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From Niches to Riches:
The Anatomy of the Long Tail

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Eric Clemons, a professor at the Wharton School, is an aficionado of Dog Fish Head World Wide Imperial Stout beer at $160 per case. How did Dog Fish Head find a customer like him? They didn't. He found them. Clemons was not always a connoisseur of rare beers, but after trying Victory Hop Devil beer, the top ranked India Pale Ale at the time, he learned of Dog Fish Head, as well as Victory's Strom King Stout and other niche beers through the Internet. Clemons notes that he "would never have bought the Dog Fish Head without the reviews on rarebeer.com and without the chain of experiences with ever-more interesting beers along the way."

For most of the past century, companies of all types strove to introduce products and services that were blockbuster hits and could capture the mass market. Bigger was better. But now dozens of markets, from beer to books, music to movies, and software to services of all types are in the early stages of a revolution as the Internet and related technologies vastly expand the variety of products that can be produced, promoted, and purchased. Though based on a simple set of economic and technological drivers, the implications of this are far-reaching, for managers, consumers, and the economy as a whole.

Early discussions of Internet markets focused on how "frictionless commerce" would lead to fierce price competition online. However, while consumers certainly do benefit from lower prices online, our research finds that they derive far more value from another important characteristic of Internet markets -- the ability of online merchants to help consumers locate, evaluate, and purchase a far wider variety of products than they can via traditional brick and mortar channels. [1] **(See "About the Research.")**

Consider the market for books. Amazon.com and other Internet retailers sell nearly all of the more than 3 million books in print. However, a typical brick and mortar store only stocks between 40,000 and 100,000 unique titles. One might argue that consumers don't really care about the remaining 2.9 million book titles. However, the data paint a different picture. We analyzed Amazon's sales patterns and found that 30-40 % of sales are in books that wouldn't normally be found in a brick-and-mortar store (**See "Share of Amazon Sales Above Rank 100,000"**). Moreover, we found that the consumer surplus created by providing access to these relatively obscure book titles exceeds one billion dollars annually.[2]

And it's not just with book purchases that consumers have been able to indulge their taste for variety online. We found a similar pattern in the other online markets we examined. **(See "Product Variety Comparison for Internet and Brick-and-Mortar Channels.")** *Wired* editor Chris Anderson has dubbed this phenomenon "The Long Tail," and his analysis has identified many other IT-enabled markets where consumers' preferences have far greater depth than what one could find in a typical brick-and-mortar storefront. Examples include consumers' preferences for music at Rhapsody and Ecast, movies at Netflix, and custom news and information through various blogs and online communities.[iii]

While the emergence of the Long Tail is now indisputable, two key questions remain: What factors are driving this change and what are its implications for the structure of markets? **(See the chart below: "Anatomy of the Long Tail.")**

Supply-Side Drivers: For all brick-and-mortar business, stocking decisions are driven by the same basic constraints: how many products can be provided in a limited amount of shelf space and how many consumers in the local geographic area are willing to pay for these products. The characteristics of IT-enabled markets change both the cost and benefit side of this equation. From the perspective of costs, brick-and-mortar retailers must allocate costly shelf space for each product in each of their locations. On the Internet, the cost of stocking an additional product is much lower, involving space in a centralized warehouse that is often located on more inexpensive real estate. For products that can be drop shipped from distributors or digital products (such as ebooks, MP3 music and database products) that can be sent over the Internet, all it takes to stock an additional product is an additional line in a product database, which can then be used to dynamically generate the relevant web pages on demand.

On the benefit-side, brick-and-mortar retailers sell to consumers in their local geographic region. Consumers with mainstream tastes will be served before consumers with one-in-a-million tastes. Internet retailers, on the other hand, can aggregate demand on a national or even global scale. With the potential Internet market approaching a billion consumers, even if you have one-in-a million tastes, there are still over a thousand like-minded consumers who share your niche tastes.

Similarly, IT systems can change production costs for products directed at a niche audience.

Print-on-demand systems for books are a good example. Books printed using traditional offset printing technologies are only profitable in volumes of 1,000 or more, and not all books have a sufficient readership to justify such a print run. Large print runs also involve the risk associated with the initial printing costs for a title with unknown demand. Using print-on-demand technologies, authors and small publishers can print individual titles for around $3.00 per copy. Further, because they can be printed one-at-a-time, authors and publishers don't need to incur up-front costs from large initial print runs and the associated risks from uncertain market demand.

IT systems can lower production costs in other ways for products in the Long Tail. For example, when author Sharon Deubreau needed a qualified illustrator for a children's book project, she posted her project to Guru.com, and within 4 days had 46 responses from experienced illustrators all over the world. This reduced her search costs associated with obtaining bids on her project and provided a larger set of bidders -- and thus potentially lower prices and a better match to her skill needs. Not surprisingly, Guru.com has become a popular site for small publishing houses and self-published authors in search of illustrators. Guru.com currently has over 1,800 professionals from 71 different countries who list "Children's Book Illustration" as a primary skill. Heidi Stanczak, Guru.com's Manager of Marketing Communication notes that "in the past year, we've experienced a 45% increase in the number of projects posted for children's book illustrators."

Similarly, music, movies, games, news and journals, are becoming all-digital. This lowers the production, distribution, and promotion costs, opening up niche markets. On the production side, when CNN needs to cover stories in remote locations they used to have to send both a cameraperson and a reporter and wait for the tape of the story to be rushed to a satellite uplink station. Now they can just send one reporter equipped with a digital camera, an Apple laptop, and a satellite phone. This reporter can record, edit, and transmit the story in a fraction of the time, and at a fraction of the cost. This allows CNN to cover stories that otherwise would not have been feasible or cost effective.

On the distribution and promotion side, up-and-coming recording artists are using websites and online networking sites such as myspace.com to connect with fans and distribute promotional copies of their songs -- bypassing radio stations, cable music channels, and brick-and-mortar retailers that previously would have served as a gatekeeper over their access to promotional and distribution channels.

Demand-Side Causes: However, the more products retailers make available, the harder it is for

consumers to locate the product they are interested in. In fact, consumers can become overwhelmed when choices are poorly organized and actually reduce their purchases as a result. Thus, the Long Tail makes it critically important that retailers provide tools to facilitate the discovery of products through both active and passive search.

Active search tools allow consumers to easily locate products they know they are interested in. Sampling tools, such as Amazon.com's samples of book pages and CD tracks, on the other hand, allow consumers to learn more about products they might be interested in. Active search tools can also help consumers identify products they weren't previously aware of. For example, while searching for his last name on google.com, Bernie Robichau came across a reference to his great uncle "Earl Robichau" in a book indexed by Google's Book Search feature. According to Mr. Robichau this discovery "prompted me to buy two copies of a book that I never would have known about." Mr. Robichau is not alone – ComScore estimates that Americans made 6.6 billion searches online in April 2006, and Page Zero Media estimates that paid search advertising will be a $15 billion business in 2006.

Passive tools, such as most recommender systems, use the consumer's revealed preferences from past purchases or even page views to identify new products they might be interested in. Consumer search is also facilitated by tools combining both active and passive search such as customer product reviews, online communities, or the readership of product-focused blogs. Product-focused blogs such as the-gadgeteer.com and gizmodo.com have become important outlets for both established companies and small inventors to promote their new products. For example, John Patterson, the CEO of Bathys Hawaii Watch Company notes that "our sales and website hits went through the roof" after their watch was discussed on the Gizmodo blog -- with website hits increasing from 60 to 1800 per day and sales increasing 300%.

Our research suggests that search tools can also be very effective in allowing consumers to discover and purchase products they otherwise would not have considered, resulting in changes in sales distribution among a company's products.[iv] We analyzed consumer purchase data collected from a retailing company that has both an Internet channel and a catalog channel. This company sells the same product selection in both channels and these two channels have the same pricing and shipping policies. However, because of search, browsing, and recommendation tools that are unique to the Internet channel, product sales are significantly more evenly distributed on the Internet than through the catalog channel where sales are more concentrated on best-selling

products. For the catalog channel, the top 20% of products generate just over 80% of this company's sales, nearly mirroring the widely-used Pareto Principle or so-called "80/20 rule," which generally holds that 20% of anything -- from world of management to the physical world -- produces 80% of the results and consumes 20% of the resources. However, at the company's Internet channel, the same top 20% products generate barely 70% of sales. Since the same products are available in both channels at this retailer, this shows that the demand side drivers of the Long Tail phenomenon can operate independently of the supply side drivers such as virtual shelf space.

Second Order Effects of the Long Tail: Powerful as these effects are, we predict that they will be amplified over time because of second order, or positive feedback, effects for both consumers and producers. For producers, the Long Tail will change the kinds of products that are profitable. In a world where only products with mass-market appeal make it to store shelves, producers have strong incentives to focus on mass-market tastes, to the exclusion of niche audiences. Expanding the types of products that can be profitably sold by retailers may provide artists and other producers with incentives to create products to serve more varied tastes.

We may already be seeing examples of this phenomenon. As noted above, print-on-demand and other IT systems have significantly lowered the costs to produce books targeted at niche audiences. Thus it is possible that these changes are driving an increase in the number of new books produced each year. R.R. Bowker, the official U.S. agency for assigning International Standard Book Numbers (ISBNs), has reported that new title output for books increased by 19% in 2003 -- the highest increase in new titles on record.[v] Over a longer time frame, the total number of new titles has increased by 72% since 1995[vi] — with most of the increase in book titles coming from small publishing houses and the self-publishing model. Sites like lulu.com and cafepress.com have sprung up to serve this market by offering on demand printing and promotional services for books produced by niche authors. Lulu.com says that it publishes 2,300 new books a month, mostly from authors who wouldn't otherwise have access to major publishing houses.

The music industry has seen a similar effect owing to changes in the cost to produce, market, and distribute music. Niche bands can reportedly turn a profit with sales of 25,000 albums, compared to break-even points of 500,000 through major labels.[vii] Other examples of "new products" include news and commentary from any of the over 40 million blogs tracked by technorati.com, or audio and video Podcasts catering to niche audiences such as Paula Berinstein's "The Writing

Show" for aspiring authors or Don McCallister's "Screencasts Online" which offers video training on Macintosh software.

Managers should understand that the underlying economic principles are not new. Over 200 years ago, Adam Smith observed that "the division of labor is limited by the scope of the market" because of the need to amortize fixed costs. What has changed is the technology and thus, both the size of the addressable market and the relevant fixed costs of production and distribution. Today, an author, singer, or film producer can cost-effectively reach billions of potential consumers via the Internet and similar technologies. This makes it profitable to invest time and effort to create products that might be of interest to even just a small fraction of them.

The Long Tail can also facilitate second order changes in consumer tastes. Markets with increased product variety, and increased information about these niche products, allow consumers to discover and purchase products that otherwise would be unavailable. This can lead consumers further down the Long Tail, allowing them to cultivate deeper tastes for these niche products, just as Professor Clemons refined his tastes for India Pale Ales.

In total, our research has found that consumer tastes are far more varied than one would expect from seeing the limited choices of products available in brick-and-mortar stores. Moreover, consumers receive a great deal of value from having access to these products. While the Internet has been touted as benefiting consumers primarily from lower prices than could be found in brick-and-mortar stores, our research has found that consumer surplus gains from increased product variety online are between 7 to 10 times larger than their gains from lower prices.

Finally, IT-enabled tools can enhance the effect of Long Tail markets by allowing consumers to actively and passively discover products that they otherwise would not have considered. Millions of these consumers have chosen to become content producers themselves, highlighted by the emergence of "Web 2.0" tools that facilitate information sharing and social networking. For example, at a typical brick-and-mortar retailer almost all product information comes from salespeople or the manufacturers themselves. In contrast, at Amazon.com the vast majority of product information is created directly by customers in the form of reviews, personalized profiles, product lists, and product wiki entries, and this information can strongly influence consumer purchase decisions.[viii] Similarly, while social networking sites like myspace.com can help musicians with supply-side promotion and distribution, they can also help consumers discover new artists by checking who is linked in their favorite artist's "friend space" section. The ability

of consumers to openly share product information creates numerous opportunities for artists, entrepreneurs, marketers, and IT-developers to shape and benefit from these new markets for information.

Niches don't translate to riches for everyone, however. The accelerated Darwinism created by improved search could erode the market for Blockbuster hits if they simply aim for the least common denominator. Ironically, even niche artists could be hurt in some scenarios – if record labels invest in new acts mainly in hopes of developing a platinum-selling superstar, then a reduction in mega-hits could mean lower incentives for investing in new talent.[ix] There can also be societal and political implications if consumer tastes become balkanized and common experiences become, well, less common.[x] Will democracy and social cohesion suffer if each voting group reads its own custom news feeds and commentary, while experiencing only carefully tailored movies, music and videos? The changes in the underlying technology and economics of production, distribution and consumption are compelling. As these drivers grow in importance, the only clear winners will be business strategies that take the Long Tail seriously.

About the Research

This research is part of an ongoing research program examining how Internet markets and IT-enabled tools have made it possible for companies to profitably produce and sell a far wider range of products than ever before.

In the first study,[1] we obtained a data set from a book publisher. This data set, gathered for three weeks in the summer of 2001, matched the publisher's weekly Amazon sales for 321 titles to the sales rank observed at Amazon.com's web site during the same week. We fit our data on sales and sales rank to a log-linear (Pareto) curve (see "Share of Amazon Sales Above Rank 100,000") and used the estimated Pareto curve to calculate the proportion of unit sales at Amazon that fall above a particular sales rank. We then developed a framework that allowed us to use these estimates to quantify the economic impact of increased product variety made available through electronic markets. We estimated that the increased product variety of online bookstores enhanced consumer welfare by $731 million to $1.03 billion in the year 2000, which represents between 7 to 10 times more welfare than consumers receive from having access to lower prices online.

The second study [4] used a data set collected from a medium-sized retailing company that sells the same assortment of clothing through a catalog and an Internet website. We empirically analyzed our data, using both Pareto curves and Gini Coefficients, to compare the distribution of sales in the two channels. We found that, Internet customers were much more likely to by niche products. Interesting, even after controlling for customer selection bias between the two channels by focusing only on those customers who used both channels, product sales were still significantly more evenly distributed on the Internet than through the catalog channel. The more even product distribution online is consistent with the theory that lower search cost through the Internet channel, caused by Internet search, browsing, and recommendation tools, can increase the collective share of niche and obscure products, leading to a more even product sales distribution online.

Exhibit 2

Share of Amazon Sales Above Rank 100,000

Our research shows that 30-40 % of Amazon book sales are represented by titles that wouldn't normally be found in brick-and-mortar stores. The consumer surplus created by providing access to these relatively obscure book titles is more than seven to ten times the value consumers receive from access to lower prices online.

Source: Brynjolfsson, Hu, and Smith, "Consumer Surplus in the Digital Economy," *Management Science*, November 2003.

Exhibit 3

Product Variety Comparison for Internet and Brick-and-Mortar Channels

The online market place had enabled consumers in many industries to locate, evaluate, and purchase a far wider variety of products than they can via traditional brick and mortar channels.

Product Category	***Large Online Retailer***	***Typical Large Brick-and-Mortar Store***
Books	3,000,000	40,000 – 100,000
CDs	250,000	5,000 – 15,000
DVDs	18,000	500 – 1,500
Digital Cameras	213	36
Portable MP3 players	128	16
Flatbed Scanners	171	13

Exhibit 4:

Anatomy of the Long Tail

To understand what is causing the Long Tail phenomenon and how it affects the dynamics of the economy, consider these first- and second-order drivers on the supply (producers/retailers) and demand (consumers) side of the market.

	1st Order	**2nd Order**
Supply-Side (Producers and Retailers)	• Cost: Virtual shelf-space, make-to-order production, Electronic delivery, etc. • Benefit: Aggregation of consumers	• Increased incentives to develop new products • Restructuring of marketing strategies to address Long Tail. • New intermediaries and industry structures
Demand-Side (Consumers)	• Active: Powerful search tools, Sampling tools • Passive: Recommendation systems, advisors, dynamic web-based storefronts • Combination: Customer reviews, Online communities	• Changes in consumer tastes and demand patterns as a result of exposure to new products • Positive feedback within niches from consumer advisory tools and their users • Cultural changes from access to more varied sources of information

References

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[1] In contrast to early predictions of commoditization and pure price competition, academic studies have found that price dispersion is often higher online than in brick-and-mortar stores (Brynjolfsson and Smith 2000), and have highlighted the importance of search (Lynch and Ariely 2000), product differentiation (Bakos 1998), and brand and loyalty (Smith and Brynjolfsson 2001) in Internet markets.

[2] See our paper "Consumer Surplus in the Digital Economy," *Management Science*, November 2003, which can be found at http://ssrn.com/abstract=400940.

[iii] See, for example, his October 2004 article on the "Long Tail" in *Wired* Magazine , his forthcoming book of the same name and his blog at http://www.longtail.com/. The wikipedia, itself an example of the Long Tail in action, has a detailed article on the topic.

[iv] Brynjolfsson, Erik, Yu (Jeffrey) Hu and Duncan Simester, "Goodbye Pareto Principle, Hello Long Tail", MIT Center for eBusiness Working Paper.

[v] "U.S. Book Production Soars in 2003" The Write News, May 28, 2004.

[vi] "U.S. Book Production Reaches New High of 195,000 Titles in 2004; Fiction Soars." Bowker Press Release, May 24, 2005 (www.bowker.com/press/bowker/2005_0524_bowker.htm).

[vii] Leeds, Jeff. 2005. "The New Is a Boon for Indie Labels," *The New York Times*, December 27.

[viii] Chevalier, J., D. Mayzlin. 2004. The Effect of Word of Mouth on Sales: Online Book Reviews. Working paper, Yale School of Management, New Haven, CT.

[ix] See Blackurn, David "Online Piracy and Recorded Music Sales" Working Paper, Harvard University, 2004 http://www.economics.harvard.edu/%7Edblackbu/papers/blackburn_fs.pdf

[x] See for instance Van Alstyne, Marshall and Erik Brynjolfsson (2005) "Global Village or Cyberbalkans: Modeling and Measuring the Integration of Electronic Communities", *Management Science*, Vol. 51, No. 6 pp. 851-868