Chapter 10

A Digital Television Ecosystem

The Battle to Shape the Future

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Key words: Strategy, market creation, business ecosystem, technology standards, government policy, social policy, resource-based competition

Abstract: The players in today's analog television world are facing imminent obsolescence. Three factions, the broadcasters, the cable companies and the PC/computing companies are vying for definition and control of an emerging digital television ecosystem. The authors explicate the construction of a business ecosystem, including a description of the stages of an ecosystem and an examination of the critical elements for success. They also explore the evolution of the digital television ecosystem to date through the lenses of the various participants, with particular emphasis on the 1997/1998 clash between Bill Gates and John Malone. The story provides insight into how companies and leaders are competing to shape the future of digital television.

1. INTRODUCTION

"We are as gods and might as well get good at it."

—Stewart Brand, Whole Earth Catalogue, 1968

We are witnessing today the birth—or perhaps more properly the assembly—of a vast new media sector, one constructed of digits and light. We know it will be global, we know it will be interactive, and we know it will likely expand faster than any media we have ever known. We do not know how it will manifest itself. Will it evolve out of today's broadcast

D. Gerbarg (ed.), *The Economics, Technology and Content of Digital TV*

television, cable television, or computer and Internet services—or will it spawn from as yet unimagined hybrids or radical new technologies?

At GeoPartners, our work involves studying strategy, new forms of competition and economic development. As we have sought to understand business strategy in an age of growth and profound change, we have come to conceive business as a great landscape upon which alternative economic ecosystems are establishing themselves and competing for desired and scarce resources.[1] These *business ecosystems* encompass rich webs of technologies, people, companies, and products and services that co-evolve to create new markets and meet new needs. Business ecosystems also include those who provide financing and regulatory direction, as well as relevant trade associations, standards bodies, and labor unions. These communities come together through a fortuitous mixture of design, accident, and opportunistic self-organization. Constituent members make contributions that complement and reinforce the contributions of other members, resulting in a complex integrated system.

In today's business world, global capital markets provide ready backing, technological and managerial knowledge is widely distributed, and industry regulations have in many instances been reduced or eliminated. The pace of technological innovation is unprecedented and start-ups are just as able as established companies to attract talented people. As these traditional barriers disintegrate, it is increasingly the mind-set of the leader that makes the difference between success and failure. Business strategy today requires that leader to fill many roles, including those of a gardener, a wildlife manager, and an ecologist. The gardener tends to his products, determining what to produce and how much attention to give the various elements in his company. The wildlife manager watches over the disparate groups under his control, directing the necessary events for the smooth functioning of his enterprise. The ecologist, with only some direct power, labors to maintain the delicate balance between competition and cooperation for a full system of interrelating species. The ecologist works with other ecologists, in turn, to bring together previously unlinked resources that provide everyone with hitherto unrealized gains. A successful ecosystem-building leader becomes, in effect, a 'god,' orchestrating the interactions of a multitude of species and environmental effects.

There are many gods in the television world, and some of the most important have names like William H. Gates III, John C. Malone, and Rupert Murdoch. Often in discussions of technology-based futures, the emphasis is on how technical innovation drives progress, and we forget just how dependent the ultimate path of evolution is on the struggles of such gods. To a large extent, business evolution is forged in an arena of partnerships,

alliances and struggles among a variety of interests favoring one or another ecosystem.

2. ASSEMBLING AN ECOSYSTEM

Biological ecosystems develop over time and in a consistent order. Ecological community development is most basic when it involves the colonization of barren land, as after a Hawaiian lava flow. Biologists refer to this as primary colonization, the establishment of an ecosystem literally from the ground up. In Hawaii, new lava comes in two textures: solid *pahoehoe* and rough-hewn *'A'a*. Innumerable small cracks in *'A'a* provide precious moisture and shade to microorganisms, lichens and ferns. These pioneers, in turn, create microscopic quantities of humus and primitive soil and extend an awning of shade.

Over time, resilient *'ohi'a-lehua* trees sprout within these small habitable zones of microclimate. Their roots carve out air pockets for microorganisms and insects, while the leaves provide additional shade. The new stability allows the extant species to expand rapidly. As years and decades pass, vegetation clothes the once-barren tract, and the assembly of life inevitably diversifies. The local ecosystem becomes more densely structured and able to nourish a cornucopia of species. Herbivores pour in, followed by carnivores, and a communion of dependence takes hold. Competition for space and resources intensifies as the ecosystem matures. Given the right conditions, a richly canopied forest can become established within a single human lifetime—and in an instant, a volcanic eruption can turn the land barren once again.

We can exploit our knowledge of biological ecosystems and draw a parallel to the four stages of a business ecosystem. Stage 1 is a pioneering stage, characterized by visionaries who focus on identifying particular seed innovations, whether technologies or concepts, that will create radically better products and services than those already available. These entrepreneurs experiment with new ideas and technologies, drum up support and participation from early adopters, search for stakeholders and key allies, and scrounge for scarce resources. When the pioneers solidify their vision and accumulate the necessary elements for a properly functioning ecosystem, they are ready for stage 2: expansion.

In stage 2, the nascent ecosystem has established a toehold and is ready for rapid expansion. Stakeholders work frenetically to ramp up every ecosystem element. Original participants become entrenched, contributions from new entrants are incorporated, product volume soars, and scale economies are finally established. The ecosystem also faces stiff competition

for the first time from incumbents or other newly formed ecosystems; battles for unique resources are common. Successful participants learn the key lessons of stage 2: expansion is fundamentally about establishing the preferred ecosystem in a given market territory and getting new partners to join in the economic community. In addition, a participant must identify and guard scarce resources to solidify one's own current and future position in the ecosystem.

The ecosystem reaches structural maturity by stage 3, though it usually continues to grow prodigiously. Intensifying intra-ecosystem rivalry offsets architectural stability, however, as fully entrenched participants fight for leadership, profit margins, and bargaining power. New entrants jostle for position, eager to establish themselves within the successful ecosystem, and often cause upheaval by introducing new concepts or business practices. Cooperation becomes more important in stage 3, as leaders struggle to keep the increasingly cumbersome ecosystem intact and moving in concert. The leaders also need to defend the ecosystem from other encroaching ecosystems eager to steal value from or leapfrog altogether the old ecosystem. Contributors whose inputs are seen as necessities command great bargaining power, which allows them to gain superior profitability and a powerful position within the community.

Stage 4 of a business ecosystem most often occurs when rising new ecosystems and disruptive technologies imperil mature business communities. Changes occur in the regulatory environment, the economic environment, or in customer preferences and buying patterns. Alternative ecosystems and innovations arise to take advantage of the changing circumstances, or sometimes cause them directly, and participants withdraw from the old ecosystem in favor of the new. The established ecosystem consequently has become less well adapted to its environment and is less able to meet the needs of its remaining customers, suppliers and stakeholders. The cycle repeats viciously. An ecosystem on the verge of this maelstrom must determine how to extend the useful life of its accumulated resources and experience.

Broadcast and cable TV industries are facing a stage 4 transition today, and PC players are anticipating stage 4 in the hopes of staving off the threat. For all of these players, the U.S. market is more or less saturated. Old physical plant, stagnant growth rates, and new threatening technologies and delivery systems are evident. The Internet is changing consumer behavior and expectations. The leaders must move rapidly and aggressively to refocus their core organizations on those markets and economic microenvironments that best suit them. At the same time, they must shift some resources into new ecosystems, supporting stage 1 economic and market forces that are more likely to succeed across a wider market terrain in the future. Members

of the broadcast television, cable TV and PC ecosystems are seeking to extend their hegemony by promoting various conceptions of a digital convergence ecosystem. Each model favors different assets, and extends, in differing ways, existing media ecosystems. In addition, each god must overcome some crucial resource scarcity to create an ecosystem capable of speedily colonizing wide swaths of the landscape. Concurrently, the gods want to keep certain elements scarce in order to ensure a position of strength. Assembling this new digital television ecosystem, consequently, is no easy task.

In recent years, ecologists have created the concept of "assembly rules," to tell us what species can coexist in a community, as well as the sequences in which species are likely to colonize an ecosystem. Not until a plant is established can the grasshopper that feeds on it arrive. And only after the grasshopper thrives can the dragonfly that dines on it enter. Other assembly rules describe how much competition can exist in an ecosystem. A songbird species may consume so much of the food supply that the ecosystem can accommodate only one or two additional songbird species. Other arrivals, rebuffed, must settle elsewhere.

Assembly rules are apparent in business ecosystems as well, and a god who ignores these rules will find it difficult to assemble a coherent ecosystem. In the transition that television faces today, from stage 4 to stage 1, incumbent gods are fighting for resources—support from other gods, original ideas, new technology—in an attempt to build the first cohesive, stable digital TV structure. In this chapter, we explore the sequence of symbiotic relationships that hopeful digital television gods have tried to assemble. Let us begin our examination with the broadcasters' vision of a digital TV future.

3. BROADCASTERS' VISION

The broadcasters' digital TV ecosystem vision is probably the simplest of the three: a relatively straightforward digitization of today's analog television world. We can use this path dependent vision as a benchmark for comparison with other proposed ecosystems. At GeoPartners, we examine seven key dimensions of a business ecosystem to test for completeness and competitiveness: customers, markets, offers, processes, organizations, stakeholders, and government & social policy. As we can see in Table 1, the broadcasters' plan calls for very expensive television set upgrades; in 1998, HDTV sets retail for between $7,000 and $19,000.[2] The corresponding network and service upgrades, however, are relatively straightforward and less capital-intensive for the broadcaster. The various ecosystem roles are

filled by the same or similar companies and organizations. In short, broadcasters are maintaining the status quo.

Ecosystem dimension	Broadcasters' digital TV ecosystem vision
Who are the target customers and how do they benefit?	Initially, the high-end aficionado; moving to the broad market over time
How is the market defined and what is the channel strategy?	Upgrade within existing market structure with same or similar consumer electronics players; seeking to limit cable companies to current role
What is the customer offer?	HDTV with many channels; interactivity is low priority
What processes and technologies will be employed?	Simple, but expensive, network upgrades; simple but very expensive television set upgrades
What organizational and management structures exist?	Same or similar organizations preserve the establishment
What financing, ownership, and control methods exist?	Similar to today's model for infrastructure and services
What is the approach to government relations and social policy?	Maintains strong relationship between broadcasters and government regulators

Table 1. The broadcasters' digital TV ecosystem vision.

Compared with the cable and PC visions, the broadcasters have only an incrementally different offer for the end-user than today's analog television world. It is an open question whether this incremental difference will be attractive enough to cause end-users to upgrade in large numbers, or whether the end-users will find more attractive the increasingly novel interactive experiences that alternative ecosystems promise to deliver in a shorter time frame. Since most of the required capital investment in the broadcasters' ecosystem is distributed among end-users, adoption rate will have an immediate and significant impact. In contrast, the cable and PC ecosystems rely much more heavily on risk capital born by investors and principal companies.

At the same time, the broadcasters' proposed path is relatively straightforward and uncomplicated, albeit broadcasters must deal with a degree of government policy that is not present in the cable or PC worlds. The broadcasting gods have found it relatively less difficult to align its

interested ecosystem members in a common direction. For the Olympians of the PC and cable worlds, however, the game is more complex. Perhaps the most fascinating illustration to date is the interactions among many of the leaders of the PC and cable worlds, and in particular a set of leadership actions and counteractions directed by Bill Gates of Microsoft and John Malone of Tele-Communications, Inc. In order to ground ourselves in the events leading up to these recent struggles, we begin by describing some of the roots of efforts that began almost a decade earlier.

4. PC AND CABLE GODS COLLIDE: THE OFFER

In 1989, while 'interactive' content was in its infancy, Bill Gates{ XE "Bill Gates" } founded Interactive Home Systems to pioneer development of interactive digital libraries. Over the years, the renamed Corbis has collected tens of millions of digital images, including the Bettmann Archive and digital rights to the combined holdings of the National Gallery of London and The Hermitage. Whether through foresight or serendipity, Gates has often acquired assets that will be of use to him far down the road; Corbis is but one example. In early 1997, he turned his attention to set-top boxes and sparked a near-revolution in the industry.

John Malone, energetic head of Tele-Communications, Inc., is a consummate dealmaker and strategist. His passion for next-generation technology and services is well known; Malone is often associated with the vision of a 500-channel digital cable future, which he championed in the early 1990's. In 1997, Malone locked horns with Bill Gates over interactive digital television. The resulting events provide a fascinating account of stage 4 gods trying to shape stage 1 transitions that may prove to save their industries.

> "The interest the computer industry is showing in cable (is) making the set-top box the most valuable square foot of real estate on earth."
>
> Paul Kagan, cable industry analyst[3]

Gates' enthusiasm for interactive home and business environments, about which he frequently lectures, is well known. In addition to developing and acquiring content for consumer interactive products, Microsoft has commissioned numerous research projects to identify future interactive products and services. Furthermore, Microsoft Research spends millions developing cutting-edge interactive technologies. Reporters and analysts

frequently speculate that Gates would like to turn Microsoft into a media company.

In April 1997, Microsoft, Compaq and Intel launched the DTV Team, to lobby for the PC approach to digital television, and the team published a white paper addressing the benefits of the PC plan from technical and market standpoints. By now, Gates and his colleagues at Microsoft were reasonably convinced that they understood the TV/PC needs of the consumer end-user. The consumers required a screen large enough to read from a distance of 6-8 feet, a fast on-line terminal that could act as a PC while simultaneously processing digital broadcast signals, and high bandwidth to the home.

While the first two requirements were well on their way to being fulfilled, Gates knew the establishment of broadband local access could use encouragement. Microsoft made investments in several of the various emerging access technologies, including cable modems, Digital Subscriber Line, and satellite wireless systems. In the end, however, the impact of Gates and Microsoft on the cable industry was the most explosive.

The leaders of the cable industry faced daunting problems in early 1997. They were heavily in debt, stock prices were depressed, and obligatory infrastructure upgrades promised to decrease cash flow even further. They struggled to agree to a common vision of the digital future, but industry-wide standardization was no more than a pipe dream, resulting in confusing and fragmented cable offers. Alternative entertainment and information delivery systems, particularly satellite, were impacting revenue. Microsoft, on the other hand, had lots of cash and both Gates and Malone thought this might be the time for Microsoft to buy a seat at the table. By late spring, Gates had begun discussions with the leaders of the cable companies and, in June, he committed to invest $1 billion in Comcast.

On July 7, 1997, under the auspices of CableLabs, Gates and cable company leaders met in New York at Time Warner's headquarters. The following is a reconstruction based on press reports and interviews. Gates pitched a hardball to the assembled moguls, led by TCI's John Malone: You are currently being dealt out of digital television—and mostly out of the Internet, as well. You also run the risk of being commoditized by satellite services. You do own, however, a very scarce resource: physical access to millions of homes, as well as millions of customers. What you lack to become strong players is capital, expertise at consumer market creation, and ecosystem-forming leadership.[4]

Gates reminded the leaders that his billion-dollar Comcast investment prompted MSO market capitalizations to shoot up by billions of dollars. He offered to invest perhaps as much as ten billion more to help make the new ecosystem a reality. In addition, Microsoft had recently acquired WebTV Networks for nearly half a billion dollars and they were moving quickly to

introduce the services to a broad market. Gates' financial commitment to his proposed ecosystem was unquestionable.

Gates argued that his company was unparalleled in creating consumer markets and he wanted to lend Microsoft's expertise in consumer devices and software to the creation of the digital television market. He envisioned a $300 WinCE-based set-top box that would be sold directly to consumers through established consumer electronics channels. The cable companies would save the considerable capital costs normally associated with subsidizing cable boxes for their customers. In addition, when Internet and interactive services rolled out, the cable companies stood to gain per-transaction and value-added services revenues. Gates was sure he had the cable leaders hooked.

Ecosystem dimension	**Issues that must be addressed**	**Gates' digital TV ecosystem proposal**
Who are the target customers and how do they benefit?	No common future vision; other service models siphoning off customers	Retention and expansion of existing customer base through stimulated demand for new services using co-branding and complementary promotion
How is the market defined and what is the channel strategy?	No common future vision; potential to fragment ecosystem as members leave to join other ecosystems	Interactive digital cable television, with services provided by MSOs and Microsoft; set-top boxes and/or enhanced TVs sold to end-users through CE channels
What is the customer offer?	Multiple non-complementary offers	Electronic programming guide, MSN/ MSNBC/ WebTV content, new advanced services
What processes and technologies will be employed?	Non-aligned offers result in fragmented or confusing processes	Microsoft and MSOs establish broadband infrastructure; Microsoft leads in distributing devices through CE channels
What organizational and management structures exist?	Fragmented industry; differing visions for stage 1 ecosystem transition	Microsoft is responsible for platform and third-party content developers; MSOs lead service branding, pricing, promotion; advanced services revenues are split according to various formulas
What financing, ownership and control methods	Very little free cash, waning control; decreasing power as	Microsoft finances R&D, manufacturing; direct investment by Microsoft in MSOs results in

exist	an ecosystem	higher share prices
What is the approach to government relations and social policy?	Little attention to government relations necessary; little attention to social policy	Microsoft brings unique innovation to consumers on an open platform

Table 2. The Gates digital TV ecosystem proposal.

Gates offered to contribute his leadership in the form of a vision, a business model, and a concrete implementation plan for the construction of a formidable ecosystem. His considerable expertise and resources would help the MSOs to create that ecosystem with themselves—and Microsoft, naturally—at the center. Gates presented the cable leaders with a comprehensive, well-researched, actionable proposal, which he believed painted a picture of a very attractive future for all. He asserted that the proposal was concrete enough for the leaders to assess the potential for the future he was so boldly fashioning and he urged them to do so at once.

As a next step, Gates called for the companies to order set-top boxes by the fall of 1997, with a chance to cancel or delay orders if the new market was slow to fulfill its promise. Microsoft would manage the shared order and the deal would result in a decreased cost per box, among other advantages. Now, the leaders had to decide how to react.

The Gates model addressed all seven dimensions of a complete ecosystem. As we can see in Table 2, Gates isolated three elements the cable leaders were having trouble producing themselves: cash, leadership direction and a market creation plan. He then went about matching those scarce components to his own resources, in order to construct a compelling plan for the cable companies. Naturally, the plan also allowed Gates to draw on those resources that the cable companies had in abundance, and which he so pointedly lacked: 'local loop' access to homes and an established customer base.

5. PC AND CABLE GODS COLLIDE: THE RESPONSE

The cable executives were positive but non-committal and began to form cliques almost immediately after the meeting's conclusion. Ted Rogers of Rogers Cable, the most technologically advanced cable company and the leading Canadian operator, was very enthusiastic. He hailed the proposal widely, calling Gates "the smartest man in America" and predicting that

there was a 50/50 chance they would form an agreement.[5] Others were not so ardent.

Several of the other leaders were ambivalent about ceding so much control to Microsoft and began to seek alternatives to Gates' proposal. Though Gates' vision and capital were attractive, they were aware of his reputation for taking advantage of allies. Naturally, any ecosystem design Gates proposed would advance Microsoft's interests both in establishing a new ecosystem and in leading and profiting from that ecosystem. Malone and the others had to consider whether Microsoft's involvement would remain as desirable in the long term as it appeared to be in the short term.

A week after the July 7 meeting, Business Week reported that some unnamed cable executives were "fearful of handing Gates a standard that will let him exert the same degree of control over their fates that he has over PC makers."[6] Oracle chief and Gates rival Larry Ellison fueled the fires with his own interpretation of Gates' motives: "We're (Navio) not going to go into the content business, competing with ABC. (Gates) wants to be Barry Diller; he wants it all."[7] As backlash against Microsoft set in., Gates' real problem became that he sought an alliance with people who weren't sure they trusted him. Many players felt Gates' own motives were obvious: as usual, Microsoft dominates at the expense of everyone else.

Gates' proposal mobilized Malone and TCI, prompting discussions with a variety of players to determine how to proceed. Players outside of the MSO band were none too thrilled with a proposal they felt addressed only the cable leaders' needs. Gates had chosen the cable companies carefully: he could gain leverage by moderating their weaknesses while their strengths would allow them to control other players. Several aspects of the Gates proposal impressed the cable leaders, but they were still wary about getting into bed with Gates. Several of the companies wasted little time in seeking alternative perspectives and shopped the Gates vision to other technology companies. Such firms as SUN Microsystems, Oracle, AT&T, Intel, and IBM showed immediate interest. Oracle's Navio division naturally indicated significant interest in a market with the potential to exceed 20 million set-top boxes. SUN's Java software seemed a natural to run the boxes, or the applications sitting on top of them.

Nonetheless, the cable leaders were impressed by the comprehensiveness of Gates' proposal. They recognized that Gates had done his homework and constructed a coherent ecosystem around their needs. Gates was also demonstrating serious financial commitment to the proposed model; he had already invested a combined $1.5 B in Comcast and WebTV and seemed prepared to drop as much as ten billion dollars more. Microsoft brought a presumed technology leadership that could help to establish industry-wide standards, as well as less expensive set-top boxes. Finally, as Microsoft had

demonstrated amply in the past, the company could create quite a profitable market.

Leaders had no desire, however, to become the next generation of an industry dependent on Microsoft for the underlying software to tie disparate hardware together. They were also reluctant to share per subscriber or per transaction revenues with the software giant. In addition, an alternative vision for cable-provided interactive content already existed, championed by John Malone: @Home. @Home was offering cable modem service for high speed—but fairly conventional—PC Internet access. Five cable companies, led by TCI, had financial stakes in the organization and had already signed contracts mandating that they would offer @Home's service.

The nascent @Home ecosystem represented a potential alternative to Gates' vision. Malone and TCI, with four board seats, had significant influence over @Home and although Malone had dealt with Microsoft in the past, he had always maintained a strong independence. @Home used Java software and an architecture that was heavily influenced by Microsoft competitors SUN Microsystems, Oracle, and Netscape. Five cable companies jointly owned 70% of @Home, thereby spreading the financial risk and increasing industry support.[8] In addition, @Home had already launched commercial operations. Finally, @Home was scheduled to make a public offering during the summer of 1997. A successful IPO would strengthen the resources flowing into the @Home and TCI ecosystems.

Ironically, the press interest in the Gates initiative focused attention on @Home's initial public offering. The subsequent IPO was a blow-out: on opening day the stock jumped more than thirty percent from its opening price of $10.50 a share and raised $94.5 million in capital. The company attained a market value of nearly $2.6 billion by day's end. Three days later, the stock closed at $22\ ^{5}/_{16}$.[9]

Malone and TCI were unable to enjoy @Home's bounty. Gates was challenging their presumptive leadership over the future vision of the cable community: he was promising to deliver what they hadn't. Malone knew he couldn't hold Gates off for long; @Home wasn't going to be enough of a threat in the time they did have. Somehow, Malone knew, they had to address the Gates proposal quickly and aggressively.

6. MALONE'S COUNTERPROPOSAL

Based on his talks with fellow ecosystem members, Malone began to plot his alternative approach. He focused on several initiatives. First, he persuaded the rest of the group to avoid making any immediate commitments to Gates. Next, he altered the deliberation structure. Gates had

established an informal series of conversations convened by Gates and centered on the Microsoft proposal. Instead, Malone launched a formal review process through CableLabs, subtly but powerfully strengthening his own leadership role. CableLabs based its voting structure on the number of a company's subscribers: the more subscribers a company had, the more votes that firm could cast. TCI topped the list with an estimated 14 million subscribers in 1997.[10] In addition, Malone wielded power as Chairman of the CableLabs board.

CableLabs put together a request for proposals that could be distributed to any interested set-top box supplier, and held discussions with vendors on other aspects of the solution. The organization consulted these vendors privately in order to understand two critical elements of a future plan. First, CableLabs assessed the strengths and weaknesses of the Microsoft architecture and technology. Second, the group discussed the ways in which an alternate, open architecture might be specified in order to prevent Microsoft (or anyone else) from controlling the ecosystem through software standards.

Malone also began to look for a wider array of cash-rich services partners, including advertisers, programmers and telephone and financial services companies. He invented a notion of "condominiumizing" the infrastructure, and promoted it at the Western Cable Show in December 1997.[11] Malone wanted to establish a funding pool by which partners would help to underwrite the set-top boxes in exchange for a prominent—though not dominant—position in the future ecosystem. Essentially, Malone adapted Gates' proposal to suit a wider variety of interests in order to gain access to a resource in short supply: cash.

Finally, in December 1997, Malone procured a 10% stake in General Instruments, and promptly made GI the systems integrator for the technology platform. Nine cable operators agreed to purchase a total of 15 million set-top boxes from GI over a three to five year period. The deal also gave the MSOs warrants to purchase approximately 16% of GI shares; the warrants would vest only as set-top box orders actually shipped in 1998 through 2000.[12] In this new scheme, Microsoft had been relegated to a position as a second tier supplier of GI.

As we see in table 3, Malone used Gates' proposal to the cable industry leaders to construct his own counter-proposal. Malone agreed with Gates' assessment of the cable companies: they needed capital, market creation and ecosystem leadership. Gates made a mistake, however, in handing his ideas over to the cable leaders on a silver platter; Malone was smart enough to co-opt them for his own purposes. He was well aware that if he accepted the Gates plan, he would be giving Gates the scarçe resource of the future: the operating system bottleneck and a central role in the advanced services. He

also knew he couldn't count on Gates to drop the ball; Microsoft's role in the digital TV space would probably look much like it does in the PC space today. Unwilling to sell his future for a chance at success today, Malone revised the plan to allow him to assemble his needed resources in a way that didn't also give someone else the potential for a superscale position down the road.

Table 3. Malone's digital TV ecosystem counter-proposal.

Ecosystem dimension	**Gates' digital TV ecosystem proposal**	**Malone's digital TV ecosystem counter- proposal**
Who are the target customers and how do they benefit?	No common future vision; other service models siphoning off customers	Same as Gates' target customers and benefit proposition
How is the market defined and what is the channel strategy?	No common future vision; potential to fragment ecosystem as members leave to join other ecosystems	Interactive digital cable television with "condominiumized" services; standard set-top boxes and/or enhanced TVs sold to end-users through CE channels
What is the customer offer?	Multiple non-complementary offers	Multiple parallel broadband pipes with dedicated content and advanced services
What processes and technologies will be employed?	Non-aligned offers result in fragmented or confusing processes	MSOs establish broadband infrastructure; multiple companies compete to build and distribute devices through CE channels
What organizational and management structures exist?	Fragmented industry; differing visions for stage 1 ecosystem transition	GI is responsible for platform, device and third-party content developers; CableLabs leads standards and technology development; MSOs lead service branding, pricing, promotion
What financing, ownership and control methods exist?	Very little free cash, waning control; decreasing power as an ecosystem	"Condominium" owners (telecom, cable, financial services, e-commerce companies, programmers, advertisers)
What is approach to government relations and social policy?	Little attention to government relations necessary; little attention to social policy	CableLabs and MSOs coordinate the development of unique innovation on an open platform.

7. THE GAME PLAYS ON

Gates still didn't have a commitment to his plan. He didn't even have any sort of assurance that next-generation cable boxes would use WinCE as the underlying OS. In January 1998, Malone incensed Gates once again.

In the wee hours of the morning before Scott McNealy, SUN's freewheeling CEO, took the stage at the Consumer Electronics Show in Las Vegas, TCI and SUN struck a deal: SUN's Personal Java software would be included in TCI set-top boxes. Malone smirked, "(Gates is) pretty agitated. You know, it's always a problem when you try to limit Microsoft to just a piece of things."[13] Gates was due to take the stage himself the next day, and wasn't looking forward to hearing McNealy's triumphant announcement without having one of his own. Mere hours before Gates spoke, the two companies made a deal to install WinCE in 5 million TCI set-top boxes, only half of the 10 million Malone says he will roll out over the next few years.[14]

In April 1998, Richard Green, CableLabs president, used a high profile opportunity at the National Association of Broadcasters convention to lobby attendees to "cooperate with other industries in building a 'national digital broadcast system' in order to speed the rollout of next-generation digital television services."[15] Green specifically noted that broadcaster and cable industry leaders needed to work with, not against, PC and consumer electronics leaders. Malone took the occasion to drum up support for the ecosystem he was intent upon assembling.

In June 1998, Malone took the game to a new level: he agreed to merge with AT&T. Malone is now in a strong position to speed the convergence of PCs and TVs. Assuming regulatory approval, the newly formed AT&T Consumer Services will now "significantly accelerate the upgrading of (TCI's) cable infrastructure, enabling (AT&T Consumer Services) to begin providing digital telephony and data services to consumers by the end of 1999, in addition to digital video services."[16] While the merger boosts TCI's cash flow, it's still unclear whether a lengthy regulatory approval process and the normal integration difficulties that come with a $48 billion merger will generate a speed bump for TCI's assembly of a digital television ecosystem.

The most recent initiative bodes well for the speedy establishment of interactive television programming. In July 1998, the Advanced Television Enhancement Forum (ATVEF) released a draft specification for data-enhanced television programming. The authoring companies hail from the broadcast and cable network, television station, cable and satellite service

provider, consumer electronics, PC and software industries and include CableLabs and Microsoft as members. The ATVEF promises a finalized specification in the fourth quarter of 1998 and commercially available receivers and programming in the first half of 1999. In the coming year, we will be watching to see whether the ATVEF manages to implement standards and move the industry forward, or whether infighting will splinter the group.

8. PIONEERING A DIGITAL TELEVISION ECOSYSTEM

Earlier, we discussed the concept of assembly rules: the order and method by which a successful ecosystem is constructed. In our work at GeoPartners, we have identified several primary ways in which leaders can fail when attempting to assemble an ecosystem. Gods sometimes fail to understand that they are in fact nurturing an ecosystem. They may not have adequate support for their model or they may encounter strong competitors for ecosystem leadership. The gods may attempt to assemble an unprofitable business model or, alternatively, they may fail in the implementation of a well-planned and supported ecosystem.

When gods fail to understand that they are nurturing a complex ecosystem, campaigns are almost always focused much too narrowly. Often, the gods will use the wrong unit of analysis for their growth strategy or doggedly follow a path dependent strategy, despite sometimes obvious benefits to changing the pattern. For example, the broadcasters were focused almost entirely on keeping their current customers and business processes; their proposed model would do little more than maintain today's analog ecosystem. Gates and Malone, on the other hand, both saw the larger opportunity and challenge and sought to assemble a complete set of resources for an interactive digital TV ecosystem with additional—and valuable—revenue streams.

Gods can also fail to build a community model that others support or underestimate competitors for ecosystem leadership. As we saw, Gates made this mistake; while he presented a well-constructed ecosystem model, his supposed co-conspirators did not want to join him. Instead, they assembled their own model, leaving Gates to determine whether he would press forward with his original plan or fit himself into his competitors' vision. All three of the main factions discussed in this chapter, moreover, had difficulty generating the necessary support for their ecosystem models, because each was promoting its future vision from an obviously self-centered viewpoint.

Furthermore, the gods may construct an unprofitable business model or fail to manage the total profitability of the ecosystem. As we have seen, profitability requires a combination of economies of scale and scarcity. Thus Gates hoped to assemble access to a much wider body of customers than he had currently, while creating a bottleneck at the set-top box. Malone, on the other hand, sought to gain access to capital, while maintaining his traditional bottleneck around customer access. A god who fails to gain control over a scarce resource or maintain the scarcity of that resource over time will have difficulty maintaining a profitable role in the ecosystem, hence Malone's protective stance around his own scarce resource.

Finally, the gods may fail to execute on a reasonably well-planned ecosystem, especially if that ecosystem has become very complex to orchestrate and integrate. Both Microsoft and TCI are vulnerable in implementing their proposed ecosystems; the degree of new alliances, technologies, standards, and business models and processes required is very high. The broadcasters, by contrast, have a much simpler goal in the straight digitization of the analog TV world; consequently, in the absence of competing ecosystems, they would find it much easier to accomplish their goals.

The result of any of these miscues when trying to assemble an ecosystem is necessarily fatal. Gates' model will not come to fruition as he proposed it in July 1997 because he underestimated Malone's ability to respond and construct his own vision. Malone may very well have difficulty maintaining scarcity under his own plan. In the long run, the broadcasters probably will not be able to succeed with their current ecosystem conception because they are limiting the potential of their ecosystem and underestimating the momentum that the computer and cable gods can bring to a competing ecosystem.

Members of the three factions, willingly or otherwise, eventually will converge on a common digital television ecosystem. The ease and speed with which this occurs will depend a good deal upon government and consumer interests, marketplace momentum and not least the industry gods' attempts to shape the future. Interestingly, only one of the three ecosystem initiatives—that of the broadcasters—must be articulated in clear view of the public. The intertwined interests of broadcasters and the government in allocating the scarce resource of broadcast spectrum demands public scrutiny. By contrast the discussions among the gods of cable and computers follow the rules of political and financial deal making. The councils of these gods are largely private, and agreements are confidential until nearly consummated. It is our belief that in the end, however, it is these more private conversations, and these relatively less visible ecosystem beginnings, that will prevail upon the digital television landscape.

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