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DIGITAL AMERICA 2012

INNOVATION IN AMERICA

Innovation is the lifeblood of the consumer electronics (CE) industry. This was evident in 2011, when a sales surge fueled by cutting-edge products was at the forefront of the nation's economic comeback. The importance of CE products and services in the overall economy was further highlighted at the 2012 International CES which set records with more than 156,000 attendees from 150 countries visiting more than 3,100 exhibits covering 1.86 million net square feet. Innovation is the reason people from a wide variety of industries come to Las Vegas each January to see the latest technology that is transforming every business.

While CEA is best known for producing the International CES, the association is also at the forefront of the innovation economy with ongoing efforts to keep a level playing field for members to sell their products. Environmental issues, free trade, access to spectrum and maintaining the delicate balance between copyright holders' rights and consumers' fair use are key issues. In 2011, there were some advances on these issues including President Obama's focus on innovation in his State of the Union address.

CEA continues to educate legislators and regulators about the importance of the innovation economy, and these efforts have paid off with successes particularly in the area of trade legislation and rules for accessibility of CE products. In the fall, the Federal Communications Commission (FCC), thanks in part to input from CEA, adopted a balanced approach for manufacturers to add accessibility features

to devices for individuals with disabilities. A big win for consumers and the industry was the passage of trade agreements with Colombia, Panama and South Korea. This legislation was particularly satisfying since CEA has been advocating for these initiatives consistently for half a decade.

In addition, the ongoing effort to protect consumers' rights to use the products they've purchased and have unfettered access to the digital content available through those devices continues. Last fall, two congressional bills, the Stop Online Piracy Act (SOPA) in the House of Representatives and the Protect IP Act (PIPA) in the Senate, had good intentions but were overly restrictive as proposed and would have hurt innovation. A groundswell of consumer opposition stopped both bills in their tracks.

This was a year of major power shifts within the industry from fixed location devices – TVs and desktop computers – to mobile devices, connected to one another and to the Internet. This year proves again that the devices and services our industry produces have been so interwoven into consumers' lives that sales hold steady even in difficult economic times.

Overall sales to dealers of CE devices rose 7.9 percent in 2011 to \$195 billion from \$185 billion the previous year as the economy began to show signs of improvement. But it was the dynamic triumvirate of new devices that really moved the needle again last year – smartphones, e-readers and touchscreen tablets.

Tablets and e-readers, products that resonate with contemporary mobile lifestyles, led the charge with sales that more than doubled in unit and dollar volume over the previous year, while smartphone sales increased by 62 percent over 2010.

This transition to "anywhere access" of information, entertainment and social connections is reflected in the surge in mobile computing devices – now the leading category in the industry surpassing television which had been the leader for six decades. Convenience and mobility are the hallmarks in home offices as notebooks and netbooks now outsell desktops by a factor of four to one.

Sales of tablets blossomed to more than 29 million units, generating nearly \$16 billion, while e-readers more than doubled in unit volume to 18.7 million while generating \$1.8 billion in revenue. Smartphone sales finally surpassed traditional wireless handsets in 2011 with sales of 87 million units (compared with 79 million standard phones) representing more than \$27 billion in revenue.

TVs and digital displays have reached an inevitable plateau following a decade-long rise. With market penetration of flat-panel TVs now approaching 90 percent and competitive pressure driving average prices down, overall display revenues for the first time in years totaled less than \$20 billion. ■

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CEA MARKET RESEARCH

CEA provides actionable information and intelligence on all aspects of the consumer technology industry, including hardware, content, services and infrastructure.

CEA Market Research produces an extensive body of research not found anywhere else.

Research Studies

- 25+ new studies conducted each year.
- 300+ unique studies in total.
- Findings presented in webcasts with available slideshows and video.

Product Ownership Rates

- Ownership rates on hundreds of products and services.

Product Sales Data (CE MarketMetrics)

- Detailed monthly factory level unit and dollars sales data reports and analysis.

Forecasts

- Five-year forecast on hundreds of products/product features.

Historical Data

- Sales data and ownership rates dating back to the 1950s.

Economic Insights

- Analysis of macro and micro trends impacting the industry
- Quarterly economic webcasts.

Research Library

- Experienced, professional librarians provide answers to the most challenging information requests.

CEA has a more than 80-year history of objective market research. Our industry sales data and market research are continually relied upon by the technology community, financial markets, the media and economists. We are proud of our widely recognized integrity, as well as our record of accuracy and expertise.

CEA Market Research is the authoritative source for industry research and analysis. To learn more, visit: CE.org/research. ■

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Global Retail Technology Sales and Forecasts

- Global retail sales and forecasts of consumer electronics (CE) products
- Product level analysis covering dozens of consumer electronic product categories
- Analysis segmented by seven global regions
- Sales by year in U.S. dollars

GfK Digital World is released semi-annually in April and October. The analysis is delivered in MS Excel and Powerpoint.

Produced by GfK Boutique Research
in partnership with CEA

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TECHNOLOGY & STANDARDS

Technical standards describe how to design, build, use or test something. They are crucial to the industry because they allow CE manufacturers to make products that will work with other manufacturers' products. They also allow consumers to compare the performance of different products.

Imagine if the connector that joins your TV set to your cable or satellite system wasn't standardized. There might be 100 types of TV cable out there, one to connect TV set A to cable system X, another to connect TV set B to system X, a third to connect set A to system Y, and so on. Imagine if there wasn't a standard describing the signals used for wireless Internet connectivity. Your laptop might have wireless connectivity in your office, but not in your hotel room. It might work in your home but not at the airport. And what if there wasn't a standard way of measuring the power consumed by a TV set? A set that uses 250 watts might appear to use less energy than a set that typically uses only 150 watts simply because it was tested under more favorable conditions.

CEA's standards committees develop and improve technical standards to help the CE industry grow and prosper. They maintain more than 100 standards while searching for areas where new standards might make the industry's future even brighter. ■

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TOP SELLING CEA STANDARDS

- CEA-708-D *Digital Television (DTV) Closed Captioning*
- CEA-2014-B *Web-based Protocol and Framework for Remote User Interface on UPnP™ Networks and the Internet (Web4CE)*
- CEA-2037 *Determination of Television Average Power Consumption*
- CEA-608-E *Line 21 Data Services*
- CEA-2017-A *Common Interconnection for Portable Media Players*
- CEA-709.1-C *Control Network Protocol Specification*
- CEA-861-E A *DTV Profile for Uncompressed High-Speed Digital Interfaces*
- CEA-852.1 *Enhanced Protocol for Tunneling Component Network Protocols over Internet Protocol Channels*
- CEA-2006-B *Testing and Measurement Methods for Mobile Audio Amplifiers*
- CEA-2040 *SD Card Common Interface Standard*
- CEA-542-C *Cable Television Channel Identification Plan*
- CEA-2009 *Receiver Performance Specification for Public Alert Receivers*
- CEA-426-B R-2010 *Loudspeaker, Optimum Amplifier Power*
- CEA-766-C *U.S. and Canadian Region Rating Tables (RRT) and Content Advisory Descriptors for Transport of Content Advisory Information Using ATSC Program and System Information Protocol (PSIP)*
- CEA-852-B *Tunneling Device Area Network Protocols Over Internet Protocol Channels*
- CEA-936-A *USB CarKit Specification*
- CEA-2014-A *Web-based Protocol and Framework for Remote User Interface on UPnP Networks and the Internet (Web4CE)*
- CEA-2030-A *Multi-Room Audio Cabling Standard*
- CEA-762-B *DTV Remodulator Specification*
- CEA-CEB21 *Recommended Practice for Selection and Presentation of DTV Audio*

CEA STANDARDS PUBLISHED IN 2011

CEA's standards committees published nine documents in 2011. A listing, by number, follows.

- CEA-CEB21 *Recommended Practice for Selection and Presentation of DTV Audio*
- CEA-CEB25 *Best Practices for Implementing Common Alerting Protocol (CAP) based Alerts for Consumer Electronics Devices*
- CEA-851.2-A *Security Services for the Versatile Home Network*
- CEA-426-B R-2011 *Loudspeaker, Optimum Amplifier Power*
- CEA-560 R-2011 *Standard Method of Measurement for Compact Disc Players*
- ANSI/CEA-909-B *Antenna Control Interface*
- ANSI/CEA/CEDIA-2030-A *Multi-Room Audio Cabling Standard*
- ANSI/CEA-2040 *SD Card Common Interface Standard*
- CEA-2042.1 *Wireless Power Glossary of Terms*

For a complete list of CEA standards and information on how to get involved, visit CE.org/Standards.

DIGITAL AMERICA 2012

ACCESSORIES

Trends

- America's passion for smartphones drives wireless communication accessory volumes.
- Cases, skins, bags, screen protectors and cleaning products are hot across CE categories as consumers seek to protect and personalize their devices.
- Consumers opt for higher-featured, higher-priced SKUs when buying gaming controllers, wired and wireless keyboards, select cleaning and maintenance products, and also carrying cases and bags for notebooks, netbooks, e-readers and tablets.
- Multi-tasking devices need multi-tasking and/or multiple accessories.
- More devices (smartphones, tablets, notebooks, digital cameras and camcorders) attach to the DTV via cable or wireless. In addition, HDMI proliferates.
- In gaming, music accessory controllers are out, while guns, dance gear and balance boards are in.
- Passive 3D HDTV sets and glasses are an increasingly affordable option as the 3D market evolves.
- Flash media vendors market products to specific applications, i.e., gaming or HD video recording via smartphones or DSLRs, and consumers pay increased attention to flash memory read/write speed performance.

How the Cloud is Driving Accessories

As someone who remembers the mainframe computers and dumb terminals of the 1970s, George Stepanchich, the CEO of sourcing advisory firm Invisionate and chair of CEA's Accessory Division, is watching

the impact of "the cloud" on accessories and consumer behavior with great interest.

Cloud content and services, coupled with the increased processing power and screen resolution available on smartphones and tablets, are driving the accessory ecosystem, Stepanchich notes. "Now if I have a tablet with a Retina display on which I can stream HD audio and video, maybe I might want to don a really quality pair of 5.1 (channel) headsets so I can listen to music in all its glory." Indeed, with consumers on the move, accessing content on a variety of electronics devices, often from the cloud, the margin-rich consumer electronics enhancements categories are deep into a sea change.

After 5.6 percent revenue growth in 2010, the CE enhancement market (including CE accessory products, primary batteries and blank media) contracted in 2011, dipping 1.57 percent to an estimated \$20 billion in shipment revenues. In 2011, sharp declines in blank media format revenues and a continued decrease in primary battery sales offset continued growth in CE accessories. Pent-up demand for key CE products (including tablets and smartphones) helped fuel unit sales growth rates, while price deflation contributed to the decline in revenue.

CE accessories (including TV, home theater, audio, digital imaging, wireless phone, videogame and PC accessories) enjoyed the second year of growth to total roughly \$9 billion in 2011, up four percent from 2010.

Total TV, home theater and audio accessory shipment revenues were essentially flat

in 2011. Despite spikes in headband and earbud headphones, and a larger contribution from 3D active-shutter glasses, the wireless and PC accessory categories boomed. Attachment sales for smartphones and tablets drove double-digit factory unit sales, in 2011. ■

Want to know more about this topic area? Turn to CEA Market Research – the source relied upon by the technology community, financial markets, the media and economists to stay on top of industry trends. CEA members should visit the member website and non-members, the CEA store. New reports are added each month.

- *14th Annual CE Ownership and Market Potential Study (2012)*
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- *18th Annual CE Holiday Purchase Patterns Analysis Brief (2011)*
- *8th Annual Teen CE Holiday Purchase Patterns Analysis Brief (2011)*
- *CE Product Returns – Understand Why They Occur and How to Reduce Them (2011)*
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AUDIO

Trends

- Sales of home audio components such as AV receivers and speakers have staged a strong comeback and are forecast to grow in 2012 at double-digit percentage rates for the third consecutive year, CEA statistics show.
- Sales of slim, one-piece soundbars have surged because of their ability to improve the sound of thin flat-panel TVs and, in many cases, simulate surround sound.
- Total factory-level home audio sales, ranging from components to tabletop radios, slipped an estimated 1.3 percent in 2011 to \$3.5 billion because of falling sales of home-theater-in-a-box (HTiB) systems, MP3-player docking-speaker systems, and tabletop radios, according to CEA.
- Modern home audio products play music stored on networked PCs and stream music from Internet-based radio stations and music services.
- The latest music source for home audio systems is the smartphone, which uses wireless Bluetooth or Wi-Fi to stream music to a home audio system.
- Portable audio products, led by MP3 players, will outsell home audio products for the eighth consecutive year in 2012 in factory-level dollar volume, CEA forecasts.
- Surging sales of touchscreen-equipped smartphones are taking a toll on portable MP3 players, whose factory-level unit sales are forecast to fall 11.3 percent in 2012, CEA statistics show.
- The number of AM and FM stations broadcasting a digital HD-Radio™ signal grew by January 2012 to more than 2,100 stations in 250 markets.

- Digital HD-Radio tuners will appear in 2012 in select home AV receivers, select iPod/iPhone docking tabletop radios, and a growing selection of aftermarket car stereo systems.
- About 50 aftermarket car audio and car AV systems are available with HD-Radio in 2012, up from 27 in 2011, said HD-Radio developer iBiquity Digital.
- Satellite radio's subscriber base grew for the second consecutive year in 2011, to end the year with about 21.9 million subscribers. SiriusXM projects 1.3 million net new subscribers in 2012.

Audio Industry Gets a Makeover

Disruptive technologies have turned the audio industry upside down and inside out, forcing the home and portable audio industries to reinvent themselves during the past decade to keep up with accelerated changes in the media that people consume and the way they consume it.

In the home, music sources such as PCs, Internet radio, portable MP3 players, smartphones and tablet computers have overthrown such legacy sources as CD players and analog AM/FM radio as dominant music sources. As for AM and FM radio, terrestrial radio stations are converting to the digital HD-Radio format to improve sound quality and transmit up to four programs simultaneously to compete with the diverse content of satellite and Internet radio broadcasters.

On the go, portable MP3 players, smartphones and tablet PCs have freed up digital music files from the desktop

PC, enabling consumers to take their MP3 files with them to enjoy anywhere, anytime. Smartphones, tablets and Wi-Fi-equipped MP3 players also stream Internet radio stations and Internet music services such as Pandora and Slacker.

All of these new music sources have one thing in common. They use compressed digital audio formats such as MP3, Windows Media Audio (WMA) or Advanced Audio Coding (AAC). ■

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- *The Evolving Video Landscape* (2012)
- *10th Annual State of the Builder Technology Market Study* (2012)
- *14th Annual CE Ownership and Market Potential Study* (2012)
- *Driving the Adoption of Aftermarket Automotive Technologies* (2012)
- *Furthering the Drive towards In-Vehicle Connectivity* (2011)
- *Notions of Quality: Audio Expectations of Consumers* (2011)

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AUTOMOTIVE ELECTRONICS

Trends

- Overall CE revenues surged 7.9 percent to an estimated \$195.2 billion in 2011 and will surpass \$200 billion for the first time in 2012, according to CEA.
- Global automotive infotainment revenues jumped 3.4 percent to \$32.5 billion in 2011 and will reach \$33.5 billion in 2012, estimates IHS iSuppli.
- In-vehicle technology equipment revenues climbed from \$9.1 billion in 2010 to an estimated \$9.4 billion in 2011 and will scale \$10 billion again in 2012, according to CEA.
- Shipments of flat-panel displays for automotive use jumped from less than 30 million units in 2010 to 42 million units in 2011 and will rise to 50 million units by 2013, according to NPD DisplaySearch.
- The global automotive integrated circuit (IC) market will grow 11 percent in 2012, to reach \$19 billion, according to research firm IC Insights.
- More than 13.9 million new cars and light trucks will be sold or leased in 2012, as the U.S. auto market continues to rebound, predicts the National Automobile Dealers Association (NADA). That total represents an increase from 12.7 million vehicles in 2011, 11.6 million units in 2010.
- The number of U.S. automotive dealerships increased 0.6 percent last year to 17,767, research group Urban Science said in its annual *Automotive Franchise Activity Report*. The increase in dealers, followed a 4.4 percent dip in 2010 and an eight percent drop in 2009.

More Fuel for Growth

Rebounding strongly from the Great Recession of 2008 and 2009 with the help of a government-backed bailout, the automotive industry has come roaring back with soaring sales and rising expectations for promising new vehicles. Overall in-vehicle technology revenues are expected to rise again in 2012 as the automotive industry continues to recover and expand in China and other emerging overseas markets.

In a prime example of the U.S. auto industry's stunning turnaround, General Motors racked up its largest annual profit ever in 2011, reporting net income of \$7.6 billion, up from \$4.7 billion in 2010. Despite losses in Europe and South America, GM sold slightly more than nine million vehicles last year, allowing it to reclaim the title of the world's best-selling automaker from Toyota Motor. As a result of its record profits, the company said it will reward its 47,500 U.S. hourly workers with its largest profit-sharing checks ever, averaging \$7,000 each, up from \$4,300 the year before.

At the same time, Ford Motor Company reported a pre-tax operating profit of \$8.8 billion for 2011, up from \$8.3 billion in 2010, as its car and truck sales also continued to rebound, particularly in North America. Thanks to its improved financial performance, Ford said it will shell out profit-sharing checks of \$6,200 apiece to its 41,600 U.S. hourly employees, up from \$5,000 in 2010.

Not to be left behind, Chrysler Group reported its first annual profit in 2011 since the financial downturn. Chrysler posted net income of \$183 million last year.

With vehicle sales back on the upswing, the U.S. remains the world's second-largest auto market, trailing only China. The National Automobile Dealers Association (NADA) projects that more than 13.9 million new cars and light trucks will be sold or leased in 2012. ■

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- *CE Product Returns - Understand Why They Occur and How to Reduce Them* (2011)
- *Furthering the Drive towards In-Vehicle Connectivity* (2011)
- *Staying Connected on the Go - A Look at In-Vehicle Smartphone Integration Systems* (2011)

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DIGITAL IMAGING

Trends

- Mirrorless models on the rise.
- CIPA reports camera shipments dip.
- DSLRs market leaders, CILCs gain attention.
- Pro shooters show brand loyalty.
- Smartphones capture images on the fly.
- Camcorder sales continue to dip.
- Flash memory driving blank media category.
- Social networks play a major role.
- Printing shifting towards retail and online outlets.
- Generation Y growing digital demographic.
- Rise in demand for consumer photo books.

Shifting Digital Imaging Landscape

Digital imaging unit and dollar sales to dealers have been shrinking since 2010, and CEA Market Research projects declines will continue in 2012. The digital imaging sector, which includes digital cameras, camcorders and digital photo frames, is facing market saturation and increasing competition from smartphones and other devices that double as cameras and camcorders. However consumer interest in photo books and merchandise,

U.S. CONSUMER ELECTRONICS HOUSEHOLD PENETRATION FORECAST				
	2011e	2012p	2013p	2014p
Camcorders	53%	52%	52%	52%
Digital Cameras	84	84	85	87
Smartphones	42	44	44	45

Source: CEA Market Research

as well as the strong relationship between digital imaging and social media, mean there are opportunities for sector growth. “More people than ever before are taking pictures,” says Chris Chute, research manager at IDC Research. “In the U.S. there were 259 billion images captured, worldwide it was over two trillion. It’s quite amazing to see just how many images are being taken. The consumer’s love for digital photography as well as the availability of new portable devices, tablets, software and social networks for the sharing their images has taken it to a whole new plateau.”

Digital Camera Sales Down

Digital cameras continue to play a key role in the overall CE market. With current household penetration for digital cameras at 84 percent, the digital camera market is largely driven by replacement models

and gifts. Yet the category seems to defy the critics. Despite a high household penetration rate, we continue to see some growth year after year. ■

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- *14th Annual CE Ownership and Market Potential Study* (2012)
- *The Changing Landscape of Digital Photography* (2012)
- *3D Digital Imaging - Consumer Perceptions of this Emerging Technology* (2011)
- *U.S. Consumer Electronics Sales and Forecasts* (January and July each year)

TOTAL DIGITAL IMAGING			
Sales to Dealers			
	Unit Sales (Thousands)	Dollar Sales (Millions)	Average Unit Price
2009	48,518	\$8,746	\$180
2010	52,924	8,611	163
2011e	49,532	7,395	149
2012p	47,036	6,695	142

Includes: Digital Cameras, Camcorders and Digital Photo Frames
Source: CEA Market Research

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DIGITAL AMERICA 2012

GAMING

Trends

- Hardware sales slide, software provides extra lives.
- Nintendo Wii U approaches.
- Indie developers find success, move onto consoles.
- Crowdfunding offers developers an alternate publishing model.
- Possible battle brewing over second-hand game sales.
- New portable devices from Nintendo and Sony arrive.
- Smartphones and tablets shake things up.
- Mobile, social games explode.
- U.S. Supreme Court rules California mature videogame sales ban is unconstitutional.

A Look at Gaming

After an explosion of record-setting growth late last decade thanks to the introduction of the current console generation, the videogame industry is leveling off as gaming hardware penetration rates plateau and gamers wait for the next-generation of hardware to power their favorite videogame titles. The videogame industry has also seen a transformation from motion-based videogame consoles and accessories to new devices such as smartphones and tablets, and the explosive popularity of social networks and the games supported by them.

As we enter the tail end of the current console generation, with the three major consoles from Microsoft, Nintendo and Sony all available for five or more years, the gaming industry has managed to maintain positive growth, according to CEA. CEA estimates overall videogame sales to

dealers (including both hardware and software) reached \$22.58 billion in 2011, an increase of 1.1 percent over 2010's \$22.33 billion. As the installed base of videogame hardware has risen, videogame software has become the main driver of sales. But new console models and bundles with popular accessories such as Microsoft's Kinect have continued to lure new customers.

CEA predicts total sales of videogame hardware and software will hit \$23.63 billion in 2012, a respectable 4.7 percent increase over CEA's estimates for 2011. Gamers snapping up two new consoles available in 2012 – Sony's PlayStation Vita handheld and the Nintendo Wii U – will likely account for part of this increase, but popular software titles released in 2012, accompanied by new trends in the mobile sector will certainly have an impact.

TOTAL ELECTRONIC GAMING SALES TO DEALERS Dollar Sales (millions)	
2009	\$21,301
2010	22,326
2011	22,576
2012p	23,626

*Includes electronic gaming hardware and software
Source: CEA Market Research*

At retail, however, things are looking like they might need some fresh air. NPD reports that overall sales of both hardware and software were \$1.06 billion for February 2012, down 20 percent from February of last year, during which the U.S. gaming industry brought in \$1.33 billion. The arrival of a new generation of console hardware should help jumpstart

the market along with strong software titles and the help of a few new areas that are new to even the most veteran gamer. ■

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- *How Social Media Influences Purchase Decisions of Consumer Electronics and Accessories (2012)*
- *Consumer Outlook on Tablets Quarterly Series (2012)*
- *18th Annual CE Holiday Purchase Patterns Analysis Brief (2011)*
- *8th Annual Teen CE Holiday Purchase Patterns Analysis Brief (2011)*
- *Connecting the Dots Between Consumers, Content and Consumer Electronics in the Home (2011)*

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HOME NETWORKING

Trends

- Eight in 10 U.S. broadband households now use a home network.
- Thirty eight percent of home network routers are now located in the living room, which is more than double the 18 percent now found in home offices.
- Thirty one percent of U.S. broadband households regularly watch TV programs or movies accessed from the Internet on their TVs.
- Wi-Fi was installed in 439 million households worldwide at the end of 2011.
- By 2016, nearly 800 million households worldwide are expected to have Wi-Fi networks installed.

Wireless Networking

Americans' penchant for mobile devices such as tablets and smartphones and the "cloud" – connected apps and services that run on them – has turned home networking technologies and broadband into essential utilities, as necessary in the modern home as electricity. Moreover, with many of these mobile devices used for entertainment, industry analysts and insiders say, the center of many home networks now is increasingly found in living rooms rather than in a home office room.

But at least one thing in home networking remains constant, experts say: wireless technologies continue to dominate wired technologies as consumers' first choice. And a new forthcoming variant of Wi-Fi named 802.11ac is expected to cement that dominance even as wired home networking technologies continue to improve and evolve.

Entertainment Propels Market Growth

"The airways inside the home are getting much more densely populated," says Paul DeBeasi, research vice president for wireless and mobility at Gartner in Milford, Mass. "In the last 18 months we're now seeing humans regularly using two or three Wi-Fi devices [each]," whereas earlier usage was one Wi-Fi device per person or fewer. "I look around my own home and 24 months ago my wife had a Mac and that was it," he says. "Now she's regularly using her iPhone and her Mac. My teenage son now has a MacBook Air, a Mac Mini, an iPhone and my old iPad." Further, he adds, "This increase in mobility that we're all taking advantage of with tablets and smartphones and the like is turning the home more into the office. You're seeing more people work from home either as a permanent way of working or as an adjunct." Therefore, he says, "the products that are sold in the home market are going to have to get more sophisticated," and as a result, "we're seeing a lot of innovation in [home network] access points, all the way down to the chips" that run them.

According to a report titled *The CE and PC Ecosystem of the Broadband Household: 2012* from the Frisco, Tex.-based market research and advisory firm TDG Research, eight in 10 U.S. broadband households now use a home network, and 38 percent of home network routers are now located in the primary living room, which is more than double the 18 percent now found in home offices. What's more, since 2001 the rise in living room placement has been essentially equal to the decline in home office placement, each rising or falling

eight percentage points respectively. In 2001, 30 percent of broadband-networked households placed their routers in the primary living room and 26 percent placed the devices in a home office, TDG says.

The reason for this shift is simple, the TDG report concludes: home networks are increasingly seen as a way to connect entertainment devices in the living room to the Internet rather than as a means to tie together stationary computers and peripherals. ■

Want to know more about this topic area?

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- *10th Annual State of the Builder Technology Market Study (2012)*
- *14th Annual CE Ownership and Market Potential Study (2012)*
- *18th Annual CE Holiday Purchase Patterns Analysis Brief (2011)*
- *Realtors and Home Technologies (2011)*

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DIGITAL AMERICA 2012

HOME THEATER

Trends

- Home theater systems deliver movie and TV soundtracks in multichannel surround sound, and household penetration of these systems hit 39 percent in January 2012, CEA's consumer surveys show.
- Audio components such as AV receivers and speakers deliver high-performance multichannel surround sound. They staged a strong comeback in 2011, with sales rising an estimated 29.2 percent to \$1.8 billion, CEA statistics show.
- Home-theater-in-a-box (HTiB) systems package all of the audio products needed, including speakers, into a single purchase.
- Soundbar sales posted their strongest growth on record in 2011, rising an estimated 138 percent in units sold to 1.6 million, and 121 percent in dollars to \$323 million, CEA statistics show.
- New sources of multichannel surround sound include Internet-based video streaming services that stream surround sound movies directly to home theater systems.
- HTiBs with included 3D Blu-ray players are now available from most major suppliers.
- More major suppliers offer HTiBs with smart TV platforms that let users download apps via the Internet for playback on a connected TV.
- The household penetration of Blu-ray disc players, including game consoles and HTiB systems with included Blu-ray players, grew 38 percent to almost 40 million homes in 2011, according to the Digital Entertainment Group (DEG).

Home Theater: Bigger than the Movie Theater Box Office

In 2011, consumers spent \$18 billion to buy or rent prerecorded digital versatile discs (DVDs) and Blu-ray discs, stream and download movies and TV episodes via the Internet, and access video-on-demand (VOD) services offered by cable, satellite TV, and local phone companies (telcos). That's according to the Digital Entertainment Group, a trade group whose members include video hardware and software suppliers.

In contrast, movie theater box office revenues were almost half that, accounting for an estimated \$9.9 billion in 2011 revenue, down from 2010's \$10.5 billion and down from 2009's peak of \$10.7 billion, according to research company Nash Information Services (the-numbers.com/market).

Without a doubt, people are voting for home theater with their wallets. Movie ticket sales fell for the second consecutive year in 2011 to 1.25 billion tickets, far from their 2002 peak of 1.58 billion.

Pundits can debate whether the box office is flagging because of high ticket prices, high popcorn prices, or the lack of hit movies. But one thing is certain: home theater systems are in demand because they recreate the audio and visual excitement of a movie theater better than ever.

Today's slim high-definition (HD) flat-panel plasma and liquid crystal display (LCD) TVs deliver bigger images with a resolution and color range that exceeds the capabilities of old CRT-based TVs. High-definition Blu-ray players are replacing

standard-definition (SD) DVD players as the video source of choice, delivering movies in crisp 1080p (progressive) resolution. And new surround sound formats on Blu-ray discs deliver movie soundtracks with the realism and impact that DVDs and VHS Hi-Fi tapes never could. ■

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- *Realtors and Home Technologies* (2011)
- *18th Annual CE Holiday Purchase Patterns Analysis Brief* (2011)
- *U.S. Consumer Electronics Sales and Forecasts* (January and July each year)

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DIGITAL AMERICA 2012

VIDEO

Trends

- TV shipments are expected to top 33 million units in 2012, according to CEA forecasts.
- U.S. 3DTV shipments are expected to top five million units in 2012.
- Mobile DTV broadcasting is re-launching with conditional access.
- Blu-ray disc player annual shipments are expected to increase more than 10.7 million units in 2012.
- Internet-delivered entertainment popularity is accelerating as more connected devices arrive.
- The first big-screen AMOLED flat-panel HDTVs are expected in second half of 2012.

The Evolving Video Market

With HDTVs now at an 87 percent household penetration rate, the digital TV sales boom of the past decade is clearly in the rear-view mirror. For 2012, business has started to shift into replacement mode as first-generation digital sets begin to wear down and consumers look to add increasingly affordable TV displays to secondary rooms.

Manufacturers looking to make a profit from non-commodity class products continue to introduce new innovations in 3DTV, connected TV, and most recently, so-called “4K” displays with more than three times the resolution of today’s Full HD 1080p sets. Also in 2012, some TV makers have announced plans to introduce the first large-screen flat-panel TVs based on organic light emitting diode (OLED) technology later in the year. These TVs will deliver more power efficiency, razor-thin form factors and pictures offering more natural contrast, black levels and

color saturation than today’s plasma or liquid crystal display (LCD) sets.

Additionally, at least one manufacturer plans to introduce TVs offering screens with a 21:9 aspect ratio in 2012. These sets are designed to display CinemaScope movie content without black bars at the top and bottom of the screen. They will also present a picture with a 16:9 aspect ratio adjoined with frame space to run Internet applications alongside the main program.

After more than a decade of steady growth, CEA research predicts a year-over-year decline in digital TV sales in 2012. But growth is still expected in important segments of the business, including 3DTV and Internet-connected smart TVs.

For 3DTV, a lower-than-anticipated performance in 2010 was followed by a rebound in 2011 to more than three million 3D-ready displays, CEA said.

Smart TVs, meanwhile, are taking a central role in a new multi-screen revolution that consumer electronics makers have enabled to share content between various handheld devices and the living room big screen. CEA reported sales of more than four million smart TVs in 2011, with expectations for significant growth in 2012.

This technology is bringing to big-screen TVs much of the same functionality users have been eagerly adopting in new smartphones and tablet PCs. The same technology also has been applied to many Blu-ray disc players and set-top boxes (STBs) to let people with older, unconnected TVs add Internet connectivity.

In 2011, the average wholesale price for a DTV dropped eight percent to \$537 and is expected to drop another four percent in 2012 to \$513. LCD TV remains the chief display technology with a forecasted 84.6 percent share of unit shipments this year. ■

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- *Analysis Brief - Cord Cutting and TV Service: What’s Really Going On?* (2011)
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DIGITAL AMERICA 2012

WIRELESS

Trends

- Wireless devices come off phenomenal 2011, sales expected to stay strong in 2012.
- Smartphones lead the way with unit sales projected to top 100 million.
- Tablets chalk up triple-digit sales growth – little slowdown is anticipated.
- 4G networks are rapidly expanding.
- Dual- and quad-core processors boost handset performance.
- E-readers retain viability, prices drop and volume increases.

Always Connected

It amounts to no less than a shift in the CE industry's center of gravity. Mobile phones, wireless networks and portable computing technology have evolved to the point where high-speed "always connected" Web access is expected by consumers, who want products to manage and use their content wherever they happen to be. The near-instantaneous result has been a dramatic increase in the sale of smartphones, which provide touch-based displays, email access and Internet-browsing capabilities, and ballooning sales of tablet computers, which are expanding faster than an automobile's airbag.

Indeed, smartphone sales have outpaced those of other CE categories by a considerable margin. And while tablets have generated the most press and certainly the most excitement, 2011 might ultimately be best described as the year smartphones went mainstream. Let's talk numbers. CEA estimates more than 87 million smartphone units shipped in 2011, up a healthy 62 percent from 2010, while generating \$27.5 billion, a 57 percent

TOTAL WIRELESS COMMUNICATION TECHNOLOGIES			
Sales to Dealers			
	Unit Sales (Thousands)	Dollar Sales (Millions)	Average Unit Price
2009	137,152	\$24,048	\$175
2010	146,361	25,307	173
2011e	167,231	34,441	206
2012p	171,100	39,491	231

Source: CEA Market Research

increase from the previous year. (Source for all CEA estimates: *U.S. Consumer Electronics Sales and Forecasts 2007-2012*, issued January 2012). This year is widely anticipated to be the inflection point where more smartphones are shipped in the U.S. than standard mobile phones.

After a phenomenal 2011, U.S. consumer wireless handset shipment volumes will moderate somewhat in 2012, according to CEA projections, and grow by three percent with an estimated 170 million units shipping compared to a 14 percent growth in 2011. With the product composition shift to more smartphones in the U.S. there will be a concurrent and robust revenue growth for the industry even as the average selling price (ASP) trends down. In 2012 total U.S. consumer wireless handset revenue is expected to increase 15 percent to \$39.4 billion in 2012, according to CEA estimates.

Meanwhile, tablets have become so quickly engrained in our culture that consumers feel they should not – or cannot – wait to join the fray. The sub-category continues to set the industry ablaze with 29.4 million shipped in 2011, up a whopping 185 percent from 2010, generating \$15.9 billion, representing a 138 percent increase year-over-year. ■

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- *Consumer Outlook on Tablets Quarterly Series* (2012)
- *The Changing Landscape of Digital Photography* (2012)
- *The New Role of Technology in Consumer Health and Wellness* (2011)
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DIGITAL AMERICA 2012

HISTORY

As we struggle to emerge from the greatest economic upheaval in the last 70 years, we seem to have found escape in consumer electronics (CE). Paradoxical to the recession, global spending on consumer technology devices topped a record \$993 billion in 2011. And for the first time in history, the world's most valuable company – Apple, sells not cars or oil, but consumer electronics.

As it did after World War II, the recession in the late 1970s and the recession in the late 1980s, it looks as if CE devices will again be a prime economic generator to help the economy emerge from the current downturn. This year, revenue from gadget sales is expected to top \$1 trillion worldwide for the first time in history.

In the previous CE fueled recoveries, consumer gadget spending was spurred by “must have” technology that was barely a fantasy a few years previously. After WWII, for instance, everyone wanted that new-fangled thing called a television along with new hi-fi audio gear and the transistor radio.

After the oil embargo-induced recession in the mid-1970s, enthusiastic uptake of new video cassette recorders (VCR), PCs and the CD boosted the economy.

Following the stock market crash in 1987, cordless phones, cell phones, PDAs, the World Wide Web, digital cameras, satellite TV, GPS devices and HDTV spurred the 1990s tech boom.

This time around, we are rushing online and into stores to snap up touchscreen devices, gesture-based game consoles,

Internet-connected “smart” HDTVs and Blu-ray players, 4G smartphones more powerful than desktop PCs were a decade ago, e-book readers, media streaming set-top boxes (STBs), cloud-based subscription services and Ultrabook laptop PCs measuring less than an inch thick and weighing less than three pounds.

While we can't yet buy personal jetpacks or *Star Trek*-like transporter chambers as many futurists thought we'd all have in the 21st century, the next few years will bring even more new technology into our homes and businesses – OLED HDTVs as thin as a pencil and as light as a Thanksgiving turkey, 802.11ac Wi-Fi with speeds measured not in megabits per second but gigabits, Thunderbolt device interconnects to complement and finally replace USB, “super” Wi-Fi hotspots measured not in feet but in miles, ultra-widescreen 21 x 9 HDTVs, body sensors to keep a constant eye on our health, maybe even glasses-free 3D.

While our CE-fueled recovery has historical precedent, in no time in gadget history has the influx of new technologies been so numerous and impactful.

Electricity, Energy and Bell

The history of technology usually begins with the invention of the telephone, the light bulb, phonograph and motion pictures in the late 19th century. But the CE era really begins with the discovery and development of electricity.

Around 600 BC, Thales of Miletus, one of the legendary Seven Wise Men of ancient Greece, found that rubbing pieces of amber together produced an effect much

like magnetism, but not quite. In 1570, English scientist William Gilbert continued Thales' amber-rubbing experiments and called the result “electric,” a modification of the Greek and Latin words for amber. In 1650, the term “electricity” was coined to refer to the resulting force.

Benjamin Franklin performed his shocking experiments with a kite and made his subsequent discovery and definition of positive and negative electrical charges in 1752. By 1800, Italian Alessandro Volta, for whom the volt is named, figured out how to produce electricity in steady current. English physicist Michael Faraday discovered electromagnetic rotation in 1821.

In 1827, German George Ohm published his eponymous law concerning voltage, current and resistance that makes possible all manner of electrical and speaker wiring. Faraday, simultaneously with American scientist Joseph Henry, discovered electromagnetic induction in 1831, making possible all future electric motors and electrical generators. But there were still no electrical gadgets until Henry, working with an obscure painter named Samuel F.B. Morse, used the principle of magnetic induction to invent the first electronic communications device, the telegraph, in 1837. ■

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