



# INVESTING IN INFO TECH

# SECTOR INSIGHTS

## INVESTING IN INFORMATION TECHNOLOGY

The smart phone, the Internet, and the personal computer are among the most popular and obvious examples of how Information Technology has changed our world. These tools have forever altered the way we send and receive information. The worldwide market for information and communications technologies and services has grown 23% from \$3 trillion in 2006 to \$3.7 trillion in 2008. Projections indicate that the market will grow to more than \$4 trillion by 2011.<sup>1</sup>

The Information Technology sector is evolving as quickly as the diverse products and services that make up the sector. The table at right shows the 16 industries that Standard & Poors includes in its definition of the Information Technology sector.

This report explores both the development and potential growth opportunities related to personal computers, mobile phones, and the Internet. In addition, we examine how this technology has fueled an explosive demand for the semiconductors needed to operate the tools we have come to rely upon. Finally, we explore how information technology has changed the way in which we interact socially and how technological advances will ideally help make us safer and more secure.

## COMMUNICATION

### PERSONAL COMPUTERS AND BROADBAND

Since the introduction of the first personal computer in 1981, personal computers (PCs) have evolved from glorified calculators to powerful tools required by people worldwide to perform daily activities.<sup>2</sup> PC usage is most prevalent in the U.S., with 22% of total PCs being used in the United States.<sup>3</sup> In fact, the U.S. currently has more than two and a half times as many PCs as second place China.<sup>4</sup> In June 2008, the number of installed PCs worldwide surpassed one billion units, and estimates project the worldwide installed base of PCs to grow just under 12% annually. At that pace, PC usage will surpass 2 billion units by early 2014.<sup>5</sup> Meanwhile, the U.S. itself is on track to have more PCs than people by 2013. Mature markets (U.S., Japan, and Europe) accounted for 58% of the first billion installed PCs, but, moving forward, the emerging market growth is expected to thrive, causing mature market growth to account for only about 30% of the next billion PCs sold.<sup>6</sup>

So why has PC growth remained steadily robust? Originally, PCs were most valued for their mathematical and software application uses, but today Internet use drives PC growth both domestically and internationally. In South Korea, for example, more than eight out of ten households have broadband access (high speed connection to the internet).<sup>7</sup> In other countries such as Denmark, Finland, Iceland and the Netherlands more than two thirds of the households have access to broadband internet.<sup>8</sup> In 2008, there were 251 million broadband subscribers in developed countries, up from 68 million in 2003.<sup>9</sup>

## S&P 1500 Information Technology Industries

Application Software	Communication Equipment
Computer Hardware	Computer Storage & Peripherals
Data Processing & Outsourced Services	Electronic Components
Electronic Equipment & Instruments	Electronic Manufacturing Services
Home Entertainment Software	Internet Software & Services
IT Consulting & Other Services	Office Electronics
Semiconductor Equipment	Semiconductors
Systems Software	Technology Distributors

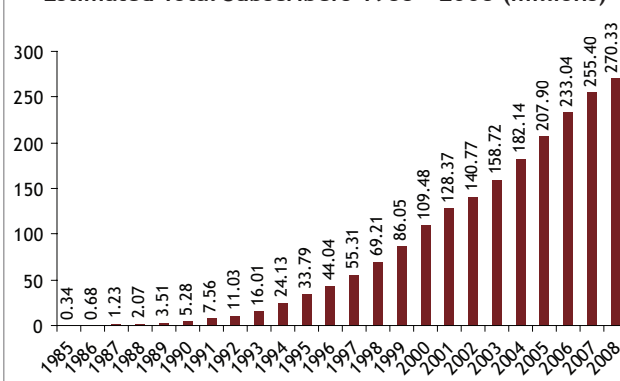
*Investing in securities involves inherent risks, including the risk that you can lose the value of your investment. An investment concentrated in sectors and industries may involve greater risk and volatility than a more diversified investment.*

As broadband internet demand continues to penetrate the global economy, the personal computers and other devices required to connect people to the internet will become more of a necessity than an amenity.

### MOBILE PHONES & SMART PHONES

Although they began to proliferate in the 1980s, mobile phones were initially regarded as a luxury item or as a resource to be used only rarely in the event of an emergency. Today, however, mobile phones are arguably viewed as essential for people of all ages. Mobile phones have become so prevalent, in fact, that most kids today rely on phones as heavily as their parents do.

Estimated Total Subscribers 1985 - 2008 (millions)



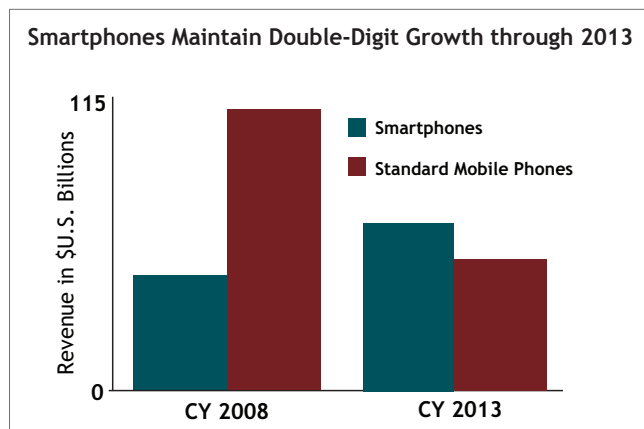
© 2009 CTIA: The Wireless Association®

According to one study, an estimated 22% of children ages six to nine, 60% of tweens ages 10 to 14, and 84% of teens ages 15 to 18 own a mobile phone.<sup>10</sup> Since 1985, wireless subscriptions have increased an average of 35.8% per year to over 270 million subscribers in 2008 (as seen in the graph on the first page).<sup>11</sup>

Looking ahead, revenues from mobile phone sales are projected to grow at nearly 7% annually through 2013, and will exceed \$200 billion in 2013.<sup>12</sup> Developing countries now account for about 70% of unit sales of cell phones.<sup>13</sup> Emerging markets in nations such as Brazil, Russia, India, and China, and on the continent of Africa, are projected to compose about 60 percent of the market share by 2013.<sup>14</sup>

And while cell phone sales are projected to grow steadily, “smart phone” growth is expected to outpace the sale of simple mobile phones. Smart phones can access the Internet, send and receive text and email messages, take photos and videos and often perform other functions as well. Wireless spending has become a key driver of IT revenue as wireless services are used to facilitate business computing and increase mobile device productivity.<sup>15</sup> Of the 270 million wireless subscribers in 2008, 95 million are mobile internet subscribers — a 21% increase over the 74 million in 2007.<sup>16</sup>

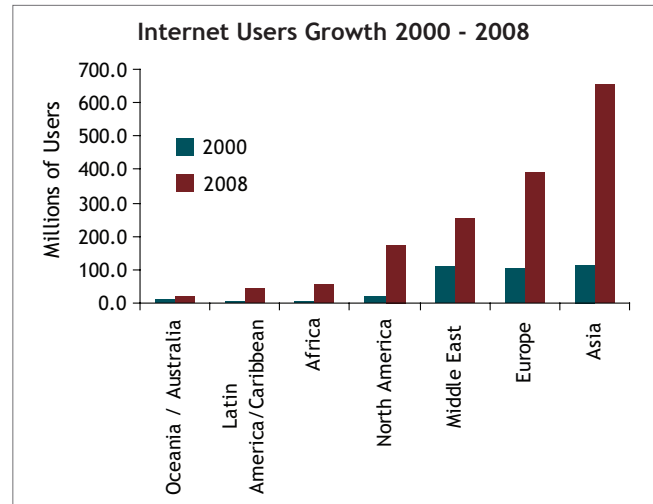
As part of the shift to wireless technologies, the use of mobile data-capable devices (smartphones) has grown dramatically. BlackBerry use, for example, is increasing. In one study, only 2.7% of businesses supported BlackBerry use in 2006. By 2007, that percentage had increased to 13.8% and by 2008 it had grown to 23%.<sup>17</sup> Worldwide mobile phone sales totaled 269.1 million units in the first quarter of 2009, an 8.6% decrease from the first quarter of 2008. Yet smartphone sales surpassed 36.4 million units, a 12.7% increase from the same period last year.<sup>18</sup> By 2012, smart phones will account for more than a quarter of the mobile phone market (as of 2008, smart phones made up 14% of the market).<sup>19</sup> And in three years, consumers will own an estimated 500 million smart phones across the globe.<sup>20</sup> As seen in the graph below, smart phones are projected to dominate the market by 2013.



© Infonetics Research, *Mobile/WiFi Phones and Subscribers Biannual Worldwide Market Size, Share, and Forecasts, March 2009*

## INTERNET USE AND DEMAND

Whether via a PC or a mobile device, internet usage is increasing across the globe. As seen in the graph at right, the growth has been attributable to usage in developing regions including Asia, Europe and the Middle East. Internet use in Asia alone increased a staggering 475% from 2000 to 2008.<sup>21</sup>



Source: [www.internetworldstats.com](http://www.internetworldstats.com) (January 2008)

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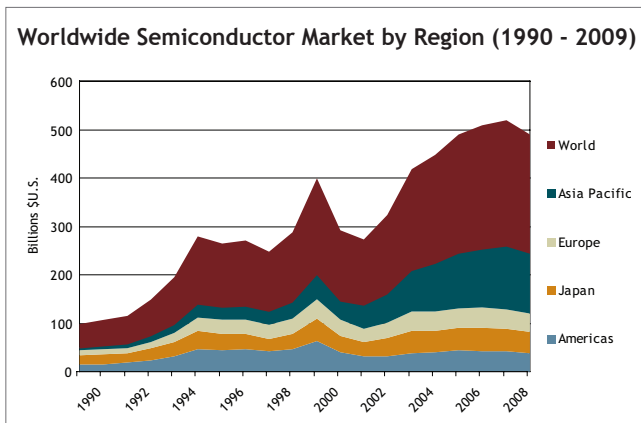
Broadband use will grow an estimated 80% in the U.S. between 2006 and 2010, reaching 90 million households, and by 90% worldwide, reaching 474 million households.<sup>22</sup> As Internet usage has increased, so has the volume of traffic and bandwidth (speed). The growth in Internet traffic around the world, which is partially attributable to the demand for bandwidth needed for intensive video transmissions and downloads, will likely continue and accelerate as Internet television and film applications increase.<sup>23</sup> By 2010, video transmissions could account for as much as 80% to 90% of all worldwide bandwidth traffic, especially with the spread of HDTV Internet-based TV.<sup>24</sup>

The demand for bandwidth should continue to outpace the supply of bandwidth capacity. A commitment to and investment in increased bandwidth will be needed if we hope to avoid Internet congestion and slowdowns that would limit people’s ability to access new innovations, thereby discouraging their future development.<sup>25</sup> Accommodating the fast-rising demands on bandwidth will require an estimated \$300 billion to \$1 trillion investment for the United States alone.<sup>26</sup>

## SEMICONDUCTORS

Semiconductors are the foundation of modern electronics and play a critical role in making everything from radios to computers to telephones faster and more compact.<sup>27</sup> As the demand for these electronic devices grows, the demand for the semiconductors essential to their success should grow as well. The graph on the following page reveals that worldwide semiconductor sales have increased an average of 10% a year since 1990, with Asia comprising approximately 68% of worldwide sales.<sup>28</sup>

In the future, electric vehicles and renewable energy sources like solar panels and wind turbines will likely use semiconductors to control and distribute the energy created by the sun, wind, and electrical car batteries.<sup>29</sup> Additionally, the demand for semiconductors could increase as distributed medicine is replaced by centralized healthcare. Estimates suggest that this transition could translate into lower-cost, higher-performance, battery-powered electronic devices for the home that would allow people to monitor their health with an iPod or similar device, store that information, and report any alerts to a doctor or a medical team via the Internet.<sup>30</sup>



Source: OECD Information Technology Outlook 2008

Thus, regardless of what direction Information Technology takes over the next several years, the semiconductor industry will likely play a key role in the sector's growth.

## POTENTIAL GROWTH OPPORTUNITIES

### SOCIAL NETWORKING

Social networking sites like MySpace, Facebook, and YouTube are a global phenomenon boasting hundreds of millions of members.<sup>31</sup> More than a quarter million people join the social networking site called MySpace every day.<sup>32</sup> Facebook, another similar site, has 125 million members worldwide.<sup>33</sup> Put together, they have as many members as the United States has citizens.<sup>34</sup> In a single day, MySpace has 4.5 billion page views.<sup>35</sup> From December 2007 to December 2008, the amount of time spent on member community sites rose by 63% to 45 billion minutes.<sup>36</sup> Facebook saw a 566% increase over that period – from 3.1 billion minutes to 20.5 billion minutes.<sup>37</sup> Twitter reported growth of 1,382% from February 2008 to February 2009.<sup>38</sup> Twitter had 9.3 million visitors in March 2009 – five million more than it did in February.<sup>39</sup>

Consumer habits and tendencies are changing as this new world of social networking blossoms. Social networks are a communication channel just like TV, newspapers, radio and the telephone. Therefore, social networks are another vehicle by which any company with an offering, product or service can use to communicate, engage and connect with consumers.<sup>40</sup>

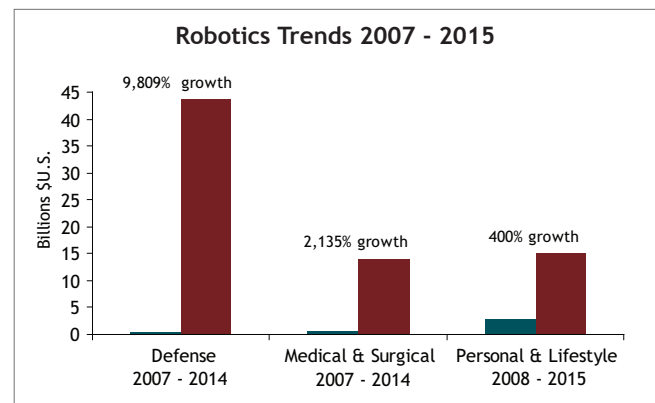
### HIGH-DEFINITION TV (HDTV)

In the late 1990s, when stations began offering the first high-definition television channels, few U.S. households had HDTV sets. HDTV had very limited programming and the average price of an HDTV set was \$3,147.<sup>41</sup> Today, most prime-time television shows are broadcast in HDTV and the price for a high-def TV set has plunged to as low as \$500.<sup>42</sup> In 2004, U.S. sales of HDTV sets grew by 78% year over year, reaching \$10.7 billion in revenues.<sup>43</sup> Currently, one-third of U.S. television homes have an HD set.<sup>44</sup> That figure continues to grow – despite a sometimes ailing economy – as consumers replace older or broken Standard Definition (SD) TVs with more advanced systems, or purchase HD TVs in the misguided belief that the Digital Television Transition requires it.<sup>45</sup> Looking ahead, forecasts indicate that the number of direct-to-home HD households will grow 27.5 percent annually to 97 million by the end of 2012.<sup>46</sup>

## ROBOTICS

Robotics (generically, devices that work automatically or by remote control which can be programmed to perform tasks normally done by people) appears to have enormous growth potential. As seen in the graph below, the market for robotics could expand nearly 10,000% in some instances.

As reflected in the graph, the defense industry spent \$441 million on robotics in 2007.<sup>47</sup> Estimates project that spending will increase to \$43.7 billion by 2014.<sup>48</sup> Similarly, medical and surgical robotics products generated about \$626.5 million in 2007 with projections estimating growth to \$14 billion by 2014.<sup>49</sup> Personal robots – which include everything from automated vacuum cleaners to robot toys – totaled about \$3 billion in 2008 and will top \$15 billion by 2015.<sup>50</sup>



Source: Japan Robotics Association and Wintergreen Research

## BIOMETRICS

Biometrics are digital templates that identify people based on a physiological or behavioral characteristics including face, fingerprint, hand/palm geometry, DNA, handwriting, iris, retinal, vein, and voice recognition.<sup>51</sup> With security breaches and transaction fraud on the rise, the demand for highly secure identification grows every day.<sup>52</sup>

As part of its effort to increase security in the wake of 9-11, the federal government has been a driving force in the advancement of biometric technology.<sup>53</sup> Financial institutions worldwide are also implementing biometric security measures in an effort to outpace fraud and address other security concerns.<sup>54</sup> For example, biometrically enabled ATMs have become popular in Japan and have seen widespread adoption in India, Latin America, and the Middle East.

Recent analysis of the world financial biometrics markets calculated earned revenues of \$117.3 million in 2006, with estimates reaching \$2.07 billion in 2013.<sup>55</sup> Other estimates project a compound annual growth rate of 21.3% in the biometric market by 2012.<sup>56</sup> Fingerprint biometrics are expected to continue to hold the largest share of the biometric market with growth from \$1.3 billion in 2007 to \$2.7 billion by 2012.<sup>57</sup> Growing at an even faster rate, facial recognition biometrics are predicted to grow from \$459 million in 2007 to \$1.3 billion by 2012.<sup>58</sup>

## FISCAL STIMULUS AND INFORMATION TECHNOLOGY

The technology sector stands to gain from the \$825 billion stimulus plan. The plan calls for \$37 billion in spending in three high-tech areas: \$20 billion to computerize medical records, \$11 billion to create smarter electrical grids and \$6 billion to expand high-speed Internet access in rural and underserved

communities.<sup>59</sup> As for the health information portion, only 13% of practicing physicians used a basic electronic health record system in 2008 and only 4% used a fully functional system. The stimulus package provides incentives for physicians and hospitals through 2016, then penalties for non participation after that date.<sup>60</sup>

**SUMMARY** The Information Technology sector continues to grow at an impressive rate. Product and service providers are working diligently to meet the worldwide demand for better and faster personal computers, mobile phones and Internet access. Because we believe this demand will fuel the sector's growth, the Information Technology sector should continue to provide us with investing opportunities.

## SOURCES

<sup>1</sup>These numbers are according to data developed by Global Insight, Inc. as published by WITSA, the World Information Technology and Services Alliance, [www.witsa.org](http://www.witsa.org).

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<sup>5</sup><http://www.gartner.com/it/page.jsp?id=703807>

<sup>6</sup><http://www.reuters.com/article/technologyNews/idUSL2324525420080623>

<sup>7, 8, 9</sup><http://www.oecd.org/dataoecd/37/26/41895578.pdf> page 6

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<sup>13</sup><http://www.plunkettresearch.com/Industries/InfoTechComputers-Software/InfoTechComputersSoftwareTrends/-tabid/173/Default.aspx>

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<sup>16</sup>Critical Mass: The Worldwide State of the Mobile Web (Nielsen online)

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<sup>18</sup><http://www.gartner.com/it/page.jsp?id=985912>

<sup>19, 20</sup><http://www.velti.com/index.cfm?page=1411&articleID=19131467>

<sup>21</sup>[www.internetworldstats.com](http://www.internetworldstats.com) (Jan 2008 © Miniwatts Marketing Group)

<sup>22</sup><http://www.usiia.org/pubs/Demand.pdf> pg 4

<sup>23</sup><http://www.usiia.org/pubs/Demand.pdf>

<sup>24</sup><http://www.usiia.org/pubs/Demand.pdf> pg 4

<sup>25</sup><http://www.usiia.org/pubs/Demand.pdf>

<sup>26</sup><http://www.usiia.org/pubs/Demand.pdf> pg 4

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<sup>29, 30</sup><http://electronicdesign.com/Articles/ArticleID/20425/20425.html>

<sup>31, 32, 34, 35, 36</sup>Throwing Sheep in the Boardroom: How Online Social Networking Will Transform Your Life, Work and World by Matthew Fraser and Soumitra Dutta, published by John Wiley & Sons, Inc. © 2008 by Matthew Fraser and Soumitra Dutta. All rights reserved.

<sup>33</sup>[www.theedgemaalaysia.com/media-a-advertising/2750-two-thirds-of-internet-users-visit-social-networking-sites.html](http://www.theedgemaalaysia.com/media-a-advertising/2750-two-thirds-of-internet-users-visit-social-networking-sites.html)

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<sup>47, 48, 49, 50</sup>[http://www.roboticstrends.com/home/features/orders\\_drop\\_for\\_us\\_robot\\_makers\\_world\\_outlook\\_remains\\_strong/](http://www.roboticstrends.com/home/features/orders_drop_for_us_robot_makers_world_outlook_remains_strong/)

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<sup>59</sup><http://www.nytimes.com/2009/01/26/technology/26techjobs.html?fta=y&pagewanted=all>

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