

The end of the Consumer Electronics industry as we know it?

BIA analysis

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We don't think so, but it is in for the greatest restructuring in its history. This year, the fog thinned just enough to see how the Consumer Electronics industry is likely to turn out. By our estimation, that change is likely to be unprecedented in magnitude – and will primarily impact that two thirds of the industry that is not appliances, that is, hitting home entertainment electronics. The change will alter the nature of the product set, re-orient the behavior of the consumer, and perhaps most strikingly, completely reshape the competitive landscape.

We estimate that little will be recognizable within 10 years. In fact, the main battles have yet to be fought and won, though it is clear that many players have been preparing for the fight for years.

In summary, we predict:

1. ***There will be a dramatic consolidation in CE entertainment devices within 5 years.***
Today's stack of CE entertainment equipment (CD and DVD players, VCRs, amplifiers, tuners, digital video recorders, etc.) will be replaced by Media Center devices, which we expect will develop in two separate parts (below).
2. ***The new 'Media Center' will evolve in two distinct parts / roles:***
 - a. ***Media Center: Content Management.*** This role will be dominated by PCs (including today's home use PC, and others such as Intel's ePC and the Mac), which will be capturing, editing and storing content.
 - b. ***Media Center: Content Access.*** This device is under development now (by cable companies, game console vendors, CE device vendors, and 'thin' PC vendors:
 - i. ***The Cable companies will come to dominate/control the 'Media Center: Access' space***
 - ii. ***Competition in 'Media Center: Access' devices will be driven by UI software functionality***
3. ***There will be substantial consolidation and change in the CE competitor lineup within 10 years.***
 - a. ***CE competitors will become increasingly weaker.*** Today's thin CE margins will be compounded by reducing unit sales (due to device consolidation in 1. above), and reducing prices (accelerating as in the PC industry). The power of cable companies (2.b.i., above) will flame this decline.
 - b. ***PC companies will merge with CE companies.*** To acquire consumer brand and channel strength.

1. CE entertainment devices will consolidate

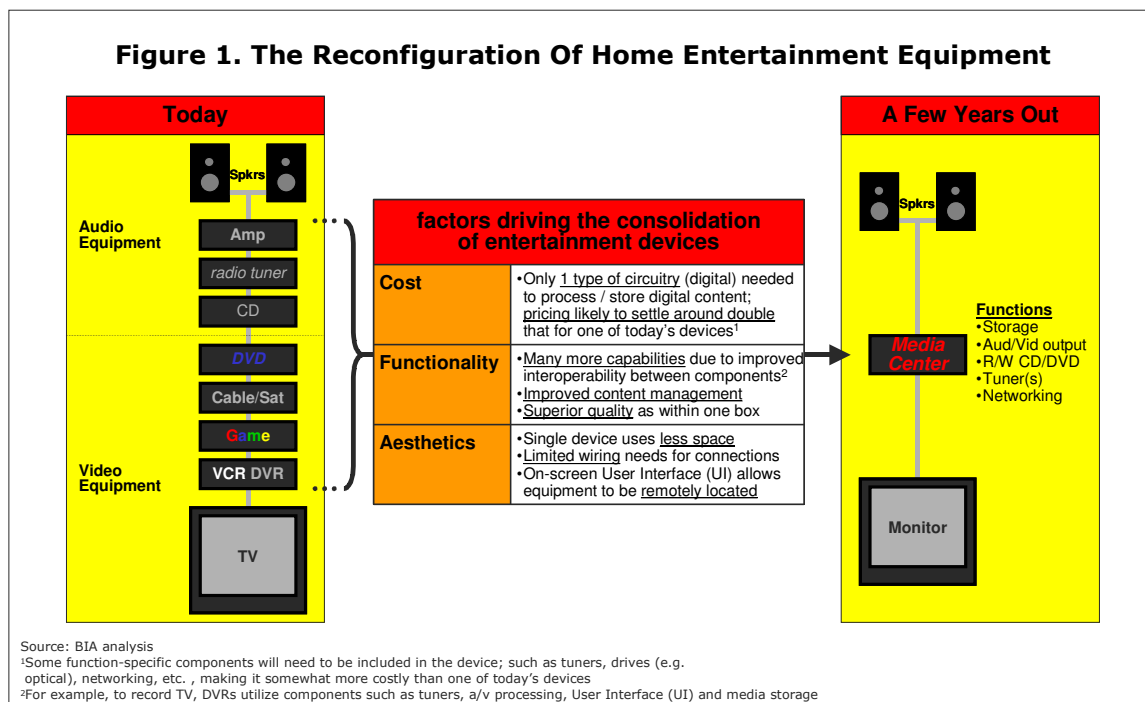
Typical in homes around the world today, is a stack of component-based entertainment equipment; including CD and DVD players, VCRs, amplifiers, tuners, digital video recorders, and many other devices. That stack of equipment is likely to be replaced by Media Center equipment – thanks to the ongoing and rapid adoption of digital content, a shift we call “dEntertainment.”

Three factors will drive the adoption of the Media Center approach; 1) dramatic savings to the consumer in purchasing less equipment, 2) substantially increased functionality - available only from the Media Center, and 3) improved flexibility in aesthetics that comes with eliminating boxes of equipment. Figure 1 summarizes the home entertainment equipment shift and the drivers for it.

However, there are components that the Media Center needs in addition to digital processing circuitry. In terms of hardware components, these are primarily TV and other tuners, disk readers/writers, and such like. And to manipulate the data, and properly process it, the Media Center also needs a dedicated operating system. Together, these additional hardware and software components are likely make the Media Center a little more expensive than one of today’s consumer electronics devices, though we believe that the price is unlikely to settle at more than double that of one of today’s consumer electronics devices.

Significantly enhanced FUNCTIONALITY

Much of the promise of having content in digital form has always been in the ability to manipulate it. In today’s terms, such manipulation includes using TV guide information to record complex programming (such as a



Reduced overall equipment COST for the consumer

Once music, video and other content is in a digital form, the hardware needed to input it, manipulate it, store it, and play it back (most of which is known as digital processing circuitry) is largely the same. As a result there are substantive savings in utilizing only one set of hardware (i.e. device) to conduct all the content processing needed.

series of shows), and sharing content among several uses simultaneously (for example, within the home). As time proceeds, many new forms of content manipulation will emerge, and only a Media Center will be in a position to deliver it, since only it – by definition – has the integrated functionality of several of today’s CE devices.

Furthermore, content distribution is set to make a dramatic shift to online distribution mechanisms, and as a result content will reside either in the entertainment device, or within its easy access. Content of all types will be stored on hard drives, and will be available for use without the consumer needing to find and launch physical media such as CDs or DVDs. In fact, improvements in the management of stored content will extend to higher quality sorting, indexing and searching in the dEntertainment paradigm. In the long term, as bandwidth improves, we believe that content storage will shift to the Internet entirely (this is many years off; when the internet 'pipe' is broad enough).

Finally, the quality of digital content is high, and does not deteriorate when transferred between digital circuits. This is in stark contrast with the analog CE equipment in most of today's homes, where the stack of multiple CE devices use lower quality formats, and content is transferred among devices through analog connections – notorious for quality degradation. The Media Center eliminates most of these quality issues (though it has some of its own).

Enhanced flexibility in equipment AESTHETICS

In terms of aesthetics, the simple consolidation in the number of CE devices will allow consumers to devote considerably less space to their entertainment equipment. In addition, the complexity and number of wiring connections will be significantly limited, as the Media Center will be internally integrated (shuffling content around internally).

Also, given the nature of the Media Center, controls will be displayed on a screen, and will be menu-driven. Such a configuration removes the need to have the device in the same room as the user, and is likely to be located remotely. Notably, there is a case for the Media Center device being built into display device (such as a plasma/LCD screen); an approach likely to be favored by today's non-Consumer Electronics competitors that are trying to break into the Consumer Electronics market.

2. The mainstream Media Center will evolve in two separate parts

Today, the contending devices for the Media Center appear to be fighting over a 'one-box' solution. Broadly, there are two camps in today's contest:

The PC: The only viable PC solution available today is driven by Windows XP Media Center Edition (or "MCE")

The Set-Top-Box (or "STB"): There are three primary sources of STBs today

- Cable companies
- Game console vendors
- CE device vendors

The first of Microsoft's MCE solution for the PC was launched by HP in 2002. The device is basically a high-performance PC (with tuner and other media-related PCI cards) sporting a version of Windows XP that is loaded with an extensive set of media drivers and a "10 foot" graphical user interface – suitable for controlling media on a screen that is 10 feet away, a distance that is typical in today's living room.

On the other hand, STBs have to date been dedicated to specific point-solutions in the home; such as cable/satellite

signal decoders, gaming consoles, or one of the many player/recorder roles today's entertainment solution.

When compared, however, the two types of device have significant weaknesses when they are considered as a 'one-box' Media Center solution. Table 1 summarizes the relative strengths of each proposition.

It is clear that the strengths and weaknesses of each offering are complementary. The PC is very capable at managing, manipulating, playing and storing content. In addition, over many years a vast array of sophisticated applications has been created to edit, arrange, and access content of any type on a PC. Such capabilities are lacking in STBs, mostly as a result of their point-solution heritage; to create software from scratch, with comparable capabilities to those for the PC, will be prohibitively costly; STBs simply cannot compete here in the near term.

Conversely, PCs are notorious for crashing, and for being generally bothersome to deal with – making them unwelcome in the living room. STBs, however, have delivered years of easy-to-use, reliable service in the living room – and have the respect of consumers as entertainment vehicles.

With both approaches having their own merits, they appeared set to embark on a long and drawn out battle.

That was until the beginning of 2004, when Bill Gates announced that Microsoft would launch Windows XP

Table 1. Merits Of Today's Media Center Contenders

	PC (running "MCE1")	Set-Top-Box
User Interface	•Allows viewing at 2 ft (for content mgmt) and 10 ft (for playback)	•Today, suitable for "10 ft" viewing
Managing Content	•Large stable of existing apps and broad interoperability (with Internet, cameras, etc.)	•No existing apps, or 2ft viewing capability; limited interoperability with other devices
Playback	•Can playback the greatest range of digital content types (audio, visual, game and other)	•Today, devices limited to specific areas (game, cable/sat, etc.) and formats
Content Storage	•Storage is significant, and readily expandable	•Little R/W storage capability ² or expandability
Stability	•Reputation for crashing, and long start time	•Reputation as stable and simple to use
Availability	•Already in homes; though not in living rooms	•Already in homes in living rooms
Consumer Credibility	•Limited credibility for entertainment	•Brands well established in entertainment

As living room entertainment device ...

 - Strength
 - Weakness

Source: BIA analysis

¹Windows XP Media Center Edition

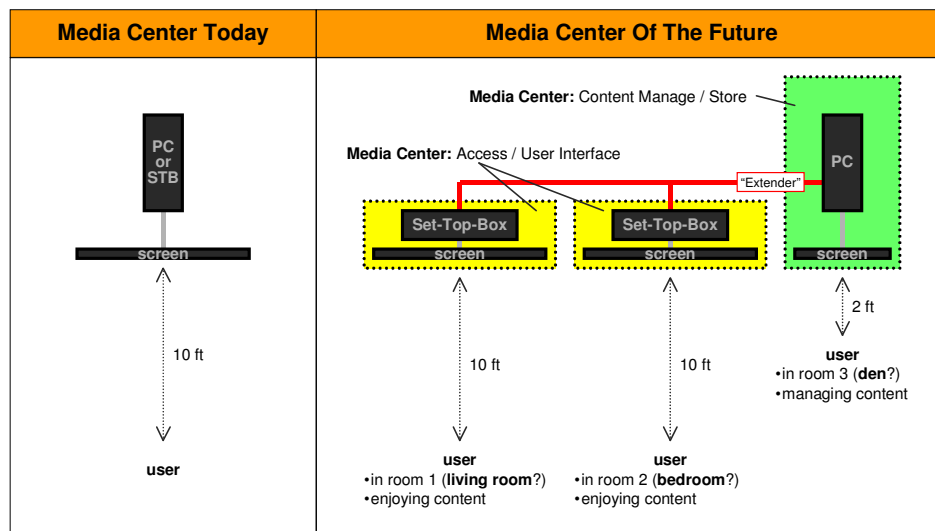
²Only DVRs have significant storage

MCE “Extender” in the autumn of 2004. In this one move, Gates appears to have ceded the PCs bid for the position as the *widely accepted* ‘one-box’ solution, and opened the door for splitting the Media Center’s function in two: The PC taking the role as content manager, and STBs taking the role as the user’s access point – the User Interface (UI). Figure 2 depicts the roles each approach will adopt, and the likely configuration future of Media Center equipment.

Today, most homes already have at least one PC. They are there as they are needed for other, non-entertainment, purposes (for which the Mac and the ePC have no intention to substitute). Consumers are unlikely to want to add a new device when an upgraded PC could fill the role.

Furthermore, many consumers have invested significantly in entertainment content and applications based on the PC

Figure 2. Likely Future Media Center Configuration



Source: BIA analysis

The “Extender” technology announced by Gates in the Consumer Electronics Show in Las Vegas in January enables both ends of the reconfigured Media Center: 1) It makes the content residing on the MCE PCs readily available to, and somewhat manipulable by, STBs; and 2) it provides STBs with the drivers and other technology needed to work with content on MCE PCs.

MCE-enabled PCs will dominate the ‘Content Management’ Media Center space

The two strongest competitors to MCE-enabled PCs as Content Management Media Centers come from, a) the Mac; and b) the new entertainment PC recently announced by Intel (known as the ‘ePC’). While both have some considerable strengths, they are significantly hamstrung by the PCs widespread installed base.

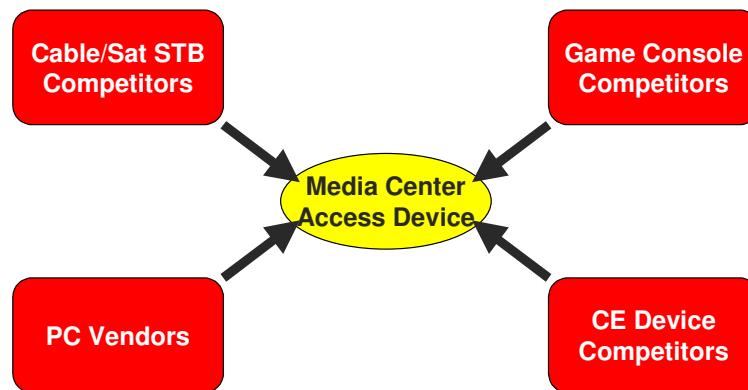
platform, and they are likely to be unwilling to want to port that content over to a new platform.

Finally, the PC boasts an unparalleled array of content management and manipulation applications. While the Mac has the potential to offer a viable alternative, the ePC cannot.

The Cable company’s solution will dominate/control the ‘Content Access’ Media Center space

Four groups of device types are in a position to compete for the content access role; cable/satellite STBs, game console STBs, CE devices, and some form of PC (see Figure 3).

Figure 3. The Media Center 'Access' Device Battlefield



Source: BIA analysis

A strategic assessment suggests that the cable offering has the advantage in terms of widest addressable market, while others will have specific strongholds. The fate of the CE players is largely dependent on their ability to weather the competitive storm in an industry that has historically been their exclusive territory.

The cable box appears the most advantaged contender

The cable companies are busy creating new STB solutions that have all the hallmarks of a viable Media Center Access device. Comcast appears to have the most advanced proposition, working with Samsung to develop the device itself, and Ucentric to develop the operating system / user interface.

This offering is likely to have considerable power in the market. The primary reason for this is the sheer level of penetration that cable enjoys in the US market today, and the fact that all those consumers that want to access the cable system do so under the direct control of the system operator, with the system operator's approved hardware / STB. The proprietary technology extends beyond simply controlling access to cable content, and is likely to deliver functionality to cable services that will only be available to cable STB owners.

Another, often under-rated, driver for the likely success of the cable solution is in the army of locally-based installation engineers. As the Media Center enters the mainstream, it runs the risk of slow adoption due to poor consumer education. While the screen-based user interface can be designed to reduce the consumer education needed in day-to-day use, the installation itself poses challenges. Connecting to the cable system, to the computer and home network, and configuring to consumer-specific content and needs are tasks that cable company local installation engineers are trained for – putting them at an advantage.

It is worth noting that the cable operators are highly motivated to maximize adoption for their solution; they are on the brink of sitting at the choke point of information into many homes. This position offers vast additional revenues from video-on-demand (VOD) and a range of other services that currently support whole industries. Given the near-monopoly cable operators have in local wired broadband (DSL has reached its limit; see BVA paper #428), they are in a position to extract substantial premiums.

Though, to make the approach work, cable operators will be forced to work with others to develop the solution itself.

Game console vendors are going to put up a fight, leveraging some natural market strongholds

The gaming console vendors also have an installed base of loyal users, and are able to exert some control through their own proprietary technologies in game rendering. However, the installed base of game consoles is considerably smaller than that for cable STBs, and the actual loyalty of users to specific vendors is questionable, given the dramatic shift to Sony's PlayStation and away from Nintendo's GameCube in the 1990s, and the expected shift to Microsoft's xBox that is likely to start in 2005 (see BVA paper #447).

We estimate that the game console-based STB is likely to have some success, though it will be centered around the Den, where the console is located today, and will find demand only in those homes where there is a strong demand for game consoles. While this is not likely to be a small market, it is also not likely to rival the wide acceptance driven by the cable box.

It must be said that Microsoft has made a good play with its xBox, and it is unlikely to accept being relegated to an also-ran position in the re-configured CE industry. Of course, Microsoft entered the game console market with the specific intention of gaining a presence in the living room. Strategically, it is now in the most advantaged position of the three key players; it will implement "Extender" technologies in its STB first (Sony and Nintendo are likely to resist for quite a while). The upgraded xBox is set for launch in 2005 - beating the next PlayStation to the market by one whole year; Sony used this same technique to beat out Nintendo's leadership in the 90s. In addition, Microsoft has been working hard to get content written for the next xBox, publishing easy-to-use programming tools, upgrading its hardware early in the 5-year cycle, and leading the market with graphics and other capabilities.

Sony has made a play for a non-PC Media Center late in 2003, launching the PSX. This STB included a hard drive, DVD player and other capabilities, though its launch was limited to Japan, and mired with production delays, functionality that fell short of promised specifications and a \$800 price tag (comparable to the price for three or so CE devices). The PSX is expected to be launched in the US in the autumn of 2004, though it is not expected to be "Extender"-enabled, and is unlikely to be a viable contender for the Media Center Access device as a result.

CE device contenders will depend on their brands to carve out a market position

The CE players are increasingly recognizing the shift to ubiquitous digital content, and the likelihood of online content distribution. This recognition is manifesting itself in a series of recent launches of multi-function CE devices.

However, none of the CE players have yet shown much sign of delivering a Media Center proposition that will be a serious contender, able to compete with features such as online music and video downloading, home video management etc..

We expect that the CE players will be very slow to develop a strong Media Center offering, and will be completely distracted as the years pass, due to substantially declining revenues from entertainment equipment (resulting from declining unit sales and declining ASPs; see Section 3).

PC players will make a play, with some (limited) success

There are three potential PC-based offerings for the Media Center Access device.

The MCE PC is one solution; where Microsoft is using "Extender" to allow more than one room to be served by the same PC. While this is a viable potential offering, it is unlikely to significantly alter the existing disadvantaged position facing the PC - specifically, its reputation for very poor stability, slow startups, and excessive complexity.

Apple's Mac represents another potential solution, though Apple has actually indicated that it is not interested in a Media Center proposition in the home. With that said, it surprised the market with its iTunes move in 2003, and has a reputation for holding back on its strategic moves - apparently relishing the impact of surprise.

Finally, there is Intel's entertainment PC chip set (the "ePC"). This new device is targeted at delivering entertainment, with many other elements pared down; it is expected to be able to run a new pared down Windows, as well as Linux. In fact, the Linux version is expected to be very quick to startup, rather like the CE devices of today. There is too little known about the ePC to get an accurate assessment on its likely path forward.

Table 2 summarizes the relative positioning of the four groups of contender.

proprietary UI systems running on Linux (assuming they will work with MCE “Extender”). In this scenario the

Table 2. Positioning Of Each Competitor Set

		Type Of Player			
		Cable/Satellite (STB)	Game Console (STB)	CE Device (STB)	PC
Competitor Set		<i>Cable/satellite providers (Comcast, TimeWarner, ...) with STB manufacturers (GI, Motorola, ...)</i>	<i>The three game console manufacturers (Microsoft, Nintendo, Sony)</i>	<i>Traditional CE equipment manufacturers (Panasonic, Philips, Sony, ...)</i>	<i>Traditional PC manufacturers (Dell, HP, Toshiba, ...)</i>
Group SWOT	Strengths	•Own ‘pipe’ and encryption •Have local install capability	•Proprietary technology •Some channel strength	•Have channel strength •Already in living room	•Can deliver 1 box solution ¹ •Much digital know-how
	Weaknesses	•Not skilled in CE branding •Limited content offering?	•Game functionality may not be wanted in living room	•Relatively new to range of digital content / standards	•Weak in CE brand/channel •Key product shortcomings ²
	Opportunities	•With advent of VoD ³ , can increase sales substantially	•Proprietary technology may open Media Center market		
	Threats			•Facing device consolidation and many new competitors	
Observations / Recent Events		•Comcast is developing its ‘Gateway’ device/solution with Samsung and Ucentric	•xBox and PS2 already broadening to include DVR, DVD, and other CE functionality in 2004	•Some consolidation already taking place among digital rendering devices	•MCE not likely to become simple/stable enough soon •Intel’s ePC (entertainment PC) offers fast start-up and Linux stability – due 2004

Source: BIA analysis

¹One box solution may be powerful purchase decision driver for dorm-room and studio consumers

²See earlier discussion

³Internet based Video-on-Demand

Media Center competition will be largely driven by operating system / user interface capabilities

Competition in today’s CE device market is largely driven by brand/reputation, features, styling and price. Going forward, however, we believe the factors for competition will be different for the Media Center, as a result of the radical alteration in the product on offer (to a the more computer-oriented / digital-based Media Center) and the accompanying entrance of many new players to the market.

We expect the net impact will be reductions in the power of brand and the impact of styling (the Media Center device may even be located remotely). In contrast, however, functionality will become king.

And greatly widened functionality is one of the key deliverables of Media Centers. Naturally, in a digital device, the functionality is completely dependent on the software, and offerings will compete largely based on the functionality provided by the device’s resident software.

How this competition will manifest itself is not yet clear. One scenario has the Media Center Access device utilizing

hardware is likely to become commoditized rapidly, and competition will center on a few UI system vendors (e.g. Ucentric).

Another model has the Media Center Access device becoming loaded with considerable proprietary hardware-based signal processing chips and the like. In this model, both hardware and software become a factor in product differentiation, and software portability becomes a little more difficult for UI system vendors. With that said, the UI software is likely to remain a key factor in the consumer’s purchase decision.

3. The CE competitive landscape will be unrecognizable in 10 years

CE competitors will become weaker

Existing CE players make almost no profit from the market as it is. Return on Sales (RoS) is typically in the low single digits: For example, as of the end of 2003, Sony – the giant of the industry – had an RoS of 1%, as did Toshiba; Philips returned 2%; and Matsushita (Panasonic) delivered a relatively whopping 5%.

The worst of the news is yet to come, however. The entrance of PC vendors and others into Consumer Electronics delivers an unparalleled blow for the established CE players – effectively doubling the number of players chasing consumer spending (see Table 3), and all strategically focusing on share leadership.

PC companies will merge with CE companies

This situation is not without precedent, and the typical outcome is consolidation among the players. The two primary industries that are merging are PCs and CE entertainment equipment; each of which has critical strengths to offer the other. In fact, the strengths and weaknesses are so complementary, that we should expect a number of unions created between the two, see Table 4.

The CE players basically offer good market-oriented capabilities; brand strength, good consumer entertainment understanding, and an established channels facility. Conversely, the PC/computer oriented players offer technology and operational strengths, such as familiarity with digital processing, software and semiconductors, and they have extensive (hard-earned) experience with cost based competition and rapid product cycles.

Table 3. Future Entertainment CE Player Lineup

Established	New	
	PC Vendors	Other (STBs)
LG Matsushita Philips Samsung Sanyo Sharp Sony Toshiba	Dell Gateway HP Legacy	GI Motorola Microsoft

Source: BIA analysis

Notably, PC vendors are much more focused on price, and are much more experienced at squeezing out cost. Such a re-charged focus on price competition will combine with the expected decline in CE device types (as the consumer adopts the multi-functioned Media Center devices); it is not unreasonable to expect that overall revenues will be significantly reduced in the years to come.

In short, twice as many players will be chasing a much lower dollar rate of spend, in a market that is more focused on price competition than ever before. Established CE players are facing reduced revenues at a minimum, and, without substantive change in the way they operate, they must expect that RoS will dive deeply into the red as the transition unfolds in the next five to ten years.

The first players to start the matching process will undoubtedly have the advantage; since they will have the pick of the bunch, and will be able to capitalize on the fruits soonest. Naturally, there will be egos and cultures to get over, as well as other strengths to consider, such as global geographic strengths.

For example, the Asian-based players will have an aversion to mergers of most kinds. Also, the industry leaders, such as Sony – perhaps even Dell – will consider mergers as too risky to their existing business models, and may reject such moves until it becomes too late. Our favorite, though, is the potential Philips-HP deal; where the cultures seem to have the best match, the product and geographic coverage fits well together, and the relative strengths and weaknesses of each is so pronounced that both have a lot to gain. HP will be the buyer – and may well wait until the price is right.

Table 4. Relative Strengths of Each Industry

		CE-Based Players	PC/Computer-Based Players
Market Related	Brand	• Accepted in living room	• Less welcome in living rooms
	Channels	• Established relationships and logistics	• Relatively poor in CE channels • However, can introduce direct channel
	Market knowledge	• Familiar with consumer entertainment needs	• Not familiar with consumer entertainment needs
Operations Related	Cost reduction	• Familiar with low margin business	• Substantive cost-competition experience
	Speed to market	• Follow typical updating cycle	• Very familiar with short cycles
	Technology	• Relatively new to digital technologies	• Mostly familiar with digital technologies

Relative capabilities of industry players ...	
	- Strength
	- Neutral
	- Weakness

Source: BIA analysis

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Leveraging market strategy to maximize cash flow and business value is a passion for Mr. Jones. Since the 1980s he has helped large and small technology clients find and exploit market Profit Pools; creating billions in cash flow.

Previous to Business Value Associates, Mr. Jones was a Partner and practice leader in the Business Strategy practice of PricewaterhouseCoopers (PwC); engagements included assessing decisions on market entry and strategy, competitive tactics, investment and turnarounds. He led several Business Strategy practice areas, including Shareholder Value, eMarkets and the Technology sector. Before joining PwC, Mr. Jones was a project manager with Marakon Associates, where he served consumer, health and pharmaceuticals clients; prior to that he was New Product Manager with Thomson Consumer Electronics.

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About Business Value Associates:

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Business Value Associates is a global market strategy consultancy. We help clients maximize long-term cash profitability and shareholder value by finding and focusing on Profit Pools, and leveraging competitive strategies that drive returns.

Business Value Associates was launched in 2002 by three Partners from the Business Strategy Consulting practice at PricewaterhouseCoopers. We have assembled a considerable body of proprietary intellectual capital at the intersection of shareholder value and market strategy; including market segmentation, Profit Pool targeting, competitive strategy formulation, and customer understanding through ethnography and other techniques.

We primarily work with C-suite managers at Fortune 500 companies, their business units, and other mid-market firms. Clients include Hewlett Packard, IBM, Liberty Media, Samsung and others.

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