procurement programs. As a result, both the product purchase and leasing models are being eclipsed in some markets by performance criteria that include parts, maintenance, and other ancillary duties.

So-called servicization typically connects material assets to existing activities such as

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<sup>1</sup> A widely cited treatment of non-digital service offerings built to address a product market is Rogelio Oliva and Robert Kallenberg, “Managing the Transition from Products to Services”, *International Journal of Service Industry Management*, 2003, Volume 14 Number 2, pp. 160-172.

<sup>2</sup> See for example C. I. V. Kerr and P. C. Ivey, “A Strategic Review of the Large Civil Aeroengine Market and the Paradigm Shift to a Service”, *The Aeronautical Journal*, Volume 105 Number 1047, May 2001, pp. 287-293. A more general discussion can be found in Andrew Davies, Tim Brady, and Michael Hobday, “Charting a Path Toward Integrated Solutions”, *Sloan Management Review*, Spring 2006, pp. 39-48.

replenishment, maintenance, spare parts provision, or financing. Automobile leasing, which in the U.S. accounts for about a fifth of the overall market but over 40% of transactions in luxury brands, has yet to substantially alter automakers' perception of themselves as producers of cars. If GE did not manufacture suitably advanced and high-performing jet engines, the services bundles would be largely irrelevant. The hybridization of manufacturing and maintenance, repair, and financing, then, joins a conventional product with traditional physically and temporally delimited services. However, the iPod model, takes hybridization to a new level by blurring the lines between product and service and even redefining the conventional attributes of service - inseparability, heterogeneity, perishability, and intangibility. We question therefore, whether digital hybrid environments may challenge our conventional views of products and services, and in so doing, support truly unique business models that will disrupt existing markets.

**“The Long Tail”.** *Virtualization of inventory* facilitates one of digital commerce’s most striking characteristics, what *Wired* magazine editor Chris Anderson has called “the long tail.”

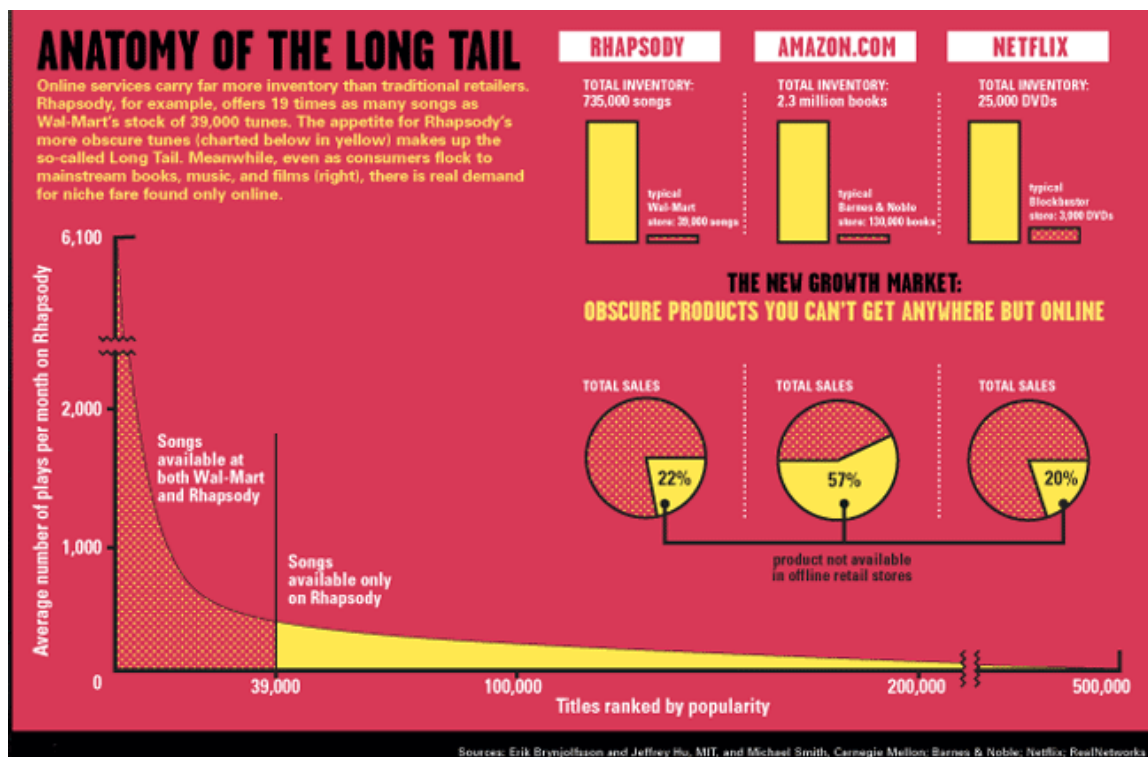


Figure 1: In contrast to bestselling books, hit songs, or blockbuster movies on the left side of the power law distribution, many titles, songs, and movies each attract a small following. Physical channels cannot economically supply small numbers of units to widely distributed audiences, but digital networks are effective in doing so. (source: *Wired* magazine).

Anderson’s insight was to watch buying behavior in stores with virtual inventory. Rather than 80% of purchases being represented by 20% of the inventory, he found that content in the long tail of the distribution, the onesies and twosies, can make online retailers such

as Amazon and eBay profitable (see figure 1). More than half of Amazon's book sales, for example, come from outside its top 130,000 sellers, which is what a typical big-box bookstore can carry.<sup>1</sup> Apple does not release sales figures, but the iTunes Music Store's inventory of 3.5 million titles testifies to the eclecticism of its listeners' tastes. The state of the physical music and movie rental chains such as Tower Records and Blockbuster further indicates the shift away from hit albums and "blockbuster" movies that the ability to explore long-tails has created. The combination of powerful search tools that can effectively mine the long-tail combined with collaborative filtering and social networking software provide powerful platforms for disruptive business models such as Netflix, and Amazon.

**Application of Digital Hybridization in B2B Markets.** The examples that we have used so far are in consumer markets. Can these concepts be applied to B2B markets, perhaps even redefining them? Many B2B markets are highly fragmented with both multiple suppliers of specialist products and multiple small buyers of such products. Such firms, classed as Small/Medium Enterprises, SME's, constitute over 90% of the world's manufacturing GDP. Traditionally such companies sell and buy through distributors who provide local inventory, advice, and fast response. They are also part of local social networks that are based on trust built up over time. Distributors may currently be the most effective way for manufacturers to reach their end customers in a global market. However, distributors also bring a number of disadvantages. By not having direct contact with users, manufacturers cannot easily gain feed back and learn of unmet needs for existing and new products and services. Thus they lose a key input into their innovation processes.

In addition, distributors often represent competing products, and are unlikely to heavily promote truly novel products requiring longer adoption and sales cycles. They also take a significant fraction of value in the supply chain, putting pressure on manufacturers' profit margins. Can this marketplace be disrupted using a digital hybrid platform? A number of factors are already are feasible:

- Search engines - a very good front-end search engine which would enable SME's to locate their needs from a large supplier base.
- Logistic networks – these enable goods to be shipped directly from suppliers to end-users on demand. This means that more of the inventory carrying costs will be born by suppliers but the opportunity to drive higher margins and be closer to their customers mitigates this effect.
- Social group software - distributors have personal relationships with their customers and provide advice and quick service. To build such trust and advice, social networking software where customers can a) recommend suppliers, b) help in solving problems for other SME's.

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<sup>1</sup> "The Long Tail – Why the Future of Business is Selling Less of More", Chris Anderson, 2006, Hyperion Press.

**Concluding Remarks.** At the most elemental level, digital product-service hybrids redefine some of the most basic words in the business vocabulary. As an example, what constitutes an asset? Physical goods and structures might occupy one category for auditing purposes but can be liabilities for long-term corporate health. As we have seen, the four traditional shortcomings of services relative to products – inseparability, heterogeneity, perishability, and intangibility – often constitute points of advantage in a digital supported environment.

The shortcomings of current vocabulary and concepts reappear regularly as citizens, scholars, and managers work towards a services-centric economy. If people made *things* in a factor, where do they create or perform *services*? In networks, perhaps?

Innovation is preceding comprehension: we can see hybridization long before it's described or taught. Based on profitable services including search, various kinds of software, and personal assistance such as direction-finding or matchmaking, it is clear that intermingling the digital and services economies will continue to have commercial impact. Even as they expose the limits of existing mental, legal, and managerial models, the opportunities at the intersection of products and services illustrate the multitude of possibilities created by the technologies at humanity's disposal.

As with previous white papers in this series, we would appreciate your insights, and comments. Can you see how the B2B market for SME's could be fundamentally reconfigured using a digital hybrid platform for replacing distributors?

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