Strategy & Technology

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Note: this is an earlier version of the chapter. All chapters updated after July 2009 are now hosted (and still free) at http://www.flatworldknowledge.com. For details see the 'Courseware' section of http://gallaugher.com

INTRODUCTION

Managers are confused, and for good reason. Management theorists, consultants, and practitioners often vehemently disagree on how firms should craft tech-enabled strategy, and many widely read articles contradict one another. Headlines such as "Move First or Die" compete with "The First Mover Disadvantage." A leading former CEO advises "destroy your business," while others suggest firms focus on their "core competency" and "return to basics." The pages of the Harvard Business Review declared "IT Doesn't Matter", while a New York Times' bestseller hails technology as the "steroids" of modern business.

Theorists claiming to have mastered the secrets of strategic management are contentious and confusing. But as a manager, the ability to size up a firm's strategic position and understand its likelihood of sustainability is one of the most valuable, yet difficult skills to master. Layer on thinking about technology – a key enabler to nearly every modern business strategy, but also a function often thought of as easily 'outsourced' – and it's no wonder that so many firms struggle at the intersection where strategy and technology meet. The business landscape is littered with the corpses of firms killed by managers who guessed wrong. Developing strong strategic thinking skills is a career-long pursuit – a subject that can occupy tomes of text, a roster of courses, and a lifetime of seminars. While this chapter can't address the breadth of strategic thought, it is meant as a primer on developing the skills for strategic thinking about technology. A manager that understands issues presented in this article should be able to more clearly see through seemingly conflicting assertions about best practices, be better prepared to recognize opportunities and risks, and should be more adept at successfully brainstorming new, tech-centric approaches to markets.

LEARNING OBJECTIVE:
After studying this section you should be able to:

1. Define operational effectiveness and understanding the limitations of competition based on this principle.
2. Provide examples of firms that use technology to compete largely based on operational effectiveness.
3. Define strategic positioning and the importance of grounding competitive advantage in this concept.
4. Provide an example of a firm that has used technology to compete based on strategic positioning.
5. Understand the resource-based view of competitive advantage.
6. List the four characteristics of a resource that might possibly yield sustainable competitive advantage.

THE DANGER OF RELYING ON TECHNOLOGY

Firms strive for *sustainable competitive advantage*, financial performance that consistently outperforms their industry peers. The goal is easy to state, but hard to achieve. The world is so dynamic, with new products and new competitors rising seemingly overnight, that truly sustainable advantage might seem like an impossibility. New competitors and copycat products create a race to cut costs, cut prices, and increase features that may benefit consumers but erode profits industry-wide. Nowhere is this more difficult than when competition involves technology. The fundamental strategic question in the Internet era is "*How can I possibly compete when everyone can copy my technology and the competition is just a click away?*" Put that way, it seems like a lost cause.

But there are winners – big, consistent winners – in the world of tech. How do they do it? In order to think about how to achieve sustainable advantage, it's useful to start with two concepts defined by Michael Porter. A professor at the Harvard Business School, and father of the *Value Chain* and the *Five Forces* concepts (see the sections at end of this chapter*),* Porter is rightly considered one of the leading strategic thinkers of the last quarter century.

According to Porter, the reason so many firms suffer aggressive, margin-eroding competition is because they've defined themselves according to operational effectiveness rather than strategic positioning. *Operational effectiveness* refers to performing the same tasks better than rivals perform them. Everyone wants to be better, but the danger in operational effectiveness is in "sameness." This risk is particularly acute in firms that rely on technology for competitiveness. After all, technology can be easily acquired. Buy the same stuff as your rivals, hire students from the same schools, copy the look and feel of competitor websites, reverse engineer their products, and you can match them. The *fast follower problem* exists when savvy rivals watch a pioneer's efforts, learn from their successes and missteps, then enter the market quickly with a comparable or superior product at a lower cost.

Since tech can be copied so quickly, followers can be fast, indeed. Several years ago while studying the web portal industry (Yahoo and its competitors), a colleague and I found that when a firm introduced an innovative feature, at least one of its three major rivals would match that feature in, on average, only one and a half months[1]. When technology can be matched so quickly, it is rarely a source of competitive advantage. The phenomenon is not limited to the Web.

Tech giant EMC saw its stock price appreciate more than any other firm during the decade of the 90s. However when IBM and Hitachi entered the high-end storage market with products comparable to EMC's Symmetrix unit, prices plunged 60 percent the first year and another 35 percent the next[2]. Needless to say EMC's stock price took a comparable beating. TiVo is another example. At first blush, it looks like this first mover should be a winner since it seems to have established a leading brand; TiVo is now a verb for all digital recording. But despite this, TiVo is a money loser, going years without posting an annual profit. Rival digital video recorders offered by cable and satellite companies appear the same to consumers, and are offered along

[1] Gallaugher and Downing, 2000
[2] Engardio and Keenan, 2002

with pay television subscriptions, a critical distribution channel for reaching customers that TiVo doesn't control.

Operational effectiveness is critical. Firms must invest in techniques to improve quality, lower cost, and design-efficient customer experiences. But for the most part, these efforts can be matched. Because of this, operational effectiveness is usually not sufficient enough to yield sustainable dominance over the competition.

Different is Good

In contrast to operational effectiveness, *strategic positioning* refers to performing different activities than rivals, or the same activities in a different way. While technology itself is often very easy to replicate, technology is essential to creating and enabling novel approaches to business that are defensibly different than rivals and can be quite difficult for others to copy.

For an example of the relationship between technology and strategic positioning, consider FreshDirect. The New York City-based grocery firm focused on the two most pressing problems for Big Apple shoppers: selection is limited and costs are high. Both of these problems are a function of the high cost of NYC real estate. The solution? Use technology to craft an ultra-efficient model that makes an end-run around stores.

The firm's 'storefront' is a website offering one-click menus, semi-prepared specials like 'meals in four minutes', and the ability to pull up prior grocery lists for fast re-orders – all features that appeal to the time-strapped Manhattanites who were the firm's first customers. Next-day deliveries are from a vast warehouse the size of five football fields located in a lower-rent industrial area of Queens. At that size, the firm can offer a fresh goods selection that's over five times larger than local supermarkets. The service is now so popular that NYC apartment buildings have begun to redesign common areas to include secure freezers that can accept FreshDirect deliveries, even when customers aren't there[3].

The FreshDirect Website, and images of the firm's tech-enabled warehouse operation[4]

The FreshDirect model crushes costs that plague traditional grocers. Worker shifts are highly efficient, avoiding the downtime lulls and busy rush hour spikes of storefronts. The result?

[3] Croghan, 2006
[4] Source: photographic tour at FreshDirect website: http://www.freshdirect.com/about/plant_tour/sort_ship/index.jsp?catId=about_tour_sorting

Labor costs that are 60% lower than at traditional grocers. As for freshness, consider that while the average grocer may have seven to nine days of seafood inventory, FreshDirect's seafood stock turns each day. Stock is typically purchased direct from the docks the morning of delivery in order to fulfill orders placed the prior night. The firm buys what it sells and shoplifting can't happen through a website, so loss from waste and theft plummets.

Artificial intelligence software, coupled with some seven miles of fiber optic cables linking systems and sensors, supports everything from baking the perfect baguette to verifying orders with 99.9 percent accuracy[5]. Since FreshDirect avoids the money-sucking open-air refrigerators found in a traditional grocery store, the firm even saves big on energy (instead, staff bundle up for shifts in climate-controlled cold-rooms tailored to the specific needs of dairy, deli, and produce). And a new initiative uses recycled biodiesel fuel to cut down on delivery costs.

Buying direct from suppliers, paying them in days rather than weeks, carrying a greater product selection, and avoiding the 'slotting fees' (payments by suppliers for prime shelf space) common in traditional retail all help FreshDirect to negotiate highly favorable terms with suppliers. Add all these advantages together and the firm's big, fresh selection is offered at prices that can undercut the competition by as much as 35 percent[6]. And FreshDirect does it all with margins in the range of twenty percent, easily dwarfing the razor-thin one-percent margins earned by traditional grocers[7].

Technology is critical to the FreshDirect model, but it's the collective impact of the firm's differences, this tech-enabled strategic positioning, that delivers success. Operating for more than half a decade, the firm has built up a set of strategic assets that address the specific needs of the NYC grocery consumer, and that are also extremely difficult for any upstart to compete against. Traditional grocers can't fully copy the firm's delivery business because this would leave them *straddling* two markets (low-margin storefront and high-margin delivery), unable to gain optimal benefits from either. Competing against a firm with such a strong, and tough-to-match strategic position can be brutal. Today there are one-third fewer supermarkets in New York City than when FreshDirect first opened for business[8].

But What Kinds of Differences?

The principles of operational effectiveness and strategic positioning are deceptively simple. But while Porter claims strategy is "fundamentally about being different"[9], how can you recognize whether your firm's differences are special enough to yield sustainable competitive advantage?

An approach known as the *resource-based view* of competitive advantage can help. The idea here is that if a firm is to maintain sustainable competitive advantage, it must control a set of exploitable resources that have four critical characteristics. These resources must be 1) *valuable*, 2) *rare*, 3) *imperfectly imitable* (tough to imitate), and 4) *non-substitutable*. Having all four characteristics is key. Miss value and no one cares what you've got. Without rareness, you don't

[5] Black, 2002 and EIUEB, 2008
[6] Green, 2003
[7] EIUEB, 2008 and Kirkpatrick, 2002
[8] Shulman, 2008
[9] Porter, 1996

have something unique. If others can copy what you have, or others can replace it with a substitute, then any seemingly advantageous differences will be undercut.

Strategy isn't just about recognizing opportunity and meeting demand. Resource-based thinking can help you avoid the trap of carelessly entering markets simply because growth is spotted. The telecommunications industry learned this lesson in a very hard and painful way. With the explosion of the Internet it was easy to see that demand to transport web pages, e-mails, MP3s, video, and everything else you can turn into ones and zeros, was skyrocketing. Most of what travels over the Internet is transferred over long-haul fiber-optic cables, so telecom firms began digging up the ground and laying webs of fiberglass to meet the growing demand. Problems resulted because firms laying long-haul fiber didn't fully appreciate that their rivals and new upstart firms were doing the exact same thing. By one estimate there was enough fiber laid to stretch from the Earth to the moon over 280 times![10] On top of that, a technology called DWDM enabled existing fiber to carry more transmissions than ever before. The end result– these new assets weren't rare and each day they seemed to be less valuable.

For some firms, the transmission prices they charged on newly laid cable collapsed by over 90 percent. Established firms struggled, upstarts went under, and WorldCom became the biggest bankruptcy in US history. The impact was felt throughout all industries that supplied the telecom industry. Firms like Sun, Lucent, and Nortel, whose sales growth relied on big sales to telecom carriers, saw their values tumble as orders dried up. Estimates suggest that the telecommunications industry lost nearly four trillion dollars in value in just three years[11], much of it due to executives that placed big bets on resources that weren't strategic.

LEARNING OBJECTIVE:
After studying this section you should be able to:

1. Understand that technology is a key to enabling competitive, modern organization design, and be able to provide examples of firms that have used technology to organize for sustained competitive advantage.
2. Define the following concepts: brand, scale, switching costs, differentiation, network effects, distribution channels.
3. Provide examples of how technology can be used to create or strengthen the resources mentioned above.

POWERFUL RESOURCES

Management has no magic bullets. There is no exhaustive list of key resources that firms can look to in order to build a sustainable business. And recognizing a resource doesn't mean a firm will be able to acquire it or exploit it forever. But being aware of major sources of competitive advantage can help managers recognize an organization's opportunities and vulnerabilities, and can help them brainstorm winning strategies.

Imitation-Resistant Value Chains

[10] Kahney, 2000
[11] Endlich, 2004

While many of the resources below are considered in isolation, the strength of any advantage can be far more significant if firms are able to leverage several of these resources in a way that make each stronger and make the firm's way of doing business more difficult for rivals to match. Firms that craft an *imitation-resistant value chain* have developed a way of doing business that others will struggle to replicate, and in nearly every successful effort of this kind, technology plays a key enabling role. The *value chain* is the set of interrelated activities that bring products or services to market (see "*The Value Chain"*, below). When we compare FreshDirect's value chain to traditional rivals, there are differences across every element. But most importantly, the elements in FreshDirect's value chain work together to create and reinforce competitive advantages that others cannot easily copy. Incumbents trying to copy the firm would *straddle* between two business models, unable to reap the full advantages of either. And late moving pure-play rivals will struggle, as FreshDirect's lead time allows the firm to develop brand, scale, data, and other advantages that newcomers lack (see below for more on these resources).

Dell's Struggles: Nothing Lasts Forever

Michael Dell enjoyed an extended run that took him from assembling PCs in his dorm room as an undergraduate at the University of Texas at Austin, to heading the largest PC firm on the planet. Dell's super-efficient, vertically integrated manufacturing and direct-to-consumer model combined to help the firm earn seven times more profit on comparably configured rival PCs[12]. And since Dell PCs were usually cheaper, too, the firm could often start a price war and still have better overall margins than rivals.

It was a brilliant model that for years proved resistant to imitation. While Dell sold direct to consumers, rivals had to share a cut of sales with the less efficient retail chains responsible for the majority of their sales. Dell's rivals struggled in moving toward direct sales because any retailer sensing its suppliers were competing with it through a direct-sales effort could easily chose another supplier that sold a nearly identical product. It wasn't that HP, IBM, Sony, and so many others didn't see the advantage of Dell's model – these firms were wedded to models that made it difficult for them to imitate their rival.

But then Dell's killer model, one that had become a staple case study in business schools, began to lose steam. Nearly two decades of observing Dell had allowed the contract manufacturers serving Dell's rivals to improve manufacturing efficiency. Component suppliers located near contract manufacturers, and assembly times fell dramatically. And as the cost of computing fell, the price advantage Dell enjoyed over rivals also shrank. On top of that, the direct-to-consumer model also suffered when sales of notebook PCs outpaced the more commoditized desktop market. Notebook customers often want to compare products in person – lift them, type on keyboards, and view screens – before making a purchase decision. You simply can't do that through a website.

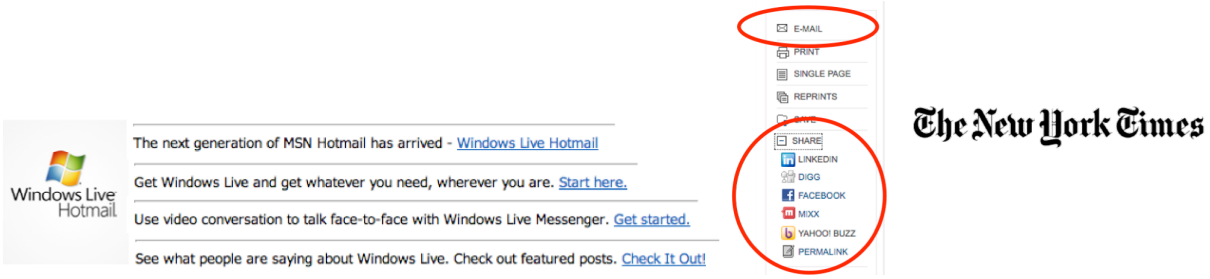
Dell's struggles as costs, customers, and the product mix changed, all underscore the importance of continually assessing a firm's strategic position among changing market conditions. There is no guarantee that today's winning strategy will dominate forever.

Brand

A firm's *brand* is the symbolic embodiment of all the information connected with a product or service, and a strong brand can also be an exceptionally powerful resource for competitive advantage. Consumers use brands to *lower search costs*, so having a strong brand is particularly vital for firms hoping to be the first online stop for consumers. Want to buy a book online? Auction a product? Search for information? Which firm would you visit first? Almost certainly

[12] Breen, 2004

Amazon, eBay, and Google. But how do you build a strong brand? It's *not* just about advertising and promotion. First and foremost, customer experience counts. A strong brand *proxies quality* and *inspires trust*, so if consumers can't rely on a firm to deliver as promised, they'll go elsewhere. As an upside, tech can play a critical role in rapidly and cost-effectively strengthening a brand. If a firm performs well, consumers can often be enlisted to promote a product or service (so-called *viral marketing*). Consider that while scores of dot-coms burned through money on Super Bowl ads and other costly promotional efforts, Google, Hotmail, Skype, eBay, MySpace, Facebook, YouTube, and so many other dominant online properties built multi-million member followings before committing any significant spending to advertising.



Promotions at the end of each Hotmail message, and the 'e-mail' and 'share' links at the New York Times, enlist customers to spread word about products & services, user to user, like a virus

Early customer accolades for a novel service often mean that positive press (read free advertising) will also likely follow. But show up late and you may end up paying much more to counter an incumbent's place in the consumer psyche. In recent years, Amazon has spent no money on television advertising, while rivals Buy.com and Overstock spent millions. MSN's budget for promoting its search product was twenty-two times greater than Google's spend. Also, if done well, even complex tech products can establish themselves as killer brands. Consider that Intel has taken an ingredient product that most people don't understand, the microprocessor, and built a quality-conveying name recognized by much of the developed world.

Scale

Many firms gain advantages as they grow in size. Advantages related to a firm's size are referred to as *scale* benefits. Businesses benefit from *economies of scale* when the cost of an investment can be spread across increasing units of production or in serving a growing customer base. Firms that benefit from scale economies as they grow are sometimes referred to as being *scalable*. Many Internet and tech-leveraging businesses are highly scalable since, as firms grow to serve more customers with their existing infrastructure investment, profit margins improve dramatically.

Consider that in just one year, the Internet firm BlueNile sold as many diamond rings with just 115 employees and one website as a traditional jewelry retailer would sell through 116 stores. And with lower operating costs, BlueNile can sell at prices that brick and mortar stores can't match, attracting more customers and further fueling its scale advantages. Profit margins improve as the cost to run the firm's single website and operate its one warehouse are spread across increasing diamond sales.

Vs.

BlueNile sold as many diamonds in one year with one location as a traditional jeweler would with 116 stores. Which model seems more scalable to you? And which will have the better price?

A growing firm may also gain *bargaining power with its suppliers or buyers*. As Dell grew large, the firm forced suppliers wanting in on Dell's growing business to make concessions such as locating close to Dell plants. Similarly, eBay can raise auction fees because of their market dominance. Sellers who leave eBay lose pricing power since fewer bidders on smaller, rival services mean lower prices.

The scale of technology investment required to run a business can also act as a barrier to entry, discouraging new, smaller competitors. Intel's size allows the firm to pioneer cutting-edge manufacturing techniques and invest three billion-plus dollars on next generation plants. And although Google was started by two Stanford students in a trailer, the firm today runs on an estimated 450,000 to 1 million servers. The investments being made by Intel and Google would be cost-prohibitive for almost any newcomer to justify.

Switching Costs and Data

Switching costs exist when consumers incur an expense to move from one product or service to another. Tech firms often benefit from strong switching costs that cement customers to their firms. Users invest their time learning a product, entering data into a system, creating files, buying supporting programs or manuals – and these investments may make them reluctant to switch to a rival's effort.

Similarly, firms that seem dominant but that don't have high switching costs can be rapidly trumped by strong rivals. Netscape once held an eighty-plus percent market share in web browsers, but when Microsoft began bundling Internet Explorer with the Windows operating system and (through an alliance) with America Online, Netscape's market share plummeted. Customers migrated with a mouse click as part of an upgrade or installation. Learning a new browser was a breeze, and with the web's open standards, most customers noticed no difference when visiting their favorite websites with their new browser.

Sources of Switching Costs[13]

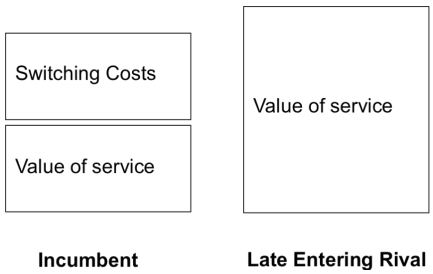
- Learning costs: Switching technologies may require an investment in learning a new interface and commands

[13] adapted from Shapiro and Varian, 1998

- Information and data: Users may have to re-enter data, convert files or databases, or may even lose earlier contributions on incompatible systems
- Financial commitment: Can include investments in new equipment, the cost to acquire any new software, consulting, or expertise, and the devaluation of any investment in prior technologies no longer used
- Contractual commitments: Breaking contracts can lead to compensatory damages and harm a user's partnership reputation
- Search costs: Finding and evaluating a new alternative costs time and money
- Loyalty programs: Switching can cause customers to lose out on program benefits. Think frequent purchaser programs that offer 'miles' or 'points' (all enabled and driven by software).

It is critical for challengers to realize that in order to win customers away from a rival, a new entrant must not only demonstrate to consumers that an offering provides more value than the incumbent, they have to ensure that their value added exceeds the incumbent's value *plus* any perceived customer switching costs (see the diagram below). If it's going to cost you and be inconvenient, there's no way you're going to leave unless the benefits are overwhelming.

Data can be a particularly strong switching cost for firms leveraging technology. A customer who enters her profile into Facebook, movie preferences into NetFlix, or grocery list into FreshDirect may be unwilling to try rivals – even if these firms are cheaper – if moving to the new firm means she'll lose information feeds, recommendations and time savings provided by the firms that already know her well. Fueled by scale over time, firms that have more customers and have been in business longer can gather more data, and many can use this data to improve their value chain by offering more accurate demand forecasting or product recommendations.

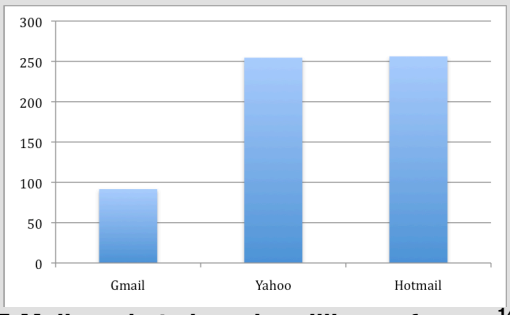


In order to win customers from an established incumbent, a late-entering rival must offer a product or service that not only exceeds the value offered by the incumbent, it must exceed the incumbent's value and any customer switching costs.

Competing on Tech Alone Is Tough: Gmail vs. Rivals

Switching e-mail services can be a real a pain. You've got to convince your contacts to update their address books, hope that any message-forwarding from your old service to your new one remains active and works properly, regularly check the old service to be sure nothing is caught in junk folder purgatory. Not fun. So when Google entered the market for free e-mail, challenging established rivals Yahoo and Microsoft Hotmail, it knew it needed to offer an overwhelming advantage to lure away customers who had used these other services for years. Google's offering? A mailbox with vastly more storage than its competitors. With 250 to 500 times the capacity of rivals, Gmail users were liberated from the infamous 'mailbox full' error, and could send photos, songs, slideshows, and other rich media files as attachments.

A neat innovation, but one based on technology that incumbents could easily copy. Once Yahoo and Microsoft saw that customers valued the increased capacity, they quickly increased their own mailbox size, holding on to customers who might otherwise have fled to Google. Four years after Gmail was introduced, the service still had less than half the users of each of its two biggest rivals.



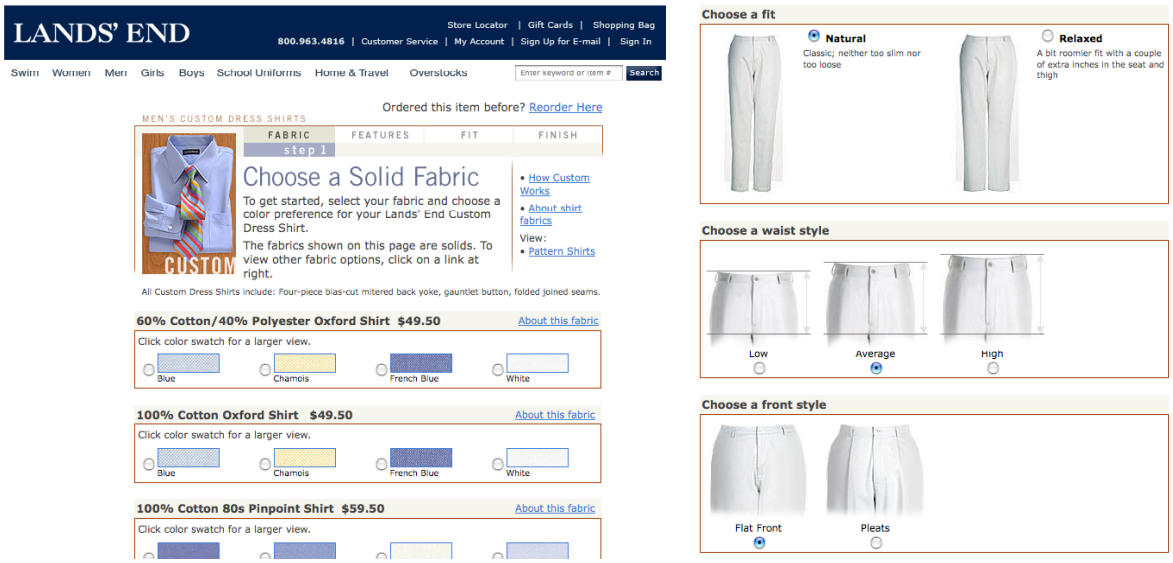
E-Mail market share in millions of users[14]

Differentiation

Commodities are products or services that are nearly identically offered from multiple vendors. Consumers buying commodities are highly price-focused since they have so many similar choices. In order to break the commodity trap, many firms leverage technology to *differentiate* their goods and services. Dell gained attention from customers, not just due to the low prices, but also because it was one of the first PC vendors to build computers based on customer choice. Want a bigger hard drive? Don't need the fast graphics card? Dell will oblige.

Technology has allowed Lands' End to take this concept to clothing. Now forty percent of the firm's chino and jeans orders are for custom products, and consumers pay a price markup of one-third or more for the tailored duds[15]. This kind of tech-led differentiation creates and reinforces other assets. While rivals also offer custom products, Lands' End has established a switching cost with its customers, since moving to rivals would require twenty minutes to re-enter measurements and preferences versus two minutes to reorder from LandsEnd.com. The firm's reorder rates are forty to sixty percent on custom clothes, and Lands' End also gains valuable information on more accurate sizing – critical since current clothes sizes provided across the U.S. apparel industry comfortably fit only about one-third of the population.

[14] Graham, 2008
[15] Schlosser, 2004



Custom clothing from LandsEnd.com differentiates the firm and creates switching costs

Data is not only a switching cost, it also plays a critical role in differentiation. Each time a visitor returns to Amazon, the firm uses browsing records, purchase patterns, and product ratings to present a custom home page featuring products that the firm hopes you'll like. Customers value the experience they receive at Amazon so much, that the firm received the highest score ever recorded on the University of Michigan's American Customer Satisfaction Index (ACSI). The score was not just the highest performance of any online firm, it was the highest ranking that any service firm in any industry had ever received.

Capital One has also used data to differentiate its offerings. The firm mines data and runs experiments to create risk models on potential customers. Because of this, the credit card firm was able to aggressively pursue a different set of customers that other lenders considered too risky based on simplistic credit scoring. Technology determined that these underserved customers not properly identified by conventional techniques were actually good bets. Finding profitable new markets that others ignored allowed Capital One to grow EPS (earnings per share) twenty percent a year for seven years, a feat matched by less than one percent of public firms.

Network Effects

AIM has the majority of instant messaging users in the United States. Microsoft Windows has a ninety percent market share in operating systems. eBay has an eighty percent share of online auctions. Why are these firms so dominant? Largely due to the concept of *network effects (See Chapter on Network Effects)*. Network effects (sometimes called *network externalities* or *Metcalfe's Law*) exist when a product or service becomes more valuable as more people use it. If you're the first person with an AIM account, then AIM isn't very valuable. But with each additional user, there's one more person to chat with. A firm with a big network of users might also see value added by third parties. Sony's PlayStation 2 was the dominant video game console in part because it had more games than its rivals, and most of these games were provided by firms other than Sony. Third-party add-on products, books, magazines, or even skilled labor are

all attracted to networks of the largest number of users, making dominant products more valuable.

Switching costs also play a role in determining the strength of network effects. Tech user investments often go way beyond simply the cost of acquiring a technology. Users spend time learning a product, they buy add-ons, create files, and enter preferences. Because no one wants to be stranded with an abandoned product and lose this additional investment, users may choose a technically inferior product, simply because the product has a larger user base and is perceived as having a greater chance of being offered in the future. The virtuous cycle of network effects doesn't apply to all tech products, and it is strongest when a firm controls a standard (think AIM with their closed system versus Netscape, which used open standards), but in some cases where network effects are significant, they can create winners so dominant that firms with these advantages enjoy a near monopoly hold on a market.

Distribution Channels

If no one sees your product, then it won't even get considered by consumers. So *distribution channels* – the path through which products or services get to customers – can be critical to a firm's success. Again, technology opens up opportunities for new ways to reach customers.

Users can be recruited to create new distribution channels for your products and services (usually for a cut of the take). You may have visited websites that promote books sold on Amazon.com. Website operators do this because Amazon gives them a percentage of all purchases that come in through these links. Amazon now has over one million of these Associates (the term the firm uses for its *affiliate program*), yet it only pays them if a promotion gains a sale. Google similarly receives over forty percent of its ad revenue not from search ads, but from advertisements distributed within third-party sites ranging from lowly blogs to the New York Times.

Apple uses iTunes as a distribution channel for all AppStore applications. Amazon enlists website owners to act as a distribution channel for information about its products.

In another move by Google to get its ads served from more places, the firm paid Dell an estimated one billion dollars for the privilege of pre-installing (distributing) the Google Toolbar and Google Desktop Search software on all the PCs Dell sells. The price tag for access to Dell desktop real estate may seem excessive, but Google feels it needs it to secure this distribution channels for its search service, since Microsoft can bundle its own search as the default in the Windows Vista operating system, on Internet Explorer, within MSN, and through its other offerings.

The ability to distribute products by bundling them with existing offerings is a key Microsoft advantage. But beware – sometimes these distribution channels can provide firms with such an edge that international regulators have stepped in to try to provide a more level playing field. Microsoft was forced by European regulators to unbundle the Windows Media Player, for fear that it provided the firm with too great an advantage when competing with the likes of RealPlayer and Apple's QuickTime (see Network Effects chapter).

What about Patents?

In the United States, technology and (more controversially) even business models can be patented. Firms that receive patents have some degree of protection from copycats that try to identically mimic their products and methods. But even if an innovation is patentable, that doesn't mean that a firm has bulletproof protection. Some patents have been nullified by the courts upon later review (usually because of a successful challenge to the uniqueness of the innovation). Software patents are also widely granted, but notoriously difficult to defend. In many cases, coders at competing firms can write substitute algorithms that aren't the same, but accomplish similar tasks. For example, although Google's PageRank algorithms are fast and efficient, Microsoft, Ask, and Yahoo now offer their own, non-infringing search that presents results with an accuracy that many would consider on par with PageRank. Patents do protect tech-enabled operations innovations at firms like NetFlix and Harrah's (casino hotels), and design innovations like the iPod click wheel. But in a study of the factors that were critical in enabling firms to profit from their innovations, Carnegie Mellon professor Wes Cohen found that patents were only the fifth most important factor. Secrecy, lead time, sales skills, and manufacturing all ranked higher[16].

LEARNING OBJECTIVE:
After studying this section you should be able to:

1. Understand the relationship between timing, technology, and the creation of resources for competitive advantage
2. Argue effectively when faced with broad generalizations about the importance (or lack of importance) of technology and timing to competitive advantage.
3. Recognize the difference between low barriers to entry and the prospects for the sustainability of new entrant's efforts.

BARRIERS TO ENTRY, TECHNOLOGY, AND TIMING

Some have correctly argued that the barriers to entry for many tech-centric businesses are low. This is particularly true for the Internet where rivals can put up a competing website seemingly overnight. But it's absolutely critical to understand that market entry is *not* the same as building a sustainable business, and just showing up doesn't guarantee survival.

iWon.com entered the portal market with amazing speed. The founders went from discussing the idea over cheeseburgers to launching a Yahoo look-alike in less than nine months. Entry barriers were low because so much of the technology and services that the firm needed to acquire were available through third parties. Consulting firm Sapient built the website; Inktomi (which at the

[16] Mullaney, 2000

time also handled search for Yahoo) provided search; and DoubleClick handled ad sales. The firm's partnership with CBS (an early investor) allowed iWon to showcase giveaways in a television program that reached a national primetime audience. But even with its rapid entry and heavy media exposure, latecomer iWon never came close to challenging Yahoo's brand power. If barriers to entry appear to be low, rivals may initially flood the market. However, as the difficulty in competing with incumbents becomes apparent, the intensity of competition from new entrants will taper off.

Platitudes like "follow, don't lead"[17] can put firms dangerously at risk, and statements about low-entry barriers ignore the difficulty many firms will have in matching the competitive advantages of successful tech pioneers. Should Blockbuster have waited while Netflix pioneered? In a year where Netflix profits were up seven-fold, Blockbuster lost more than one billion dollars[18]. Should Sotheby's have dismissed seemingly inferior eBay? Sotheby earned $69 million in profit in 2005; eBay earned $1.3 billion. Barnes & Noble waited seventeen months to respond to Amazon.com. Amazon now has over three and a half times the profits of its offline rival and its market cap is twenty-five times greater. Today's Net giants are winners because in most cases they were the first to move with a profitable model and they were able to quickly establish resources for competitive advantage. With few exceptions, established off-line firms have failed to catch up to today's Internet leaders.

Timing and technology alone will not yield sustainable competitive advantage. Yet both of these can be *enablers* for competitive advantage. Put simply, it's not the time lead or the technology, it's what a firm *does* with its time lead and technology. True strategic positioning means that a firm has created differences that cannot be easily matched by rivals. Moving first pays off when the time lead is used to create critical resources that are valuable, rare, tough to imitate, and lack substitutes. Anything less risks the arms race of operational effectiveness. Build resources like brand, scale, network effects, switching costs, or other key assets and your firm may have a shot. But guess wrong about the market or screw up execution and failure or direct competition awaits. It is true that most tech can be copied – there's little magic on eBay's servers, Intel's processors, Oracle's databases, or Microsoft's operating systems, that past rivals have not at one point improved upon. But the lead that each of these tech-enabled firms had was leveraged to create network effects, switching costs, data assets, and helped build solid and well respected brands.

But Google Arrived Late! Why Incumbents Must Constantly Consider Rivals

Yahoo was able to maintain its lead in e-mail because the firm quickly matched and nullified Gmail's most significant tech-based innovations before Google could inflict real damage. Perhaps Yahoo had learned from prior errors. The firm's earlier failure to respond to Google's emergence as a credible threat in search advertising gave Sergey Brin and Larry Page the time they needed to build the planet's most profitable Internet firm.

Yahoo (and many Wall Street analysts) saw search as a commodity – a service the firm had sub-contracted out to other firms including Alta Vista and Inktomi. Yahoo saw no conflict in providing startup funding for Google and in using the firm for its search results, as well. But Yahoo failed to pay attention to Google's advance. Over time,

[17] Carr, 2003
[18] The Economist, 2005

Google's unmatched technical lead allowed the firm to build up an advertising network (distribution channel), brand, and scale – all competitive resources that rivals have never been able to match.

Google's ability to succeed after being late to the search party isn't a sign of the power of the late mover, it's a story about the failure of incumbents to monitor their competitive landscape, recognize new rivals, and react to challenging offerings. That doesn't mean that incumbents need to respond to every potential threat. Indeed, figuring out which threats are worthy of response is the real skill here. Video rental chain Hollywood Video wasted over $300 million in an Internet streaming business years before the high-speed broadband-to-the-home was available to make the effort to work[19]. But while Blockbuster avoided the balance-sheet-cratering gaffes of Hollywood Video, the firm also failed to respond to Netflix – a new threat that had timed market entry perfectly (see the Netflix case study).

Firms that quickly get to market with the 'right' model can dominate, but it's equally critical for leading firms to pay close attention to competition. Take your eye off the ball and rivals may use time and technology to create strategic resources. Just ask Friendster!

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LEARNING OBJECTIVE:
After studying this section you should be able to:

1. Diagram the five forces of competitive advantage.
2. Apply the framework to an industry, assessing the competitive landscape and relative power of buyers, suppliers, competitors, and alternatives.

KEY FRAMEWORK: THE FIVE FORCES OF INDUSTRY COMPETITIVE ADVANTAGE

Professor and strategy consultant Gary Hamel wrote in a Fortune cover story that "The dirty little secret of the strategy industry is that it doesn't have any theory of strategy creation"[20]. While there is no silver bullet for strategy creation, strategic frameworks help managers describe the competitive environment a firm is facing. Frameworks can also be used as a brainstorming tool to generate new ideas for responding to industry competition. If you have a model for thinking about competition, it's easier to understand what's happening and to think creatively about possible solutions.

One of the most popular frameworks for examining a firm's competitive environment is *Porter's Five Forces*, also known as the *Industry and Competitive Analysis*. As Porter puts it, "analyzing [these] forces illuminates an industry's fundamental attractiveness, exposes the underlying drivers of average industry profitability, and provides insight into how profitability will evolve in the future." The five forces this framework considers are 1) the intensity of rivalry among existing competitors, 2) the threat of new entrants, 3) the threat of substitute goods or services, 4) the bargaining power of buyers, and 5) the bargaining power of suppliers (see Diagram 2).

[19] Wingfield, 2007
[20] Hamel, 1997

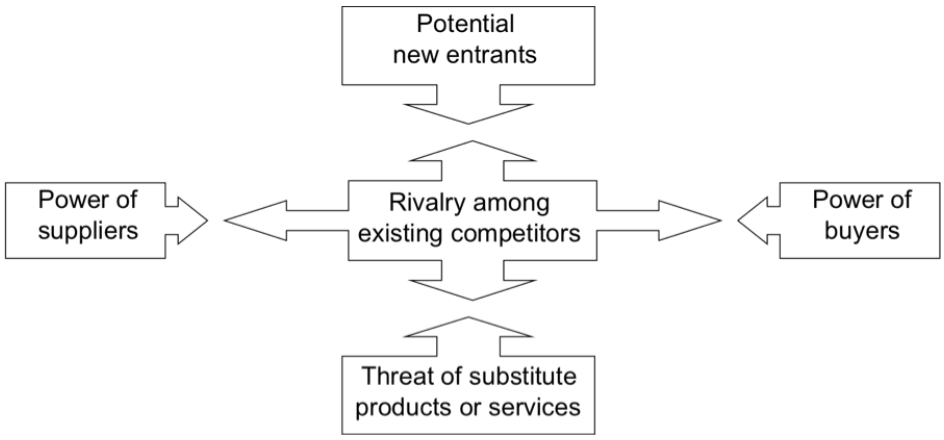

Diagram 2: The Five Forces of Industry Competitive Analysis

New technologies can create jarring shocks in an industry. Consider how the rise of the Internet has impacted the five forces for music retailers. Traditional music retailers like Tower and Virgin find that customers are seeking music online and are scrambling to invest in the new channel out of what is perceived to be a necessity. Their *intensity of rivalry* increases because they not only compete based on the geography of where brick-and-mortar stores are physically located, they now compete online as well. Investments online are expensive and uncertain, prompting some firms to partner with *new entrants* such as Amazon. Free from brick-and-mortar stores, Amazon, the dominant new entrant has a highly scaleable cost structure. And in many ways the online buying experience is superior to what customers saw in stores. Customers can hear samples of almost all tracks, selection is seemingly limitless (the "*long tail*" phenomenon—see this concept illuminated in the Netflix Case), and data is leveraged using *collaborative filtering* software to make product recommendations and assist in music discovery[21]. Tough competition, but it gets worse because CD sales aren't the only way to consume music. The process of buying a plastic disc now faces *substitutes* as digital music files become available on commercial music sites. Who needs the physical atoms of a CD filled with ones and zeros when you can buy the bits one song at a time? Or don't buy anything, subscribe to a limitless library.

From a sound quality perspective, the *substitute good* of digital tracks purchased online is almost always inferior to their CD counterparts. To transfer songs quickly and hold more songs on an MP3 player, tracks are encoded in a smaller file size than what you'd get on a CD, and this smaller file contains lower playback fidelity. But the additional tech-based market shock brought on by MP3 players (particularly the iPod) has changed listening habits. The convenience of carrying thousands of songs trumps what most consider just a slight quality degradation. iTunes is now responsible for selling more music online or off than any other firm, online or off. Most alarming to the industry is the other widely adopted substitute for CD purchases – theft. Music is available illegally, but free. And while exact figures on real losses from online piracy are in dispute, the music industry has seen sales drop by roughly one-third since 2000[22]. All this choice gives consumers *(buyers) bargaining power*. They demand cheaper prices and greater convenience. The *bargaining power of suppliers* – the music labels –

[21] for more info on The Long Tail and Collaborative Filtering, see the NetFlix Case
[22] Brandle, 2007

also increases. At the start of the Internet revolution, retailers could pressure labels to limit sales through competing channels. Now, with many of the major music retail chains in bankruptcy, labels have a freer hand to experiment.

While it can be useful to look at changes in one industry as a model for potential change in another, it's important to realize that the changes that impact one industry do not necessarily impact other industries in the same way. For example, it is often suggested that the Internet increases bargaining power of buyers and lowers the bargaining power of suppliers. This is true for some industries like auto sales and jewelry where the products are commodities and the *price transparency* of the Net counteracts a previous *information asymmetry* where customers often didn't know enough information about a product to bargain effectively. But it's not true across the board.

In cases where network effects are strong or a seller's goods are highly differentiated, the Internet can strengthen supplier bargaining power. The customer base of an antique dealer used to be limited by how many likely purchasers lived within driving distance of a store. Now with eBay, the dealer can take a rare good to a global audience and have a much larger customer base bid up the price. Switching costs also weaken buyer bargaining power. Wells Fargo has found that customers who use online bill pay (where switching costs are high) are 70 percent less likely to leave the bank than those who don't, suggesting that these switching costs help cement customers to Wells even when rivals offer more compelling rates or services.

Tech plays a significant role in shaping and reshaping these five forces, but it's not the only significant force that can create an industry shock. Government deregulation or intervention, political shock, and social and demographic changes can all play a role in altering the competitive landscape. Because we live in an age of constant and relentless change, mangers need to continually visit strategic frameworks to consider any market impacting shifts. Predicting the future is difficult, but ignoring change can be catastrophic.

LEARNING OBJECTIVE:
After studying this section you should be able to:

1. Diagram and list the components of the value chain.
2. Name various software technologies that can be used to automate aspects of the value chain (e.g. SCM, CRM, ERP).
3. Discuss why a firm may or may not want to use commonly available software programs to automate aspects of its value chain.

KEY FRAMEWORK: THE VALUE CHAIN

The *value chain* is the "set of activities through which a product or service is created and delivered to customers"[23]. By examining the activities in a firm's value chain, managers are able to gain a greater understanding of how these factors influence a firm's cost structure and value delivery. There are five primary components of the value chain and four supporting components.

[23] Porter, 2001

The primary components are:

- *Inbound logistics* – getting needed materials and other inputs into the firm from suppliers
- *Operations* – turning inputs into products or services
- *Outbound logistics* – delivering products or services to consumers, distribution centers, retailers, or other partners
- *Marketing and Sales* – customer engagement, pricing, promotion, transaction
- *Support* – service, maintenance, and customer support

The secondary components are:

- *Firm infrastructure* – functions that support the whole firm, including general management, planning, IS, and finance
- *Human resource management* – recruiting, hiring, training, and development
- *Technology / Research & Development* – new product and process design
- *Procurement* – sourcing and purchasing functions

While the value chain is typically depicted as it's displayed in Diagram 3, goods and information don't necessarily flow in a line from one function to another. For example, an order taken by the marketing function can trigger an inbound logistics function to get components from a supplier, operations functions (to build a product if it's not available), and/or outbound logistics functions (to ship a product when it's available). Similarly, information from service support can be fed back to advise R&D in the design of future products.

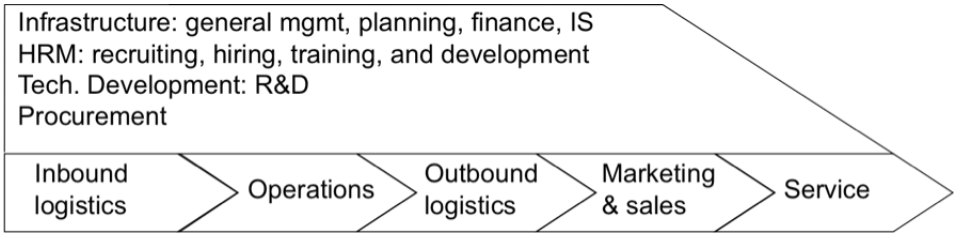

Diagram 3: The Value Chain

An analysis of a firm's value chain can reveal operational weaknesses, and technology is often of great benefit to improving the speed and quality of execution. Software tools such as *supply chain management* (SCM: linking inbound and outbound logistics with operations), *customer relationship management* (CRM: supporting sales, marketing, and in some cases R&D), and *enterprise resource planning software* (ERP: software implemented in modules to automate the entire value chain), can have a big impact on more efficiently integrating the activities within the firm, as well as with its suppliers and customers. But remember, these software tools can be purchased by all competitors. Although they can cut cost and increase efficiency, if others can buy the same or comparable products then these technologies, while valuable, may not yield lasting competitive advantage.

Even more important to consider, if a firm adopts software that changes a unique process into a generic one, it may have co-opted a key source of competitive advantage. SCM, CRM, and ERP software typically require adopting a very specific way of doing things. Dell stopped deployment of the logistics and manufacturing modules of its ERP implementation when it

realized that the software would require the firm to make changes to its unique and highly successful operating model. By contrast, Apple had no problem adopting ERP because the firm competes on product uniqueness rather than operational differences.

From a strategic perspective, managers can also consider the firm's differences and distinctiveness compared to rivals. If a firm's value chain cannot be copied by competitors without engaging in painful tradeoffs, or if the firm's value chain helps to create and strengthen other strategic assets over time, it can be a key source for competitive advantage. Many of the cases covered in this book, including FreshDirect, Amazon, Zara, NetFlix, and eBay, illustrate this point.

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About the Author:

John Gallaugher is a member of the Dept. of Information Systems in Boston College's Carroll School of Management. Prof. Gallaugher teaches courses and conducts research at the intersection of technology and strategy. He leads the School's TechTrek programs, co-leads the Asian field study program, and has consulted to and taught executive seminars for several organizations including Accenture, Alcoa, Brattle Group, ING Group, Patni Computer Systems, Staples, State Street, and the U.S. Information Agency. Writings, podcasts, course material, and research by Prof. Gallaugher can be found online at www.gallaugher.com.

This reading is available to faculty for non-commercial use. Enjoy! If you do use it, please send an e-mail to john.gallaugher@bc.edu. More chapters and cases will follow in Professor Gallaugher's forthcoming book "Information Systems: A Manager's Guide to Harnessing Technology", to published (in both free online and low-cost print version) by Flat World Knowledge (FlatWorldKnowledge.com). Thanks!

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