1. INTRODUCTION

Microsoft co-founder Bill Gates’ vision is, "A computer on every desktop, in every home." This was the beginning of a new paradigm within the computer industry from large centralized mainframes to decentralized personal computers dedicated to single users. As we enter the 21st century, a new paradigm promises to radically alter the landscape of the computer industry once again: the era of networked computing.

Networked computing implies that all computers (from large mainframes to desktop PCs to handheld PDAs) are networked together to allow communication with one another. From a technological standpoint, networked computing results in the convergence of two traditionally separate industries -- computers and telecommunications. But the social and economic ramifications of this convergence are huge -- the ability to see and hear people from across the world as if they were next door, instant dissemination of timely information, collaboration and sharing of data, and mass product and service customization are just a few of the applications networked computing promises. The Internet has provided us with a glimpse of what networked computing can offer, but this is only the tip of the iceberg for this new era of "Connected: anytime, anywhere.”

For companies hoping to ride the networked computing wave to financial success, it is imperative that they understand the dynamics of this new infrastructure paradigm. Entrepreneurial cowboys need to be aware of the characteristics and behaviors of developing new markets. Established companies must be open to change in order to adapt to new business conditions. Indeed, networked computing has changed the game. You need to understand the rules if you want to play, and win, this new game.
This paper discusses several strategies for competing in the era of networked computing, with emphasis on a unique strategy called "co-opetition." As the name implies, co-opetition is a combination of competition and cooperation. As we shall see, in many circumstances co-opetition is a more optimal strategy than the traditional methods of competition. In this paper we discuss 1) the motivation and fundamentals of networked computing, 2) a survey of traditional business strategies, 3) co-opetition as an emerging business strategy, 4) a brief presentation of the Technology Adoption Life Cycle, and an analysis of the different business strategies applied to networked computing.

1.1 Rules of the New Game

The computer industry has gradually evolved from a centralized computing model to a decentralized model.

- In the 1950s-60s mainframe computers emerged. Since these were large and expensive, they were only affordable by large corporations.
- The shift to time-shared computing in the 70s allowed more users to interact with applications on the mainframes through dumb terminals.
- The 80s saw a shift to decentralized computing with the emergence of the PC, which provided users with their own suite of desktop applications.

In conjunction with this technological evolution, several industry trends have also emerged:

- The computer industry has embraced open systems and standards. The PC is a classic example of this. Since it has an open architecture, each component of the PC can be supplied by a separate vendor -- microprocessors from Intel, modems from 3Com, memory from Micron, OS from Microsoft, etc. This environment promotes competition and innovation at each level (component) of the PC, allows faster time-to-market by allowing vendors to specialize by working on their parts in parallel, provides interoperability among vendors, and reduces vendor lock-in.
- A trend from vertically integrated companies to horizontally diversified companies. In the old mainframe era, vertically integrated companies competed by offering the best full system solution. In the open systems model, companies compete by offering the best solution within their horizontal layer (i.e. component of the PC).

As we move towards networked computing these trends are likely to continue. In addition, networked computing introduces even more rules:

- Network effects and network externalities become much more influential in the networked model of computing. This is true since network applications only have value if there is someone else to connect to. For example, the first fax machine sold had little immediate value since it could not send faxes to anyone. Once the second fax machine was sold however, the first machine was immediately worth something since it could then send faxes to the second machine. Thus, each subsequent fax machine sold adds value to the first machine since it represents another machine to send faxes to. Mathematically stated, as the number of nodes in a network increases linearly, the value of the network increases exponentially.
- Industry convergence. Networked computing results in the convergence of two very different industries: computing and telecommunications. Traditionally, not only were these two industries technologically different, but also fundamentally different. The computer industry has a history of
rapid-change and high-competition. The telecommunications industry, on the other hand, has a more stable history due to its dominance by the AT&T monopoly. Indeed, as these two industries converge, merging the two ways of thinking may be more difficult than merging the two technologies.

1.2 Winning the Game

Just as the mainframe and PC eras produced the likes of IBM, Intel, and Microsoft, networked computing will likely produce immensely successful companies as well. Indeed, the networked computing industry will be so large that many companies will emerge victorious -- that is, profiting from the networked computing wave. However, without an understanding of the rules of this new game, a company has no chance of winning. But, simply understanding the rules does not guarantee winning. You must be actively aware of your position within the industry, and select appropriate strategies to carry out your business plan. Furthermore, you must be willing to change strategies as your position in the industry changes and/or the industry itself evolves. A summary of traditional business models follows.

2. BUSINESS STRATEGIES

2.1 Traditional Business Strategies

In deciding how to conduct your business, one of the traditional and most widely accepted approaches of the past twenty years has been to conduct a competitive analysis. Harvard Business School professor and independent consultant Michael Porter formalized this approach with his competitive forces model which identifies five basic forces with which a commercial organization must contend. This model provides a framework for collecting and organizing industry information. Traditional business strategy emphasized a firm’s internal strengths and weaknesses while neglecting or considering only one aspect of industry structure. Porter’s notion of competitive strategy requires a knowledge of both the firm’s internal strengths and weaknesses and the industry structure. His thesis is that the more competitive an industry is, the thinner the profit margins are likely to be, and vice versa.

As mentioned above, the competitive forces model considers five forces for a competitive analysis. These are:

*The Threat of Potential New Entrants*
Assessing the threat of new entrants can be accomplished by identifying barriers to entry. Potential barriers to entry include economies of scale, proprietary product differences, capital requirements, and absolute cost advantages.

*Customer Bargaining Power*
In some instances buyers can exert considerable influence upon the providers of goods and services (e.g. volume purchases, long-term contracts).

*The Threat of Substitution*
When assessing how readily buyers will substitute a different type of product for the one the commercial organization sells, four factors should be considered.
Availability of substitutes
Relative price performance of substitutes
Switching costs
Buyer propensity to substitute

Supplier Bargaining Power
Factors that determine how powerful an organization’s suppliers are in setting the price of supplies include:

- Differentiation of inputs
- Switching costs
- Presence of substitute inputs
- Importance of volume to the supplier
- Cost relative to total purchase
- Impact of inputs on cost or differentiation of the final product / service

Rivalry Among Competition
Assessing the level of competition that exists between the various players in an industry can become a very involved exercise. In lieu of a comprehensive industry analysis, one should at least appraise:

- The industry’s growth prospects
- Competitors’ capacity to take aggressive actions
- The quality and size of competitors
- Barriers to exit - the effort and costs associated with withdrawing from this market

Government Regulation
Although it is not part of Porter’s model, it is generally accepted that government regulation is a sixth and very important force which must be considered. As a barrier to entry, Porter considers the impact of regulatory influences when evaluating the threat of potential entrants. In some industries / economies, government regulation may represent a pervasive factor which needs to be considered explicitly as a competitive force (e.g. utilities, airlines, People’s Republic of China).

2.2 Generic Competitive Strategies
In his book, Porter also outlines three generic competitive strategies upon which firms may embark. In his view, failure to focus on one of the strategies significantly limits an organization’s performance potential. These are:

Cost Leadership Strategy
An organization pursuing a cost leadership strategy gains a competitive advantage by becoming the low cost provider of a product or service. Characteristics of a cost leadership strategy include:

- Pursue high volumes, large market share
- Low costs derived from economies of scale and the experience curve (volumes)
- Minimal market segmentation
- Suitable for homogenous markets, standardized products
Lower cost producers or declining volumes represent significant threats to organizations pursuing this strategy. According to Porter, this is not an advisable strategy for highly segmented markets nor markets characterized by rapid changes in technology and customer requirements.

**Differentiation Strategy**
Offering a product or service that buyers consider unique and to have a valuable difference enables the product or service to be sold at a premium price, thereby yielding a higher profit margin. Characteristics of a differentiation strategy include:

- Product innovation and superior quality are necessities
- Fast product development
- Often requires a perception of exclusivity which is incompatible with market share
- Differentiation along several dimensions (brand image, technology, features, customer service, distribution network) is ideal

The ability to differentiate is only valuable if it is valuable to your customer. The challenge in pursuing a differentiation strategy is to maintain costs that do not affect differentiation in parity with competitors. Differentiation requires that a company emphasize product and promotion. As an industry matures, differentiation is difficult.

**Focus Strategy**
In any market, there will be only a few successful, differentiated competitors and usually only one cost leader. According to Porter, the other companies in an industry must choose a focus or niche strategy under which the company concentrates on a narrow segment of the market and produces a specialized offering. The pursuit of a focus strategy entails identifying a narrow segment of the market with specialized needs and then devising a mix of cost leadership and differentiation to attract this segment. While this strategy does not achieve low cost or differentiation from the perspective of the market as a whole, it does achieve one or both of these positions in its narrow target markets. Through specialization the firm justifies higher prices than supported by a differentiation strategy and captures higher unit profit margins.

### 2.3 New Business Strategies

These traditional strategies have recently been reevaluated. Until recently it was believed that the only three generic models to choose from were *Cost Leadership, Differentiation, or Niche* strategies. Adding to the strategic fray, Joseph Pine in his 1993 book *Mass Customization*, outlines a creative new strategy in his Dynamic Stability model: *Mass Customization*. Pine says industries are characterized by their products and their processes. The degree of change in those products and processes as measured on the Dynamic Stability Product/Process matrix (see figure 1) defines what kind of strategy the company is pursuing.
So, for example, a traditional production strategy such as *Mass Production* concentrates on generating economies of scale by specializing in standardized, unchanging processes to manufacture cookie cutter products. This represents a low degree of change in products and process and is one alternative route toward Porter’s *Cost Leadership* strategy. Another traditional strategy involves *Invention* in which there are constant changes in processes and products (e.g., Thomas Edison, Bell Labs). This reflects a high degree of both product and process change and gibles with Porter’s *Differentiation* strategy. In the past 30 years Japanese manufacturing companies, especially auto manufacturers, have championed another quadrant on this matrix known as *Continuous Improvement*. Instead of seeking occasional revolutionary changes to achieve improvement, these companies have continually sought incremental improvements in an evolutionary strategy. When these incremental improvements are summed up, they often are more significant than occasional changes brought about by a revolutionary change strategy. This is another route companies take to achieve *Cost Leadership* with fairly standardized products. Finally, imagine if you will, a strategy in which you are able to benefit from your ability to customize your products to individual customer specifications while still maintaining the capacity to produce with economies of scale. This scenario describes a situation in which your products change as needed but you are able to specialize and generate economies of scale by utilizing stable processes. This fourth quadrant which is considered outside the realm of Porter’s traditional business and production strategies is called *Mass Customization*. Mass Customization, however, is not necessarily the most exciting new business strategy.
3. CO-OPETITION

In deciding how to conduct a business in an increasingly complex world, it now seems an oversimplification to limit one’s analysis to the competitive environment. Furthermore, the reliance on competitive analyses implies the existence of purely adversarial relationships between the players in a given industry. In reality, there may be cooperative relationships within a competitive industry without resorting to unfair or non-competitive monopolistic practices. In fact, cooperation and competition often exist concurrently between the same two players. For example, General Motors and Toyota produce a nearly identical car (Chevrolet Prizm / Toyota Corolla) which they collaborated to design; but they go out into the marketplace and try to outdo each other. Recently on network television, the first part of a crossover story began on Fox’s Monday night program, Ally McBeal with characters from ABC’s Law and Order program. The following night, the program concluded on Law and Order with characters from Ally McBeal. So, cooperative strategies can be used to create a new market (or expand an existing market), and once it is created, competitive strategies can be used to divide it up amongst the players. This is based on the premise that business is not necessarily a zero sum game where each situation is win-lose. There can actually be scenarios in which win-win is achieved by cooperation and others in which lose-lose occurs without it. In fact, without cooperation often times there exists a lose-lose-lose situation because not only do the competitors end up losing out on a potential market, but the market gets underserved because consumers lose out on a potentially useful product or service.

In highly segmented industries with strong network effects, such as the information technology industry, cooperation and competition, or Co-opetition, may be the only way to conduct business. Because of strong network effects it is often difficult in the information technology industry to get new products off the ground. In addition, the market demands more and more interoperability and this requires technical standards. However, the establishment of technical standards by competitive market forces in and of themselves is usually a rocky road. Frequently, it leads many incipient companies down the road to bankruptcy and established companies down the road of product abandonment before their contributions can get any wind in their sails. Many years of fruitless, cutthroat competition in which no clear winner emerges inhibits the overall health of the market, in terms of company profitability and in terms of interoperability and high customer investments which often become stranded once a clear winner does emerge. New strategies are needed to avoid this undesirable situation. Co-opetition, which has its theoretical foundations in game theory, does just that.

3.1 Game Theory

The classical formulation of game theory was presented in the highly acclaimed book Theory of Games and Economic Behavior by John Von Neumann and Oskar Morgenstern in 1944. This theory studies the "game of strategies" in a social exchange economy, as distinct from the "Robinson Crusoe" economic model. The latter consists of an economy of an isolated single person or otherwise organized under a single will. Consider the following scenario:

"Crusoe is given certain physical data (wants and commodities) and his task is to combine and apply them in such a fashion as to obtain a maximum resulting satisfaction. There can be no doubt that he controls exclusively all the variables upon which his result depends - say the allocating of resources, the determination of the uses of the same commodity for different wants, etc."
This is an ordinary maximization problem, posing mostly practical rather than theoretical difficulty. In a social exchange economy, a participant also tries to obtain an optimum result. "But in order to achieve this, he must enter into relations of exchange with others. If two or more persons exchange goods with each other, then the result for each one will depend in general not merely upon his own action but on those of the others as well. Thus each participant attempts to maximize a function of which he does not control all variables. This is certainly no maximum problem, but a peculiar and disconcerting mixture of several conflicting maximum problems. Every participant is guided by another principle and neither determines all variables which affect his interest."

This characterization leads to the primary insight of game theory for business strategies, summarized by Brandenburger and Nalebuff, as "the importance of focusing on others -- of putting yourself in the shoes of other players and trying to play out all the reactions to their actions as far ahead as possible. By adopting this perspective, a company may, for example, discover that its chances for success are greater if it creates a win-win, rather than a win-lose, situation with other players. In other words, companies should consider both cooperative and competitive ways to change the game."

The idea of looking for win-win as well as win-lose opportunities is captured by the term "co-opetition." According to Brandenburger and Nalebuff, this portmanteau word can be traced to Ray Noorda, CEO of Novell, who has used it to describe relationships in the information technology business: "You have to cooperate and compete at the same time" (Electronic Business Buyer, December 1993).

Co-opetition comes down to communication and ways to negotiate win-win scenarios. The Harvard Negotiation Project also embraces the concept of win-win scenarios. By negotiating based on your legitimate interests and not from rigid positions, participants in many negotiations can find ways to create win-win situations. As an example, take the case of the two sisters who were arguing over who would get the last orange in the fruit bowl. They argued based on positions, each one asserting that she had the right to the whole orange. In the end they settled their differences "half way" by slicing the orange down the middle, taking half each and going their separate ways. The first sister peeled her half, threw away the peel and ate the sweet juicy pulp. The second sister peeled her half, threw away the sweet juicy pulp and used the peel to make an orange cake. Now, if they had only seen their way clear to negotiating based on their legitimate interests (one wanted to eat the orange pulp, the other wanted to use the orange peel), both sisters could have gotten more out of the agreement. However, they turned a potential win-win situation into a lose-lose situation by negotiating based on positions (each wanted the whole orange). When looking at what stage your business is at and deciding how to conduct it, you should evaluate the existence of potential win-win situations. If your company is negotiating from a position of weakness, then it may be in your interest to cooperate. If your company is negotiating from a position of great strength, then it may be in your best interest to all-out compete. However, this strategy should not be pursued without properly addressing the possibility of a win-win scenario.

3.1.1 Prisoner’s Dilemma

An example that illustrates the potential benefits from cooperation is the prisoner’s dilemma. This is a problem presented by two RAND scientists Flood and Dresher in 1950. A modern version of the formulation is given by William Poundstone in his book Prisoner’s Dilemma.

Suppose you have stolen the Hope Diamond and are trying to sell it to a potential buyer, Mr. Big. You suggest to execute the trade this way: You hide the diamond in a wheat field in North Dakota, while Mr.
Big hides his money in a wheat field in South Dakota. Then both of you go to the nearest public phone and exchange directions on how to find the hidden goods.

As you are about to hide the diamond in the field, an idea pops into your head, why not just keep the diamond? By the time Mr. Big finds out, you would have already been on a plane to Rio. But before you get excited, you realize that Mr. Big must be thinking the exact same thing. Both of you have equal incentive to betray the other. This situation is summarized below in figure 2:

<table>
<thead>
<tr>
<th>Mr. Big sticks to agreement</th>
<th>Mr. Big cheats</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>You stick to agreement</strong></td>
<td>Deal goes through: you get money, Mr. Big gets diamond.</td>
</tr>
<tr>
<td><strong>You cheat</strong></td>
<td>You walk away with money and diamond, Mr. Big gets nothing.</td>
</tr>
</tbody>
</table>

Figure 2. Extrapolation of the Prisoner’s Dilemma

In the business world, many transactions are potential prisoner’s dilemma. When facing competition, how do you decide whether to lower the price? If you take a selfish approach and lower the price, you can garner increased market share. However, your competitor could adopt the exact same strategy and a price war would start resulting in both sides being worse off. On the other hand, if both agree not to enter a price war, you may still split the market with your competitors but at higher profit levels. Both sides benefit from such cooperation.

3.2 PARTS

According to game theory, the game has five elements: players, added values, rules, tactics, and scope -- PARTS for short.

3.2.1 Players

The players are customers, suppliers, substitutors (competitors), and complementors. It is important to realize that none of the players are fixed, including yourself. An effective business strategy may entail bringing in new players or pushing out existing ones. For example, if you only have one supplier, you may want to pay for other suppliers to enter the game in order to make the raw material market for your business more competitive, or even to commoditize your supplier’s products. On the other hand, if you are considering becoming a new player as a supplier to big companies, you should try to get compensated by the future customer for the competition you create. Within the players element, the concept of the Value Net expresses the relations amongst the players.
The Value Net (figure 3) is a sub-component of PARTS which explains who the game’s players are. Brandenburger and Nalebuff also use the Value Net to explain the interdependencies amongst the players. They argue that there are both vertical and horizontal symmetries in the Value Net. Vertically, it demonstrates that customers and suppliers are both "equal partners in creating value." Organizations need to listen to the needs and wants of both players. They cannot follow the convention of just placing the customer first. They must also nurture supplier relations, a strategy which at present is not always the norm. Listening to suppliers allows organizations to create partnerships and possibilities to improve the supply process. Horizontally, Brandenburger and Nalebuff state that "complementors are just the mirror image of competitors." Customers value your product more when there are complementors whereas they value your product less when there are substitutors. Understanding this relationship highlights a deficiency in current competitive practices - only focusing on how to eliminate one’s competitors. Rather organizations should also attempt to develop commodity complementors which in the long-term increases an organization’s overall value to a customer.

By understanding these two symmetries, the Value Net carries greater potential for successful application. Instead of focusing on only the conventional players like customers and competitors, the Value Net shows that organizations really have four players to choose from when developing business strategies. This alone may be enough to give a company a competitive advantage over other players playing the game.

3.2.2 Added Values

Added values are what each player brings to the game. Trying to raise your added value or lower the added values of other players can make yourself a more valuable player. Some ways to raise your added value are tailoring your product to customers’ needs, build a brand, use resources more efficiently, etc. One the other hand, creating competition among your suppliers, controlling production to generate shortage of your products, using commodity parts in your products, etc, are some possible ways to lower the values of others.

3.2.3 Rules
Just as the players and added values of the game are mutable, so are the rules. In business, most of the rules people play by are well-established laws and customs. But there are other rules that can be changed or negotiated with other players, such as contracts. Players may want to revise the rules to their advantage. For example, a meet-the-competition (MCC) clause in the contracts give the incumbent seller the right to make the last bid, which allows the producer to sustain a higher price and reduce the chance of a price war. This in turn also helps the challenger some room to raise prices to its own customers. And for the customers, their producers are more willing to invest in serving them since MCC guarantee producers a long-term relationship if they so choose. In addition, the imitation of MCC will allow the producers to push the prices up further, so they have even more to lose from starting a share war. This is a typical case in co-opetition to create a win-win situation. From Game theory point of view, the function of rules is to limit the possible reactions to any action. To analyze the effect of a rule, a player must look forward and reason backward.

3.2.4 Tactics

Business is a complicated game, mired in uncertainty. Tactics are used to influence the way other players perceive the uncertainty and mold their behavior. Some tactics work by reducing misconceptions, other work by creating or maintaining uncertainty. For example, if Netscape decided not to compete directly with Microsoft in the browser business, and just go after a niche market, it could have been able to avoid the price war on browsers. To do this, it would have had to make it clear to Microsoft that it was not going after the whole market. And both companies could have co-existed and divided the market. If Microsoft had been convinced, it would not have reduced the price of Internet Explorer to nothing and tried to drive Netscape out of business.

3.2.5 Scope

Games are not static, they evolve over time and are linked across space. Scope describes the boundaries of the game. Managers should constantly evaluate the possibility of expanding or shrinking those boundaries. For the Netscape example discussed above, when Netscape lost market share to Microsoft on the browser market, it expended the scope by including the server software as a major part of their business. In fact, it is plausible to conjecture that this was just their strategy. Since the browser and server software markets are tightly linked, commoditizing the browser software by inducing competition is actually helpful for increasing the server software market.

The Value Net and PARTS are important frameworks for managers to find co-opetition opportunities. However, there are many potential traps that must be avoided. First, you must realize that you don’t have to accept the game you find yourself in. The bottom line is that you can change the game to your advantage and it is far more rewarding to be a game maker than a game taker. Secondly, it is important to know that changing the game doesn’t have to come at the expense of others. This mind-set is critical for finding the win-win strategy. The third trap is to believe that you have to find something to do that others can’t. Some textbooks on strategy warn that if others can imitate something you do, you can’t make money at it. But in the world of co-opetition, imitation can actually be healthy, as shown by Brandenburger and Nalebuff. Another trap is to only focus on part of the game. If you fail to see the whole game, you can’t change the part you don’t see. Lastly, alway keep in mind that business is a dynamic process. Other player are also trying to change the game. Their changes could either be beneficial to you or not. You often need to change the game again to maintain a game maker position. And there is no end of game.
3.3 Using Tactics to Gain Advantage: The Dispute between Sun Microsystems and Microsoft over Java

The Java dispute between Sun and Microsoft is based on Microsoft’s attempt to change the game and Sun’s unwillingness to let this happen. The original game focused on conquering the operating systems industry. Sun introduced Java technology to facilitate cross-platform compatibility. Once Java was firmly entrenched, it could serve as "a mini-operating system that would be an alternative to the Windows platform" (Bowman). Even though Java usage was far from achieving this goal, Microsoft recognized Sun as a potentially strong competitor capable of stealing part or even all of its market share. Because a cross-platform operating system (OS) would hold a stronger added value than an OS strictly for PCs, Microsoft’s market share was endangered. Without an installed base of OS consumers, Microsoft could lose its competitive advantage not only in the OS market but in markets for its complementary products.

Rather than compete according to the game that Sun laid out, Microsoft chose an alternative option. It used co-opetition to turn the tables on Sun. It cooperated initially with Sun and fellow Java licensees to develop Java technology and applications. This let Microsoft keep an eye on its future competitors by collaborating with them until it could create a strong enough counterattack to Java. When it found itself in a position to compete, it used two tactics to decrease the scope of Java, thereby limiting the number of potential players capable of competing in the OS market.

*The first tactic introduced a renegade version of Java in IE 4.0 that was incompatible with Sun endorsed versions of Java. The second tactic presented a Microsoft substitute to Java in the form of Dynamic HTML. The first tactic eroded Java’s claim of "Write Once Run Anywhere." Because software developers could not use a single development kit to interface with all versions of Java, developers would be forced to write two versions of each Java application - one compatible with Microsoft IE 4.0 (and possibly higher) and one for the rest of the Java community. This obstacle defeated the original added value and appeal of Java to software developers, the elimination of writing multiple versions of code to suit different platforms.

*With the introduction of Dynamic HTML, Microsoft also undermined Sun’s marketing position of Java as the only cross-platform programming language. Now programmers had the option of using an alternative language. This reinforced the perception Microsoft was trying to achieve by making Java look like "just a programming language" one of several options - one of which happened to be proprietary to Microsoft (Bowman).

By using these two tactics, Microsoft at the very least delayed Sun’s capability to reach a critical mass of Java developers and applications. Without this critical mass, neither Sun nor any licensee will be in a position to market a Java OS. With fewer potential players in the OS market, Microsoft could retain its market share better. Despite the legal fees and time involved in being sued by Sun, Microsoft still maintains the upper hand. If Microsoft can continue delay or diversionary tactics it may be able to dampen Java enthusiasm enough to stamp it out completely. Or if it only delays the general community from adopting Java technology, the delay might be long enough for Microsoft to formulate another tactic to protect its OS market share. Using game theory principles, Microsoft’s legal battles do not seem so unfortunate after all. In fact, it may actually serve Microsoft’s long-term goals.
3.4 Technological Standardization: Co-opetition in Action at the Object Management Group

As mentioned above, without cooperation often times there exists a lose-lose-lose situation because not only do suppliers end up losing out on a potential market, but the market itself gets underserved because consumers lose out on potentially useful products and/or services.

To head this undesirable outcome off at the pass, standards initiatives, such as the Object Management Group’s (OMG) efforts to unify 700 software companies’ object-oriented technology development efforts by endorsing individual technologies such as CORBA (Common Object Request Brokerage Architecture), embody the need for and benefits from co-opetition. This situation is clearly win-win for the 700 companies involved in the OMG’s efforts. They are cooperating to create a pie now and will later compete in the division of that pie. However, without co-opetition, there might not be a pie in the first place or the pie might take an extremely long time to form. In these cases, not only do the companies suffer but the consumers do too, as mentioned above, by being unserved or underserved.

An interesting case is Microsoft’s participation in OMG which is tangential at best. Because they are operating from a position of great market strength, Microsoft sees an opportunity to benefit from a winner-take-all effect and therefore, are proposing their own answer to CORBA, i.e. DCOM (Distributed Common Object Management). This is the traditional adversarial tack which may work for Microsoft or may come back to haunt them if OMG’s mass outweighs Microsoft’s.

3.5 ADVANTAGES AND DISADVANTAGES OF CO-OPETITION

3.5.1 Advantages

Co-opetition can provide organizations a portfolio of potential opportunities if used properly.

*It provides organizations with a new model by which to devise strategies that incorporate both competitive and cooperative tactics. Traditional organizations that rely exclusively on competitive models will be at a disadvantage from their peers who are willing to consider a new model pointing to new and perhaps even better strategies. These strategies could even lead to win-win situations where all competitors receive some benefit from their participation in the industry.

*Brandenburger and Nalebuff provide organizations with a systematic approach to manipulate their business environment. This new conceptual framework consists of the Value Net and PARTS. Both aspects of the framework apply game theory principles to the business world and provide ways to change the game if it is more advantageous to an organization and if others allow it.

*Co-opetition could result in greater profits. If co-opetition increases the total market, organizations can compete for market share of a bigger pie. In some cases, this turns out to be more profitable than having a larger market share of a smaller pie. Without considering co-opetition, an organization could have settled for lower profits, without realizing it had the capacity to earn even more money.

3.5.2 Disadvantages
Co-opetition is a double-edged sword. In some instances, it can give organizations a larger market share and even a larger market. In other cases, it can lead to legal disputes or it can create stronger competitors who take market share away from you. Therefore, great care should be taken in selecting when and how to use co-opetition to your organization’s advantage.

3.5.2.1 The Potential for Legal Disputes

Organizations engaging in co-opetition run the risk of breaking the Sherman Anti-Trust Act of 1890 and the Clayton Anti-Trust Act which attempt to prevent organizations from controlling prices, discriminating in pricing, driving out their competition, or developing a monopoly. In both acts, conspiratorial activities are not limited to organizations which explicitly communicate their intent to one another. The Supreme Court has upheld in numerous cases like Interstate Circuit, Inc. vs. United States (1939) that conspiracy exists even if there is no explicit communication (verbal, written, or otherwise) between organizations. This form of collusion, known as tacit collusion, is punishable by law and receives the same penalties as explicit collusion. No distinction is made in the eyes of the court.

The unfortunate aspect of co-opetition is that it could be perceived as tacit collusion. For instance, in The Right Game, Brandenburger and Nalebuff describe how the New York Post was able to get the New York Daily News to raise its price ten cents above the original price both competitors had been selling newspapers at. Rather than explicitly agree to a price hike, the Post used an ingenious method to tacitly get the Daily News to agree to a price hike. As Brandenburger and Nalebuff explain it, the two newspapers were not colluding to raise prices so much as avoiding a price war. But the same scenario could be seen from a collusory perspective.

The Co-opetition Argument:
In response to a price cut from the Daily News, the Post cut its newspaper price by 25 cents on Staten Island. When the Daily News saw that it did not have enough added value to retain its customers, it had to follow some course of action before the Post expanded its price cut to rest of New York. If it chose to compete it would have to engage in a price war that would have no winners. But if it choose to co-opetete, it could match the Post’s price of 50 cents, thereby regaining its subscribers as well as making an extra 10 cents on each newspaper it sold. It chose the latter.

The Collusion Argument:
Both the Post and the Daily News wanted to increase profits. They both knew that a price war would decrease their long-term profits so they chose the option by which they could both squeeze more money out of their subscribers without needing to directly compete with each other on price. Subscribers were left in a position where there was potentially no other competitor with a lower price for subscribers to choose. Therefore, the New York Post and the Daily News were able to control newspaper pricing.

There is some degree of validity to both arguments. In either event, the result is the same. Consumers pay a higher price that would not have been possible without competitors agreeing, whether explicitly or implicitly. Nalebuff and Brandenburger attempt to address this issue in R (short for Rules) of their PARTS model. They argue that organizations engaging in co-opetition should consider the legal and regulatory environment in which they operate. They advocate considering all legislation that may lead to legal disputes, but this short warning glosses over the fact that tacit conduct of anti-trust activities can be just as illegal as explicitly conspiring with competitors. Therefore, organizations should carefully consider not only what they do but how the law may perceive its actions.
3.5.2.2 Strengthening Competitors at Your Expense

In the process of co-opeteting, organizations may find themselves in a worse predicament than when they started. They may actually determine that co-opetition has led to stronger competitors or new entrants into the market. Hamel probes this issue in Collaborate with Your Competitors - and Win. He identifies the fact that even though competitive collaboration is on the rise, the long-term effects may compromise a company’s ability to compete in the future. He uses examples of "Asian companies and their Western rivals" who forge temporary alliances only to have the weaker Asian company become more successful and profitable than its former ally e.g. Rover and Honda. He hypothesizes that this is in part due to the Asian company’s willingness to learn as much as it can from its ally even if it is not directly correlated to the work at hand. An example of this occurred when the authors, "accompanied a Japanese development engineer on a tour through a partner’s factory. This engineer dutifully took notes on plan layout, the number of production stages, the rate at which the line was running, and the number of employees. He recorded all this despite the fact that he had no manufacturing responsibility in his own company, and that the alliance didn’t encompass joint manufacturing.”

This example points to one key lesson: in the event of formal alliances, competing organizations should limit the amount and type of information conveyed to their allies. They should remember that today’s allies are tomorrow’s competitors, or even today’s. They should control the transfer of information to current allies whether this be through facility security or having one central office serve as the gatekeeper for information requests. Following this same line of reasoning, you should try to learn as much information as possible from your allies. If your ally does not have the forethought to limit your access, why should you waste such a valuable opportunity?

4. THE TECHNOLOGY ADOPTION LIFE CYCLE

In the 1950s, research on how communities respond to discontinuous innovations introduced a model known as the Technology Adoption Life Cycle. Discontinuous, or revolutionary, innovations often lead to paradigm shifts, since the new products or services require users to dramatically alter their past behavior in return for dramatic benefits. This is contrasted with evolutionary innovations, which offer improvements (speed, functionality, etc.) but do not require dramatic behavior changes.

The Technology Adoption Life Cycle model states that people will segregate into 5 distinct groups when faced with a discontinuous innovation, depending on their risk aversion -- innovators, early adopters, early majority, late majority, and laggards. In Inside the Tornado, Geoffrey Moore provides a profile of these groups:

- **Innovators** (Technology Enthusiasts) These techies are the people who typically are the first to try anything new. They enjoy tinkering with new technologies since they fundamentally believe new technology will improve their lives.
- **Early Adopters** (Visionaries) Visionaries see an unproven new technology as a potential competitive advantage. By being an early adopter, they hope to exploit the technology before the majority in order gain leadership status.
- **Early Majority** (Pragmatists) These people prefer evolution over revolution, and are thus initially skeptical about any new discontinuous innovation. However, once the new technology has proven that it can provide benefits to the pragmatist, he/she will adopt the new technology.
• **Late Majority** (Conservatives) These people are highly skeptical about any new technologies, and are even a little afraid of change. However, conservatives will eventually adopt a technology when the only other alternative is letting the world pass them by.

• **Laggards** (Skeptics) These people are more critics of new technologies than they are customers. They are extremely skeptical and highly adverse to change.

The Technology Adoption Life Cycle is depicted as a bell shaped curve (**figure 4**), which shows both the approximate size of each segment and the sequence in which each segment adopts the new technology. On the x-axis is time and on the y-axis is the number of people adopting the new technology at a given point in time. The Early and Late Majority are the largest segments (the largest markets) and, as such, are the most lucrative from a business standpoint. An important point to remember is that the Technology Adoption Life Cycle is a graph of technology adoption vs. time, not sales vs. time. Indeed, assuming constant prices, the graph of sales vs. time for the new technology would simply be the integral of the Technology Adoption Life Cycle curve (**figure 5**).

![Figure 4. The Technology Adoption Life Cycle](image)

![Figure 5. Graph of Sales vs. Time](image)
The Technology Adoption Life Cycle can be applied to both products and entire industries. For example, the PC revolution in the 1980s was a discontinuous industry revolution since it forced people to alter their behavior from centralized mainframe computing to decentralized PC computing. Within an industry life cycle, there can be many individual product life cycles. Product life cycles can likewise be revolutionary (Windows was a revolutionary innovation over DOS since it required a substantial change in behavior) or evolutionary (the x86 family of microprocessors from Intel were evolutionary innovations since they all used the x86 architecture).

### 4.1 The Tipping Point

A very crucial point on the Technology Adoption Life Cycle lies between the Early Adopters and the Early Majority part of the curve. This point is often called the Tipping Point or, in order to emphasize its perils, is sometimes referred to as "the Chasm." The Tipping Point is the point that separates the small early market from the much larger mainstream market. As can be seen by the non-linearity of the Technology Adoption Life Cycle at the Tipping Point, getting past the Tipping Point and entering the mainstream market can result in a rapid growth in success.

This picture of non-linear success has many examples from high technology. During its first ten years, Microsoft’s profits were negligible. But around 1985, when its profits began to rise, they exploded, helping Microsoft’s market capitalization grow to over 200 billion dollars. It took Sony 7 years to ship its first 10 million CD-ROM players. But the next 10 million were shipped in seven months! These examples of tremendous success exemplify the importance of crossing the Tipping Point.

However, getting past the Tipping Point is not a simple task. It is like rolling a boulder uphill. Before getting to the Tipping Point is where co-opetition has its greatest value, ie. creating a market.

### 4.2 Different Segment, Different Strategy

The early market of any new technology is predominantly composed of innovators and early adopters. Innovators (technology enthusiasts) eagerly adopt the new technology because they like to tinker. Early Adopters (visionaries) enter the early market because they can envision dramatic benefits from the new technology. However, since the technology is still unproven, the Early and Late Majorities are hesitant to adopt the new technology. Thus, the early market is a small market. The main goals of any business whose products are in this early stage of the Technology Adoption Life Cycle are to gain a foothold in the early market and to create the necessary demand to achieve critical mass (pass the tipping point between the early market and the mainstream market).

The mainstream market is composed of two segments, the Early Majority and the Late Majority, which as their names suggest, make up the majority of the population. In terms of the Technology Adoption Life Cycle, the Early Majority corresponds to a period of tremendous growth and the Late Majority corresponds to one of high volumes. The Early Majority are pragmatists, since they do not like to adopt a technology until its benefits have been proven. But, once they do decide to adopt the technology, they do all at once in a herd. This leads to tremendous growth, which Moore dubs "the Tornado." In the tornado, the goal is to gain market share, since the Early Majority herd has decided to adopt and thus enter the market. Conversely, the Late Majority is more conservative and thus more price sensitive. In order to get them to adopt, it is necessary to lower prices. This period of high volumes and low margins
is known as "Main Street." On Main Street, the goals are to differentiate your products in order to maximize margins and to prevent new discontinuous innovations from emerging and stealing your markets.

According to Moore, since each of the segments of the Technology Adoption Life Cycle has a different response to a new technology, a company must continually change its business strategies and tactics in order to deal with the different behaviors of the different segments. Effectively, this means a business cannot simply choose one of the business strategies discussed above (co-opetition, volume cost leadership, differentiation, niches, or mass customization) and simply stick with it for the life of the business. Instead, different strategies may have different applicability depending on the target market segment, the timing and the market structure.

This implies two crucial decisions you need to make: 1) deciding where you are on the Technology Adoption Life Cycle (i.e. which segment you are targeting), and 2) deciding what business strategy to use given your position on the cycle and the industry structure.

Brandenburger and Nalebuff state rather bluntly, "(T)he game of business is all about value: creating it and capturing it." In mathematical terms, this can be rephrased as:

\[
\text{Total Revenues} = \text{Market Size} \times \text{Market Share}
\]

That is, a company can increase its revenues by either increasing the size of the market (making a bigger pie) or by increasing its market share (getting a bigger piece of the pie). In the early market, creating value is more important than capturing value since having a large market share is useless if the market is not a pie but only crumbs. However, once a technology has proven its worth, we progress to the mainstream market, where capturing value is the game.

### 5. NETWORKED COMPUTING

Networked computing can be considered a discontinuous revolutionary innovation since it requires people to drastically alter their behaviors in order to gain dramatic new benefits. For example, online banking promises faster, more convenient banking. But, in order to achieve the benefits promised, people must change their old behaviors. Instead of driving to the bank, filling out a transaction form, and waiting in line for a teller, online banking requires the user to log onto the network, go to the bank’s website, and fill out an online form. Since it is a discontinuous innovation, the Technology Adoption Life Cycle can be applied to networked computing, which can give businesses a good idea of what business strategies they should follow.

#### 5.1 Networked Computing: The Early Market

Networked computing presents several hurdles for businesses in the early market stage of the Technology Adoption Life Cycle:

- **Switching Costs.** Since networked computing results in the convergence of the computing and telecommunications industries, customers must bear substantial switching costs in order to adopt...
the networked computing paradigm. These include tangible costs such as building infrastructure, hardware/software upgrades, and training, as well as intangible costs such as changing behaviors and routines, time, and hassles.

The computing industry is accustomed to rapid change and turnover. In fact, it is not uncommon for new technologies to supplant old ones every few years. Thus, for the computing industry, the switching costs associated with adopting networked computing may not be an excessive burden, but rather an accepted industry cost for adopting new technologies. However, the telecommunications industry has historically been much more stable and thus has not often been forced to deal with switching costs related to new technologies. For this reason, it may be more resistant to change. The telcos, for example, might be hesitant to upgrade their networks to handle data traffic because of the huge upfront investment costs and the fear of cannibalizing their own profitable businesses. Ordinary consumers might likewise be hesitant to switch from their old telephones to new ones based on packet switched technologies.

- Network effects and network externalities. Since network applications only have value when they have something to connect to, they have little value during the early market stage when very few people have adopted the technology. This is a catch-22; network applications with few users have little value, but mainstream users (Early and Late Majorities) are only willing to adopt an application if it has a high value.

As a corollary, network effects can amplify fears of stranded investments. In the early market, when a new network application has been introduced but has not yet proven its benefits, people may be wary of anteing up the initial costs for the new application, fearing that if the product does not become popular it may have little value or support, leaving the consumer with a useless product and possibly large stranded investments. This is especially true for network applications, since their value depends on a number of network externalities that the consumer cannot control.

- Products, not solutions. In the fast-paced world of high-technology, often times new products come to market based on a hot new technology. For example, a new breakthrough in audio compression technology might lead to a new voice capture product. While this is great for techies who love to tinker with new toys, by itself it would have little value to mainstream consumers. Mainstream consumers want solutions that work and don’t want to spend time tinkering. Thus, a solution they might be interested in would be Internet telephony, which could include the voice capture product with a matching playback application, microphone, speakers, equalizer, network transmission protocols, etc. Unfortunately, in the early market stage, companies often do not have complete solutions but rather only individual products.

5.1.1 So how do you tell if you are in the early market stage of the Technology Adoption Life Cycle?

Here are some hints:

- Technical standards bodies activity. During the early market stage, there will often be considerable activity from technical standards bodies. Technical standards help network applications overcome the network effects catch-22 by defining interoperability among competing products. For example,
before the 56k modem standard was established, people were hesitant to purchase 56k modems out of fear that if they purchased a modem with the losing 56k technology, their modem would be useless since they would have nobody to connect to. However, once the standard was established, the 56k modem market boomed, since people knew any 56k modem could connect to any other 56k modem. Standards can also help overcome the products-only hurdle by defining interoperability between products. For example, the HTTP protocol defines a standard language for WWW interactions. Suppose a company developed a standalone client browser product. By itself it would have little value, but if it understood HTTP, it would become an information retrieval solution since it could interact with all servers which also understood HTTP.

Press and reviews. Since products in the early market stage are predominantly used by Innovators (technology enthusiasts) and Early Adopters (visionaries), much of the press and reviews will focus on the technological benefits of the new product. For example, a review of competing handheld personal communicators might compare features such as network connection speed, screen size, battery life, etc. Since these are targeted to technology-savvy consumers, they will often use technology-jargon. The hand-held personal communicator review might contain the phrases, "3MB RAM", "100Kbit/sec modem", "100 MHz processor", "SCSI I/O", etc.

Hot topic of applied academic research. Often times, people in academia are the Innovators (technology enthusiasts) since they enjoy tinkering with new technology and furthermore pursue research based on the new ideas. Thus, a survey of current applied research in computer science is likely to find much more work related to networked computing than mainframe computing (theoretical research, on the other hand, transcends individual technologies and is thus consistently popular).

Co-opetition, in its various forms, can be an extremely valuable business strategy for networked computing companies in the early market. Since the early market is small, competing for market share does not make much sense. Instead, in the early market stage, companies should focus on creating demand and getting past the Tipping Point. In light of this, co-opetition can create a win-win situation for all companies by actually lowering the Tipping Point for reaching the mainstream market. We shall describe how this can occur.

A very effective method of co-opeteting during the early market stage is by participating in and developing for open systems and open standards. Open systems provide a good system framework that allows multiple vendors to supply individual components of the system rather than requiring each vendor supply complete proprietary systems. This can be beneficial for two reasons: a company may not have enough capital to develop an entire proprietary system, and a company can gain efficiencies by focusing on a specific component of the system. Open standards, on the other hand, help define interoperability between products. This is very important in networked computing in which value is dependent on the number of other entities you can communicate with.

Open systems and standards can lower the Tipping Point by reducing fears of stranded investments. Suppose a customer was faced with three different implementations of a new network application. The fear of choosing the wrong technology and being left with a stranded investment might be enough to prevent this customer from purchasing any of them. But if the three companies decided to cooperate and develop one open system architecture or a standard for interoperability, this would eliminate the customer’s fears, as long as he/she chose a product conforming to the open system or standard. By providing consumers an industry-supported solution, all cooperating companies benefit from the resulting greater total market size.
An example where co-opetition to form open standards might be beneficial is broadband access to the home. Currently, this technology is in the early market stage and several alternatives exist -- xDSL, cable modems, wireless, satellite, fiber optic cables, for instance. Without any standards, consumers (and the broadband access providers) might be fearful of choosing the wrong technology and being left with large stranded investments. Instead, an open standard for interoperability between the different alternatives (and between competing choices within the same alternative, as well) could help expedite the adoption of broadband access to the home.

However, as the name co-opetition implies, cooperating on developing open systems or open standards does not necessarily compromise away all of a company’s competitive advantages. Instead, it provides a common architecture on which companies can compete by adding proprietary added-value features. In an open systems architecture, a company’s added value might be the efficiencies it gains from focusing on a specific component (layer) of the open system rather developing a whole proprietary system. With open standards, added value might take the form of added performance or features while still retaining complete interoperability and standards conformance.

In the early market stage, co-opetition may also be beneficial in order to develop whole product solutions. This might take the form of strategic alliances or partnerships. As previously mentioned, new technologies in the early market stage are often single products, not complete solutions. By themselves, single products have little value. It is only when they are integrated into a whole product solution are they valuable. This is crucial for getting over the Tipping Point and entering the mainstream market. In order to get over the Tipping Point, the Early Majority (Pragmatists) must decide to adopt the technology. As defined by Moore, Pragmatists will only adopt a technology if there is a proven real-world benefit from using the new technology. Real-world benefits require whole product solutions, not single products. The Internet telephony (whole product solution) vs. audio compression scheme (single product) example presented above is a good example of this.

However, companies in the early market stage often do not have the money or the time to develop a whole product solution. Enter co-opetition. By entering strategic alliances or partnerships with other companies, a whole product solution can be developed without requiring large capital or time expenditures. If successful, the benefits for each company are great. By getting the Pragmatists (Early Majority) to adopt, the whole product solution has effectively crossed the Tipping Point and entered into the much more profitable mainstream market.

Thus, in the early market stage co-opetition can be a very good strategy for overcoming the hurdles networked computing presents. By co-opetiting to form open systems and standards, companies benefit by removing market fragmentation and developing a larger common market. By co-opeteting to develop whole product solutions, companies benefit by providing a compelling reason to buy the new technology. This can eliminate the network effects catch-22 and, since network effects increase the value of the solution, reduces the impact of switching costs.

5.2 Networked Computing: The Tornado

The Tornado is a period of rapid growth. This is because the Early Majority has decided that the new technology is actually beneficial; it is worth adopting because the benefits outweigh the switching costs. The rapid growth appears because the Early Majority moves in a herd to adopt the technology all at once. In networked computing, positive network effects amplify the Tornado into a period of
hyper-growth. As more and more people adopt the technology, positive network effects cause its value to rise. As the value rises, more people decide to adopt the technology, and thus a fortuitous cycle emerges. Indeed, the tornado is an exciting and very profitable stage of the Technology Adoption Life Cycle.

So how do you tell if you are in a Tornado?

- Incredible demand. The Early Majority is moving so fast to adopt the new technology that they are buying anything and everything. Witness the Internet. Recent press has suggested that the WWW has reached 50 million users faster than any technology ever -- faster than radio, television, or even computers on which the Web runs. What caused this explosion? The Technology Adoption Life Cycle shows a rapid increase in the rate of adoption after the Tipping Point is crossed. This is because the Early Majority has determined that the technology can provide a solution to a real-world problem. But why was the rise of the WWW so much faster than other technologies? This is likely attributable to the positive network effects associated with applications of networked computing. As more and more people adopt a new network application (ie. the WWW) its value increases exponentially, since there are more people to connect to.

- Press and reviews. While press and reviews focused primarily on technological features during the early market stage, during the tornado they will focus more on the solutions and benefits the new technology promises. This is because the tornado-like growth is the result of the Early Majority entering the market. They will only adopt a new technology once it has proven its benefits and can provide a specific real-world solution. Thus, the majority of press and reviews of products in the tornado stage will focus on these factors.

Returning to the example of the World Wide Web, a good indication that it had crossed the Tipping Point and entered the tornado stage of the mainstream market was a shift in the focus of the press. In the early market days of the WWW, the press focused on the technological aspects of the Web -- HTML allowed people to easily create and publish content, hypertext allowed easy "surfing" of data, browsers enabled multimedia webpages. This was great for the Innovators (Technology Enthusiasts) but the WWW had not yet proven its capability to provide a solution to a real world problem; it was not yet ready for the mainstream market. Thus, in the early market stage, the WWW saw a proliferation of personal homepages created by techies tinkering with the new technology. However, once the WWW crossed the Tipping Point and entered the tornado stage of the mainstream market, we witnessed a shift in the focus of the press. Nowadays, much of the press deals with the real world solutions the Web promises -- e-commerce, information dissemination, distance learning, etc.

A company must change its business strategies once it crosses the Tipping Point and enters the tornado stage of the mainstream market. While strategies in the early market stage were primarily focused on market creation, in the tornado the primary focus is gaining market share. The Early Majority have decided to adopt and thus the mainstream market has been created. Thus business strategies in the tornado should focus on competing for as large a share of the Early Majority as possible. There are several reasons for such a strategy:

- While most would agree having multiple supply vendors is beneficial, most Early Majority actually prefer a dominant supplier. This is because the Early Majority is composed of pragmatists who prefer practical, dependable solutions to tinkering and experimentation. Thus, they prefer a
dominant supplier because it provides the security of a well-supported vendor.

- As a corollary to the point above, since the Early Majority prefers a dominant supplier, once a dominant supplier has emerged, they will most likely stick with it for the life of the technology -- barring any enormous blunders from the supplier. This results from lock-in -- both technological (from adopting the technology) and vendor (from choosing the dominant supplier). This exemplifies the need to win over customers early on in the tornado in order to guarantee their continued business later on.

Because of these reasons, the tornado stage of the mainstream market can be considered a zero-sum game. In zero-sum games, a player can either win or lose; there are no win-win situations. Larry Ellison, CEO of Oracle, was once quoted, "[in the Tornado] it is not enough that we win -- all others must lose." Thus, the tornado can be considered a zero-sum game since it is a period of intense competition and once a customer is lost to a competitor, he/she is likely lost for the life of the technology.

Thus, in the tornado stage, a good business strategy might be volume cost leadership which relies on economies of scale.

5.3 Networked Computing: Main Street

Sometime during the mainstream market a shift occurs from the Early Majority to the Late Majority. While this is a subtle shift, companies in the mainstream market must recognize the shift and likewise adjust their business strategies to compensate. Why does this shift occur? As we have seen, the Early Majority are pragmatists and will adopt a new technology once it has a proven benefit. However, the Late Majority is slower to adopt a new technology because it is more skeptical of change and is even a little afraid of change. For example the Late Majority might include people who are extremely skeptical about the benefits of the Web. They might believe that old routines are simpler than the Web, or even that the Web is too hard to use. Alternatively, they might believe that the WWW does not have any "useful" content -- but rather is full of useless junk or pornography. Thus they are highly skeptical. Generally, the Late Majority will only adopt a technology for several reasons:

- The price has gotten extremely low. Since the Late Majority is extremely skeptical, one motivation for adopting a new technology might be an extremely low price. This way, if the technology indeed does not provide and real benefits, the actual money lost in the investment is not very high.
- Fear of having the world pass them by. Another reason the Late Majority might choose to adopt a new technology is fear of letting the world pass them by. This might be a sense of urgency or a feeling that there is no choice but adopting. For example, a highly skeptical Late Majority consumer might only learn to use a computer out of fear that he/she might be unemployable if he/she did not have any computer skills.

5.3.1 So how can you tell if the mainstream market has entered main street?

- Product differentiation. Since costs have been driven down by manufacturing efficiencies and competition, the actual technology might have become rather commoditized. Thus, companies will try various strategies in order to differentiate their products and increase margins. These might include versioning, value-added features, mass customization, or entering related niche markets.
- Press and reviews. In the main street stage of the mainstream market, companies will often focus on differentiating themselves from their competitors. This might include brand awareness.
campaigns in order to build brand loyalty. Intel was highly successful in launching their "Intel Inside" ad campaign. Recently, many WWW search engine companies have begun advertisements on broadcast television in order to build brand awareness and loyalty from the mainstream market.

The different dynamics of the main street stage of the mainstream market require that a company rethink its business strategies and evaluate whether those utilized in the early market and tornado stages remain appropriate. In this stage, it would be appropriate for companies to focus on product differentiation strategies including niche marketing (focus strategy) and mass customization.

As a secondary focus, companies should consider strategies in order to prevent new discontinuous innovations from emerging and stealing the existing market (or from becoming a new revolution which could sweep the company aside). This squarely places co-opetition within the theoretical bounds of Porter’s competitive strategy analysis in addressing the threat of new entrants in order to prevent new technologies from stealing the market.

6. CONCLUSION

After maturing market and industry analysis over the past twenty years, there is a whole new set of business strategies which companies have at their disposal in order to decide how to conduct their business, how to compete. The term co-opetition serves as an umbrella for a significant portion of these. After evaluating whether its internal characteristics and competitive position and market dynamics call for it, using co-opetition organizations can climb up the product adoption life cycle and achieve the critical mass necessary to hurdle over the tipping point in order to create a market. Once they get past this point, it is up to every organization to re-evaluate its competitive and cooperative opportunities in order to determine where each has the greatest comparative advantage (or least comparative disadvantage). An organization may decide to compete if it determines that it is in a strong position and that it feels it is in a zero-sum game. Or it may decide that the pie can be expanded by further cooperative initiatives. In order to reap the benefits of exciting market opportunities, combinations of these two strategies, ie. co-opetition, will become increasingly prevalent as companies realize that business is rarely a zero-sum game.

7. REFERENCES

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