# Intel® Centrino® 2 processor technology – High performance on the go
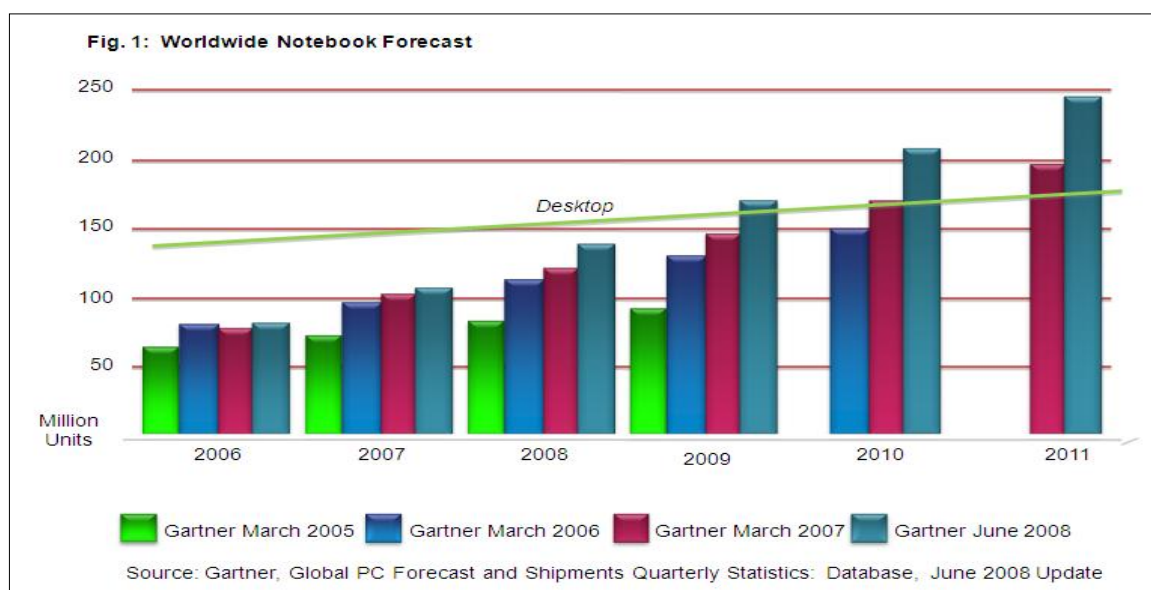
In our increasingly fast and connected world, we have a constant need to acquire and exchange information. The number of people online worldwide is likely to increase by 44 percent between 2007 and 2012, reaching 1.8 billion users[1]. Wireless connectivity and the availability of affordable, light, high performance notebook PCs with longer battery life have fuelled the growth of mobile computing. Over the past few years, online social networking has exploded, while online video consumption has dramatically risen as movie-lovers have downloaded more digital files than ever before. Strategy Analytics* assesses that the global online video market surpassed the $2 billion mark in 2007, and that by 2012 it is likely to reach the $17 billion mark. This equates to 54% compound annual growth for the 2008-2012 period[2], reflecting the enormous surge in mobility.

But we are not content with just updating our Facebook* profile or to Photoshop* our latest images whilst sat at home. In 2008 and beyond, people will require access to their favourite Web sites 'on-the-go', to fit in with their dynamic, mobile lifestyle, and advancements in mobile computing will continue to support the increasing popularity of notebook PCs.
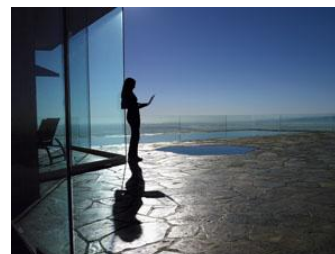
Notebook PCs: growth set to continue

Notebook PC manufacturers are tailoring their products to appeal to a wider audience and in so doing they are contributing to a rise in demand for notebook PCs. In Europe, Middle East and Africa (EMEA), sales of notebooks exceeded that of desktop PCs for the first time during the third quarter of 2007[3]. Global mobile PC sales are being driven upwards to such an extent that they are expected to represent over half of the global PC shipment volume by 2009 (Fig. 1)[4].

Fig. 1: Worldwide Notebook Forecast

Gartner March 2005   Gartner March 2006   Gartner March 2007   Gartner June 2008

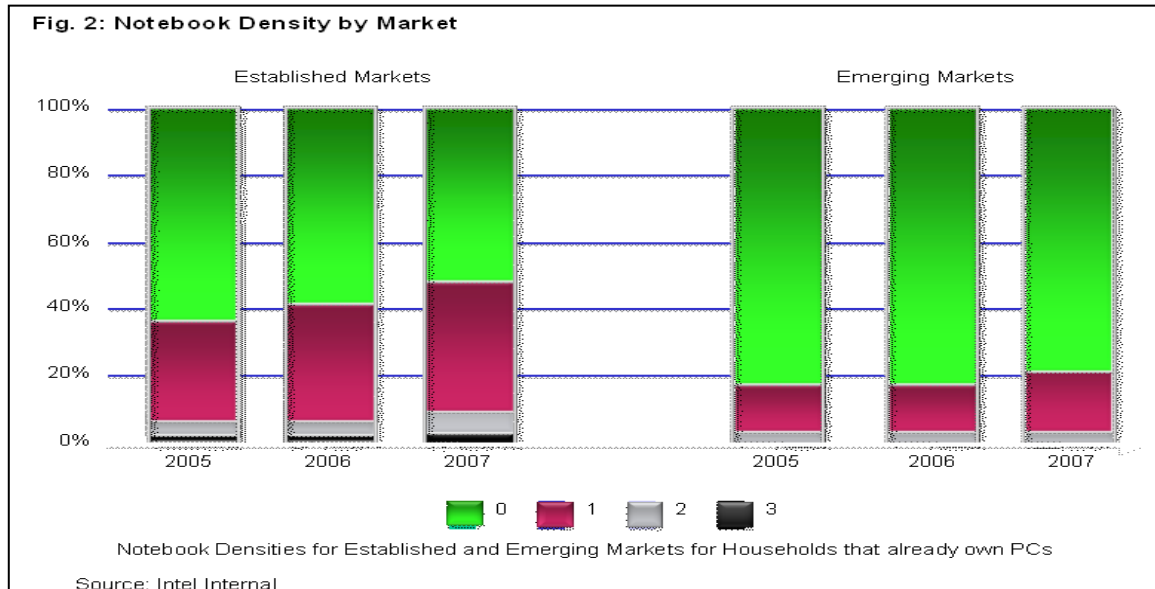Source: Gartner, Global PC Forecast and Shipments Quarterly Statistics: Database, June 2008 Update

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[1] Source: JupiterResearch Press Release, JupiterResearch Says That One Quarter of the World's Population Will Be Online By 2012, Totalling 1.8 Billion Users, 16th June 2008.
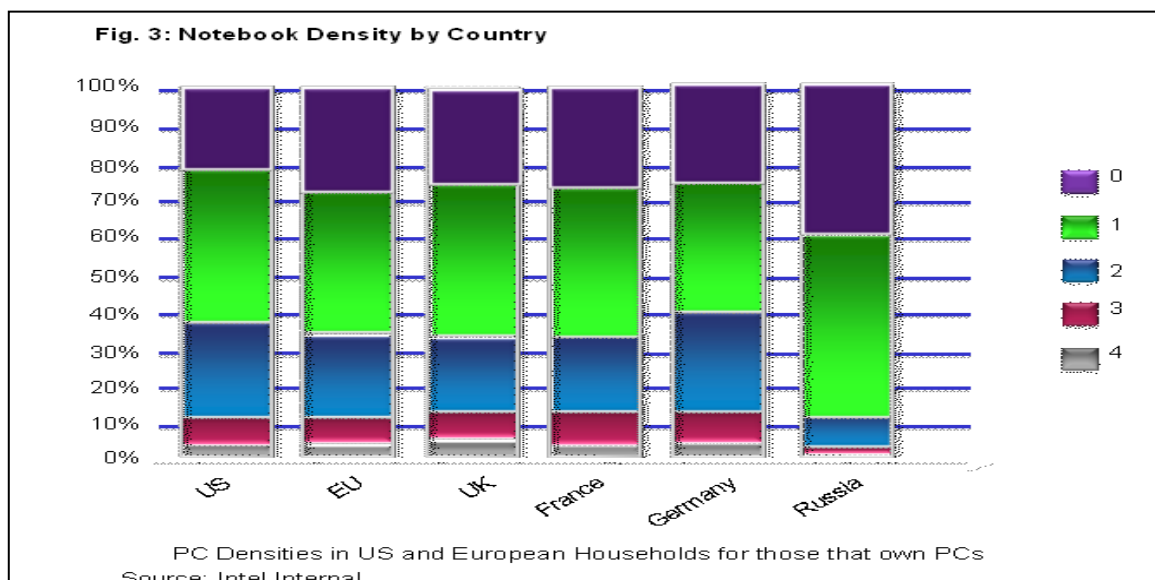[2] Source: Strategy Analytics, Online Video: Global Market Forecast, 27th May 2008
[3] Source: IDC EMEA, Quarterly PC Tracker, Q3 2007 Preliminary Results
[4] Source: Gartner, Global PC Forecast and Shipments Quarterly Statistics: Database, June 2008 Update

In established markets[5], notebook PCs have experienced significant growth, the rate rising from 35% of total PC ownership in 2005 to 48% in 2007[6]. For emerging markets[7], the percentage of PC owning population who chose a notebook PC was just over 20% in 2007 (Fig. 2)[8]. However, emerging market mobile PC growth is expected to outdistance mature market growth by a significant margin — 47.4 percent versus 22.3 percent - during 2008[9]. Intel believes this underlines a considerable opportunity for expansion of the mobile PC market as a whole.

Fig. 2: Notebook Density by Market

Notebook Densities for Established and Emerging Markets for Households that already own PCs

Source: Intel Internal

Within the established market, the level of penetration and density of notebook ownership is increasing. Currently in the United States, 80% of those owning a PC selected a notebook PC. The European average is around 73% with Germany at the higher end of the spectrum with 77% followed by the UK and France at 74%.Russian penetration is healthy, although lower, at just over 60%. The bulk of these figures are accounted for by single notebook PC ownership, though across certain European countries the mix incorporates a larger percentage of owners of two, three or even four notebook PCs (Fig. 3). The highest percentage is in Germany with ~40% of PC owners owning more than one notebook PC[10].

Fig. 3: Notebook Density by Country

PC Densities in US and European Households for those that own PCs

Source: Intel Internal

[5] 'Established markets' include: USA, Western & Central Europe, Russia, Australia, New Zealand and Japan
[6] Source: Intel
[7] 'Emerging markets' include: Brazil, China, Egypt, India, Indonesia, Mexico, Poland, South Africa, South Korea and Turkey
[8] Source: Intel
[9] Gartner Press Release: Gartner Says Worldwide PC Shipments on Pace for 13 Percent Growth in 2008, 12th June 2008. Note: Gartner's classification of emerging markets differs from Intel's and includes a wider range of countries. For a full list please contact Gartner directly
[10] Source: Intel

Technology innovation and lifestyle trends

Technology evolution only becomes significant when linked to the lifestyle trends and usage models it is designed to support. Sharing multimedia content over the Internet is a phenomenon that is shaping our culture in the 21st century. Online music is one notorious example. From its origins as peer-to-peer music sharing, best illustrated by Napster's popularity in 2000, online music has grown into a thriving industry, so much so that iTunes* topped the music retailers chart in 2008. A wide variety of media is shared online. Friends and families no longer need to wait for latest photos of those close to them – digital image sharing sites such as Snapfish* and Flickr* allow content to be uploaded straight from their camera and viewed immediately. The uptake of such sites has surged as digital camera sales have grown dramatically - from 11 million units sold in 2000 to 131 million units in 2008. At the same time, Internet traffic has been steadily rising, with just 360 million Internet users in 2000 exploding to 1.4 billion in 2008[11].

Wireless technology has become part of the fabric of our urban infrastructure. The number of wireless hotspots has risen globally from 1,200 in 2000 to around 250,000 in 2008[12] and connection speed has progressed from an average of 56kbps to up to 450 Mbps[13]. The thirst for digital content that can be quickly downloaded, incorporated into an individual collection and edited to our personal taste continues to fuel the development of new technology. It drives the evolution of the devices we use, and capacity we have to access that content wherever we are.

Innovation is set to continue with the introduction of Intel® Centrino® 2 processor technology based notebook PCs in July 2008, which bring additional advanced multimedia functionality and connectivity features to mobile PC users. This advanced processor technology thrusts notebooks into a new category - multi-purpose machines which can be portable gaming consoles, home theatres, virtual turn-tables and essential communication devices.

The evolution of mobile computing technology has been rapid and expansive – permeating both home and business environments. Intel has been leading the development of mobile computing technology for well over a decade – marking some important milestones along the way – and helping popularise mobile computing by making powerful yet easy-to-use notebook PCs widely available.

Today's notebook PCs: state-of-the-art functionality

A survey commissioned by Intel in December 2007, confirmed that notebook PCs are an integral part of their owner's lifestyle. Almost three quarters of respondents care about the image their notebook PC projects to the world. Europe's notebook PC users rely on their device for a variety of functions each day – ranging from e-mail and gaming to downloading music and online shopping. We anticipate a number of key trends affecting mobile computing for consumers:

Faster, wider wireless connectivity - consumers and businesses will take advantage of faster, more widespread wireless connectivity to easily access the Internet on-the-go. Most cities across Europe already offer a variety of wireless connectivity options through both chargeable and free Wi-Fi hotspots. The European mobile broadband market is expected to grow at an annual compound growth rate of 22.9 percent during the next five years to reach USD $4.1 billion[14].

Mobile WiMAX takes the stage in 2008 - Intel® Centrino® 2 is Intel's first processor technology for notebooks offering the option of integrated Wi-Fi and WiMAX wireless technologies for greater wireless broadband access. Mobile WiMAX, is a broadband wireless technology that provides low-cost, multi-megabit speed and great throughput for accessing large amounts of data such as movies and multimedia content. And WiMAX is a technology readily accessible by recreational users – the

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[11] ABI Research
[12] http://www.jiwire.com
[13] Source: Intel
[14] Source: Berg Insight, Mobile Broadband adoption, June 28, 2007

consumer market currently represents 98% of WiMAX CPE (customer provided equipment) revenue[15]. WiMAX is set to offer users a new era of connectivity, with global mobile WiMAX adoption continuing to grow with recent announcements of investment and collaboration. 260 WiMAX networks (fixed and mobile) have so far been deployed in 110 countries[16].

Entertainment on-the-go – Notebook users can now pack all of the features from their home entertainment system into their notebook PC. Opportunities for recreational usage are unrestricted, from showing off recent holiday photos to producing movies using the latest film editing software. This flexibility means that consumers don't have to miss out on things they enjoy. A missed episode from a favourite TV show can be seen in transit, whether at an airport or train station, using online television.

To meet the HD demands of these users, notebooks with Intel® Centrino® 2 processor technology will feature integrated HD-DVD*/Blu-ray* support and High Definition Multimedia Interface (HDMI) connectivity to HD TVs. And the energy-efficient performance of the Intel® Centrino® 2 processor ensures optimal utilisation of battery power. Based on Intel® Core™ microarchitecture, it is designed to provide powerful yet efficient performance so users can do more at once without increasing power consumption.

Centrino 2 – Free yourself and your notebook
High-performance Intel® Centrino® 2 notebook PCs are not only enhancing our capacity for recreation and creativity – they expand the flexibility we have to be creative where we want, when we want. Mobile computing has revolutionised the way we communicate, work and entertain ourselves – giving us a new lifestyle that we can share, on the move.

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* Other names and brands may be claimed as the property of others.

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[15] Source: ABI Research, WiMAX Market Analysis and Forecasts, 4Q 2007
[16] Source: Informa 2008, data as of March 2008