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April 2004

digit

>> **Your Technology Navigator**

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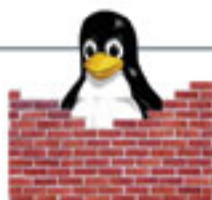**Technology is revolutionising
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**Convert your PC into a
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**Why Microsoft calls this
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6 Web sites your travel agent hopes
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12 simple steps to enliven your
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Citizens First: The challenges of
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Don't Vote for Bits

A paperless office is still a mythical entity, but this year when you vote, it will be paperless. Offices continue to feel the need for paper records, but our General Elections will be conducted without any. Electronic voting machines have been deployed in India since the turn of the century for various local polls; but for the first time, 600 million Indians will elect a Central Government with the press of a button.

Paperless elections have been conducted around the world for a while now, but the merits and risks are still a subject of heated debates. Brazil, for example, enforces mandatory voting for national elections using electronic voting machines.

The benefits of 'paperless' are quite clear and immediate—enabling quick vote counts and eliminating the possibility of ballot-rigging as well as the huge and expensive exercise of printing and distributing thousands of tons of paper securely around the country.

But it has its dark side, too.

At the recent New Delhi assembly polls, returning officers and election booth staffers were unable to operate the machines. At another place, a major party allegedly scared voters by telling them the machines would deliver an electric shock if they voted for the rival party; while the other party was accused of teaching voters to 'start' the machine by pressing their allocated vote button first!

In some cases, ballot-stuffing could even be undetectable. In Tamil Nadu, one party alleged that a machine was accepting votes for all parties, but crediting them to only one party. Similarly, the then Punjab chief minister claimed before an assembly election that it was possible to tamper with the programmed chips to change the votes recorded.

While these incidents may be unsubstantiated, this scenario is indeed possible. Worse, without a voter verifiable audit trail (paper is the usual method), there is no way to confirm whether your vote was counted for the right candidate. While officials may claim that no instances of tampering have ever been noted, that is simply the nature of the new kind of tampering—no one will ever know. Hackers just may find the election year quite profitable.

Just as computer astrology is an exercise in databases and not the divine word, electronic voting machines are simply tabulating systems, and not the solution to our electoral ills. Technology is an enabler; it can help and it can hinder. The conveniences of electronic voting may be compelling, but the prime responsibility is ensuring the voter's intent is not lost.

That remains to be demonstrated.

sumod_hajela@jasubhai.com

Sumod Hajela
Assistant Editor

" *Hackers just may find the election year quite profitable* "

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▲ *86*   Ah, let the holidays boss over you!

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Your Linux box is at risk! We help you secure it

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Reviewed this month

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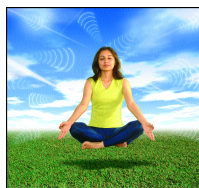
Beyond Wires

We take a look at the three most common wireless standards available today-infrared, Bluetooth and WiFi. Learn how they work, and how to use them.

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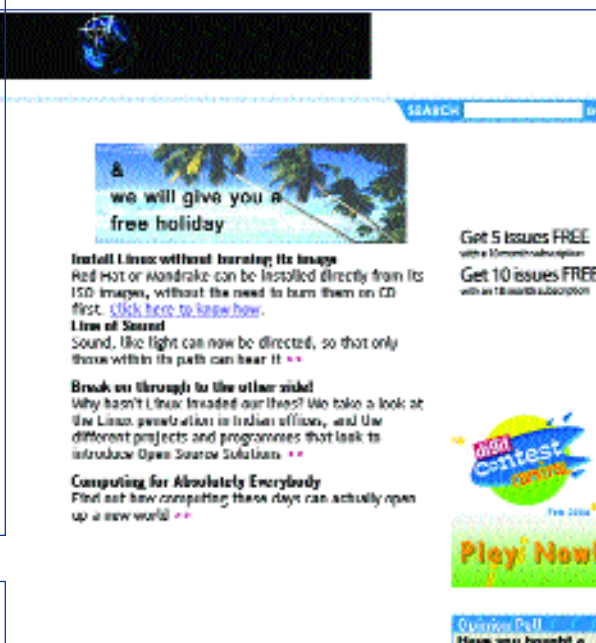
BY DEMAND

You get to choose what goes on Digit Interactive. This month, you have chosen:

Polyphonic Wizard 2.7.7
▶ Size: 4.53 MB
Mindware

Splinter Cell: Pandora Tomorrow
▶ Size: 119 MB
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Expect these on the May 2004 CDs

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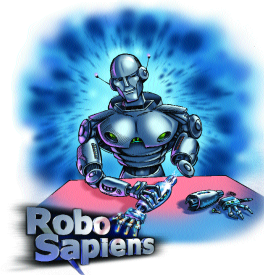
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Multimedia

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Folder Match
Synchronise two folders easily
System

KNOW YOUR CD

MINDWARE\CONNECT

The Connect section on your Digit CD brings you some fun reading with Bookmarks and Newsletters.

The Bookmarks section contains a list of sites on a particular subject, along with a detailed description of the sites. You can browse each site by simply clicking the URL. This month we bring some cool sites on popular hobbies. The Newsletters section brings you a collection of newsletters on different topics every month. This month we have some newsletters that keep you updated with new hardware driver releases.

So, if you're looking for some light and interesting reading, this is one section that you don't want to miss.

MUST TRY SOFTWARE

Mindware

A compilation of useful software across various categories and genres. Something for everybody.

Open Watcom 1.2 is a feature packed IDE for C/C++ and FORTRAN
Multi Desktop 2003 helps your organise your work in multiple virtual desktops
Groowe Search Toolbar 1.2 will give you easy access to various search engines

Abrosoft FantaMorph Pro 2.23 will let you take your friends picture and morph it into yourself
The **Bagle Fix tool** will remove that pesky virus from your computer, with just a click

Playware

Bored with that drab PC of yours? Find on this CD stuff to pamper yourself, and your Windows installation

Use your logic to put dominoes in a pattern, and then watch them all fall down in one go in **Domino Dash**
Watch the latest movie trailers including **The Whole Ten Yards, Home On The Range, Starship Troopers 2**
Listen to some funky new music from the **Smiling Bee Band** and more

news feed
DIGIT ■ APRIL 2004

snapshot

29 per cent of American users have **reduced** their overall use of **e-mail** due to abundance of **spam**

Source: Pew Internet & American Life Project

Powell, Sinha *bhai bhai*

Why should a meeting between US Secretary of State Colin Powell and Indian Foreign Minister Yashwant Sinha feature in a technology magazine? Good question. The answer lies in one of the most raging issues of our times—technology outsourcing.

US lawmakers are waging a battle to curb the flow of jobs to offshore locations, where services are offered at unbelievably low rates. Legal moves in the US Senate and Congress threatened to hurt the love affair between India and the US on the political side.

Powell and Sinha decided that these business issues will not affect bilateral ties. Powell suggested that India too open up its markets to US investments.

Powell feels outsourcing is a logical offshoot of the technology available today, so if India opens its trade avenues, the US would be able to offset the losses sustained due to current work and job trends.

Still sounds like bullying, if you ask us. Only this time, it is couched in diplomatese.

Meet the new polluting champ: The PC

Spoilsports! We admit that the United Nations is doing a great job of preserving world peace, telling the world in advance about the SARS and Avian Flu epidemics and also bringing around one-tenth of Africa out of the clutches of poverty. But really, did they have to tell us that our dear PCs are now the world's worst pollutants?

A UN research group has concluded after years of, well, research, that computers create more pollution than cars as they contain higher amount of toxic chemicals. They say that a PC weighing 24 Kg uses up energy equivalent to 240 Kg of fossil fuels, 22 Kg of chemicals and 1.5 tons of water.

Farzana Cooper

Even after the machine has become useless, the group says, the environmental damage continues. As the discarded PC ends up in a landfill, it becomes even more hazardous to human health. The only solution to this is to upgrade or re-use the computer hardware by manufacturers and users instead of throwing it away.

PCs contain chemicals such as brominated flame retardants and heavy metals like lead and cadmium. In theory, local water supplies are at greater risk when these chemicals leach into the ground where they are dumped.
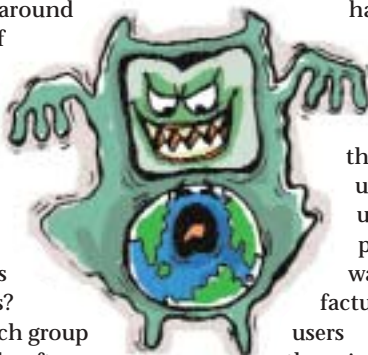
Is it a lens? Is it an eye?

Philips wants to get back into the innovation mode. Big time.

At the recently held CeBit technology fair at Hanover in Germany, the Netherlands-headquarted consumer electronics giant debuted a tiny lens that works by manipulating fluids in a tiny tube.

When a small electric current is passed through the two fluids, one of them attaches to its edge, while the other fills up the remaining space. The spot where they touch, functions as a lens.

The 3-mm lens will be used in low cost digital cameras used inside phones.

The lens, whose technology is patented by Philips, can be shaped to be hollow or curved, by changing the current passed. As a result, the lens can focus on objects far away or as close as five centimetres.

Ingenuous, we would say.

■ Macromedia updates Dreamweaver MX 2004, runs 50 per cent faster on a PC ■ Sony to launch personalised radio service for phones

Another Kodak moment: A lawsuit against Sony

Some years ago, Kodak settled a patent infringement lawsuit against Polaroid corporation by giving it US$ 925 million in damages. We are pretty sure it wants that money back.

Now to make its brand name synonymous with digital photography, Kodak has filed a suit in a US Federal District Court against Sony Corp, alleging that the latter has infringed upon 10 patents issued to Kodak within 1987 and 2003.

The patents covered various aspects of capturing, storing and displaying both, still and moving digital images. Sony's official line is: "We have not violated any Kodak patent related to digital imaging and will fully defend any allegations made in this regard."

Kodak, however, will be pretty confident of winning the case since they won a similar patent infringement case against Sanyo Corp three years ago. Sanyo then agreed to license technologies from Kodak. Before they could become another Kodak "victim", Olympus also agreed to license technologies from Kodak.

For the record, Kodak holds an amazing 1,000 digital photography patents.

statattack

Internet Users in India (in million)

Source: Nielsen/NetRatings, ITU and Ipsos

People cruising the Internet
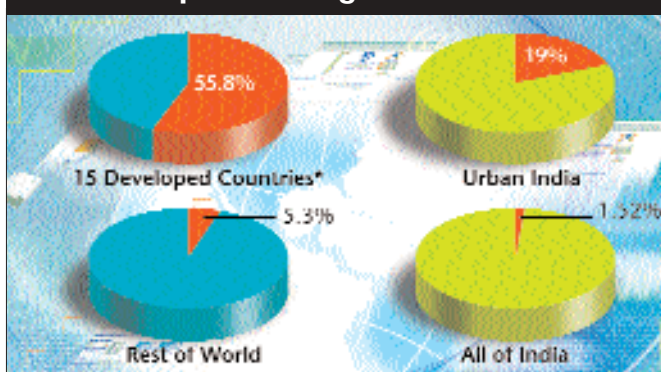
Source: Nielsen/NetRatings and ITU

Solomon Lewis

Intel changes nomenclature

Intel will stop using clock speeds as the name differentiator for its processors. The new system will account for performance factors such as bus speeds and cache memory.

The Celeron line-up will get a 300 series number—for example 355—the Pentium 4 desktop processors will be the 500 series and the Pentium M mobile processors will be the 700 series.

Wait! Didn't Intel spend millions to market clock speeds as the ultimate performance gauge? Yeah, but that was to oppose AMD, who all along said that clock speed was not the only indicator of speed.

The new naming scheme seems to exchange one kind of complexity for another. The question is: Will this work better for the consumer, or will it simply make matters worse?

Apple sings— 50 million times!

In the popular folk tale The Pied Piper of Hamelyn, the storyteller never told us how many rats the piper eventually enamoured to be condemned to the sea. But we can tell you how many songs did the world's modern pied piper Apple's CEO, Steve Jobs, manage to get people download into their devices: all of 50 million, all paid for, and in only five months.

Apple's strategic tie-up with Pepsi means that another 100 million songs will be downloaded free.

It was in October that Apple expanded the iTunes store to work with Windows-based computers—just another brilliant idea from Jobs, the king of comebacks.

snapshot

52 per cent of **San Diego city** in California, **USA** use **broadband** access

Source: comScore Networks

■ SuSE Linux 9.1 to use new 2.6 kernel; Novell to make YAST management tool open source ■ Windows XP SP2 reaches Release Candidate stage

USB survival tool

How cool is a USB Swiss Army Memory Stick!

Victorinox, the world's favourite creator of the multifunctional Swiss Army knife, has joined hands with flash memory manufacturer Swissbit to create a USB memory stick Swiss knife. The knife, immortalised in popular literature and films, will also have the usual assortment of quality tools such as the saw, the corkscrew and a tin opener, along with 64 MB and 128 MB USB memory stick options.

It debuted at the much-liked CeBIT tech fair at Hanover, Germany held March. Here is how

you can use it: Suppose you are on a jungle safari carrying your favourite Victorinox knife, and you are also carrying your laptop, and you are stranded, and maybe you are still alive, thanks to your survival tin food or the absence of wild animals, you may be able to exploit the memory stick to its fullest. Just connect it to your laptop, and let GPS systems help you get back to civilisation.

Have more ideas on how to use the Swiss Army Knife USB memory stick? Write to us at *readersletters@jasubhai.com*. We will publish the top three innovative reasons in next month's Digit.

No more freebies, please

Our guess is that the US Department of Defence has not even spoken to, or has not been influenced by its Indian counterpart, which, allegedly, does not cringe at earning a little money on the side, even coffin deals.

Why would the officials at the Defence Department otherwise tell Microsoft not to send free copies of their Office suite to army officers. The department is not alone. The army itself has issued a letter to Microsoft's chairman Bill Gates asking his com-

pany to desist from offering free software to army personnel.

The letter also points out that army personnel may unknowingly violate ethics rules and regulations. The army has asked all its officers to return the freebies.

For its part, Microsoft says the software was sent "without obligation". Hmmm, is this the same company that fought the US government tooth and nail, claiming it does not want to kill others in the market by institutionalising its monopolistic outlook?

Hitachi ships 400 GB giant

What would you call the Hitachi 400 GB Deskstar 7k400? OK, let's see. Giant? Nah. Leviathan? Maybe, but it has a negative connotation. So, we thought we would settle for the serpentine Leviathan's arch mythological enemy—the Behemoth.

A quick calculation on what a 400 GB hard drive could hold:
■ One lakh MP3 songs at 4 MB per song;
■ 1 crore MS Word files at approximately 40 KB per file;
■ 100-125 DVD movies at 3-4 GB per movie

Now, let us calculate how much time would we take to absorb all this data:
■ Listening to all one lakh songs would take 6,666 hours or 278 days at a stretch.
■ Reading all the MS Word files (assuming we take 15 minutes to read one file) at one stretch would take 2.5 million hours.
■ To watch all the movies would take 625 hours at a stretch, assuming two hours per movie.

Our question, then, is: Who would want to buy a 400 GB hard drive? Hitachi says

the drive is aimed at the audio-visual market where the principal criteria for selecting a drive are size and cost per GB.

Besides, Hitachi informs us, the drive features a new industry standard AV feature known as Streaming Command Set used for optimising storage and retrieval procedure of content on a digital video recorder (DVR).

All that is great news. But our question still remains: Why would you want to buy this behemoth?

■ China shuts down blog sites; says content is "against regulations" ■ TDK joins Blu-Ray Disc group to create next generation optical storage products

Dice loaded against online gambling

It is a classic cat-and-mouse game. US prosecutors spend a lot of time busting online gambling sites. But US law holds online gambling illegal only within the US. Most gambling sites are located outside US territory (Costa Rica, etc).

So, American law enforcers are doing the next best thing—targeting those US companies that do business with such sites by providing advertising and other services.

Several individuals and

companies who have worked with Internet casinos have been issued legal notices. Along with pornography and shopping, gambling is the Internet's biggest moneyspinner. So, we guess it is back to the good old days of heading to Las Vegas to bask in the hospitality of Caesar's Palace.

snapshot

In last quarter of
2003, total
Linux servers
shipments were
about **2,50,000**
a growth of over
53 per cent over
last year

Source: IDC

China's search engines take on Google

Ladies and Gentlemen, welcome to the bout that decides the undisputed heavyweight search engine champion of China. We have three contenders for the championship belt. Join your hands for Baidu.com, Zhongsou.com and the interestingly named Yahoo subsidiary, 3721.com in the Red corner.

And in the Blue Corner, we have the current undisputed search engine champion of the world, Google.com, who entered China some time back to corner a piece of the US$ 100 million market.

The bout has begun well, with all the Nasdaq-listed Chinese sites becoming profitable, thanks to sponsored links at the top of the search results.

But will Google sit back and relax? No siree, the champion fought back in February launching a Chinese language ad service. But 3721.com founder Zhou Hongyi who sold his company to Yahoo for US$ 120 million has said a few

sweet words about Google recently. We quote him verbatim: "My job in China is to kick Google's ass."

Hongyi is all ready to take on Google. With a Net penetration of 80 million users and expected market size to be US$ 200 million by 2006, Hongyi sees nothing but a brutal fight for the top spot. He has already scored the first jab on Google's chin: His site's database of searchable sites is already at 150 million.

His partner in the tagteam bout is Robin Li, founder of Baidu, who claimed a searchable index size of 220 million. But chances are that Google may buy over Baidu.

Zhongsou, meanwhile, has a database of 280 million.

With this, ladies and gentlemen, we come to the end of Round One of the heavyweight search engine championship in China. Right now, the honours have been shared. See you soon in Round Two.
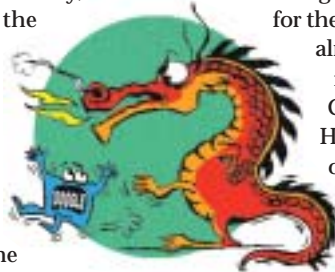
Universally digital

IBM's legendary chairman Tom Watson used to have a board behind his desk. On the board were written five letters in large type: THINK. Universal Music International (UMI) has added three letters to that, and come up with THINK BIG.

UMI has announced that it has finished digitising three lakh songs from the 25,000-odd albums in its catalogue, amounting to 20 Terabytes.

UMI tells us that each CD worth of music has been stored as a disc image and not as individual tracks, with the Universal Packaging Code (UPC) and International Standard Recording Code (ISRC) codes intact.

Now, distributors can demand a format and a bitrate of their choice for online delivery. As of now, Europe, where UMI is located, has only one legal download service—O2.

snapshot

IBM has the
largest server
market share in
Asia Pacific
region—**37.4** per
cent in 2003, based
on revenue

Source: Gartner

How the mighty fall

Microsoft has knelt before the courts. At least for the time being. The world's largest software manufacturer, and best known in the recent past for its much publicised fight with the US Department of Justice, has offered to include rival software on CDs.

And if you are happy about it, you should thank European Union (EU) anti-trust regulators who said Microsoft has violated competition rules by tying its media player software to Windows. EU is considering asking Microsoft to offer two different versions of its operating system, one with audio and video playback features and one without them. EU is considering this to give consumers more choices over audio and video playback software.

The EU, always known for its policy of doing everything that Americans do, did the same in this case. Instead of attacking Microsoft by focusing on browsers (like the Americans did), EU concentrated on the Windows Media Player. And it won.

EU has also indicated that it will make sure that big PC makers are free to choose what multimedia software they want to install on new PCs. Whoa! Where does that leave Microsoft now? Wait and watch.

snapshot

Worldwide sales of camera phones expected to reach **150 million** in **2004**

Source: InfoTrends Rresearch Group

The Bagle has sounded; run for cover

Though the Beagle project for Mars exploration may have not got what it really wanted, the Bagle Internet virus has no full stops. Since its inception mid-January, it has as many as 16 variants even as we go to print.

Bagle's ingenuous way of affecting a PC by enforcing a backdoor entry has troubled hundreds of network administrators. It spreads by scanning the PC and all shared folders with names starting with 'shar', for any lists of e-mail addresses, and then mailing the infection to these addresses.

The virus spoofs the domain name of the recipient. Therefore, a person would feel that the e-mail came from someone within his domain such as the administrator, or from his friend (by his e-mail ID found on his PC).

It compresses the infected file inside a password protected zip file. The password is provided in the e-mail body. Virus scanners responded by 'reading' the password, and using it to decompress the attachment and weeding out the virus.

Virus developers soon created a new variant—the password was now part of an image, something that Yahoo or Hotmail give you to verify your account while signing up. Anti-virus firm Symantec, meanwhile, has claimed that it can delete this virus even without referring to the image.

The chase continues.

Find the Bagle removal tool on the Mindware CD

tomorrow's technology

Net speed demon

A new Internet data protocol developed at the North Carolina State University may well have what's needed to give truly amazing speeds for data transmission.

Called Binary Increase Congestion-TCP (BIC-TCP), the new protocol was tested alongside six other competing protocols at the Stanford Linear Acceleration Center, and was judged on top on several parameters including stability, scalability and fairness in comparison to the others.

BIC works by using a binary search algorithm to search for maximum network capacity within minimal data loss. It means that such a protocol can be used for large scale scientific studies in nuclear and high energy physics, astronomy, geology and meteorology. BIC-TCP can deliver speeds that can work out to 6000 times the throughput available from today's DSL lines or 1,50,000 times faster than a modem connection.

Co-developer Injong Rhee says what TCP can do in two hours, BIC can do in less than a second. That's an impressive statistic for what might become a dominant protocol on tomorrow's Internet.

■ Haryana Government picks StarOffice for administrative purposes ■ Siemens unveils new 1.3 megapixel camera phone

New Arrivals

New Arrivals is an advertiser-sponsored section that showcases the latest launches in the Indian market. All product specifications featured here have been obtained from the contacts listed, but have not been verified by the Digit Test Centre. You may look forward to reviews of some of these products in our Test Drive section soon.

O'rite Cameras

O'rite cameras will be available in various models such as the O'rite VC3260 6.0 mega pixel 4-in-1 digital camera, the O'rite MC1300 USB PC Camera featuring a pure 1.3M CMOS, which sets a 'new standard' for webcams earlier limited to 350k sensor. Also available will be exclusive products such as the O'Rite RAM-CAM (RC300).

Contact: Mediatech India
Phone: 91-11-6495941, 42, 45
E-mail: piyush@mediatechindia.com
Website: www.orite.com.tw

MoBo for AthlonTM64

The GAK8VT800M is the first AMD certified motherboard supporting the revolutionary AMD AthlonTM64 processor. It delivers a cost effective platform and brings new levels of performance and features to the desktop systems. Accompanied with the innovative designs of AthlonTM64, the advanced VIA K8T800 chipset and Gigabyte's unique technology also contribute to its functionality and stability.

Contact: Digi Giga Systems
Phone: 9892642524
Email: dlinkpr@dlink.co.in

2.4 GHz Home Antenna

SMC Networks announces a home networking solution – a pair of high-gain antennae that extends range and improve signal strength for the popular 2.4 GHz WiFi network (802.11b, b+ or b/g) – at prices that are ideal for the home users.

At just Rs 4950/- each, plus local taxes and duties, there are two variants, viz: SMCHMANT-4 and 6 which represent a great investment to improve home networking performance.

Contact: SMC Networks
Tel: +91 11 26234613
Email: sanjay.koul@smc-asia.com

Millennium Legend
Feature-rich Indian laptop

To cater to the advanced high-quality mobile computing needs of an executive on the move at an earthly price, Millennium offers you the new Legend laptop. This laptop is powered by an Intel Pentium M 1.4 GHz processor featuring Intel Enhanced SpeedStep Technology. Features include 30 GB HDD, 256 MB DDR Memory, 8x DVD-ROM drive, 56.6 kbps modem, 10/100 Mbps Ethernet card, 1MB L2 Cache, three USB 2.0 ports, Intel 855GM, excellent graphics on a bright 15" XGA TFT Screen made possible by Intel Extreme Graphics 2, one FireWire, and PCMCIA slot, besides the regular PS/2, S-Video, Analog Video, integrated LAN and Modem, Line In/Out, and Mic.

Price: Rs. 67,250
Contact: Millennium Automation and Systems Ltd
Phone: 011-26495941/42/45, 26495799
E-mail: maslinfo@milleniumsystem.com
Web site: www.milleniumsystem.com
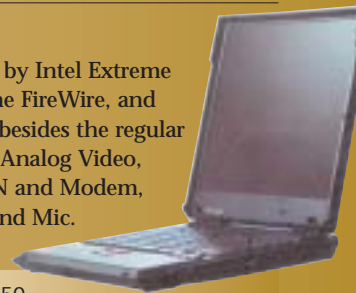
Pinnacle PCTV Stereo
Hi-quality TV Viewing

This TV viewing card on a PC with full featured remote is a fully-featured PCI card with highest resolution quality. Powerful digital features include recording of TV programme or video streams in MPEG-1/2 formats, allow you to burn direct to a CD or DVD without having to convert, and time-shifting features on remote let you pause or replay while recording a live show. It includes a T-Rex multimedia file converter and a trial version of Pinnacle Studio video editing software.

Price: Rs. 3,500 (all inclusive)
Contact: Pinnacle Systems
Phone: 011- 51608210
E-mail: MGupta@pinnaclesys.com
Web site: www.pinnaclesys.com/asia

HP Officejet 5510
Versatile Cameras

This All-in-One delivers fast printing, faxing & copying, along with outstanding scanning, everything in one compact integrated product. Offering professional print quality in both black and colour (17 ppm black/12 ppm colour), it is perfect for all office needs. The integrated flatbed scanner makes it easy to scan and copy a variety of materials like documents, books and more.

Contact: Rs 12,499 (taxes and levies extra)
Phone: (0124) 256 6111
E-mail: rajiv.rao@hp.com
Web site: www.hp.com/in

Pureview LCD Monitor

Value for Money

Pureview has launched its branded TFT-LCD Monitors in India in technical collaboration with Funet, Taiwan, with its range of LCD monitors from 13.3"/ 14.1"/ 15". Pureview has set up its state of the art manufacturing unit in Sri Lanka with Japanese collaboration in order to ensure quality products. These LCD Monitors are backed by a three-year on-site warranty with 43 service centres across the country. Pureview will be emphasising on 14.1" LCD monitor as they want to position this model against CRT monitors. This product has some unique features like built-in speakers, wall-mounting facility and 330 degree rotation horizontally. This will be a product of "value for money" keeping the masses in mind.

Contact: Pureview Technologies Pvt Ltd
Phone: 022-2416 5455
E-mail: sudipto@pureviewindia.com
Web site: www.pureviewindia.com

Philips 170T Monitor

This all-in-one full-featured LCD monitor and TV combo has a 17-inch Wide WXGA LCD screen with excellent display performance. It can be used as a HDTV setup box and progressive DVD input (1080i/ 720p/ 576p/ 480p). There are multiple video inputs for display of PC,TV, DVD and VCD signals. The screen has a mode adjustment for best movie or DVD viewing ratio. It sports a Digital Nicam/ 2CS stereo and an AUTO adjustment optimizes picture quality with standard VGA analog input.

Price: Rs. 75,000
Contact: Philips india
Phone: 022-56912353
E-mail: sanjay.maheshwari@philips.com
Web site: www.philips.com

ZEN Digital Wireless Keyboard + Mouse (RF)

Freedom from cables

The new ZEN Digital Wireless Keyboard + Mouse provides you freedom from physical restraint. The Optical Mouse with 3 buttons and 1 scroll wheel is worth the extra cost. These peripherals use Radio Frequency (RF) to give you reliable wireless performance from a range of upto 1.5 metres for the keyboard and 1 metre for the mouse. The new Zen Digital Wireless Keyboard features 107 keys-basic enhanced windows layout, eight media hotkeys and four Internet hotkeys, up to 256 IDs to be free from interference, low battery consumption circuit design for power saving, low memory resources taken by utility and finished with Dual Tone Color (Silver Body with Black keys).
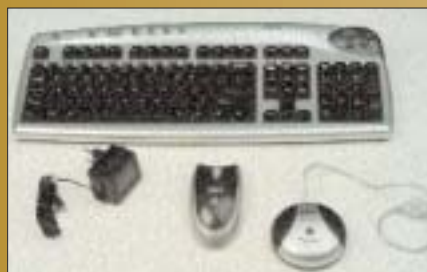
Contact: Turn On Systems
Phone: 022 - 22620444
E-mail: turnon@vsnl.com

LG EPE-N21HM3 A PC

LG introduces this new MyPC with a Pentium 4 2.66 Ghz, 128 MB DDRAM, 40 Gb HDD, a Combo Drive along with an Internal modem, Onboard Sound , AGP and a LAN. The PC comes bundled along with a special TV Tuner Card with recording functions and remote and FM Radio function. It comes bundled with a MS Windows XP Home. The monitor is a 17" Flatron Monitor.

Contact : LG India
Tel : 0120 - 2560959, 2569957
email: AjaySurjan@lgezbuy.com
Website: www.lgezbuy.com

MSI 915P Apex motherboard

Fully-loaded with the most cutting edge technology, MSI 915P Apex is optimized for Intel LGA775 Pentium 4 processor, DDR2 memory technology and PCI Express interface. MSI exclusive D.O.T. (Dynamic Overclocking Technology) can perfectly coordinate with Dynamic Vid in LGA775 Pentium 4 processor. Balance your PC system between performance and power consumption.

Contact: MSI
Tel: 886-2-3234-5599
Website: www.msi.com.tw

For any new product announcements in this section, vendors / manufacturers can get in touch with

- **BANGALORE:** Bibhor Srivastava, **E-mail:** bibhor_srivastava@ jasubhai.com, **Phone:** 5325670/88, 37629285
- **CHENNAI:** Sahayaraj Prabhu, **E-mail:** prabhu_sahayaraj@ jasubhai.com, **Phone:** 28235186/89, 33629282
- **KOLKATA:** Jayanta Bhattacharyya, **E-mail:** jayanta_bhattacharyya@ jasubhai.com, **Phone:** 22345100, 33629284
- **MUMBAI:** Saurabh Pandey, **E-mail:** saurabh_pandey@ jasubhai.com, **Phone:** 56310515/14, 33629278
- **NEW DELHI:** Arvind Prabhakar, **E-mail:** arvind_prabhakar@ jasubhai.com, **Phone:** 51608658/59, 32358374
- **PUNE:** Vinayak Inamdar, **E-mail:** vinayak_inamdar@ jasubhai.com, **Phone:** 24482059
- **SECUNDERABAD:** Vinayak Inamdar, **E-mail:** vinayak_inamdar@ jasubhai.com, **Phone:** 55221051, 3362980

Sponsored Product Annoucements

Your fashion navigator?

Ahoy Digit! I have been a regular reader of your magazine for quite a few years now, and most of my computer knowledge (little as it is) has been acquired through your magazine and CDs. I am also a die-hard First Person Shooter gaming fan.

I have a suggestion. For years now, my wife Anu has been jealous of my FPS gaming and your magazine. She says Digit just keeps me realising how outdated my PC gets every year, even with upgrades. Yeah, yeah, I know that today's best is tomorrow's crap. But your magazine keeps me abreast of all the latest technologies, and I do learn a bit with each issue. I am a doctor and she is a fashion designer.

I would like a page (no more please) dedicated to various software with demos on CD (not system heavy though) in the fields of fashion, modelling, designing, recipe-cocktail collection, family photograph collection, edited from a woman's perspective, thereby keeping myself still one step away from the saying… 'If you can't beat them, join them'.

Jean Mathew
Via e-mail

Mahesh Benkar

digit
Dear Jean,
Firstly, thank you for your kind words. It is feedback from readers like you that keeps us motivated month after month. We have indeed taken cognizance of your suggestion, and we will try and implement it as soon as we can.

Tip that!

This is with reference to Digit's section on home theatre systems in March 2004. There is a useful thing to remember, which I would like to share with readers of Digit who have Intel D865 motherboards.

I have a D865 board with a 2.6 GHz CPU with hyperthreading, and the motherboard comes with software that allows you to connect a 6.1 channel speaker setup on to the three audio-out ports. For

people like me who do not want to buy a separate sound card for surround sound, or maybe cannot afford it, this is a cheap and versatile option.

And one for the road: I converted my Windows desktop into a Macintosh OS X Panther desktop, and I am proud to say that I nearly fooled one Mac user— until he found windows task manager running in the background.

Pranav Naik
Via e-mail

digit
Dear Pranav,
You have a knack for the unusual, and there is no doubt in our mind that your tips will be useful to all our readers. As for your fooling the Mac user is concerned, well, all we can say is: Congratulations!

Six to a dozen

I must admit upfront that I am not a regular reader of Digit, since I can afford to buy only six of the 12 issues every year. But, I must add that the March issue of Digit was brilliant, and I more than glad to get the software provided with the Mindware CD.

I had to buy the issue once I saw the contents, and yes, I was not disappointed since the graphics were stunning. Getting know about speaker enhancements in the home theatre section was good, and I understood it quite well, despite the fact that I am not a technologist.

Ashish Anand
Via e-mail

digit
Dear Ashish,
We are sorry you cannot buy all 12 issues of the magazine in a year. However, please do keep coming back to the news-stands to check out our content. Who know, you may just be tempted to buy all 12!

Patch me up

Viruses, worms and Trojans are surely one of the biggest risks a computer is exposed to. Apart from running virus scanners, it is possible to minimise this risk by downloading and applying the so many Windows patches that Microsoft releases at regular intervals.

The only problem is that most users are not aware of this or do not have the resources (read 'high bandwidth') to download such patches. I would request you to start a section on your CD, which contains these downloaded patches. This could be the biggest service you could do to your readers.

Karanvir Singh
Via e-mail

digit
Dear Karanvir,
Your wish is our command. Check out the Bagle / Beagle patch on the Mindware CD with this issue.
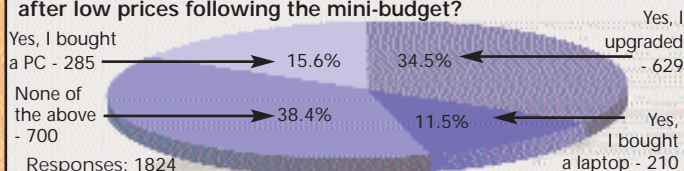
Service with a smile

Hi! I work in the Merchant Navy, and after five months of exhausting tour-of-duty at sea, I recently came back eagerly waiting to feast my eyes on Digit. All the technology knowledge I have is primarily because of Digit. So imagine my disappointment when I realised that two issues sent to my residence had to be returned because there was no one at home.

I immediately wrote to Digit, explaining my problem. This time around, it was my turn to be delighted. I was mighty impressed that the two missing copies of Digit landed at my doorstep within 24 hours of my mail. How cool is that!

I know people sometimes do not have a good opinion about Digit's customer service, but hey, how much better can you get than this.

My special thanks go out to Reema at the Customer Service desk, and may your magazine succeed all the time. In the meanwhile, let me get back to my favourite pastime when I am home—reading Digit, and exploring the CDs.

Dilip D'Souza
Via e-mail
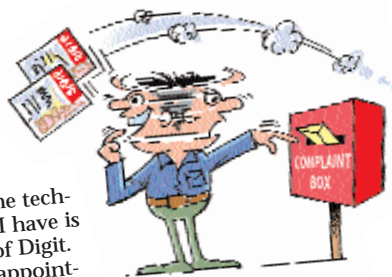
Dear Dilip,
Our customer service desk is always ready with solutions for our readers—be it subscription related queries, or defective or broken CDs. Please do no hesitate to get in touch with the customer service desk at **help@jasubhai.com** any time.

Yes we have ESP

What can I say, but huge thanks for the February issue's Tips & Tricks section, which covered useful stuff for Web designers. That was a real help!

It was also good to read the review on *Gothic2*, the game. I am a big fan of *Gothic* or horror-based RPGs and there are not many that are publicised. I would love to play *Gothic1* before I go for the sequel.

Yuvan
Via e-mail

Hey guys, I have tried out 3ds max, Maya, Softimage Rhinoceros 3D and Cinema 4D. 3ds max 6 is really cool, especially the new architectural tools and integrated DX9 shader support in the material manager. Nice for us game developers.

I found Maya to be user-friendly, though the interface isn't as appealing as Max's at first glance. Maya has better features for nurbs and subdiv modelling, while Max would be the better choice for polygonal modelling.

You can find a trial version of Maya at www.alias.com (it's called PLE and is actually a free version of Maya). Maya was used in the making of *Final Fantasy: The Spirits Within* and *LOTR 3: Return of the King*.

Anidex
Via e-mail

Dear Yuvan and Anidex,
There is a treat awaiting you in this month's Tips and Tricks section—all of eight pages devoted to just Maya and 3DS Max. We have two of India's best professionals—Suzanne Rebello and Sachin Puthran—who have given some great tips for both these amazing software. Have fun.

The Winner of the 'Post your best Planet Digit Experience' contest is...

vickymustdie
Analogue Novice

Joined:
03 March 2004
Posts: 1
Location:
Mumbai

Posted: Mon Mar 15, 2004 3:06 pm **Post Subject:** Games as acareer...

Hi guys, Almost everyone at the Digit Forum likes to play games. The only thing I wanna ask is: How many are seriously taking games as a career? How many are looking forward to develop one? There's a hell of a choice in this industry that one can choose from... such as cinematic artist, game tester, game designer, level designer, screenwriter, sound engineer, junior programmer, lead programmer, special effects programmer, audio programmer/engineer, artificial intelligence programmer, multiplayer networking programmer, 3D modeller, etc.

So, I request all you gamers to think of getting in the game industry.

crusader77
In-House Geek

Joined:
29 Dec 2003
Posts: 198

Posted: Wed Mar 17, 2004 10:03 am **Post Subject:**

What's sorely lacking in the Indian gaming industry are good 'ideas'. These kind of games have a very small audience and it will get nowhere by making these kinda games. Also, there aren't enough people seriously into this field (as a career) as compared to any other country. In the US and UK, there are full-fledged courses and diplomas in game development, designing, and programming. These also play a very important role as it's a very overwhelming task to start off especially in game programming, on your own. For example, trying to learn and master Direct-3D programming on your own, I know how difficult this is cause I am doing this on my own.

Goof Ups

■ The Intel 845GVSR motherboard featured in February 2004 on page 47, is based on the Intel 845 chipset and features Socket 478 as opposed to Socket A. The motherboard's documentation mentions that it is designed, especially for the Intel Celeron and so, we tested it using a 2.8 GHz Celeron, leading to a total score of 41.01. However, the motherboard also supports the 533 FSB Pentium 4. We re-tested it using a P4 3.06 GHz CPU, resulting in a total score of 47.22, which is approximately 15 per cent more than the previous one.

Notice any goof-ups?
Write to goof@jasubhai.com

The Challenges of e-governance
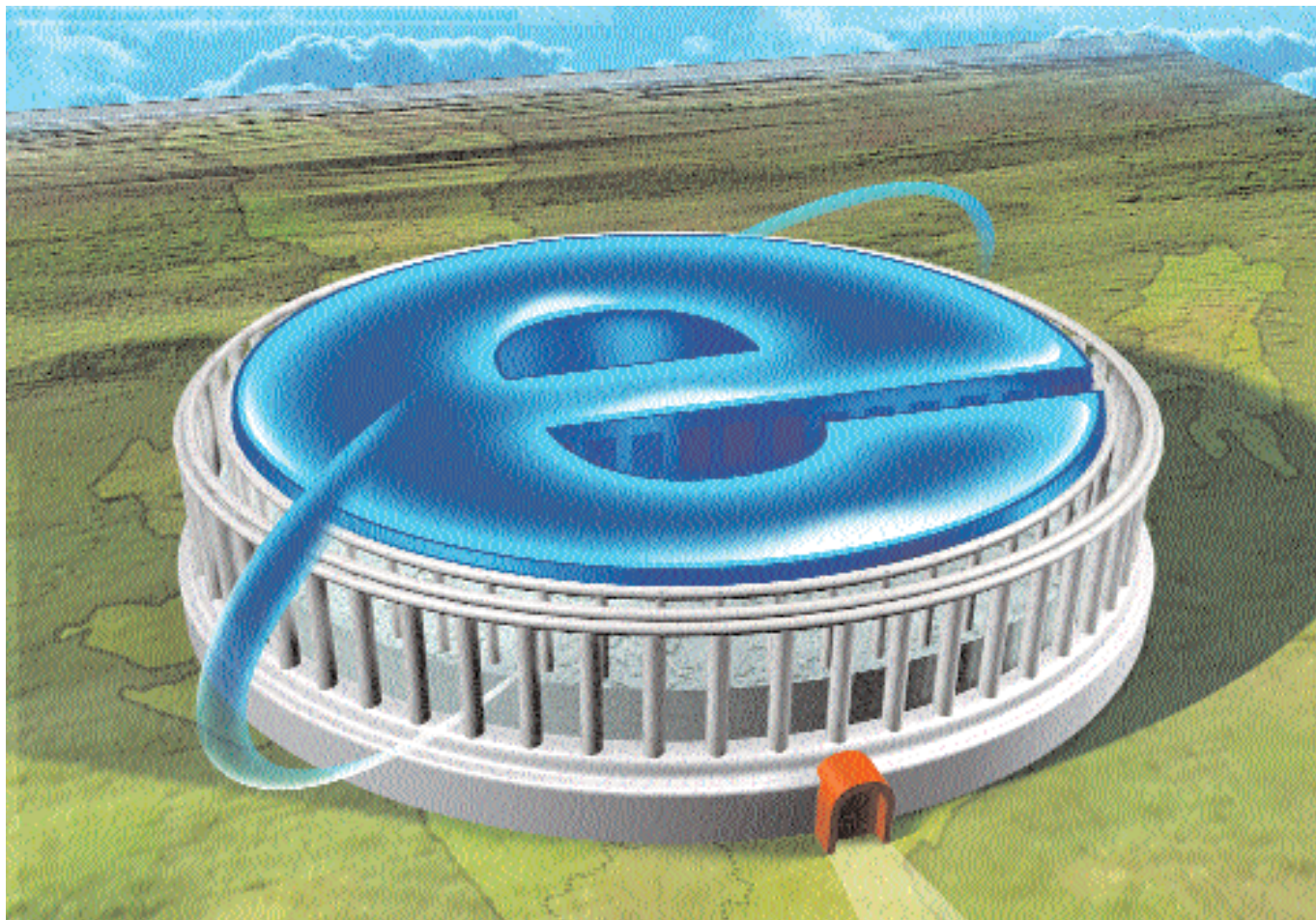
Mahesh Benkar

By Jaijit Bhattacharya,
M P Gupta and
Prabhat Kumar

It was the wheel that began it all—technologies that have a fundamental impact on human society. The steam engine, electricity, the car, the airplane, the television, the phone—tools we cannot think of existing without.

But surely, if there has been one advancement in human endeavour that has overshadowed all others in the last decade and a half, it is information technology. Arguably, it is also the only development that has touched so many lives in so little time.

The dotcom boom and bust may have earned the Internet a bad name, but the initial experimentation with associated business models and democratisation of technology during the dotcom boom provided a deep knowledge base to leverage the Internet for the greater good.

Consider this: The bust actually paved the way for an evolved vision—growth accompanied and tempered by ground reality. What this meant was that corporates adopted the Internet to not only enhance productivity, but also to develop innovative business models.

Once the corporate world adopts this model, governments have to take it up too under pressure to perform in a democratic setup. Which naturally means that governments will have to look into issues concerning people, processes and technology. In the not-so-distant future, our public administration system could well have an online interface to liaise with people.

An online government implies a single point of access to all public information, and greater citizen interaction with the administration through Internet-based services. It also helps actualise the potential to streamline relationships between gov-

Jaijit Bhattacharya *is Head, Oracle-HP E-Governance Centre of Excellence,*
Dr. M P Gupta *is senior faculty at IIT, Delhi,*
Prabhat Kumar *is additional director general, Directorate of Systems (Customs and Excise), Government of India*

ernment, business and citizens.

Government departments operate in isolation, and surely the first logical step to a single window government is to create coordination architecture. And perhaps the first government function to be tackled could be financial management. Right from the preparation of the budget to its execution and tracking of funds, every department goes through the same set of pains.

Obviously, an integrated financial management solution should also enable governments to switch from cash-based accounting to accrual-based accounting. This fulfils two functions - it protects the government's information technology investment from future changes in accounting standards. And secondly, it also adheres to the World Bank Treasury Reference Model, which ensures that the global best practices in managing government financial systems are adopted.

developing countries have tried to e-enable their service delivery mechanisms. But to date, most implementations have centered on publishing of information with isolated instances of transactional service delivery through government portals.

One successful attempt has been eSeva in Andhra Pradesh, where change management is handled deftly.

In fact, it is municipalities that are aggressively adopting e-governance. But, they face problems in scaling up to this demand. A primary issue holding them back is their financial management processes and systems.

It is believed that municipalities would benefit from a clearer division of functional responsibilities and enhanced linkage among different levels of government that will ensure upward and downward accountability. It will also help state finance corporations in their constitutional task of

> **Municipalities are aggressively adopting e-governance. However, they face problems in scaling up to this demand. A primary issue holding them back is their financial management processes and systems.**

Next on the roster of activities is coordinating and collaborating with other departments and agencies, managing employees and payroll, managing large government projects, and providing effective public services.

Technologically, government solutions are mission critical—no government can provide the excuse that it could not function because of a system failure. Therefore, the systems need to have high availability built-in.

The other pillar of technology is security. Imagine having systems with every bit of municipal data. Any security compromise on such a system will completely undermine the faith in the government and may even lead to serious financial losses. One process of ensuring that the appropriate security is built into the solutions is to adopt solutions having appropriate security certifications.

The technology stack in total, includes technology pieces like packaged applications, database, application servers, operating systems, business intelligence (datawarehousing and datamining), support systems, Geographic Information Systems (GIS), open source software, document management, knowledge management, smart cards, biometrics, telemedicine, and wireless.

Once the government has its backend in place and has crystallised its application architecture and IT architecture, it would be in a position to roll out citizen-oriented services.

Many national, state and local governments in

devolution of funds to municipalities.

One problem, though: Most municipal bodies in India, with the exception of Tamil Nadu, follow the traditional governmental cash basis accounting system. Some forward-looking municipalities like the Kolkata Municipal Corporation, have also adopted a modified accrual basis of accounting as an intermediate basis of accounting.

One of the key problems arising out of the cash basis of accounting is that municipalities do not prepare or publish balance sheets. Because of this practice, the overall financial position (assets, liabilities, receivables or payables) of the municipality is not known at any point in time. Moreover, the accrued income or expenditure is also not known. There are no journal vouchers or revenue and expenditure accounts. Hence, the financial status of the municipality, for the period or year, is not known.

Such a situation leads to difficulty in managing the municipality. It makes it tough for municipalities from going in for innovative financing of its projects by issuing bonds or using other financial instruments. So it is obvious that implementing integrated financial management systems for municipalities would benefit them tremendously.

In addition, municipalities like the Ahmedabad Municipal Corporation is using appropriate e-governance solutions to increase revenue generation by a phenomenal 125 per cent. The Kalyan Dombivli Municipal Corporation (KDMC) near Mumbai has used e-governance to create a highly successful online citizen service with the objective

of making each citizen's interaction with KDMC easy, simple, and efficient, while ensuring accountability and transparency.

The Coimbatore Municipal Corporation (CMC) has used e-governance for a "Anytime, Anywhere" governance. This has helped CMC in making their administrative processes transparent, efficient and productive. It also helped in creating a simple, friendly and efficient interface for their citizens.

Another issue that has almost become synonymous with e-governance in India is the financing of the e-governance projects, or more precisely the financing mechanism of Public Private Partnership (PPP).

It is an old mechanism of engaging with private partners, namely private companies as well as non-governmental organisations (NGOs) to bridge the gap in the quality, speed and efficiency in the service delivery process in the public sector. In e-governance, this partnership has been cemented in public projects like creation of infrastructure and pro-

agement, still the basic tools of change management are being ignored in the rush to come out with projects on the ground.

Change management should start even before the project itself has been identified. If the project affects the departments then one should have mechanisms to involve the departments for conceptualising the project and then keeping them informed about the progress of the project as well as key decisions involving the project.

A mechanism that has been widely adopted is to have extended workshops to educate the departments on the management issues of e-governance and the possibilities opened up by e-governance. Having done that, the departments would be in a position to articulate their requirements, based on which projects can be conceptualised. Such a process also helps in reducing the "re-inventing of the wheel" by reducing re-development of common applications.

It also helps in prioritising the applications to

> ❝ Once the government has its backend in place and has crystallised its application and IT architectures, it would be in a position to roll out citizen-oriented services. ❞

visioning of services in the entire gamut of activities relating to hardware, application software, maintenance, finance and other activities.

Governments have limited resources, and hence cannot achieve everything by themselves. There is already a financial crunch for investing in and improving basic facilities like education, health care and infrastructure projects in roads, power plants etc. Few governments have ready-cash for investing in IT-infrastructure projects.

Therefore, governments are taking advantage of the complementary strengths of private players to achieve the best results in the shortest possible time.

In fact, e-Governance projects are infrastructure projects requiring large investments into an area that is not the Government's core competence. Moreover, there are multiple risks involved in such projects. These risks are mainly technology risks, financial risks, operational risks and user acceptability risks. Therefore the governments need to leverage its limited resources, which is where private financing and operating skills come in handy.

Finally, comes the issue of change management. Although most governments who have seriously started off on the path to e-governance are aware of the perils of ignoring change man-

be developed by identifying the common applications that needs to be rolled out. The workshop approach also helps in creating an appropriate technology architecture that can be centralized as apriori the government can get a view of the total requirement of all the departments.

Finally, the workshop helps in getting the buy-in and ownership for the solutions so that during the actual implementation of the solution, the departments extend their full support to the project. This is absolutely critical as such large and complex projects are highly people dependent.

India is being looked upon as a source of innovative low cost e-governance solutions that are appropriate for countries besotted with poor physical infrastructure around the world. So not only should we be developing and implementing the best-in-class solutions for e-governance for the sake of a more efficient government and consequently a more efficient domestic economy but also because it is our responsibility to be the thought leaders in e-governance in order to help out countries facing similar socio-economic issues. And of course, no one is in doubt that the Indian central, state and local governments will stand up to this challenge, but the issue is how efficiently and how fast can they show the results. ▯

The Unc

OK. The picnic is the decision to make … and the factors are the rain, and the ants … which love humidity.

Rain means no picnic… The ants could ruin it too. And they love humidity.

It's raining now

You may or may not go for that picnic tomorrow.

It's still raining.

If it rains for some time, perhaps it keeps raining?

Looks like you may not go.

It's humid as well.

There's a good chance of ants, and so no picnic.

It's stopped raining.

Better chance of going.

It's still not raining, and it's not so humid.

Some rain means it keeps raining and once it stops, it stops. Humidity – no correlation to the rain.

Hey, the rain seems to have gone! But it's humid again…

I was right about the rain stopping for good. But the humidity is definitely random.

It probably won't rain, but I don't know about the ants.

Mahesh Benkar

If a spammer sent you an e-mail with a subject line that said, "Your mail storage limit has changed," you'd probably open it, wouldn't you? You wouldn't know it was spam until you opened it… but CRM114—the Controllable Regex Mutilator—would. And it's 1,000 per cent more likely to classify the e-mail as spam than humans are. CRM114 is a spam killer that employs Bayesian Learning, a technique that's getting increasingly popular in spambusting.

Largely ignored so far, the possibilities afforded by Bayesian Belief Networks (BBNs) and Bayesian Learning (BL)—learning in BBNs—have only recently begun to be explored.

Spam detecting and search enhancing is just the tip of the iceberg when it comes to the possibilities of this technique, which, though it made its debut in 1984, had its basic theoretical foundation spelt out 250 years ago.

BL is a process whereby a machine is trained on past data so it can come to decisions about the future. The basic idea is that the likelihood of something happening can be estimated by how often it happened in the past. These decisions—that something will happen, or that something is true or false—are probabilistic and are

End of **Certainty**

Experience is the best teacher, but not in technology, until recently. Find out how a 250-year-old theorem is being employed in today's systems to make use of the knowledge of the past

never a surety, but more a recommendation. For example, a Bayesian learner might say, after observing the weather, that it'll be sunny tomorrow, with an 80 per cent probability. Though it might well rain the next day, the 80 per cent probability is a certainty. It's up to us to decide how to react to it. Some of us might disbelieve it, others may plan a trip to the beach, while still more might toss a coin thrice, and only believe the 'sunny' outcome if the coin turns up tails twice or more.

So, a Bayesian learner can predict outcomes based on data. But so can Neural Networks (NNs), and various other AI models. What's so special about Bayesian? To begin with, a Bayesian learner can make predictions incrementally, that is, as more knowledge is fed into the system, the system's prediction changes instantaneously. Secondly, BBNs are not 'black boxes' like NNs, where no one can know what's going on in the system. Also, NNs generally give yes or no answers, while a probabilistic estimate is often preferable. With BBNs, the 'answer' is updated as soon as data is updated, which is not the case with NNs. BBNs are more robust than rule-based methods and other statistical methods. *(See box 'Method Madness')*

Where have I seen a BBN?
Wherever anything needs to be predicted, and wherever a pattern is to be found, BBNs can work. Both these—prediction and pattern finding—can come from learning from the past; when you observe something over a period of time, you can predict what's going to happen, and find patterns in what you've observed.

Bayesian methods you see every day include spam filters and also the cute but immensely irritating assistants in MS Office. The Office assistants learn from the mouse clicks you make, the text you enter in your searches, and such. Printer troubleshooters, too, benefit from Bayesian knowledge.

Have you noticed how personalised content delivery on the Net seems to

---

Method Madness

Here's a comparison of three learning methods: rule-based methods (make and find rules and stick to them), Neural Nets, and BBNs. An example application is spam filtering. Suppose a rule has been learnt by all three systems, a rule that says that any e-mail with the word 'debt' in it is spam. And now, suppose you work for a debt-consulting agency for just three days, so all legitimate e-mails contain the word 'debt' in them. You want to classify these mails as 'not spam'. What would happen in each case?

Rule-based learning	Neural Nets	BBNs
You would have to change the rule manually, and after the three days, the system would need to relearn the rule from scratch.	The system gives a yes or no answer about spam, and it would take a lot of learning—many e-mails—for it to learn that your new job mails aren't spam.	The system only gives probabilities. And, after you get a few e-mails with the word 'debt' in them, and you say they aren't spam, the system would look for other factors in those e-mails that make them non-spam.

increase by the year? Cookies are becoming more ubiquitous. News sites offer personalised news. When you make a purchase at Amazon, it makes a list of 'similar items'—items bought by others who made the same purchase. The recommendations aren't based on only that list of similar items, but also on what you've bought before.

In an interesting twist, even spammers deliver spam based on the last few messages you opened. Advertisements are delivered to your browser, based on what ads you clicked on before. Bayesian techniques also promise to infuse search with an unheard-of degree of personalisation, since there's a whole lot of data that the user enters—search queries that patterns can be derived from. Microsoft and Google are already looking at Bayesian search.

From Bayes' theorem to BBNs

To see how BL works, an understanding of Bayes' theorem is essential. Suppose we know the probabilities of three things—that of catching a cold (A), that of catching a fever (B) and that of catching a fever if you already have a cold (C). Bayes' theorem says that the probability of someone with a fever having a cold is simply C times A, divided by B. Things such as A, B and C are called events; and in BBNs, events are represented as nodes in a graph, with their associated probabilities.

Data about events—their probabilities, whether they took place, etc—are 'pumped into' the nodes. When data comes in at one node, it is sent to all other connected nodes. The network is updated each time a node receives fresh data.

Let's add two variables to the fever and cold example—flu and pneumonia. A BBN

is typically drawn such that if a node is beneath another and connected to it, it is dependent on it—for example, a cold can cause a fever, so the 'fever' node would be above, connected to the 'cold' node beneath. Now, for example, say we know that pneumonia causes fever, and that flu does not. If the patient contracts a fever, data gets pumped into the 'fever' node. The 'pneumonia' node is affected by this, gets updated, and the 'belief' of the network is set to new probability values—the 'pneumonia' node would now have a higher probability associated with it. On the other hand, the 'flu' node would not be affected. Dependencies can also be deduced by the system: if, often, the 'flu' node is often sent a value of '1' just after

The Rev. Thomas Bayes

An English theologian, Thomas Bayes was a Presbyterian minister who happened to be a very good mathematician. He argued that the existence of God could be deduced from equations. He wrote an essay on his theory of probability, which was published by the Royal Society in 1764. He also set out a method of deducing the future from past events.
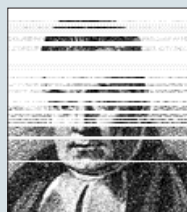
His findings and methods have always been controversial. And Bayes' theorem, as such, was not published until after his death.

Read My Lips

Researchers have found that adding lip reading to conventional speech recognition (SR) makes for better accuracy, especially in noisy spaces. And Intel has come up with software—Audio Visual Speech Recognition (AVSR)—which, combined with Intel's OpenCV computer vision library, lets SR programmers build lip reading into their software. The AVSR combined with OpenCV can detect one face amongst several, and observe that person's mouth movements.

the 'fever' node is sent a value of '1', the system may deduce that fever causes flu.

Bayesian Learning is essentially the process of the network changing its values, based on the values that are pumped into certain nodes. Each and every causal relationship need not be specified in a BBN: the network can deduce likely dependencies on its own.

A system called PicHunter gives a flavour for how Bayes' theorem can work in real life. PicHunter finds a picture based on certain parameters: a picture that comes under a certain category, or a picture that looks like another, etc. Now, say you want to find a picture that looks like one of a certain dog. You look at some pictures, and say 'hot' or 'cold', based on whether the picture shown to you is similar or not to the one you're looking for. A non-Bayesian system might analyse the pictures you choose, and try and find the one you're looking for based only on that. PicHunter finds a pattern in the sequence of pictures you've been choosing, and builds your profile. The problem is changed from that of finding the picture to the problem of building a user profile! Once this user profile has been built, it's a matter of comparing it to PicHunter's model of what users would do if they wanted a particular picture, and thus delivering the correct picture.

Damn that spam!

Spam filtering is hot right now. It won't be, if Mr Gates' proposal of ISPs charging a penny per e-mail sent is implemented, but that doesn't seem likely—and so we have a whole bunch of commercial and open-source spam blockers, each claiming to be the best. Several of these use BL as part of their repertoire of methods. Anti-spamming is ideally suited to BL, because it →

Computers To Mature With Experience

Intel's new Probabilistic Networks Library (PNL) and Open Source Machine Learning Library (OSML) are collections of software using which computers might be able to learn from experience. OSML is free, and is available from Intel's Web site. Machine Learning (ML) is the discipline dealing with, of course, machines learning, and thus being able to make predictions, among other things. And BL is a methodology that's being increasingly embraced by ML folks.

OSML is basically a toolkit, which incorporates Bayesian Learning methods, for designers of computers

and robots. The PNL and OSML can also be used in enhancing applications, for example, gene-database searching, and, of course, spam classifying.

Using typical Bayesian phraseology, David Tennenhouse, Intel's Director of Research, says, "Computers need to be able to learn from their experiences with users, and the world around them. Using new statistical methods to identify key patterns, these systems will start anticipating the needs of their users and pre-computing responses to the most likely questions, so that the answers will be instantly available the moment they are needed."

involves patterns and predictions.

Accuracy is of paramount importance: if you thought a filter with 99 per cent accuracy is good enough, think again. You'd rather wade through a hundred spam e-mails a day than lose that important e-mail from your boss, or worse still have your boss classified as a spammer and blocked without your knowledge. Spam classifiers can botch things in two ways: classifying non-spam as spam, called false positives, and spam as non-spam, called false negatives. The latter is certainly preferable to the former; but we wouldn't want too many of either. Another problem is that people tend to rely on and trust their spam blocker too much, and to not double-check those marked as spam, for false positives. Accuracies, therefore, need to reach something like 99.99 per cent. Bayesian spam blockers learn from what you tell them, improving their accuracy every day.

Consider some of the things that make Bayesian filters more effective than traditional techniques:

These filters see causal connections. So, if the word 'debt' is evidence of spam, but the phrase 'get out of' is not, Bayesian filters would notice, all by themselves, that e-mails with both these in them—as in 'get out of debt'—are spam.

They evolve with spam. As spammers' techniques change the filter adapts. Even if the spammer starts saying "Get 0ut of debt"—with a zero instead of an 'o'—the filter would notice, because of the pattern in the other letters.

Since they are aware of causal connections, both 'good' words as well as 'bad' words contribute to the decision.

ERIC HORVITZ
Senior Researcher,
Microsoft Research

> " I believe that probability is at the **foundation** of any **intelligence** in an uncertain world where you can't **know** everything "

'Gleeful' or 'Bayesian' hardly occur in spam, and this makes as much of a difference to the learning process as words such as 'debt' or 'xxx.'

Two open-source spam killers are SpamBayes and PopFile. SpamBayes is different; in addition to 'spam' and 'non-spam,' it can assign an 'unsure' classification too—so there's virtually no risk of losing a good e-mail. PopFile uses a Naïve Bayes classifier (NBC). An NBC operates taking only two factors into account: the number of spams you receive, and the ratio of the probability of any word in the dictionary occurring in spam versus that of it occurring in non-spam. If 'debt' occurs with a 40 per cent chance in spam, and with a 2 per cent chance in non-spam, this ratio is 20. Surprisingly, even using just these two factors, NBCs are very effective.

As an example of how effective Bayesian searching and classification is, consider these: Microsoft plans to incorporate Bayesian in Longhorn for search and other functions. Netscape 7.1 includes Bayesian anti-spam. AOL is now using Bayesian to kill spam. Jim Nail, a Forrester Research analyst, believes this is a more sophisticated approach than others: "The tools in the 9.0 release could be a major improvement… I don't think spam has become a game-loser for AOL just yet." And Paul Graham, designer of the Arc language and a major crusader in the spam battle, says: "Of all the approaches to fighting spam, from software to laws, I believe Bayesian filtering will be the single most effective."

Bayesian everywhere

In biology, researchers are using Bayesian to determine previously unsuspected correlations between symptoms and diseases. Also, searching through gene data, correlations between genes and cell behaviour have been found. Such correlations are useful in cancer research, for example.

Bayesian prediction naturally finds wide application in the fields of finance and commerce. Stocks and shares are unpredictable, and it's intuitive that there are hidden patterns at work, which makes the stock market an ideal candidate for Bayesian intervention. A real-world example of a BBN at work in finance is Bayes-Credit, which is used for predicting the risk that a corporate will crash within a given timeframe.

In addition to being able to read people's lips, Bayesian learners can also find what a subtle change in a person's gait can mean. Certain changes mean an impending stroke,
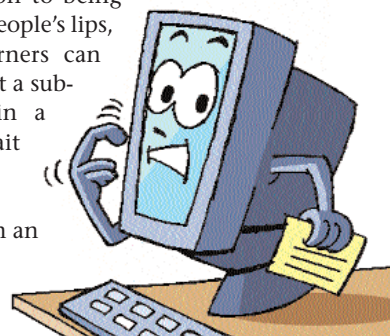
He's Probably In The Shower

Microsoft's Notification Platform (NP), part of .NET, employs Bayesian techniques. The NP will enable cell phones and computers to automatically filter messages, schedule meetings without human intervention, and find the best strategy to contact someone. An element of the NP called Coördinate can gather data from keyboards, personal calendars, sensor cameras, etc, to create an entire 'person profile.' In this profile, one can expect to see the person's schedules, the time and duration of work hours and lunch hours, what kind of messages he sends and receives, and so on. The NP then uses this profile to arrange for the best possible time and place to deliver the information, or notification.

Say you want to contact someone: you get onto the NP, and declare that you want to contact Mr X. The NP will first identify you, then Mr X, decide whether he's busy or not, what kind of communication he'll prefer at this time of the day, etc. It'll then advise you of the best mode and time to contact Mr X.

If the NP turns out to be a success, 'context servers' could be next: electronic butlers that'll help people organise their information and their schedules.

researchers have found, and the person can be warned. Along the same lines, a security camera can feed a Bayesian learner that can then learn to identify suspicious persons at airports. For example, if someone gets out of a car and waits uncertainly for a long time before entering the terminal, it might mean a potential troublemaker.

Intel's robotics branch has an ongoing project that focuses on building Bayesian control systems that will help create more intelligent industrial robots. And robots are being taught, in Bayesian fashion, to navigate more effectively.

Bayesian inferences come in useful where individuals need to make strategic decisions of a certain kind repeatedly, for example, pricing policies, or military strategising. As the number of decisions made increases, Bayesian inferencing makes it easier and easier to make the next.

Bayesian is probably here to stay

Dr Marina Meila of the University of Washington says, "Bayesian inference is to statistics what the thermodynamical laws are to physics"—not fitting in nice-

http://www.gametheory.net/Mike/ applets/Bayes/Bayes.html
A cool applet that demonstrates Bayes' Theorem. It enables you to answer the question, "How worried should I be if I tested positive for a particular disease?"

http://dmoz.org/Computers/ Artificial_Intelligence/Belief_Networks/
A comprehensive collection of links to resources on Belief Nets, including BBNs.

http://excalibur.brc.uconn.edu/~baynet/ fieldedSystems.html
This page lists some real-world systems that employ BBNs.

http://yudkowsky.net/bayes/bayes.html
An intuitive explanation of Bayesian reasoning, which provides a great non-technical understanding of how all things Bayesian work.

http://crm114.sourceforge.net/
All about the Controllable Regex Mutilator, or CRM114.

ly with the rules, somewhat startling, but intuitive all the same.

It took centuries before Bayes' rule was conjoined with graphical methods to result in BBNs. And it's taken years for BBNs and Bayesian reasoning and learning to be taken as seriously as they are today. This is partly because probabilistic decision-making has been viewed as something dark and untrustworthy.

In the mid 90s, 'Fuzzy Logic' was much hyped; a phrase that was bandied about as the method of choice for almost any AI problem. Anyone talking loudly about fuzzy logic was looked up to and taken very seriously. Of course, fuzzy logic is employed today in several problems, but there was more hype about it than was warranted.

So are 'Bayesian Learning' and 'Bayesian methods' just buzzwords in today's AI and other scientific communities? Probably not. To quote Eric Horvitz again, "This is a foundation… it was overlooked for a while, but it is a foundation for reasoning."

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SoniqCast Aireo ▶▶
Peerless Wireless

Armed with a 1.5 GB micro hard drive, a 1.5 GB capable Secure Digital (SD) slot, an FM radio receiver and transmitter, the tiny Aireo supports MP3 and WMA, and also doubles up as a storage device. Unlike others in its class, this SoniqCast uses Wi-Fi connectivity to link to your playlist on your Wi-Fi enabled PC and sync with it! Now doesn't that tempt you to junk your iPod? Truly portable, get it to sit at home on your tabletop or on your car's dashboard.
Price: US$ 300 (approx)

Dancing in the Street

All you road warriors out there—get set to burn down the highway with the best in portable audio and video this month

Altec Lansing InMotion iPod speakers ▶▶
iPod boom box

Of course, you may well choose to keep your iPod and use this powered add-on audio system to make it sound even better! The high-powered amplifiers let you boom your mixes across the street, and the built-in iPod dock means that you can use the sync and data transfer options as well. With a total power of 4 W RMS, this pocket blaster may look tiny, but makes a big sound. An added plus—run the system through the power mains and charge your iPod as you hear it rock.
Price: US$ 149

◀◀ Samsung 'yepp' YP-910GS Napster Digital Audio Player
Yep, it rocks

Samsung's newest portable music maker has 20 GB of hard drive space, a built-in FM transmitter, and also acts as a backup device. The yepp comes with built-in USB 2.0 support, and a charming feature—direct MP3 recording. Connect the line-out from your tape player or LP and make MP3s on the fly—no PC needed! And yes, yepp connects seamlessly to the re-born Napster 2.0 service!
Price: US$ 349.99

Roku SoundBridge Network Music Player M1000 ▸▸
Tap the music, silently

Roku's SoundBridge Network Music Player is made for all those digital music junkies who need to stream their Mac and PC-based files all over the house. No moving parts here; it comes with 16 MB of DRAM, wired Ethernet support as well as a slot for a Compact Flash Wi-Fi card to connect to your Wi-Fi enabled PC. Connect this to your home theatre either through the optical digital output or the coaxial digital output. Control the music through the infra-red remote, or use a handy PC interface—either way, your music will follow you.

Price: US$ 249.99
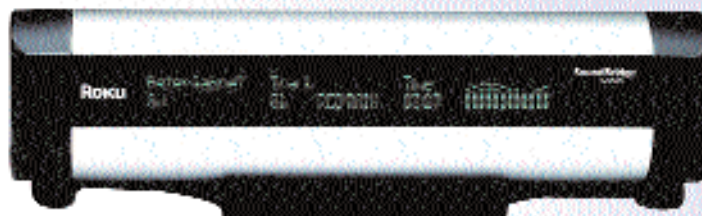
◂◂ Rosen Entertainment's A9 All-In-One Mobile Video
Video cruise control

For road warriors, there's nothing like this car roof-mounted Rosen that lets you view DVDs as you drive down. Its drop-down bright 9-inch 16:9 wide LCD screen is designed for easy viewing. The A9 also supports MP3 and CD audio as well. Control everything through the included wireless remote.
Price: US$ 1400 (approx)

Archos AV380 Video Recorder, with the AVCam 300 and DVR 100 ▸▸
Handy studio!

This feature-rich handheld will leave you gasping for more audio and video. Its monstrous 80 GB hard drive lets an incredible 250 hours of DVR video or 4,000 hours of audio recordings sit on it. View photos, watch MPEG4 movies on its clear 3.8-inch TFT display or connect it to a TV for large screen output. Connect the AVCam 300 and shoot your own live videos, or use the DVR 100 and record straight from a VCR. It also reads the DivX and XviD video formats!
Price: US$ 899.95+ US$ 199.95 (AVCam 300) + US$ 59.95 (DVR 100)

◂◂ HandHeld Entertainment's ZVUE! Personal Video Player
Zounds! What videos!

This Motorola Dragonball-powered compact full colour video playback device is made for all you video junkies out there. The screen features a resolution of 160 x 234, with 24-bit colour. It's also compatible with SD and MultiMediaCards (MMC) cards. The TFT LCD screen lets you view videos even in bright sunlight, at 15 fps. It features full MPEG4, compatibility and also has proprietary format cards for secure video.
Price: US$ 99

Banking
on technology

Customers have never had it this good as banks go all out to woo them. A look at what Indian banks have on offer…

Pop in your ATM card and it takes less than five seconds for the bank's computers to respond to your request, but Yudhishthir Chede isn't really thinking of that as he checks his account and withdraws cash. If you bank with HDFC, for instance, all the ATM, Internet and phone banking queries that you make worldwide are routed through the core customer-banking database in suburban Mumbai. In fact, with many Indian banks today, it doesn't matter where you are, or how you choose to connect—you always get service, anytime, and just about everywhere. Welcome to banking in the new millennium; the customer is king here!

Banking has moved a long way from the 19th century. However, the kind of services that we customers have come to take for granted have been a recent phenomenon as private and public sector banks go all out to woo customers with quality services. Even a decade ago, you'd be standing in a queue and waiting for service; today, you conduct transactions in seconds at the press of a button or the click of a mouse.

Computerisation is working
"Automation has come forth as a by-product of business requirements," says V Chandrasekhar, CTO, Bank of Baroda

(BoB), one of India's largest public sector banks.

His bank has an enviable record, having been recognised internationally for its remote banking services. Microbanker Online magazine awarded BoB the Best in Remote Banking award in 2001. As a matter of fact, banking operations today aren't different from those at cutting edge network operations centres.

At HDFC, for instance, bankers manning the operations at their worldwide data centre are technologists to the core. They monitor the centralised banking database, the core

Atul Deshmukh

banking system of the bank and ensure that services are up round the clock all day, all year long.

Banking's real push to reach out and become more customer-friendly was brought about by private sector banks, who started by targeting customers who maintained larger bank balances, and then progressed to reaching out to large numbers of urban customers.

All banks are moving towards setting up core systems that will integrate their retail and corporate banking operations, and all associated services. Nationalised banks are also computerising and consolidating their operations, and offering customers the same levels of service that private banks offer.

The bottomline—the only way to retain your customer is to give them quality services. Consolidating all their operations around the core banking system has meant that banks can now offer universal access to funds and other banking services around the clock from anywhere across the globe.

You can access your account using an ATM machine, the Internet, a phone, and effectively, bank without walking into your bank. How do customers find this? Exciting at the very least…

Anytime money

Bankers agree that ATMs are fast becoming the main point for customers interaction. A senior SBI official pointed out that in certain branches, the load on the staff has come down by almost 70 per cent. This is a phenomenon that's been happening across banks.

Private sector banks also see their customers interacting through the ATM. Today, ATMs offer you several services besides cash withdrawals. Services that Krishnan Raghavan, a software developer in Mumbai, prefers to utilise often. "I really like the idea of ATMs," he says, and points out that most of his primary interactions with the bank take place through the ATM. He's been banking with ICICI for several years now and has absolutely no complaints on any front. He withdraws and deposits cash and cheques, monitors his balance, and routinely takes bank statements, all over the ATM.

Ask him about any additional services he would like to see, and he says he thinks the tie-up of VSNL with ICICI, allowing the bank's customers to debit their accounts directly to pay for their ISP accounts, is pretty cool. He goes on to say, "I'd be using this service when I run out of access time on my VSNL account. All I

V CHANDRASEKHAR
Chief Technology Officer,
Bank of Baroda

Blind computerisation doesn't help; there has to be a **carefully charted** out **business strategy** to provide **improved** services to **customers**

have to do is go there and get the amount debited, and then use the serial number on the generated receipt to update the account. Simple."

Customer concerns

Customers do have their grouses though. One of them is the ATM network. While ICICI customers such as Raghavan are satisfied with the ATM network, Citibank customer, Yudhisthir Chede, isn't too pleased with the Citibank ATM network. "There's one located near IIT Bombay and the others are quite a distance away". Banks are listening to customers like him; Citibank, for instance, lets customers conduct transactions a limited number of times from other ATMs free of charge. HDFC has over

Core Banking for The Public Sector and Private Sector

Private banks such as HDFC Bank have started off by computerising all their branches and networking them to the core banking system. So, you can walk into any branch and get your work done. Most PSU banks have gone in for computerisation at the branch level, and have only now got down to networking individual branches and setting up core banking systems.

At Bank of Baroda, for instance, even as the core banking system is being set up, the individual networked banks work on a smart solution.

During banking hours, the customer communicates with the branch for any ATM, Internet or phone banking transactions. At the end of banking hours, all this data is uploaded to a central database, after which, till the start of the next business day, the customer conducts transactions with the central database.

As the banks open the following day, all this data is transferred back to the individual branches, which then update their records.

850 ATMs, and BoB 140. However, ATM alliances haven't really matured, and using another bank's ATM almost always invites a service charge, except for privileged customers.

Other concerns have more to do with the limitations on the ATMs themselves. Kiran Khade is a young businessman who deals in timber, plywood and aluminum, and his bank, Abhudaya Co-op Bank, handles some of his business transactions.

He prefers the ATM to walking into the bank any day, but has a problem—he doesn't like the Rs 10,000-per-day limit imposed on ATM transactions. He points out that if he has to make larger cash payments, he either withdraws over two days or pays a visit into the bank. Indeed, business-related transactions are grossly limited by debit limits on the machines.

However, most banks do score on services offered. Chede regularly uses ATMs to top up his pre-paid mobile phone credit, and hasn't bothered to hop into a store to pick up recharge coupons—he can fill up the amount of his choice at the ATM. Overall, Chede is satisfied with the service he gets, and has also opted for a credit card from the same bank.

What really impresses him about the services is the quick response. Chede has never had credit card bills coming in late, and is gung-ho about banking in India. "It's definitely changed, banks have become so people-friendly today as compared to the old times," he says.

Net money

Internet banking is another place where changing times have made a difference.

Banks appear to be tripping over themselves to give users services over the Internet. The initial level of service provided by banks are, for instance, account checks and

YUDHISHTHIR CHEDE

Web Associate,
TransWorks Information
and Citibank customer

> I'm **satisfied** with the kind of **banking services** that we have at our disposal **today—vastly different** from the **old days**

getting balance statements, cheque book orders, transfers to other accounts and so on. Recently, several banks tied up with billing companies to provide a uniform interface to pay utility bills such as telephone and power bills.

At HDFC's Net banking portal, for instance, you can pay your mobile phone, landline and electricity bills, and also pay your LIC premiums and update your VSNL account. Other features include setting up a Demat account. You can also apply for a

loan by filling up forms online—the bank contacts you for further information.

There are other customer-friendly initiatives as well—for example, the OneView service lets customers having accounts with HDFC, Citibank, ICICI, HSBC, Standard Chartered and Global Trust Bank use a single window mode of access for inspecting their account details. This is an example of the ease of Internet banking, where you can access various accounts across six banks, and side-by-side check out your credit card balance or the balance in your Demat account.

Public sector banks, too, are providing online banking features. For instance, SBI lets you buy railway tickets at the Indian Railways ticketing portal and pay directly through your Net banking account; institutions such as IIT-Madras allow you to pay tuition fees online through an SBI Internet banking account.

Yet there's a fundamental problem with adopting this. A senior MNC bank IT manager pointed out that it's primarily ignorance, and the fear of weak security, that keeps people away from using Net banking. Customers aren't always all that upbeat either—Kiran Khade, for instance, doesn't like the idea of automating bill payments monthly through the bank. "I wouldn't know at what point of time during the month my bank balance goes down to zero", he jokes, and says that he is more comfortable signing cheques instead.

Chede, on the other hand, enthusiastically uses Internet banking facilities such as making drafts. "It is bit more expensive," he says, "but Citibank made it easier for me by despatching the draft where I needed to send it, saving me the time." Raghavan thinks that bill payments are a great idea, and says he'd prefer doing that. It also translates to additional revenues for banks since every transaction done through them benefits the banks financially, and there's not a bank that isn't tom-toming it.

Calling for cash

Phone banking is as simple as dialling your bank's helpline number, authenticating, and then accessing standard banking functions such as procuring account statements, making fund transfers, and asking for cheque books and drafts. Banks also allow you to set up mobile phone banking. With this, you can set up SMS alerts to make account transactions and enquiries. It's a useful feature that comes out as a

The PSU dilemma

PSU banks have had a two-fold responsibility—one, to maintain their financial health, and the other, to fulfill the social obligation of letting customers bank with them, regardless of the profitability of the business, employing large numbers of people. This has typically meant that PSU banks have been slow in computerising their work process, typically because of their larger customer base and internal staff strength. Owing to social responsibility, PSU banks are forced to maintain unprofitable branches in both rural and urban areas. An SBI official told us that 70 per cent of the profitable business is conducted by 20 to 30 per cent of the 9,000-odd branches. The flight of customers hasn't helped; now PSU banks are gearing up to provide the same level of retail-banking services that private sector banks provide to keep their customer base intact. It has also meant that at this point of time, large amounts of money (several hundred crores for each bank) are being invested towards consolidating their services.

How your buck moves

When you interact through an ATM, there's a two step validation process. First, the ATM validates your card by reading it in, after which the customer authenticates it by entering a Personal Identification Number (PIN). This immediately connects you to the bank's core banking system, after which you can conduct transactions. The ATM communicates with a local gateway through secured links—either a leased line or a satellite communication link—which forwards the request to the central gateway, and from there to the servers that house the core banking system. For Internet banking, you log into the Internet banking site with a username and password. After authentication, the online banking portal securely connects you to the core banking system servers. Phone banking works the same way, with customers dialling up the bank, entering details through the automated interface, and then either conducting transactions or talking to a banking official. Irrespective of the mode of interaction, the customer ultimately connects straight to the core banking system.
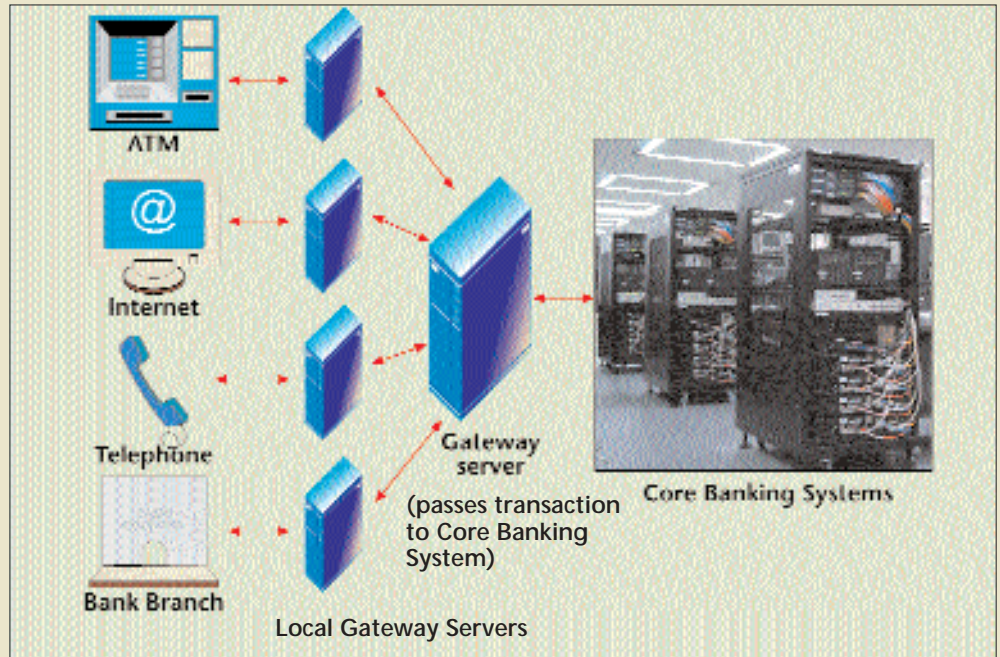
ATM

Internet

Telephone

Bank Branch

Gateway server (passes transaction to Core Banking System)

Core Banking Systems

Local Gateway Servers

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result of a "mature customer market," as Chandrasekhar would tell you. Chede regularly uses this—"It lets me monitor the balance in my account," he says, and points out that at the cost of an SMS, he can be anywhere and yet be checking back with his bank. In fact, phone banking is rapidly becoming a mode of interaction that banks intend to promote; both BoB and HDFC Bank for instance, goes a step further by offering WAP banking.

Mobile phone banking services are network-dependent, though, and work through tie-ups with mobile providers.

Walking in

Ask customers when they last visited the banks they maintain accounts with, and they aren't too sure. Take cash withdrawals, and it's a far cry, as V Chandrasekhar would himself say from the times when encashing a cheque meant spending at least an hour at the bank.

Raghavan says he visited ICICI's bank branch about six-odd months back, to get some account details. "Otherwise," he quips, "I'd probably go there to see the folks and keep in touch!" There are some transactions where it's inevitable to head for the bank. For instance, making an international fund transfer is one. It works on a system called the Society for Worldwide Interchange of Fund Transfer (SWIFT), where a bank employee at one end enters the transaction on a machine securely linked to a bank at the other end.

SWIFT merely needs the employee to fill in the debiting and crediting account details, and the transaction is complete. Chandrasekhar points out there's even more automation along the way for banking operations. Bankers are excited about the real time gross settlement (RTGS) that will enable inter-bank fund transfers, traditionally routed through an Reserve Bank of India (RBI) clearing-house, to happen faster.

RBI itself is spearheading the RTGS implementation, and individual banks are implementing it too. This means that the RBI will maintain individual clearing accounts with the participating banks and hence enable faster transactions. As Chandrasekhar puts it, "For the customers, this means quicker inter-bank fund transfers, and for the banks, it's a step towards paperless transactions."

The future of banking is an interesting study in prediction, yet there are ele-

ments already coming in. From the banker's side, the CTO of a large MNC bank says, "I'd like to see all of our customers using the bank's Internet and phone banking services to pay for anything, be it groceries or school fees—it benefits the customers and us".

For traditional bankers too, there's a reason to change. Chandrasekhar points out that public sector banks have made huge investments in human resources, and now the front-office banking officer's job is fast changing from a clerical post to that of an investment adviser.

"I'd soon see my workforce advising customers where to invest their money," he says, "rather than just tell them details of their accounts." Banking services, as he says, "are seeing an exciting phase of change as we generate more revenues with increased services, and with the tools of modern banking, we can maintain our social obligations and yet offer customers quality services, second to none."

Indeed, it looks like the customers are on a roll, on this wave of customer-oriented services—as they go laughing all the way to the ATM. ▣

SRINIVASAN RAMAKRISHNAN
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How we Test

It looks good and the technology is glitzy, but does it do the job?

To ensure that our readers have all the information they need to make an informed buying decision, reviewers at the Digit Test Centre conduct comprehensive tests to evaluate the latest hardware, software and technology services in accordance with international standard evaluation processes and methodologies.

Our test results may be presented either as Comparison Tests, or as individual reviews in the Bazaar section. The representation of the results is different for each in the interests of clarity, but the test process for both is identical in all respects.

Of all the products we test, only the best make it to the A-List.

Comparison Tests

In the comparison tests, we compare the performance of products within a particular category. Each product is evaluated under different parameters such as performance, value for money, features, ergonomics, etc.

Weightages are then applied to the various test parameters according to their importance for that particular category of products. These weightages are then used to arrive at scores for features, ergonomics and performance for each individual product. A detailed test process is included with each comparison test, and explains the parameters that were taken into consideration, along with weightage allocation and reasons for the same.

In Bazaar

The evaluation of products in Bazaar also covers the same parameters such as performance, ease of use, value for money, build quality and features of the product.

Here, each of these parameters is rated on a scale of 5, which is represented by arrows (->).

The greater the number of arrows, the better the product. This simple five-point rating system is designed to give you an easy-to-interpret assessment of a product. For example, a product that receives a value for money score of five arrows signifies an outstanding buy.

The Awards

Digit awards outstanding products by selecting a Best Performance and Best Value winner in each comparison test. The winner of the Best Performance Award will be the product that scored the highest in the performance segment combined with rest of the package including features, ergonomics, bundled accessories etc. This award represents the best performing product in our tests in terms of the complete package that is offered to a customer. The winner of the Best Value Award will be the product that scores the highest in our value for money parameter which is derived taking into account the ratio of a product's ergonomics, performance and features to its price. The product winning this award offers a good combination of performance and features at a great price. Since value for money takes into account all scores for all parameters including the price, this score will be used to arrive at a grade (e.g. A+) for each product.

The 5-point Rating System used in Bazaar	
▶ ▶ ▶ ▶ ▶	**Excellent:** A brilliant combination of price, performance and features—far beyond expectations
▶ ▶ ▶ ▶ ▶	**Good:** A good buy, better than most products in its category
▶ ▶ ▶ ▶ ▶	**Average:** Reasonably competent but nothing spectacular about the product
▶ ▶ ▶ ▶ ▶	**Mediocre:** Does not live up to expectations, needs improvement in many areas
▶ ▶ ▶ ▶ ▶	**Poor:** has serious drawbacks and needs improvement before it can be used for its target application

(Ink) Jet, S

Quality. Speed. Cost. Colours. Four brands. Fourteen models. We compared them so you can make an informed choice

et, Go...
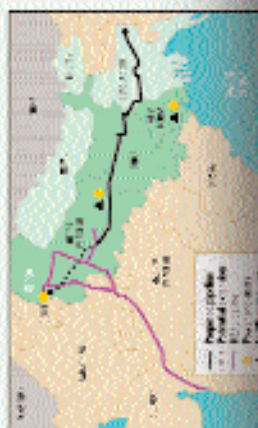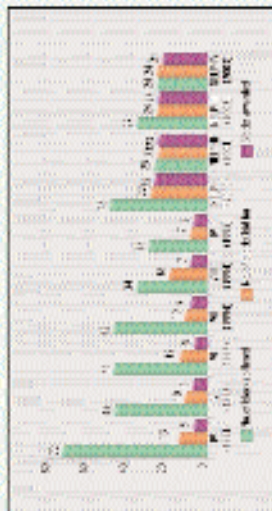
Quick! Tell us about some childhood memories. Ummm, ok. Kindergarten? Yeah. Being punished in class for talking too much? Hide and seek at the local playground? That was fun. The do-it-yourself colouring book?

Cut to last week. You now have a job, and your friend runs a small business. You meet again, and you realise that the only thing that still binds you to your childhood is colour. Does it really matter that you're a high-flying executive, or that your friend runs a profitable SoHo business?

In school, you had to impress your teacher. At work, you have to impress your boss or the client. So, we come back to our basic premise—no matter where you are, colour is more than just a small component. And what better way to express colour than a well-printed and well-presented document. Colour printers are no longer expensive marvels that sit in a corner, with only the privileged few getting access. For small, yet thriving businesses, printers are indeed engines of growth.

To understand what printers would suit small businesses, we tested five of the best available in the Rs 6,000 to Rs 10,000 range. What about a home user? For him, we reviewed six colour printers in the range of Rs 2,500 to Rs 5,000. Lexmark's Z605 was the cheapest, while Canon's xnu i255 topped.

On the other hand, we haven't concentrated on the ink cartridges, or consumables. Let's see why. The Lexmark Z605 printer costs around Rs 2,500, while its cartridges cost around Rs 1,800 for both black and colour. Now, if you replace cartridges more than once, you would be actually surpassing the cost at which you brought the printer. It is better to go in for refilled cartridges that are one-fourth the cost or a new one. Or buy a new printer.

These apart, we reviewed three others that could interface with a digital camera to take printouts directly. Although HP and Canon are strong in this particular segment, Canon has the upper hand in compatibility.

H ome Printers

Canon xnu i255

Designers touch

In text printing mode, this entry-level inkjet from Canon, which replaces the older xnu i320 model, was the fastest. The USB 2.0 interface shows its usefulness when printing the same text file in best quality mode—it was twice as fast as the others. Similarly, it printed the image file faster than any other printer in this category. The Canon i255 uses two cartridges and the black printout amounted to Rs 2.44 per page, whereas a colour printout costs Rs 1.44 per page.

On the print-quality front, it showed no jagged edges or smudging. The photo output had good colour reproduction, but overall it was dull and lacked the crispness shown by the HP printers.

Some cosmetic changes have been done to the original design, and it looks a lot better. The bright blue side panels of the older design have been replaced by better-looking grey panels. The Canon i255 comes with a foldable paper input tray that provides enough paper support. The lack of an output tray makes the design smaller. It was the only printer in this category to support USB 2.0.

Installing the printer is quite simple. All you need to do is connect it to the USB port and install the driver from the accompanying CD-ROM. The maintenance tab, in the Printer Properties dialog box, allows you to clean the cartridges, align the print head as well as switch off the printer via software. The status monitor was always wrong when displaying the amount of remaining ink.

Priced at Rs 4,500, the Canon xnu i255 is expensive, but if you need a quality printer, this is it!

+ Great quality printouts and looks good
- No output paper tray

Canon xnu i255	B-
Performance	
Features	
Build quality	
Value of money	

Epson Stylus C43SX

The last parallel samurai

The Epson Stylus C43SX is a spruced up version of the older C41SX. Available with both the USB and parallel interfaces, the one reviewed here is the parallel version—indicated by the suffix 'SX'.

As we expected, it was the slowest, a clear indication of its legacy interface. The Epson C43SX took nearly double the time to print text documents as compared to other printers. While printing combi-documents, it was able to beat some of the

better-configured printers. It took twice the time to print the test photo when compared to the HP and Canon, but was much better than the Lexmark Z605.

Quality-wise, the Epson C43SX was a complete letdown. Despite the rise in its optimised resolution, it couldn't match the print quality displayed by the Canon and HP printers. Jagged edges and smudging were clearly visible. The photo prints were good, with true colour reproduction, but were too bright. The cost for a black page came to about Rs 3.27, and the colour page translates into Rs 2.08 per page.

This model has undergone absolutely no cosmetic change compared to the Epson C41SX, and still offers the same, dated design. Nevertheless, the use of translucent plastic for the cartridge bay and output tray accentuate the otherwise dull looks. The top-loading paper tray can hold about 100 sheets, and the output tray does a good job of holding the printed papers together.

Installing the printer is quite simple and requires the accompanying parallel cable to be hooked on to the computer before you install the driver. Comparatively, the driver installation is not as intuitive as the ones from HP or Canon, but definitely not difficult either. The driver allows for cleaning and maintenance of ink cartridges, and the ink status indicator is fairly accurate.

Priced at Rs 3,250, The Epson Stylus C43SX is one of the cheapest printers available. Given the dated interface this printer has, it's the only available choice for people with legacy computers. However, do keep in mind the average print quality that is on offer.

+ Offers legacy parallel port
- Below par printing quality

Epson Stylus C43SX	B-
Performance	
Features	
Build quality	
Value for money	

Epson Stylus C63

A mate for the desk

The Epson Stylus C63 was a little slower than its younger sibling—the C43SX—in most of our tests. In text printing, it's reasonably fast, finishing second after the Canon i255. However, in all the other tests it lagged way behind the i255.

Both the printers from Epson perform below par when it comes to quality, but the C63 is better than the C43SX. The text does show jagged edges and smudging, but only to a small extent. Photo printouts reproduced every minute detail properly; however, the image just didn't seem vivid enough. The cost per black page comes to Rs 3.50, and a colour page costs Rs 2.

The Epson C63 uses four separate cartridges, which is good,

because you can replace only the cartridge that runs out first. It comes with specially-formulated ink that Epson claims to be water-resistant, and fade-resistant up to 80 years. A slight accident in the Test Centre proved that the printouts really are water-resistant.

The drivers are full-fledged, and allow for maintenance of the cartridges, etc. Another nice feature is support for both the parallel and USB interfaces.

It has a foldable paper-out tray, which fits nicely with the body when folded back. The translucent cartridge bay flap hides the cartridges, and also adds a touch of style to the otherwise bland plastic body. The paper capacity is around 120 sheets.

At Rs. 4,750, it's the most expensive in this segment. If you need a printer with decent output quality, and one that can do bulk text prints, look for the Epson Stylus C63 as a potential deskmate.

Epson Stylus C63	C
Performance	▶ ▶ ▶ ▶ ▶
Features	▶ ▶ ▶ ▶ ▶
Build quality	▶ ▶ ▶ ▶ ▶
Overall	▶ ▶ ▶ ▶ ▶

+ Good features, water-resistant ink
- Just decent quality printouts, a tad expensive

HP Deskjet 3550

The hippie

The HP Deskjet 3550 was neck and neck with the Canon xnu i255 in dishing out prints. In text printout at normal mode, the 3550 was faster than the i255 by 4 seconds. However, when the same file was printed in Best mode, the HP 3550 was almost four times slower than the Canon i255, the reason being its USB 2.0 interface.

Similarly, when the combi-document was printed in Normal mode, the HP 3550 did the job faster, but was beaten by the Canon i255 in Best printing mode.

One thing that will scare away potential buyers is the cost per page. A single black page sets you back by Rs 6, and a colour page works out to about Rs 4.

Both the HP 3550 and the Canon i255 set themselves apart from the rest of the crowd when it comes to print quality. The printed text document is as good as the ones from laser printers. Images printed from the HP 3550 were crisp, vibrant and all colours were reproduced truly. Contrast and brightness were optimum, despite the fact that no image enhancements from the driver were used.

The successor to the HP 3325, the HP 3550 comes very close to being the ideal home printer. Smaller than the Canon i255, the HP 3550 is better engineered. While Canon sacrificed on several functional things, such as the output tray on its i255, HP has built the 3550 to be small, but fully functional.

With the off-white and grey plastic panel, this printer had the best looks amongst all those compared. The foldable paper input tray tucks away under the ink cartridge bay. The same tray also functions as the output tray, and hence, human inter-

vention is required at times to separate printed papers from blank ones. The HP 3550 supports the USB 1.1 interface, but not the parallel interface. Installing the printer is easy, and the drivers offer good functionality. The ink-status monitor is the best amongst the lot in terms of accuracy and legibility.

Priced at Rs 2,999 plus taxes, the HP Deskjet 3550 is a good buy, considering its all round capabilities in terms of performance and quality, but do bear in mind that it has a high running cost. For a home where printing is irregular, this printer will do the job best.

HP Deskjet 3550	B
Performance	▶ ▶ ▶ ▶ ▶
Features	▶ ▶ ▶ ▶ ▶
Build quality	▶ ▶ ▶ ▶ ▶
Overall	▶ ▶ ▶ ▶ ▶

+ Quite cheap, good photo-printing capability
- High cost per page

HP Deskjet 3650

Face Off!

The HP Deskjet 3650 was no firecracker when it came to pure speed, but met the best of the crowd at eye-level. It was better than the HP 3550 in the text, combi-document and image printout speed tests. However, it certainly is no match to the superior Canon i255 that beat the hide out of it when it comes to printing heavy documents such as the image printout.

Quality was one aspect where the HP 3550 beat the HP 3650 hands down. Whether it's text documents or a full blown image printout, the HP 3550 yields better prints than the HP 3650. Both the printers reproduced every minute detail of the test photograph. The only parameter where the HP 3550 beat it is in colour reproduction. Like its younger sibling, the HP 3650 is an ink guzzler, and a single page of black will cost you Rs 4.50; a colour page costs Rs 4.

The HP 3650 attempts to look like a SoHo printer—everything right from the colour to the design, attempts to imitate a business look. But this attempt to be an office solution stops with its looks—the paper capacity of only 100 sheets and its features sends it back to the home segment. It comes with separate foldable paper tray for input and output, which neatly tucks away inside the cartridge bay. The separate output paper tray solves the paper problem associated with the HP 3550. Like its younger sibling, the HP 3650 interfaces with the PC via USB 1.1.

Installation was a breeze with no hassles. The driver remains the same for both the printers, as do the utilities that come bundled with them. The ink-status monitor is accurate.

Priced at Rs 3,999, the HP Deskjet 3650 offers good looks, decent performance and equally good print quality. But the Rs 1,000 difference between its price and that of the HP 3550 just for the design is unjustifiable.

HP Deskjet 3650	C+
Performance	▶ ▶ ▶ ▶ ▶
Features	▶ ▶ ▶ ▶ ▶
Ease of use	▶ ▶ ▶ ▶ ▶
Value for money	▶ ▶ ▶ ▶ ▶

+ Great looks and decent output
- Tad expensive for its features

How We Tested

Our test-bed comprised a Pentium 4 3.2 GHz processor plugged onto an Intel 875PBZ motherboard, with 512 MB of Corsair 400 MHz DDR RAM, an MSI Ti4800 display card and a 40 GB 7,200 rpm ATA IV Seagate Barracuda hard disk. We used Windows XP with SP1 as the OS. The system was loaded with all the latest chipset and graphics drivers. We also installed the USB patch for XP, and connected the devices on the USB 2.0 port for optimum performance. Across the tests, we used paper as shown below.

Tests	Paper Used
Normal tests	100 GSM
Photograph printing	NovaJet 130 GSM
Cost per page test	75 GSM

GSM: Grams per square metre
NovaJet: A widely available photo paper brand for inkjets

according to the printing qualities and feature sets available.

The graph below shows the individual weightages assigned to the features set, the print speed, quality and cost per page for all the three areas. The ideal home solution would therefore

Having established the three areas—home, SoHo and 'graphics and professional' printing to evaluate the printers, we decided to further define these areas

Distribution of weightages

	Features	Speed	Quality	Cost per page
Graphics & Profess onal	20	25	45	10
SoHO	20	35	35	10
Home	15	30	40	15

be a printer that gave decent speeds for both text and images, and decent
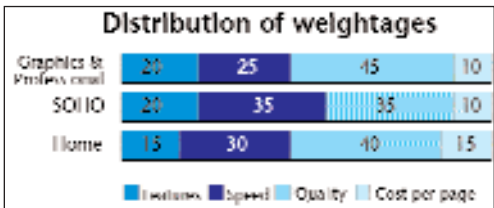
photo printouts, while still being affordable—in the range of Rs 3,000 to Rs 5,000.

In the SoHo category, we assigned equal weightages for speed and quality. This was done with the assumption that in a typical office, a perfect balance of speed and quality is needed, along with features such as two-sided printing, ink status reports through the driver, a larger buffer memory, etc.

Coming to graphics and professional printing solutions, the score split was the same as for office printers, with one difference: In terms of performance, output quality was given more importance than speed.

We tested all the printers on the same test benchmarks. These comprised a text document, a combi-document and an image file. These documents incorporate every small detail that a printer might need to reproduce—the smallest-point text and lines, the specular effect (shine) on metal, etc.

The combi-document had text with varying points: lines drawn inside a circle, seven colour bars of decreasing gradient, and a small picture at one corner. Each of these sub-sections tests a printer's ability to reproduce details. Varying-point text size tests its ability to reproduce the smallest possible text, that is, the spatial resolution of the printer. The circle of lines tests whether the printer can reproduce lines without jarring edges. Similarly, the seven-colour bar test gauges the colour reproduction capabilities of the cartridges.

The image document, too, was made up of several elements, with areas of varying contrast and brightness. This tests a printer's colour reproduction capability on photo paper.

The text and the combi-document were printed at Normal and Best quality settings, whereas for the image file, we used only the Best quality setting.
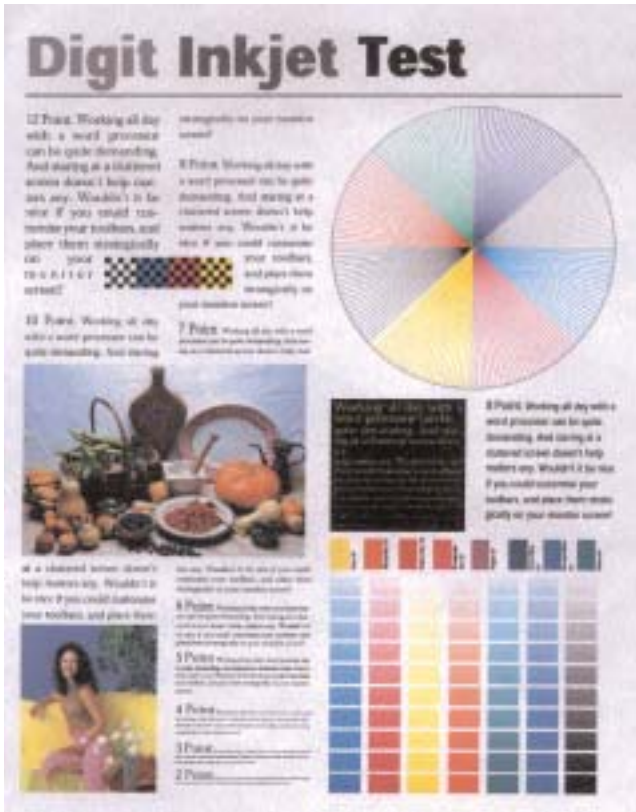
Lexmark Z605

Couch potato

The Z605 is the only printer from Lexmark to take part in this shootout. It was the slowest when it came to printing, but has definitely improved over the previous models. In the text printing in normal mode, it matched the Canon i255. In the other tests, it was a slow coach. It took almost 25 minutes to print the image, whereas the average time taken by the others was around seven minutes.

The print quality has improved vastly over the year, and this one betters the Epson C43SX in this department. Jagged edges and smudging were visible, but to a very low extent. The details in the photos were reproduced perfectly, but the final printout was overly red. As far as cost per page goes, the Z605 is right up there with the ones from HP—a bad thing.

As compared to last year, the Lexmark Z605 shows a quantum leap for Lexmark in terms of performance and quality, but still has a long way to go.

The Lexmark Z605 has evolved from a pedigree of products that sported elegant looks. The use of a light and dark grey panel gives it an identity of its own. The design cues are classic European—simple, elegant yet sophisticated.

The Lexmark Z605 comes with a 100-paper capacity top loading paper tray. The output paper tray extends out of the main body and spans enough to hold the printed papers in place. The cartridge holders are flimsy and you have to be careful when installing them. The printer installation was easy. The driver pack, among the best in the business, is quite intuitive. The printer switches itself off when the PC is switched off.

Priced at Rs 2,599 plus taxes, the Lexmark Z605 is the cheapest inkjet printer around. As far as recommendations go, there are better printers around that cost a tad more, but are faster and better.

+ Good design
- Slow

Lexmark Z605 ⒷⒷ

Performance	▶▶▶▷▷
Features	▶▶▶▷▷
Build quality	▶▶▶▶▷
Value for money	▶▶▶▷▷

Text quality (Best)

Canon-i255	4
HP 3650	3.75
HP 3550	3.75
Lexmark-Z605	3
Epson-C63SX	2.5
Epson C43SX	2.5

Scale of 5

SCORE BOARD

CATEGORY	HOME PRINTERS					
Brand	Canon	Epson	Epson	HP	HP	Lexmark
Model	xnu i255	Stylus C43SX	Stylus C63	Deskjet 3550	Deskjet 3650	Z605

FEATURES (15%)

	Canon	Epson	Epson	HP	HP	Lexmark
Printing technology	Thermal Inkjet	Piezoelectric	Piezoelectric	Thermal Inkjet	Thermal Inkjet	Thermal Inkjet
Resolution (dpi x dpi)	600 x 600	2880 x 720	5760 x 1440	600 x 600	600 x 600	2400 x 1200
Interface	USB 2.0	Parallel	USB / Parallel	USB	USB	USB
Input buffer	NA	12KB	32 KB	NA	NA	NA
Paper capacity input tray	100	100	120	100	100	100
Max document size supported	A4	A4	A4	A4	A4	A4
Data cable included	USB	Parallel	USB	USB	USB	USB
Accuracy of ink tanks status through driver (S05)*	2.5	3	3	4	4	3.5
Special features	None	None	Durabrite ink	None	None	Automatic OFF

Speed test (in seconds)

	Canon	Epson	Epson	HP	HP	Lexmark
Text print - Normal	22	40	30	18	19	22
Text printout - Best	37	77	44	140	138	157
Combi-document- Normal	95	121	132	72	66	139
Combi-document - Best	182	236	249	148	322	349
Photo printout	217	614	616	395	387	1514

Quality test (S05)*

	Canon	Epson	Epson	HP	HP	Lexmark
Text quality (Best)	4	2.5	2.5	3.75	3.75	3
Image quality (combi-document, Normal)	3.4	3.2	3.3	3.4	3.4	3.3
Image quality (combi-document, Best)	3.3	3.1	3.4	3.4	3.18	3.27
Image quality (photo, Best)	2.8	2.8	3	3.5	3.3	3.03

Cost per page (Rs)

	Canon	Epson	Epson	HP	HP	Lexmark
Cost per black page	2.48	3.27	3.48	5.93	4.85	5.59
Cost per colour page	1.92	2.08	2.21	3.93	3.67	2.28
Cost of black cartridge	395	490	695	800	800	850
Cost of colour cartridge	745	770	1185	1100	1100	950

OVERALL SCORE

	Canon	Epson	Epson	HP	HP	Lexmark
Performance + Cost per page	68.92	53.91	57.05	60.80	58.60	51.51
Features	7.5	6.2	9.2	8.6	8.6	8.4
Grand Total	76.42	60.11	66.25	69.40	67.20	59.91
VFM	2.39	2.31	1.74	2.89	2.10	2.88
Price Rs)	3,995	3,250	4,750	2,999	3,999	2,599
Grade	Ⓑ	Ⓑ	Ⓒ	Ⓑ	Ⓒ⁺	Ⓑ

FEATURES (15%) · PERFORMANCE (70%) + COST PER PAGE (15%)

* Scale of 5

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Canon i455

Born in a studio

Only the Canon i455's elder sibling overshadowed its performance in the speed tests. It's faster than a tracer bullet when printing text in both Normal as well as Best modes. As for cost-per-page, both a black as well as a colour printout will cost you around Rs 2.50—quite decent if not near-perfect.

It also does not compromise on quality. The printed text was crisp and clear, matching the ones from HP. It also reproduced minute details in

the combi-document perfectly. It does a reasonably good job at printing photographs, but falls short of reproducing the exact tonal balance, with the yellow spectrum predominant in the output.

The Canon i455 is an entry-level SoHo inkjet printer that integrates good features and performance in a small package. The design is refreshing and cuts away from the older mould.

The steep foldable front hides a translucent plastic tray that extends to serve as an output paper tray. You need to clip the input paper tray to the back of the Canon i455. It holds 100 paper sheets. A unique feature is the presence of the new Pictbridge port that lets it connect directly to a digicam *sans* any PC intervention. However, one can only control the preferences offered by the camera, since the printer has no controls to do so. The Canon i455 uses the two cartridge system, so if you run out of, say, yellow, you're going to have to buy a new colour cartridge.

Installation takes hardly any time—pop in the CD-ROM, install the drivers and connect the Canon i455 to the PC when prompted to do so. While printing, it displays the print job status as well as the current ink-level. The only grouse about the otherwise decent driver was its inaccurate ink-level measurement.

At Rs 7,995, the Canon i455 is way too expensive, as better models are available for less.

PictBridge

PictBridge is a technology developed by Camera and Imaging Product Association (CIPA) in Japan, to connect digital cameras and printer, eliminating the need for a PC. PictBridge ready cameras and printers can be connected over a USB interface, and images printed directly. You can tweak the settings of the image from the printer itself. Earlier, some printers could print the camera input directly, but they were compatible only with specific camera models.

Many camera and printer vendors such as HP, Epson, Lexmark and Kodak are yet to register with CIPA for the PictBridge protocol.

With PictBridge, the advantages are many. You can print images displayed on

the camera, or select a portion of an image and print it. You can also print one or multiple copies of an image, as well as define the size of the print from the printer itself, before printing it out.

Once connected to a PictBridge-compliant printer, the camera displays connection-establishment messages and also displays a progress bar when printing.

Companies such as Canon, Sony, Sanyo, Samsung, Fuji, Nikon, and Olympus have their products PictBridge-certified. Visit *http://www.cipa.jp/pictbridge/CertifiedModels/PictBridgeCertifiedModels_E.html* for a complete list of PictBridge-certified products. Interestingly, no American or European vendor is on that list.

Canon i455					B-
Performance					
Features					
Build quality					
Value for money					

+ Compact body and attractive design
- Expensive for its features

Canon i560
Blazing cannon

The Canon i560 broke all the speed records that were established thus far. The text printout shot out in an astonishing 11 seconds—the best registered till date had been 14 seconds. The test photo, too, zoomed out in a quick 141 seconds.

With such speeds we expected print quality to diminish, but surprisingly, the Canon i560 set the benchmarks for the other printers. Not even the upmarket Canon i905D could match its quality. The only printer that came close was the HP 5160. However, when it comes to photograph printing, it still seems to be HP's playground—they beat all the printers on this turf, and the Canon i560 was no exception.

The printer is beautifully designed to hide away its expanses. It is bound to appeal to those worrying about an impeccable décor.

Its well-crafted dimensions ensure that it doesn't take up too much desk space. The areas near the extendable paper trays are well protected by plastic panels that act as dust caps. The Pictbridge port is in the front. There are no controls to set the preferences for the Pictbridge function; these can be set via the controls on the digital camera.

The Canon i560 comes with four ink tanks, and hence, is more cost effective in the long run, since you can replace only the cartridge that runs out first. On the cost-per-page analysis, a black ink printout will cost you around Rs 2 whereas a colour printout will lighten your pocket by Rs 2.50. Installation of the printer was a no-sweat affair. Drivers loaded perfectly, and allowed complete control over the printer's settings and preferences.

Priced at Rs 9,995, the Canon i560 is definitely worth the money. If you need an exceptionally fast printer and your work pertains to text and combo-documents, buy the i560—it will deliver.

+ Class-leading print speeds
- None

Canon i560	B
Performance	
Features	
Build quality	
Value for money	

Epson Stylus Photo 830

Six colours, zero appeal

Speed-wise, the Epson Stylus Photo 830 is stuck in the middle—the Canon printers are too fast for the Epson 830 to catch up with and the HPs were too slow to give it competition. However, it got beaten black and blue when printing photographs—it took around 10 minutes to complete the job; in contrast, the Canon i560 took 2 minutes to do so.

Despite its claims of a 5,760 dpi resolution, we found it lacking in the photo-printing department by a huge margin. The printed text was smudged and jagged along the edges and way behind the standards set by the Canon i455 and i560. The photograph was very detailed with every small area highlighted. The photo colours had too much of contrast, making them look surreal rather than natural.

The Epson 830 is quite bulky, and requires sizeable desk space. The design is classic Epson. The paper-feeding mechanism is top- loading and has to be guarded against dust. The input tray holds 100 A4 sheets. The three control buttons are placed on the top for easy access. The two-cartridge system uses a black cartridge and one comprising 5 colours. The integrated colour cartridge is a bad idea since running out of one colour will mean replacing the entire module.

It has a photo cartridge, wherein you have six colours as opposed to the four in a regular inkjet printer. This feature should have brought better colour reproduction capability, but it didn't. Our black page printout cost us Rs 3 and the colour Rs 2.

- Slow
- Lacks quality output

Epson Stylus Photo 830	C
Performance	
Features	
Build quality	
Value for money	

❓ Jargon buster

Bleed: The outer region of the page that falls outside the printing range of the printer.

Buffer: This is the memory within the printer that stores data from the PC until it's printed. Currently, this varies from 16 KB to 16 MB. The greater the buffer, the better is the handling of large print jobs.

CMYK: This is an acronynm for the four-colour process printing industry standard for cyan, magenta, yellow and black. By combining these four colours, a printer can print all possible colours. Some newer printers use a six-cartridge concept—with a lighter version of cyan and magenta each.

Colour Balance: This term refers to the correct combination of cyan, magenta and yellow required to reproduce the colours of the original scene or object.

DPI: Dots per inch is a measure of the number of dots printed per square inch. For example, a 300 dpi printer produces 90,000 dots in a square inch. Higher dpi values produce sharper printouts—the minimum dpi supported by any printer today is 600.

Duplexing: This process helps you print on both sides of a page, thus reducing wastage of paper. These days, many printers come with this utility.

International paper sizes: The International Standards Organisation (ISO) categorises paper into three sizes: A, B and C. Series A is used for general printing, Series B for posters and charts, while Series C stands for envelopes and stationery. A detailed report on paper sizes is available at *http://www.cl.cam. ac.uk/~mgk25/iso-paper.html*

PostScript: This is a page-description language. It instructs the printer about where to place ink. PostScript was invented by Adobe. Currently in version 3, it supports complex page layouts and provides excellent quality. PostScript has become the *de facto* standard in imaging technology.

G raphics Professional s

Canon i905D

Expensive hardware

The Canon i905D is a slightly slower than Canon's other models, such as the Canon i455 and the Canon i560. Text printing somehow doesn't go well with the Canon i905D, but it's fast when it comes to printing photographs.

The print quality of text output was ordinary, going by the standards set by the Canon i560 and Canon i455. There was some smudging and jaggedness near the edges of characters. But when it came to images, each minute detail was reproduced with near-perfect quality. The tonal balance was excellent, except for the yellow spectrum. Even then, the photos aren't as good as those printed by the HP Photosmart 7960. A colour printout will set you back by Rs 4, and a text page will cost you Rs 2.

The Canon i905D can be hooked to a PC via USB. It uses the six-individual-cartridge system, which makes for savings on ink as well as great photo reproduction. You can connect a digicam directly to the Canon i950D without the need for an intervening PC. The driver has several tweaking options, such as noise reduction, image enhancing, etc. The ink-level monitor is rather inaccurate.

The printer is compact. The external paper trays folds for a clean look, but are flimsy and more cosmetic than functional. The control panel comprises an LCD display with a jog dial. The display shows all menus, from where one can choose from almost all options, such as paper size, ink mode, etc. It also comes with a 5-in-1 memory card reader. Other accessories such as CD-face printing adapter and a 4x6 photo printing adapter come bundled.

At Rs 21,995, the Canon i905D is an expensive piece of hardware. Exclusivity of features makes it stand out from the crowd, but the output quality does not justify the price tag.

Photo Printout (Best)

HP Photosmart 7960	3.6
Epson Stylus photo 900	3.2
Canon 905D	3.1

Scale of 5
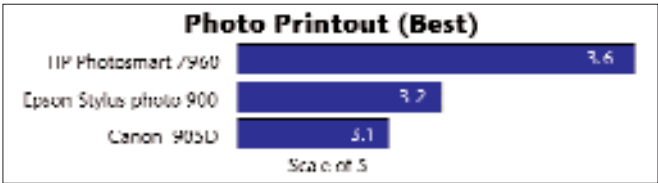
+ Feature-rich
- Quite expensive as a package

Canon i905D	B
Performance	▶ ▶ ▶ ▶
Features	▶ ▶ ▶ ▶
Build quality	▶ ▶ ▶ ▶
Value for money	▶ ▶ ▶ ▶ ▶

Duplex printing

Printing large documents can really be a cumbersome task, especially if your establishment is on a big cost-cutting drive and you have to print on both sides of the sheets. The actual procedure is long drawn—print one sheet, take it out, reverse it, place it back into the feed tray and print on the opposite side.

A faster alternative would be to print out the even-numbered pages first on one side, and then invert the entire stack to print the odd-numbered pages. This requires relatively lesser attention and work from the user's perspective. However, in single-turn as well as stack-turn manual-duplexing, the process of switching the sheets around can cause the paper to crumple, leading to further problems such as paper misfeeds, and paper jams. To avoid this, printer manufacturers provide secondary duplexing units, such as the one shown below, which when attached to the main printer unit, completely automates the duplexing process. The duplexing attachment usually sits very conveniently at the back of the printer, and doesn't require any separate calibration and driver installation. To actually begin printing on both sides, there are a couple of things that need to be enabled in the properties settings of the printer.

STEP 1 Go to Control Panel, right-click the printer driver and select Properties. Next, switch to the General tab and click on Printing Preferences.

STEP 2 In the new dialog box that pops up, click on the Features tab. Now, enable 'Two-sided Printing' and tick the box just below to enable automatic duplexing.

So now while printing on both sides, after completing one side, instead of dropping into the output tray, the sheet gets retracted automatically back into the printer to print on its other side. At this point, the only thing that you need to do is remind yourself not to pull the paper out!

Epson Stylus Photo 900

Fast forward

When it comes to printing speed, the Epson Photo 900 beats both the HP and the Canon hands down. This goes for both text as well as images. And in print quality, the Epson is at par with Canon's i905D, in terms of text—you can clearly see jagged edges and smudging. Combi-documents with many colours are vivid and crisp, thanks to the six colour cartridges. The Epson 900 is good at reproducing details, but tonal balance goes for a complete toss. There's too much contrast in photos, which therefore seem too dark. A black printout will cost you Rs 4.60, whereas a colour page is Rs 3.

This printer's six colours are packed in two cartridges. Unlike the other two products in this category, the Epson 900 is not a true photo printer. You can't connect a digicam directly, nor does it have a multi-memory card reader. However, there are quite a few handy features, such as the CD-face printing tray. There's also an attachment for paper rolls.

The printer is bulky for its features; also, the input paper tray is an external attachment rather than an extendable one. The buttons are on the front, which makes them less accessible.

At Rs 14,495, the Epson Stylus Photo 900 is no match for HP's Photosmart 7960, which is Rs 3,000 more, but turns up results better on every front.

+ Relatively inexpensive
- Average-quality printouts

Epson Stylus Photo 900	A
Performance	▮ ▮ ▮ ▮ ▮
Features	▮ ▮ ▮ ▮ ▮
Build quality	▮ ▮ ▮ ▮ ▮
Value for money	▮ ▮ ▮ ▮ ▮

HP Photosmart 7960

Picture perfect

The HP Photosmart 7960 is a firecracker when it comes to text printout, and leaves the competitors biting the dust. But despite the mammoth 16 MB of internal memory, the printer is slower than the Canon and Epson models. However, the marginal difference does tilt in favour of the HP 7960, because of the quality aspect. Printout quality is really good, whether it's text or images. The photograph we printed was reproduced without loss of details; moreover, the tonal balance was perfect, with true skin tones.

A black printout costs Rs 3, and a colour printout Rs 2.50—quite reasonable considering the quality. There are more colour cartridges with additional shades, so photos are more vivid, with great contrast.

The HP 7960 has a memory card reader that allows you to plug in almost any type of compact storage device. Also, if you have an HP digital camera, you can print directly from the camera. The printer uses three cartridges—two are regular cartridges, and the third is the

1/2 V

photo cartridge, containing additional colour shades. Ink level monitoring is accurate.

The printer takes up a lot of desk space. The build quality of the flaps and paper trays are good. It has a crystal-clear LCD that displays the image to be printed, and the menu structure. Dedicated buttons are available for zoom, resize, rotate, etc, making the printing process easy—you don't need to go through any menus.

Priced at Rs 16,999, the HP Photosmart 7960 is a good proposition if you need great photos.

+ Excellent at photo printing
- Lacks direct camera attachment for non-HP cameras

HP Photosmart 7960	**A**
Performance	▶ ▶ ▶ ▶ ▶
Features	▶ ▶ ▶ ▶ ▶
Build quality	▶ ▶ ▶ ▶ ▶
Value for money	▶ ▶ ▶ ▶ ▶

Refilling Cartridges

HP touched US$3 billion in revenues from consumables (or cartridges) in 2002. This figure would have been higher if not for the refilling of cartridges, which remains a big business despite efforts by vendors to discourage it—by attempting to educate channel partners and users through articles and advertisements. The volume of ads in the print media speaks for the spread and acceptance of the business.

Vendors say refilled cartridges give low-quality prints, damage print heads, and, if leakage occurs, damage other parts. Warranties are also void if refills are used. But Praveen Khandelwal, Director of LIPAP Systems, which sells refill kits and provide refill services, claims, in typical fashion, that their ink is as good as the original, and that it's harmless. As far as quality is concerned, it depends entirely on the ink used and quality differs from refiller to refiller.

To counter refilling, Epson in the US, installed smart chips in one of its models—the Epson Stylus C60—that lock the printer once the cartridges are empty, or if the printer doesn't have an original supply. While Epson claims that by doing this it encourages users to use the original cartridge supply, customer reactions have been negative.

We contacted a local refill service provider. His prices for black and colour cartridges for the HP DeskJet 990CXi were just Rs 100 and 400 respectively. Also, refilling would take only half an hour. Using a refill kit is even cheaper, but time-consuming and messy.

Cartridges can't be refilled more than three or four times—the quality drop is significant, and the chances of damage increase. But, a cartridge set for, say, the HP Deskjet 3350 costs Rs 1,900, and the printer with its free cartridge set costs only Rs 3,000. Refillers, therefore, say that it makes more sense to buy a new printer, if you insist on original cartridges.

If you'd like to know how exactly to refill a cartridge all by yourself, be on the lookout for the May issue of Digit.

Settings Galore

We used the HP Photosmart 7960 to take a brief look at the printing options provided with the printer driver.

Use the HP Digital Photography options to tweak images

The HP Digital Photography Options is under the 'Paper/Quality' tab. It provides useful tools such as red-eye removal, smoothing and digital flash.

If you want to print with text on facing sides, enable 'Print on Both Sides' in the 'Finishing' tab. Enable 'Flip Pages Up' to create a calendar-like book. There's also a selection mode for booklet layout, that lets you print two sheets on a page: After printing is done, fold the pages at the centre, and staple them together.

If you need to print several sheets on one page, just select the number from the dropdown box at 'Pages Per Sheet.' You can also specify the order in which pages prints.

To enlarge a page, you need to select one option from 2 x 2 (4 sheets), 3 x 3 (9 sheets), and so on. Once your document is printed in the enlarged format, staple up the individual sheets.

Set the colour attributes here

The Effects tab provides resizing as well as watermarking options. Enabling 'Scale to Fit' rescales your image to fit the page. Insert a watermark too—the available ones are 'DO NOT COPY', 'TOP SECRET', etc.

Manage your resources by controlling these features

The 'Advanced options' helps you control ink consumption and drying time, so a sheet isn't released until the ink's dried.

The 'Color' tab lets you control 'Color Options' and 'Color Attributes,' such as printing in greyscale, saturation, etc.

Resize your image to fit the media, in the Effects tab

Canon	HP	Samsung	Epson	Lexmark
Canon India Ltd	Hewlett-Packard India Ltd	Samsung Electronics India Information & Telecommunication Ltd	Epson India Ltd	Computer Track
(011) 26806572	(1600) 444999 (toll free)	(011) 51511234	(022) 28261515	(022) 25362479
rajeev.singh@ canon.co.in	seema.dawar@hp.com	farrukh@samsungindia.com	bertha@eid.epson.co.in	ctrack@hotmail.com
www.canon.co.in	www.hp.com	www.samsungindia.com	www.epson.co.in	www.lexmark.com

CATEGORY	GRAPHICS & PROFESSIONALS PRINTERS		
Brand	**Canon**	**Epson**	**HP**
Model	i905D	Stylus Photo 900	Photosmart 7960

FEATURES (20%)		Canon	Epson	HP
	Printing technology	Thermal Inkjet	Piezoelectric	Thermal Inkjet
	Resolution (dpi x dpi)	4800 x 1200	5760 x 720	4800 x 1200
	Interface	USB	Parallel / USB	2 x USB
	Input buffer	NA	32 KB	16 MB
	Paper capacity input tray	100	100	100
	LCD panel	✔	✗	✔
	Memory card reader	✔	✗	✔
	Camera port	✔	✗	✗
	Accessories	CD-face printing tray	CD-face printing tray	✗
	Standalone printing possible	✔	✗	✔
	Data cable included	USB	Parallel	USB
	Accuracy of ink tanks status through driver (S05)*	2.5	4	4
	Special features	Pictbridge	Paper-roll printing	✗

PERFORMANCE (70%) + COST PER PAGE (10%)		Canon	Epson	HP
	Speed test (in seconds)			
	Text print - Normal	55	40	18
	Text printout - Best	106	80	113
	Combi-document- Normal	90	48	46
	Combi-document - Best	122	94	127
	Photo printout	150	141	299
	Quality test (S05)*			
	Text quality (Best)	3	3	3.5
	Image quality (combi-document, Normal)	3.3	3.1	3.6
	Image quality (combi-document, Best)	3	3.5	3.7
	Image quality (photo, Best)	3.1	3.2	3.6
	Cost per page (Rs)			
	Cost per black page	2.06	4.66	3.06
	Cost per colour page	4.04	2.94	2.43
	Cost of black cartridge	545	1520	978
	Cost of colour cartridge	2725	1840	1615

OVERALL SCORE		Canon	Epson	HP
	Performance + Cost per page	59.43	60.99	63.25
	Features	11.8	8.6	10.6
	Grand Total	71.23	69.59	73.85
	VFM	3.24	4.80	4.34
	Price (Rs)	21,995	14,495	16,999
	Grade	🏅	🏅	🏅

* Scale of 5

Conclusion

For the home segment, our Best Performance vote goes to the Canon xnu i255 printer for its good performance, reasonable number of features and an equally good print quality. If you are looking for a printer that can print crisp text printouts and fairly good images, then opt for the Canon i255. The Best Value award goes to the HP Deskjet 3550 for its impressive performance and output quality at an excellent price of just Rs 3,000. The HP Deskjet 3550 stands out as a good printer for text printing as well as those occasional photo prints.

For the SoHo segment, our choice for the Best Performance crown was unanimous—the Canon i560. The i560 combines the best of everything to deliver groundbreaking speeds, without compromising on quality. The price is a bit high, but it is worth the money if you want a really fast inkjet printer for your small office. The HP Deskjet 5652, on the other hand, offers excellent output quality at reasonable speeds, earning itself the Best Value award. Buy the HP 5652 if your needs pertain to printing image documents, for which it's actually better than the Canon i560.

DIGIT TEST CENTRE
testcentre@thinkdigit.com

1/2 pg H AD

WHY LASER?

The dream of the paperless office is still a dream, and printing is still very much of a critical function for the whole gamut of PC users—home users, small offices and corporates. Whether it's printing business reports or presentations for your boss or clients, marketing material for your sales people, bills for customers, or photos to share with your non-wired friends—computer-generated printouts are everywhere. Usage patterns, and therefore, the type of printer required for different kinds of user are different. We analyse where the laser printer fits in.

For any printing requirement, you'd generally consider three types of printer—dot-matrix, inkjet and laser. There are three broad parameters to be considered with each—print quality, costs, and print volumes and printing speed.

Quality: Dot-matrix printers are severely limited in terms of print quality. Inkjets are suited for images as well as graphics, while laser printers provide crisp text printouts.

Cost: There are two cost factors to be considered when purchasing a printer: the upfront purchase cost, and the operational costs in terms of cost per page (cpp). You can buy an inkjet printer for as low as Rs 2,600, an 80-column dot-matrix for about Rs 7,000, and an entry-level mono laser for Rs 10,000. However, in terms of operational costs, inkjet printers are the most expensive, with an average cpp of Rs 2. Dot-matrix printouts are the cheapest with a cpp of just about Rs 0.15, while lasers hover around Re 1 per page.

Volume and speed: At about six to seven pages a minute, inkjets are slow, and not suited for high-volume printing, especially when you consider the high cpp. Moreover, the print head tends to heat up, leading to ink leakage if you're doing high-volume printing. But both dot-matrix and lasers are suitable for high volumes. The duty cycle for entry-level lasers can be about 5,000 pages per month, and you can get around 15 pages a minute.

Considering these factors, laser printers are ideally suited for small-office and corporate environments where print volumes are higher, and it's primarily text that's printed.

Entry-level Monochrome Laser Printers

Ever since the prices of laser printers came down to the level of affordability of small and medium businesses, it's made more sense to go for a laser printer rather than a dot matrix or an inkjet. There are several reasons for this, primarily speed and quality. Lasers are fast compared to the average inkjet, and much faster than dot matrix printers. That's why a laser makes a very good choice in environments where one printer is shared amongst five to ten users. Entry-level laser printers are generally capable of printing around 12-16 pages per minute (ppm). This speed is good enough for SoHo environments, where printing is not a continuously-performed task, as in large organisations. Even in a kind of setup where continuous printing is done, the laser printer comes in; inkjets start leaking after being used for several hours at a stretch.

Mono lasers are the best choice where documents primarily contain text. Laser printers are also the printer of choice for small DTP houses which see lots of customers every day for various printing needs. Here, most customers come for prints that are later used for making screens for screen printing. Inkjets and dot matrix printers are useless here, because both are ink-based, and light passes through the prints. Laser printers create fonts and graphics by depositing solid toner on solid paper. Similarly, inkjets and dot matrix printers are useless in transparency printing, because ink does not dry easily on transparencies.

Laser printouts generally show no smudging, and graphics, too, are crisp. Mono lasers are also capable of producing excellent shades of grey, which makes even combination documents look lively. And lasers are quieter compared to dot matrix printers.

You Need	A printer that can give you good printing speeds and better quality than an inkjet printer. Should have low running cost and should be compact	A one-stop solution for printing, scanning and copying at a reasonable speed, provides good quality, and incurs low running costs.	A printing solution that can print at laser speeds and be capable of high print volumes, while being able to print colour printouts at inkjet-like quality
Look For	A monochrome laser printer that has at least 128 MB of buffer memory, offers networking features, and can fire out a minimum of 15 pages per minute	A laser MFD that'll give good printing speeds, be able to scan at high resolutions, and have a toner life of around 3,000 pages	Most entry-level colour laser printers will meet these requirements
Our Pick	HP LaserJet 1015; Canon LBP3200	Xerox PE16; Samsung SCX4216F	HP LaserJet 1500L; Canon LBP2410
Price	Up to Rs 15,000	Up to Rs 45,000	Rs 45,000 upwards

Canon LBP3200
Round and fast!

The LBP3200 has a rated speed of 18 ppm, and supports 600 dpi. When we tested it, we got 16 ppm in factory default mode. When the driver was set to 'direct print' mode, it managed 17 ppm—this is the fastest we've come across in any entry-level laser printer so far. We recommend this printer, with this setting, for environments where there's sharing amongst five-10 users. The 200 MB test image took just 17 seconds, as compared to the 27 seconds taken by the HP 1015 in factory default mode.

The 3200 uses Canon Advanced Printing Technology (CAPT), where data processing is shifted to the PC. This means that this printer should be used in conjunction with a system that has a decent amount of memory, and decent processor speed.

The tray mechanism is unusual—the tray is at the bottom and is semi-detachable; it protrudes from the back of the printer. You need to pull out the tray to feed in paper, and it might get damaged if not handled carefully.

Pluses: It has a small footprint, weighs just 6.5 Kg, and measures just 245 mm in depth and 367 mm in width. Dual-colour with rounded contours makes for attractive looks. A minus: It works over USB 1.1.

This printer is best suited for small and medium businesses, as well as DTP houses—where the pages printed are usually different from each other, as opposed to multiple copies of the same document. The 3200 can also be used as a network printer—you can plug in a C-6200U network card.

Canon LBP3200	A-
Performance	
Features	
Value for money	

+ Compact and light; fast 17 ppm text printing speed
- Flimsy paper tray mechanism
Price: Rs 13,995 + taxes

Samsung ML-1710 Laser Printer
Good things come in small packages

The ML-1710 was able to print 15 pages in one minute—only two pages short of the 17 ppm Samsung claims. Output quality was very good, considering the printing speed. It printed the test image and combination document in just 17 seconds and 22 seconds respectively, which was quite fast.

This printer has an 8 MB buffer, which is quite effective, as can be seen from its performance. The downside is that the memory can't be upgraded. The printer uses the USB 1.1 interface, which is a minus.

Drivers for a host of OSes are provided, including all Windows versions as well as many Linux distributions. The drivers also have features such as watermarking and high altitude correction. Bundled accessories include a 15A power cord and an extensive manual, but no USB data cable.

The printer also comes with a Toner Save button—Samsung claims this saves around 40 per cent in ink. The front panel consists of just one multi-functional button and two indicating LED's. The printer also supports a manual paper feed mechanism, located on the front side.

The body is milky white, decorated in slate grey. Despite its small size of 13.7 x 14 x 7.6 inches, the printer features a removable paper tray that holds up to 250 sheets. The upper body serves as the output tray but can hold only about 40 sheets, after which the papers start flying around—the flap to hold the print-outs in place is very small.

At Rs 16,000, this printer is ideally suited for a typical small office, and is a good buy for those on the lookout for a small, fast, good quality laser printer. It may not be suitable for a large organisations due to the lack of networking capabilities, the small paper capacity, and poor paper handling.

Samsung ML-1710	B+
Performance	
Features	
Value for money	

+ Good driver support for multiple OSes including Linux; 8 MB memory
- No USB cable bundled
Price: Rs 16,000

HP Laserjet 1010 Laser Printer

Windows, please!

In our tests, the HP Laserjet 1010 performed better than the Laserjet 1015, both in terms of speed and quality. However, the test image showed prominent banding across the sheet. On the other hand, the printed text was clear and sharp.

The dimensions—37 x 23 x 20.8 cms— make it suitable for a cramped office desk. Also, weighing just under six Kg, it's more portable than most other laser printers. The 1010 has a small paper input tray, with a capacity of just 150 sheets. There's no output tray as such—the top of the printer acts as the output tray, with the help of a small detachable flap. The 1010 lacks a protective plastic cover for the paper input tray.

The printer controls, located on the top of the printer, reflect the same simplicity of design as in the 1015—in fact,

the 1010 is almost identical to the 1015, featuring the same mixed bluish grey and white shaded body. There are just two buttons, and three indicator LEDs to indicate the operational status. The printer is only compatible with Windows OSes, a big minus for the product. The package includes the driver CD, a power cord, the printer cartridge and a setup guide. The USB cable is not provided.

The Laserjet 1010 is targeted at the ultra-low-end laser printing segment. At Rs 11,000, the Laserjet 1010 is a good printing solution for the home and SoHo segments.

+ Quite affordable, simple design
- Mixed results for image quality; the test document showed prominent banding, but printed text was clear
Price: Rs 10,999

HP Laserjet 1010 Laser Printer	B+
Performance	▶ ▶ ▶ ▶ ▶
Features	▶ ▶ ▶ ▶ ▶
Value for money	▶ ▶ ▶ ▶ ▶

Colour Laser

Colour laser printers have been around for some time now, but haven't appealed to the SoHo segment so far because of exorbitantly high pricing. But now, it's possible to get one for as little as Rs 50,000. Colour laser printers have advantages over inkjet printers. First, colour document printing is faster. Second, it's even faster if multiple copies of the same document are printed. When quality is important, inkjets might be better, but then again, the cost per page is higher, printing takes longer, and quality may not be uniform if print volumes are larger. Colour lasers can print as many copies as needed without a drop in quality. Third, colour lasers have separate toner cartridges for each colour, so you can just change the one that runs out first.

Most entry-level colour lasers can also have a network card attached. This facilitates printing for multiple users over a network. Some others come without a network card, but with network capabilities: this means that you can plug in the card as and when it's required. You can also plug in a wireless LAN card into some colour lasers, which gives you the flexibility to place the printer at the most convenient location, without any wire clutter. Entry level colour laser printers are a good choice for printing documents that are a mix of text, graphs and images. The colour reproduction is excellent, minute details are printed excellently, and the text looks as good as when printed on an inkjet.

Canon LBP2410

Fast and colourful

It took 16.7 seconds for the LBP2410 to print our test document. This time includes the warm-up time, which was 9 seconds. For 10 pages, it clocked 52 seconds. This means the 2410 is fast when you print several pages at the same time, and not so much so for single printouts.

We also tested the printer for image quality using the same test image we used for inkjet printers. The image was dark with a lot of banding. Also since the image was on the warmer side, the contrast took a beating. However, the LBP2410's performance in the combo-document printing test was good: colours were vibrant, details accurate and two-point-size fonts readable. The shades of grey the LBP2410 produces are good, too. Ditto the quality of fonts printed on plain paper. The fonts were readable up to two-points, with edges straight and curves smooth.

Hence, we recommend the LBP2410 for pure text documents that use coloured fonts, fonts on coloured backgrounds and those that have images and graphics. We don't recommend it if your primary purpose is printing images.

The LBP2410 is compact, but not light. Rated speeds are 16 ppm in mono mode, and 4 ppm in full-colour mode. The printer is Canon Advanced Printing Technology (CAPT)-capable, which means you won't have to invest on additional printer memory, as your system memory is utilised. The paper tray is like the ones found in inkjet printers, and it can hold 125 sheets. There's one output tray on the top, and one at the back. By default, the top tray receives the printed sheets,but if you open the back tray, the output sheets finds their way there. The back tray facilitates the straight paper path for media such as postcards that jam inside the printer if folded.

The printer doesn't come bundled with a network card.

+ Fast for multiple copies, good quality text and greyscale
- Not very suitable for image printing
Price: Rs 49,995 + taxes

Canon LBP2410	B+
Performance	▪▪▪▪▪
Features	▪▪▪▪▪
Value for money	▪▪▪▪▪

HP Color LaserJet 1500L

The SoHo printer

The HP Color LaserJet 1500L printed our text page in 18 seconds, including the 8-second warm-up time. It finished the 10-document printing test in 52 seconds. This means this printer is suitable for the SoHo environment, where eight to 10 people would be using the printer. An optional network card lets you convert it into a network printer, and you can straightaway set the printer up for sharing amongst several users.

However, the 1500L took 179 seconds to print a 200 MB test image, for which the LBP2410 took just 105 seconds. As for the print quality of the image, it was nowhere near the what you get from inkjet printers—it appeared dark and had a lot of banding.

However, the combination document test returned very good results. two-point fonts were readable, and the embedded image was crisp, with excellent detail reproduction.

All this means this printer is best suited for printing presentation documents, marketing collaterals, and even magazine pages: these usually have custom fonts, images and various colour tones. The 1500L is a fast colour printing solution for SoHos and departments within big organisations. Graphic design houses would be better off using inkjet printers for quality image prints.

+ Compact and light
+ Fast 17 ppm text printing speed
- Flimsy paper tray mechanism
Price: Rs. 44,999 + taxes

HP Color LaserJet 1500L	B+
Performance	▪▪▪▪▪
Features	▪▪▪▪▪
Value for money	▪▪▪▪▪

HP Color LaserJet 3700dn

Connected Colour of Laser

The 3700dn is slower compared to the other low-end models. It took 31 seconds to print a text page, which is twice the time taken by the HP 1500. It also printed the test image slowly, taking 34 seconds. This means that if someone fires a test image, others who have fired simple documents will have to wait in queue for a long time. Again, image quality was not up to the mark. The first print was very dark, and in an attempt to get a better idea of the print quality, we printed multiple images to warm up the printer and then evaluate the copies. The rest of the prints were better than the first one, and comparable to those offered by the LaserJet 1500, but nowhere near the quality offered by an average inkjet printer.

This network colour laser printer has an unconventional cartridge assembly. The CMY and K toner cartridges are placed one above the other rather, than in a circular fashion. This makes the printing process faster, since the printer saves on the roll time of four toner cartridges. HP claims that the printer prints both mono and colour pages at 16 ppm.

The printer works over the USB 1.1 interface, and has a built-in network card. The 3700dn also has a built-in Web server, using which the administrator can access the printer over the network and troubleshoot and monitor it. A test page provides the necessary information such as the IP address and DNS server, necessary to access the printer. The Web server can be accessed through a browser that has three tabs—Information, Setting and Networking. The page displays information such as toner cartridge levels, paper level in trays 1 and 2 and so on. The printer supports TCP/IP, IPX/SX, AppleTalk, Netware and Unix/Linux (RedHat and SuSe) networks, which means that most OSes, if not all, in use today in big organisations are covered.

The printer has two paper-handling trays, and if needed, you can use the optional third tray. The first tray can hold 100 sheets, whereas the second, 250. The printer is capable of automatic two-sided printing, which means that you can get 700 prints at one go.

All in all, the 3700dn is a good solution for organisations where print documents are primarily text, with images only occasionally.

+ Network-ready; easy configuration of the network possible via the built-in Web server; toner and paper levels visible via a Web browser; two paper trays with a third optional tray
- Image quality not up to the mark
Price: Rs. 97,999 + taxes

HP Color LaserJet 3700dn **B+**

Performance	■ ■ ■ ■ ■
Features	■ ■ ■ ■ ■
Value for money	■ ■ ■ ■ ■

Buying tips

■ Initial price and the price of consumables are the most important factors to consider before investing in a laser printer. Buy a laser printer only if volume, speed and quality are all important. Also check the price and availability of toner cartridges
■ Go for a printer that is network-ready, or, at the least, has a slot for a network card. Also, find out if wireless networking is possible
■ Find one that offers a memory upgrade option. This will help with larger print loads, once more users are added to to the existing pool
■ See if you can find a printer that can take an optional paper tray—you can purchase a paper tray if and when needed. Add-on paper trays increase paper capacity by 250 or so
■ If there's going to be a lot of volume printing, look for USB 1.1/2.0. It's faster than the parallel interface
■ You need an on-site warranty. If you don't get one, and the printer stopped working, you'd have to lug 25 Kg of equipment to a service centre

How Colour Laser printers work

The technology behind a laser printer is completely different from that of inkjets. A laser printer has a laser beam that creates an image of what you're printing, on the photoreceptive drum. Here's how a laser printer works:

Shown here are the four toner cartridges that are responsible for the colour, and the toner drum with Photoreceptor roller (green roller).

The PC sends printed matter in either HP's PCL (Printer Command Language) or Adobe's PostScript language. Here the data is converted into vector information.

The printer converts the vector information into dots (or, a bitmap). Some printers use the GDI (Graphical Digital Interface), where the bitmap is generated by the PC, and then passed on to the laser.

Now, the laser fires when there should be a dot, and remains

This figure shows the holder, where the toner cartridge are seated. The gear, which is motor driven, helps in rotating the toner cartridge.

off when there should be a blank space. The onboard electronics control the movement of the laser, and the beam is then passed through the lens filter to the Photoreceptor drum. Here the laser beam is moved horizontally only, hence creating the dot patterns on the photoreceptor drum. Once an entire line of dots is completed, the drum rotates to receive the next line. Wherever the laser hits the positively-charged drum, a negative charge is created. The toner consists of a pigment that imparts colour onto a paper. The pigment is blended into a plastic particle to prevent smudging and making the borders of images look sharp. There are four toners in a colour laser printer—cyan, magenta, yellow and black. The positively charged toner attaches itself to the negatively charged regions of the drum.

Shown above is the drum cartridge that holds the photoreceptor drum and corona wires. On the opposite side is the Cyan toner cartridge, which also holds the toner developer and toner hopper.

This is done four times in a colour laser printer. Now the paper is passed over the drums. The paper is negatively charged by the transfer corona wires. This charge is greater than the negative charge on the drum, and thus attracts the positively charged toner pigment. The pigment doesn't stick to the paper here, and the paper is then neutralised and passed through the fuser assembly—nothing but a Teflon coated metal roller, heated by the quartz lamp. The heat fuses the toner and the paper—this is why if you print multiple copies one after another, the output paper becomes increasingly warmer. The pattern is cleaned off the drum using the charged corona wire, and the printer is ready for the next document.

Multi-Functional Devices

Multi-Function Devices (MFDs) come in where scanning, printing, fax and copy functions all need to be done. Ever since they got cheaper, even home users have begun considering MFDs as a viable replacement for separate scanners, copiers and printers. They're a great solution for all kinds of office, partly because they save so much space. The quality of copies you get from MFDs is higher than from standalone copiers. A laser MFD gives excellent fax prints. Laser MFDs are a better choice than inkjet MFDs—they afford low cpp, whether printed or copied, and print quality is also good.

One reason for the popularity of MFDs is that they can increase productivity in offices. As one example, instead of scanning a document, OCRing it, and then taking it to the copier, which may be at a different location, these can all be done from one computer attached to the MFD.

Laser MFDs are the ideal choice for small firms like legal advisory firms and accounting firms; legal documents, account statements, bills, etc., are usually printed on standard stationery. In these situations, mono printing is preferred over colour, leaving the inkjet as both a low-quality and a more expensive option.

Samsung SCX 4016

Fast to print, slow to scan

The SCX 4016 offers laser printing, digital copying and colour scanning, but doesn't integrate faxing. The operation console is intuitive, with button functions clearly marked. The little LCD panel displays sufficient information, but it could have been larger. It is built for economy, with such features as Toner Save. Paper handling is via a 250-sheet capacity paper cassette. There's also a single-sheet feeding mechanism on the front side.

The printer unit is the ML-1710, the fastest laser printer we've tested so far. The scanner unit performance was not up to the mark—the IT8 card's tonal deviation test did not show great results. Results were similarly poor in the dark region of the IT8 card, but with acceptable resolution. Copies on the 4016 were crisp and clear, and the time it took for a copy was average (10 seconds).

At Rs 36,000, the SCX 4016 is a good deal if you want a laser MFD with fast printing and decent printouts. The unit as a whole should be up to the task in a typical office.

+ Single sheet feed mechanism present
- No fax function
- Average quality scanning unit
Price: Rs 36,000

Samsung SCX 4016	B+
Performance	▶ ▶ ▶ ▶ ▶
Features	▶ ▶ ▶ ▶ ▶
Value for money	▶ ▶ ▶ ▶ ▶

Canon	HP	Samsung	Xerox
Canon India Ltd	Hewlett-Packard India Ltd	Samsung Electronics India Information & Telecommunication Ltd	Xerox Modicorp Limited
(011) 26806572	(1600) 444999 (Toll Free)	(011) 51511234	(0124)2561930/40
rajeev.singh@canon.co.in	seema.dawar@hp.com	farrukh@samsungindia.com	kuldeep.malhotra@ind.xerox.com
www.canon.co.in	www.hp.com	www.samsungindia.com	www.ind.xerox.com

Of Letterheads and Envelopes

Placing media improperly is one common problem across the board, be it a home user or office users. Usually, most vendors mark the printers with symbols that clearly indicate the placement of media. Here, we look at the envelope and the printed letterhead. We used the Canon LBP3200.

Envelope (Size 10: 4¼ x 9½)

The tray in the printers has an adjustment knob, which slides in and out to provide a straight media path. Several printers have a detailed list of media sizes printed on the tray to facilitate quick placement. Place the envelope facing down if you are using the bottom tray. Adjust the knob to fit the media size by moving it inwards or outwards. Remember to open the back cover, which is the alternate output paper path. This provides a straight paper path eliminating bending of paper and therefore paper jams. In case of a top-loading mechanism, the print surface faces the user. Now, open a new document in Microsoft Word and type in the recipient's address. After that, go to *Tools > Letters and Mailings > Envelops and Labels*. A dialog box appears, providing you with two choices—'Envelope' and 'Label'. 'Envelope' is selected by default; preview the address here and adjust its placement. Once these settings are through, click Print.

Shown in the figure is the Size 10 envelope placed face down for printing. The symbol on the tray clearly shows which surface will be printed on, with the help of the fold corner and parallel line.

Letterhead

Type the content in Word, and adjust the margin. Do that by shifting the text down to avoid printing on pre-printed content. Place the media face down with its topmost edge towards you. Different printers have different ways to insert media. Refer to the user manual for the steps you need to follow.

Samsung SCX 4216F

Print 'em cheap

The 4216F has good fax features such as support for resolutions up to 300 x 300 dpi, 4 MB of memory—enough for storing 320 pages, fax forwarding, and more. It comes with a hefty 8 MB of buffer memory that gives it the extra edge while bulk printing. It can connect to a PC via both the USB and parallel interfaces. The scanner unit supports a native optical resolution of 600 x 600, and an enhanced resolution of 4,800 x 4,800 dpi.

The printer unit is the fastest we've seen, and prints are crisp and crystal clear. At scanning, the SCX 4216F is slower than the 4016. In the IT8 card tonal deviation test, the scanner unit on the 4216F performed no better than did that on the 4016. And in the resolution test, the unit was just mediocre, not detecting the finer lines. Copying quality was excellent, and copying speed was typical.

The cartridge for the 4216F is priced at Rs 3,300, and this means lower cpp compared to any inkjet MFD.

Priced at Rs 45,000, the SCX 4216F offers good features at a competitive price, and should be considered if you want to replace all your ageing peripherals with a single, cost-effective solution.

+ Good fax features
+ USB and Parallel interfaces
Price: Rs 40,000 + local taxes

Samsung SCX 4216F	B+
Performance	▶▶▶▶▶
Features	▶▶▶▶▶
Value for money	▶▶▶▶▶

Xerox PE16 All-In-One

A better scan, please

The Xerox PE16 is a laser MFD that can print, copy, scan and fax. The printer can print at a maximum speed of 16 ppm in normal mode. It can go up to 600 dpi if the document includes images or graphics. The paper tray can hold 250 pages, and has separate slots to manually feed in single paper sheets, or media such as envelopes, greeting cards, transparencies and so on. However, the support tray is missing here, and the user needs to push the media into the slot.

The flatbed scanner comes bundled with an Automatic Document Feeder (ADF) that can hold a maximum of 30 sheets at a time. The scanner is capable of scanning at a maximum resolution of 1,200 dpi at 24-bit colour depth.

The PE16 is a stand-alone copier too, which means you can get as many as 99 copies of a document directly from the unit. The menu allows you to set the type of page and the number of copies. A hot key on the keypad allows you to set the contrast and quality level. The toner-save button is a good feature—enabling it makes the printer use less toner. These prints were light, but were good enough for use in office environments.

The PE16 is also a full-fledged fax machine and has all the features of a standalone fax machine. You can use the ADF to send multiple faxes to a single number in one go. The broadcast feature lets you send a single document to multiple numbers. You can set a group dial to send one document to several numbers frequently. The toll-save feature enables you to automatically restrict the sending of faxes only during the period for which the carrier charges a discounted rate.

We were able to print readable two-point fonts. However, the standard test document took 16.37 seconds—two seconds more than the Xerox Workcentre Pro 412 that we tested earlier.

The scanner was a real letdown, as it was slower than that of any other MFD we've tested. At full-colour mode, we were greeted with dark images, which when tested with Photoshop's Histogram feature, returned pathetic readings. We do not recommend the PE16 for scanning images that will be be put to use in presentations and other collaterals.

The PE16 doesn't have network capabilities, and has a comparatively slow printing speed of 17 ppm. However, its faxing and copying features are good enough for us to recommend it for use in small offices as well as departments within large organisations.

+ Good fax features, compact design
- Below-par scan speed and copy quality
Price: Rs 40,000 + local taxes

Xerox PE16 All-In-One	B+
Performance	▪▪▪▪▪
Features	▪▪▪▪▪
Value for money	▪▪▪▪▪

Conclusion

The popularity of laser printers can only increase. Prices will drop further. As of now, because of toner costs, only SoHo users can afford a laser printer; but once the price gets into the Rs 6,000-7,000 regions, home users will begin considering laser printers. 600 dpi laser printers are entry-level now, and most of them have faster processors; this has enabled them to support both HP's PCL and Adobe's advanced PostScript printing language. PostScript makes it easy for networked users, some of whom might be using Macintosh systems, to print without problems.

Such high-end features at entry-level price will make mono lasers will eat more and more into the dot matrix market, because entry-level models cost just about as much as 130-column dot matrix printers, while offering much faster speeds and far better quality. Dot matrix usage then will be limited to specialised tasks such as billing, ticketing, etc., where print quality is not important. However, the dot matrix printer will survive, partly because of the low cpp, and partly because of general unwillingness to learn new things.

Large corporates prefer laser MFDs because of their higher duty cycles and low print costs. But everywhere else, it will still be some time before Laser MFDs replace inkjet-based MFDs. Colour lasers are now already under the Rs 50,000 mark, and their prices, too, will come down as the technology matures. Of course, we're still a few years away from the time when colour lasers get to the home.▪

DIGIT TEST CENTRE
testcentre@thinkdigit.com

The A-List

The best products in different hardware and software categories

Products that topped our performance tests

APRIL 2004

CPU
AMD Athlon64 FX-51
+ Great performance with multi-media applications
- Expensive
Contact: Tech Pacific
Phone: 022-55960101
E-mail: pratik.chube@techpacindia.com
Price: Rs 45,000

Motherboard
MSI 875P Neo
+ Terrific performance and equally good features
- Bad component layout
Contact: Cyberstar
Phone: 080-2276986
E-mail: narend@cyberstarin.net
Price: Rs 14,500

Primary Storage
Maxtor 250 GB MaxLine Plus II
+ Tons of space
- Gets heated
Contact: Cyberstar
Phone: 011-6438216
E-mail: yogi@maxtor.com
Price: Rs 19,500

Secondary Storage
DVD-Writer
LiteOn LDW-811S DVD-Writer
+ Fast write speeds
- Cannot write on dual-layered media
Contact: Mediatech India
Phone: 022-56396696
E-mail: sales@mediatechindia.com
Price: Rs 13,750

Graphics Card
Gainward GeForce FX 5950 Golden Sample
+ Extremely good performance
- Expensive
Contact: Mediatech India
Phone: 022-56396696
E-mail: sales@mediatechindia.com
Price: Rs 31,475

Display
LCD Monitor
SONY SDM-N80 18.1-inch
+ Stylish, great performance
- External power supply takes up extra space
Contact: Rashi Peripherals
Phone: 022-28260258
E-mail: ho@rptechindia.com
Price: Rs 1,47,000

Speakers
Creative Inspire 5700D
+ Crystal clear sound reproduction
- Will not be able to shake the room
Contact: Creative Technology Ltd
Phone: 9820357713
E-mail: rajshekhar_bhatt@ctl.creative.com
Price: Rs 23,999

Input Devices
Microsoft Natural Multimedia Keyboard
+ Great quality and ergonomics
- Takes time to get accustomed to new key layout
Contact: Microsoft Corporation
Phone: 011-26294600
E-mail: connect@microsoft.com
Price: Rs 3,020

Microsoft Wireless IntelliMouse Explorer
+ Optical Mouse, USB interface
- Expensive
Contact: Microsoft Corporation
Phone: 011-26294600
E-mail: connect@microsoft.com
Price: Rs 4,278

Sound Card
Creative SoundBlaster Audigy 2 Platinum
+ 6.1-channel output
- Expensive
Contact: Creative Technology Ltd
Phone: 9820357713
E-mail: rajshekhar_bhatt@ctl.creative.com
Price: Rs 14,199

Laptop
IBM T40
+ Great design, excellent performance
- Expensive
Contact: IBM India Ltd
Phone: 080 2063199
E-mail: sanmenon@in.ibm.com
Price: Rs 1,53,366

Branded PC
HCL Beanstalk 4658
+ Great package
- None
Contact: HCL Infosystems Ltd
Phone: 0120-2520977
E-mail: raman@hclinsys.com
Price: Rs 51,490

Multi-functional Device
Xerox PE16 All-In-One
+ Good fax features, compact design
- Below par scan and copy quality
Contact: Xerox Modicorp Ltd
Phone: 0124-2561930/ 940
E-mail: kuldeep.malhotra@ind.xerox.com
Price: Rs 40,000

Laser Printer
Canon LBP3200
+ Compact and light; fast 17 ppm text printing speed
- Flimsy paper tray mechanism
Contact: Canon India Ltd
Phone: 011-26806572
E-mail: rajeev.singh@canon.co.in
Price: Rs 13,995 plus taxes

Inkjet Printer
Canon i560
+ Classy printing speeds
- None
Contact: Canon India Ltd
Phone: 011-26806572
E-mail: rajeev.singh@canon.co.in
Price: Rs 9,995

PDA
Palm Zire 71
+ Feature-rich
- Below average audio
Contact: Tech Pacific
Phone: 022-55960303
E-mail: manishl@techpacindia.com
Price: Rs 24,500

Mobile Phone
Sony Ericsson P800
+ Easy and intutive navigation
- Blocky design makes it bulky
Contact: Sony Ericsson Mobile Communications International
Phone: 011-26180808
E-mail: sudhin.mathur@sonyericsson.com
Price: Rs 34,995

Digital Camera
Canon IXUS 400
+ Cerabrite body, better buttons layout, wide shutter speed range
- Ultra compact body hampers handling
Contact: Canon India Pvt Ltd
Phone: 011-26806572
E-mail: shyam@canon.co.in
Price: Rs 49,995

MP3 Player
Apple iPod
+ Hard-drive based, FireWire cable bundled, line-out socket
- Very expensive
Contact: Apple Computer International Private Limited
Phone: 080-25550575/ 73
E-mail: indiainfo@asia.apple.com
Price: 30 GB-Rs 41,000

BEST VALUE digit APRIL 2004
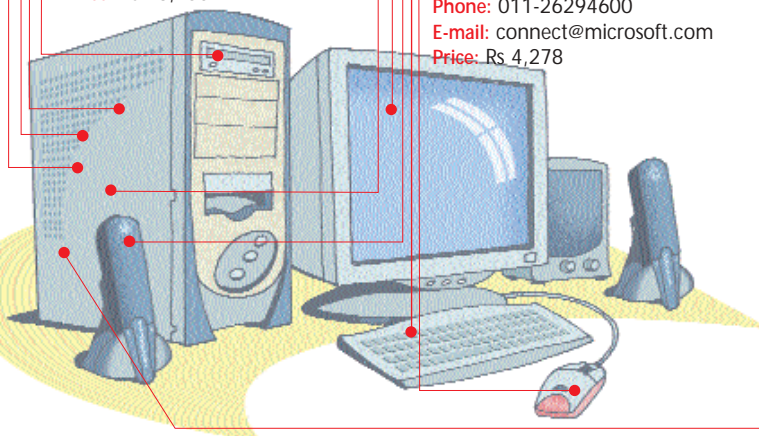
Products that are the best value buy

CPU
AMD 2400+
+ Sufficient power for normal desktop use
- Cumbersome installation
Contact: Tech Pacific
Phone: 022-55960101
E-mail: pratik.chube@techpacindia.com
Price: Rs 4,300

Motherboard
Krypton NF2400U NEW
+ Good features, impressive performance
- Lacks onboard video
Contact: Priya Ltd
Phone: 022-56663100
E-mail: priyabom@priyagroup.com
Price: Rs 3,900

Primary Storage
Samsung SV1203N 120 GB
+ Noise Guard and ImpacGuard
- 5400-rpm drive
Contact: Samsung Electronics India Information Telecommunication India Pvt. Ltd
Phone: 011-515111234
E-mail: marketing@ samsungindia.com
Price: Rs 7,200

Secondary Storage
CD-Writer
Benq CRW5224W
+ Cheap
- Data cable not bundled
Contact: BenQ India Pvt Ltd
Phone: 022-25705231
E-mail: salesenquiryin@benq.com
Price: Rs 2,000

Graphics Card
Ennyah GeForce FX 5700 NEW
+ DirectX 9.0 compatible
- Very expensive
Contact: Great World Tech Pvt Ltd
Phone: 022-23892828
E-mail: sales@gtechworld.com
Price: Rs 8,500

Speakers
Frontech JIL-1870
+ Good sound at an affordable price
- Cannot handle high volume
Contact: Jupiter International
Phone: 022-22001211
E-mail: frontech@bom5.vsnl.net.in
Price: Rs 1,750

Display
CRT Monitor
LG StudioWorks 700S
+ High resolutions, great performance, anti-static, anti-glare, anti-reflection surface treatment
- No extra accessories
Contact: LG Electronics India Pvt Ltd
Phone: 0120-2560900
E-mail: response@lgezbuy.com
Price: Rs 5,825

Input Devices
Samsung PC Keyboard
+ Unmatched value for money
- No multimedia buttons, wrist support not bundled
Contact: Samsung Asia Pvt Ltd
Phone: 022-22814886
E-mail: marketing@samsungindia.com
Price: Rs 300

Logitech Scroll Mouse
+ Ambidexterous design
Contact: Rashi Peripherals
Phone: 022-28260258/ 59
E-mail: ho@rptechindia.com
Price: Rs 475

Branded PC
HCL EzeeBee
+ Winner of Best Value and Best Performance
- Needs a better graphic card
Contact: HCL Infosystems Ltd
Phone: 0120-2520977
E-mail: raman@hclinsys.com
Price: Rs 26,500

Laptop
ACI Ethos 4
+ Good configuration for the price
- Hampered ergonomics
Contact: Allied Computer International (Asia) Pvt Ltd
Phone: 022-56943260/ 26733124/ 56407000
E-mail: sales@aci-asia.com
Price: Rs 46,990

Multi-function Devices
HP Officejet 4110 All-in-one NEW
+ Very fast printing speed
- Lacks a flatbed scanner
Contact: HP India Ltd
Phone: 011-26826000
E-mail: seema.dawar@hp.com
Price: Rs 8,999

Laser Printer
Samsung ML-1510
+ Good image quality
- Slow print speed for combo document
Contact: Samsung Electronics India Information and Telecommunication Ltd
Phone: 011-51511234
E-mail: farrukh@ samsungindia.com
Price: Rs 10,990

Inkjet Printer
HP Deskjet 3550 NEW
+ Good photo printing capability, quite cheap
- High cost per page
Contact: HP India Ltd
Phone: 011-26826000
E-mail: ashwini-k_aggarwal@hp.com
Price: Rs 2,999

PDA
Palm Zire
+ Affordable, good battery life, comprehensive PIM applications
- No Palm Universal Connector, no backlight, no expansion slots
Contact: Tech Pacific Technology (India) Limited
Phone: 022-55960101
E-mail: aparna@corvoshandwick.co.in
Price: Rs 7,500

Digital Camera
Kodak DX6340
+ 3.1 megapixel camera with 4X optical zoom
- Only 16 MB memory
Contact: Neoteric Infomatique
Phone: 022-24172600
E-mail: rajeev@neoteric-info.com
Price: Rs 18,900

Mobile Phone
Sony Ericsson T200
+ Light-weight, perfect grip, WAP 1.2.1 browser and 43.2 Kpbs GPRS, PIM features
- Keys are hard and noisy, unusual socket for the charger
Contact: Sony Ericsson Mobile Communications International
Phone: 011-26180808
E-mail: sudhin.mathur@ sonyericsson.com
Price: Rs 6,300

MP3 Player
Ennyah Digisound II DS601
+ Fast data transfer, feature-rich
Contact: Great World Tech Pvt Ltd
Phone: 022-23892828
E-mail: sales@gtechworld.com
Price: Rs 6,000 (approx)

Bazaar

We test the latest and the best hardware and software products available in the market

Geo G1
All photo, no voice

The Geo G1 has the camera and flash in the front, close to the external LCD. Its left side has the headset jack, while the right side has a camera button.

The phone stores 300 contacts, each with different numbers for home cellular and office and data such as e-mail address and anniversary.

Use the Geo G1 to take self-portrait pictures, or use the multi-shot feature to capture multiple shots at one go. A nifty feature is the inclusion of about 17 different frames that can be selected before or after clicking a picture.

The Geo G1 also includes Avatar—an application that offers you a menu of different face types, eyes, etc, that you can use to create and save digital personas. You can then associate these with your contacts, or sent them as MMSes.

Voice clarity is decent. The phone has a problem in detecting the network in weak signal strength areas and goes in search mode, thereby affecting battery life.

It captures decent images and video clips but lack of audio support is noticeable. It connects to the PC through the serial port via the bundled cable. The Geo-sync software provided lets you synchronise data with the PC. However, it rebooted the phone a few times when we tried to connect it.

The lithium-ion battery provides about a day and a half's worth of life, though this reduces significantly if you shoot a lot of images and use the flash. An extended lithium-ion battery is also bundled that lasts for about double the time. An external desktop charger, a travel charger and a manual are also bundled.

Considering its problems with network detection, poor application support, lack of support for Java applications combined with the high price tag, this is not a worthy buy. Consider buying a Nokia 6600 in the same price range.

SPECIFICATIONS

Dimensions: 88 x 46 x 23.2 mm, Weight: 90 gms, dual band, dual-LCD, 260 K colours, integrated VGA camera with 4X digital zoom, video recording, MMS, 64-note polyphony

Price: Rs 24,999
Contact: First Mobile India Pvt Ltd
Phone: 022-56944070
Fax: 022- 26845085
E-mail: response@ firstmobileindia.com

Geo G1				C
Performance				
Features				
Ergonomics				
Value for money				

ACi Ethos V Barebone G320 laptop
Affordable portable!

The Ethos V from the ACi is probably the first laptop to carry a price tag as low as Rs 30,000. Its 256 MB DDR RAM is shared by S3 graphics core.

It has a D-SUB connector to connect an external display, serial and parallel ports to connect a mouse or printer, and a PS/2 connector for a keyboard.

The keys make quite a noise; but they have a grainy finish and provide good tactile feel. There are four hotkeys provided to control volume and access the Internet and e-mail clients.

The 14.1-inch TFT screen provides enough space to work scroll free in Word or Excel applications and also view Web pages easily at a resolution of 1,024 x 768.

In Business Winstone 2002, we got a low score of 11.5, which means that this product will provide crash-free computing only with older applications. In *Quake III*, we got a playable frame rate of 30.8 at 640 x 480 pixels. At a higher resolution of 1,024 x 768, we got just 10.2 fps. The Ethos V isn't heavy, yet it's not compact, which makes it feel hollow. It didn't heat up after even four hours of use—good news for those who want a travel companion.

Overall, the Ethos V is suited for students and small business owners to access e-mail, keep notes and type business letters. At just Rs 30,000, this laptop is ideal for those on shoestring budgets.

Business Winstone 2002

HP Compaq nx9005	18
ACi Hhex G320	11.5
	Index

Price: Rs 30,000
Contact: Allied Computer International (Asia) Pvt ltd
Phone: 022-56943260
Fax: 022-26733119
E-mail: sales@aci-asia.com
Web site: www.aci-india.com

SPECIFICATIONS

VIA Ethos 1GHz CPU, 256 MB DDR RAM, 20 GB hard drive, 10/100 LAN, 56K modem, 14.1-inch TFT LCD screen, Weight: 2.4 Kg

ACi Ethos V Barebone G320 laptop				B+
Performance				
Features				
Build Quality				
Value for money				

BenQ S830C Mobile Phone

Flip it open

The BenQ S830C has dual LCD screens. Colour clarity is reasonable, though the screen is hardly readable under direct sunlight or when the backlight goes off.

The left softkey activates the silent mode if pressed and held for a couple of seconds. The phone memory can hold 500 entries. Features such as MMS, and predictive text input are supported. Voice clarity is quite good, and it detects weak signals too. However, images taken using the tiny external camera attachment appear grainy. PC synchronisation is also an area of concern.

Though the BenQ S830C is above average as far as voice clarity and feature set go, the Rs 12,450-plus price tag is a tad too high.

SPECIFICATIONS

Dual band for GSM900/1800; Dimensions: 87 x 45 x 19 mm; Weight: 98.5 gm, integrated WAP 2.0 microbrowser, seven caller groups for identification, IR port

Price: Rs 12,450 (Rs 2,000 extra for camera attachment)
Contact: BenQ India Pvt Ltd
Phone: 022-25705230
Fax: 022-25705235
E-mail: salesenquiryin@benq.com
Web site: www.benq.co.in

BenQ S830C Mobile Phone	B-
Perfrormance	
Features	
Ergonomics	
Value for money	

Ennyah GeForce FX 5700

High performance, low price

This NV36 core-based chip has 256 MB DDR II memory that provides bandwidth in excess of 14.4 GBps. A TV encoder chip with support for MPEG 2 decoding is included. The Y-cable (S-video to RCA and stereo cable) is also provided.

In the Gunmetal benchmark, it returned 20.76 fps at 1,024 x 768, and beat the 3D Prophet Radeon 9600 256 MB card, which logged 19.05 fps. In Aquamark 3, it averaged 32.31 fps at a resolution of 1,024 x 768.

Priced at only Rs 8500, it has an amazing price to performance ratio.

Gunmetal
(1,024 X 768 X 32) Scores

	fps
Ennyah FX 5700	20.76
Compro Paladyne FX 5600 (128MB)	14
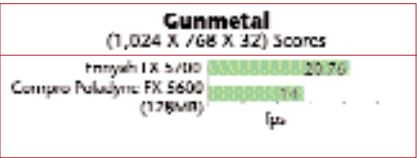
SPECIFICATIONS

425 MHz core clock, 500 MHz memory, 256 MB DDR II memory, 0.13 micron fabrication process, 14.4 GBps memory bandwidth, 1.9 billion texel per sec fill rate, AGP 8X interface, DVI connector

Price: Rs 8,500
Contact: Great World Tech Pvt Ltd
Phone: 022 - 23892828
Fax: 022 - 23879020
E-mail: sales@gtechworld.com
Website: www.ennyah.com.tw

Ennyah GeForce FX 5700	A-
Performance	
Features	
Build quality	
Value for money	

Umax Draco MP3 Player
Meet Count Draco!

The Umax Draco combines an MP3/WMA player, a portable USB storage device, and a voice-recorder into one. Build quality could be an issue if you drop it accidentally.

The PC recognises it as a removable drive under Windows 2000, Me and XP. The jog switch lets you switch modes between music, recorder and voice playback, apart from customising other settings.

Bass and treble output for the English tracks were quite weak. However, the Hindi tracks sounded reasonably good. The audio output was low even at maximum volume and not up to the mark.

You can create folders in the removable drive, but only music files stored in the root can be played. The unit gave us just about four hours of continuous playback, while the rated time by the vendor is 12 hours. The battery gets charged automatically once you connect it to the USB port. However, it tends to heat up while charging.

With its sub-Rs 5000 price tag, the Draco may appeal to the younger crowd. However, the average audio quality, average build-quality, and poor battery life need to be considered before purchasing the product.

Price: Rs 4,900
Contact: Neoteric
Phone: 022-24172600
Fax: 022-24185294
E-mail: sales@neoteric-info.com

Features

Creative LX100	14.5
Errayali DS601	
Umax Draco	30.5

Out of 50
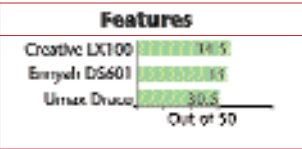
SPECIFICATIONS

128 MB flash memory; supports MP3 and WMA formats; multiple repeat function: Loop one, Loop all, A-B/A-V repeat, USB storage, 1.5V AAA chargeable battery

Umax Draco MP3 Player	A
Performance	
Features	
Ease of use	
Value for money	

Altec Lansing MX 5021
Luxurious sound

The first thing that strikes you about these speakers is their design—classy and sleek. The Altec Lansing MX5021 is a 2.1 system with a wireless remote and THX certification.

The *Minority Report* DVD sounded great, but the surround experience was missing. The satellites brought out the tiniest detail, while the sub punched in the lows with equal strength. Listening to '*O rey chhori*' from *Lagaan* made us want to watch the movie again. Gaming benchmarks also gave it a top-notch rating, especially the *Quake III* intro movie.

The MP3 tests also went well. The frequency tests were a bit of a let-down, especially the mid-range frequencies, but only experienced ears can catch the difference. Distortion was noticed only when we played with the EAX equalizer settings—setting it to rock, pop, etc.

It's steeply priced at Rs 12,000. You can get a 5.1 set for just as much. This is for those who want the best 2.1 sound available.

Price: Rs 12,000
Contact: Zeta Technologies
Phone: 022-24102277
E-mail: tejas@zetaindia.com
Web site: www.alteclansing.com

Altec Lansing MX 5021	B+
Performance	
Features	
Build Quality	
Value for money	

Siemens C60 mobile phone
Flash it!

The Siemens C60 looks good in its grey silver outfit with a dash of chrome that adds beauty. The colour panels are exchangeable, and you can opt for other colour schemes. It has small cramped buttons that are hard to press and lack tactile feedback. The build quality leaves a lot to be desired.

The 7-line colour display screen is nothing to write home about—so long as you use this phone indoors, you won't go blind trying to read the screen. The icon based menu structure is really simple to operate.

You can store 350 phone book entries in all. Support for MMS and Java applications is included. The phone comes with an external camera and flash attachment.

Taking pictures drains the battery very fast-especially when you use the flash.

No infra-red connectivity is provided. The package includes the handset, a 700mAh lithium-ion battery, battery charger and a user guide. The voice clarity is good and the reception is clear. The battery lasts for about three days on normal usage. At just Rs 8,000, the C60 is sensibly priced. We recommend it only if you spend most of your time indoors and are not an SMS junky.

Price: Rs 8,000
Contact: Siemens
Phone: 022 - 2498 7430/46
Fax: 022 - 2496 8085
E-mail: contactus@bom4. siemens.co.in
Web site: www.my-siemens.com

SPECIFICATIONS

Tri-band, 12 bit colour display, 16 polyphonic ringtones, GPRS, 350 phone entries and external camera with flash

Siemens C60 Mobile phone	B+
Performance	
Features	
Build quality	
Value for money	

HA! CD Burner

Impressive!

HA! CD Burner, a CD recording software made in Taiwan, supports CD as well as DVD media. The software has all the necessary elements such as Disc Copier, Raw Copier, Audio Copier, MP3 CD,

HA! CD Burner is the new kid on the write

Video CD, Super VCD, etc. You can also create audio CDs on the fly from MP3 format. Just drag-n-drop MP3 files in the wav copier, and your audio CD is ready.

The manual was outdated—it mentioned only support for CD-R and CD-RW, when in fact, it also supports DVD burn-

ing. The documentation didn't even mention some features related to CD-burning such as Video CD, Super VCD, etc.

Performance-wise, it's similar to other applications such as Nero. It also offers most of the features such as multi-session, drag-n-drop, image creation, etc. A few features such as format CD, over burning, copy protection support are missing.

The interface is simple and won't even scare a novice. At Rs 2,700, it's a good software to buy as it performs well and has the required features.

SPECIFICATIONS

Media supported:CD-R/RW, DVD-RAM, DVD-R/RW, and DVD+RW/+R; supports Windows 98, Me, NT, 2000 and XP

Price: Rs 2,700
Contact: Mediaman Infotech Pvt Ltd
Phone: 022-23823100
E-mail: alok@mediamangroup.com
Web site: www.acard.com

HA! CD Burner	A-
Performance	
Features	
Ease of Use	
Value for money	

SMC SMC2655W Wi-Fi Access Point

Freedom of movement

The SMC2655W is a tiny device that measures about 117 x 62 x 22 mm, and weighs under 100 gms. It comes with the external dipole antenna, and works on the Direct Sequence Spread Spectrum type radio signal.

The utility bundled with it is easy to use and set up.

It comes with a default IP and DNS that are needed to access it. These can be changed of course. You can also enable MAC-level filtering by creating and adding a MAC address list to it. Thus, only devices that match the MAC address list will be allowed access. This is a must have, especially when the neighbours also have a wireless network.

Though the SMC2655W claims to offer speeds of 11

Mbps at a distance of 128 metres, our tests showed otherwise. It took us 12 minutes and five seconds to transfer a 200 MB single file—a data transfer speed of approximately 2.2 MBps only; and this was at a distance of just 12 metres, with only a single user connected and even the line-of-sight criteria satisfied for best performance. So though it claims to support up to 32 users per device, practically, this doesn't seem feasible.

The access point came bundled with a power adapter,

Price: Rs 8,000
Contact: SMC Networks
Phone: 022-56962790
Fax: 022-56962794
E-mail: Jayesh.dabrai@ acctontech.com
Web site: www.smc-asia.com

the utility software CD and a manual that explains the setup process. We recommend this device for a wireless network wherein most data transfers are just surfing and e-mail access, and that too, for a small group of users.

SPECIFICATIONS

802.11b compliant, 2.4 GHz operating frequency, dipole antenna, 825-feet operating range, supports 64 or 128-bit Wired Equivalent Privacy (WEP) encryption, support for up to 32 users

SMC SMC2655W Wi-Fi Access Point	B
Performance	
Features	
Ease of use	
Value for money	

Wacom Graphire 3 G-430 Pen Tablet

The pen is mightier than the mouse

The Wacom Graphire 3 combines the accuracy and ease-of-use of a pencil to draw images, along with the enhanced functionality of the mouse as a pointing device.

The well-designed cordless pen sports an electronic eraser at its end. The re-programmable dual side-switch can be assigned functions such as right-clicks and double-clicks. The tablet's surface has a smaller customisable active area to detect the pen's motion and replicate it correspondingly onto the screen.

We had to manually enable the pen's pressure sensitivity in Photoshop, but otherwise it was quite precise. However, as the pen

Price: Rs 5,400
Contact: Trifin Information Technology Ltd
Phone: 011-26236061
Fax: 011- 26436447
ashish@trifintech.com
Web site: www.wacom.com

activates within 5 mm of the tablet's surface, novices may find it tricky to use.

With a price tag of Rs 5,400, the Graphire 3 is a better buy for design professionals and artists.

SPECIFICATIONS

Tablet size: 8.27 x 8.20 inches, active area size: 3.65x5.02 inches, pen accuracy: ±0.02 inches, bundled software: Painter Classic, PhotoExpress 4 SE, Pen Plus Personal

Wacom Graphire 3 G-430 Pen Tablet	B+
Performance	
Features	
Ergonomics	
Value for money	

Techcom SSD-8in1 1.1Card Reader

Read one, read all

The SSD-8in1 card reader can read flash memory card and plugs into a USB port. It can read Compact Flash (CF), MultiMedia Card (MMC), SmartMedia (SM), MemoryStick, SecureDigital (SD), Microdrive cards and xD-Picturecard formats.

Once the reader is plugged to the system, Explorer shows a total of 5 drives. The advantage of this is that you can plug in different cards, and read or write to all of them simultaneously. The disadvantage is the reduced bandwidth shared across four slots.

We tested it with the Princeton 32 MB Compact Flash card. In SiSoft Sandra 2004 Pro, it logged a score of 936 KBps. The sequential read maxed out at 949 KBps and sequential write topped at 943 KBps. For a card reader, sequential data transfer is more important over random, as it is used mainly to transfer large images, music files or short video clips. The random read and write score was 948 KBps and 801 KBps respectively, which is quite good.

The card shows 30.6 MB of space, and we tested it by transferring a 30.4 MB single file and the same amount of assorted data. It took 35.26 and 41.12 seconds respectively.

This card reader costs just Rs 1,090, which not only makes it affordable, but a must have for all those with cards plugged into your digital cameras, PDAs, etc. Since it can both read and write to the cards, you could also use it as a USB memory stick.

Price: Rs 1,090
Contact: Shree Sagarmatha Distributors Pvt. Ltd
Phone: 011-26428541
Fax: 011-26428542
E-mail: sagarmatha_dlh@bol.net.in

SPECIFICATIONS

USB 1.1 interface, USB cord, four slots, supports MMC, SD, SM, MemoryStick, Microdrive, xD-Picturecard

Techcom SSD-8in1 1.1 Card Reader	B+
Performance	▮▮▮▮▮
Features	▮▮▮▮▮
Ease of Use	▮▮▮▮▮
Value for money	▮▮▮▮▮

Simmtronics USB PnP 128 MB Flash Drive

The Plug and Play Drive

The Simmtronics USB Flash drive is extremely light, and is among the thinnest we've tested so far; measuring just 10.3 mm, or less than half an inch. Despite its size, the build quality is good.

The installation was simple and was immediately detected in both Windows XP and Windows 98, but needed the driver CD for proper installation in 98. For data protection, the drive only features a physical write-protection switch, and lacks a software password-locking tool. In fact, besides the driver CD, the package only includes a carry strap and a short extension cable.

We ran Drive Benchmark from the SiSoft Sandra 2004, to gauge the theoretical transfer speeds. The sequential write speed of 923 KBps reported was the highest we have ever logged for a USB Flash drive. The CPU utilisation, as reported in HDTach, was very low. In the real world tests too, the drive turned in an excellent performance in the assorted write test with a high data transfer speed of 1.47 MBps.

The Simmtronics USB PnP Flash drive is a good deal-for just Rs 3,000, you get amazing performance.

Price: Rs 3,000
Contact: Silicon Impex Pvt. Ltd.
Phone: 011-54618247/48/49
Fax: 011-31061852
E-mail: a_silicon@rediffmail.com

Assorted max write speeds
(Real-world tests)

Simmtronics 128 MB PnP USB Flash Drive	1.47
Princeton MPDUSB 256 MB Flash Drive	0.85
Transcend TS512MJFLASHA	0.61
Easydisk	0.52
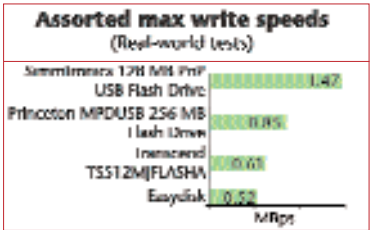
SPECIFICATIONS

USB 1.1, 128 MB capacity, physical dimensions 73.6 x 24 x 10.3 mm, carry strap, extension cable

Simmtronics USB PnP 128 MB Flash Drive	B+
Performance	▮▮▮▮▮
Features	▮▮▮▮▮
Build quality	▮▮▮▮▮
Value for money	▮▮▮▮▮

Samsung SP1614C 160 GB SATA hard drive

Bigger is better!

The Samsung SP1614C uses the SATA interface, which is becoming the interface of choice on the latest motherboards. It also has an 8 MB buffer to speed up the data throughput.

Performance-wise, its results were on par with other SATA models tested earlier. The SiSoft Sandra 2004 Pro test returned a drive index of 41,724 with sequential read touching 62 MBps and access time as low as 7ms.

The drive logged a decent random read/write score of 12 MBps. It logged a relatively high CPU utilisation of 4.4 per cent in the HDTach 2.60 tests. The drive we received wasn't bundled with any kind of manual or documentation, nor was any interface or power cable supplied.

The SP1614C is best suited for gaming PCs and work-stations that need fast and continuous data access. With a price tag of Rs 7,000, it also goes well with a home system that has a horde of mp3 songs, movies and images.

SiSoft Sandra 2004 Pro Random Write

Maxtor DiamondMax Plus9 6Y700M0	19
Samsung Sp1614C	12
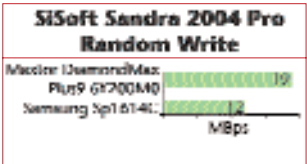
SPECIFICATIONS

150 MBps, SATA interface, 8 MB buffer, 7,200 rpm fluid dynamic bearing motor, Weight: 653 gm

Samsung SP1614C 160 GB SATA hard drive	A-
Performance	▮▮▮▮▮
Features	▮▮▮▮▮
Build quality	▮▮▮▮▮
Value for money	▮▮▮▮▮

Price: Rs 7,000
Contact: Samsung Electronics india information & telecommunication ltd
Phone: 011-51511234
Fax: 011-51608820
hddsupport@samsungindia.com
Web site: www.samsungindia.com

Xerox PE16 All-In-One
A better scan please

Xerox PE16 is laser multi-function device that can print, copy, scan and fax. The printer is capable of printing at a maximum speed of 16 pages in normal mode and can go up 600 dpi if the document includes images or graphics.

The printer tray can hold 250 pages and has separate slots to manually feed in single paper sheets or media such as envelopes, greeting cards, transparencies and so on. However, the support tray is missing here and the user needs to push the media in the slot, which is then pulled in by the printer.

The flatbed scanner is bundled with an Automatic Document Feeder (ADF) that can hold a maximum of 30 sheets at a time. The scanner is capable of scanning documents and images at the maximum resolution of 1,200 dpi at 24-bit colour depth.

The PE16 is a stand-alone copier too, which means you can get as many as 99 copies of a document directly from the unit. The menu allows you to set the type of pages and the number of copies. A hot key on the keypad allows you to set the contrast and quality level. The toner save button provided on the keypad is a good feature that can be enabled to get more copies as less toner is used. The prints were light after we enabled this feature but were good enough for use in office environments.

PE16 is also a full-fledged fax machine and boasts all the features of a standalone fax machine. Use the ADF to send multiple faxes to a single number in one go. The broadcast feature lets you send a single document to multiple numbers. Set a group

Ennyah GeForce FX 5700
High performance, low price

CLICKITY-CLICK

Agent 001 hits the streets to find the ideal keyboard and mouse

Ah! Finally got my hands on *Unreal Tournament 2004*. After a few hours of adrenaline pumping action from my professional, well greased gaming skills, I finally overcame the game in record time—3 seconds faster than Agent 000—my brother! Yay! Kabloooey!. Sniff sniff! Huh? What was that? Oh damn! I spilled coffee on my keyboard in my excitement. Oh well, time for new keyboard, Agent 000 can pay for it—after all, he lost the bet.

So, after a quick trip to 000's ATM, I was off to Lamington Road, Mumbai's haven for all things electronic. I want something with hotkeys to launch the heat-seeking rockets in *Unreal*.

The first shop had an Acer keyboard for Rs 550. "No way", I thought. The next shop had a wall lined with keyboards, but when I asked the shopkeeper to recommend a reliable multimedia keyboard, I was told, "*Yeh sab deewar par hain naa*, see for yourself! They're all good keyboards". It was obvious this guy treated keyboards like potatoes, and probably sold them by the kilo as well…

The next shop owner seemed too interested in his phone call than in me. Now, while shopping, if you fail to find what you want…cross the street; and I did.

I walked into a shop and the owner seemed excited to see me—it was obvious from all the scribbled-on paper lying about that business was slow here today. "Good for me", I said to myself. They always pay attention to you when they're hard-up for customers. He showed me an Odyssey multimedia keyboard, but I didn't want to look at unheard of brands. "Show me the good stuff," I said.

With a smile, he told me about the Microsoft optical combo pack of wireless mouse and keyboard. Controlling my 19-inch flat screen from the bed itself, now that would be something.

Whilst I was daydreaming, I was just nodding to everything the owner said, and

Mahesh Benkar
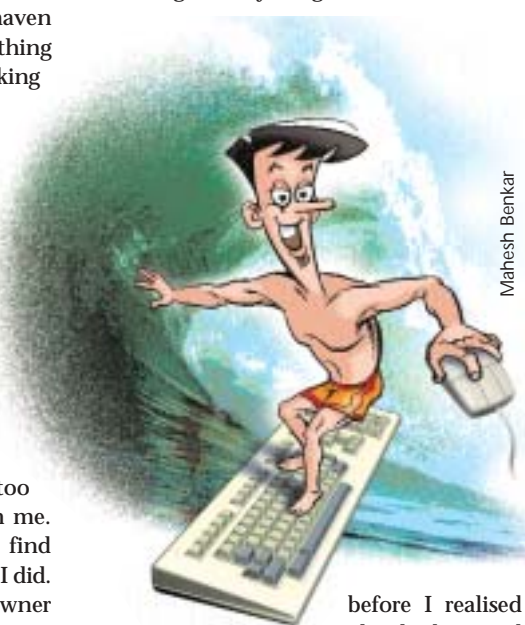
before I realised it, he had started writing up a bill. "Wait," I shouted, "How much did you say it costs?" "Only Rs 5,400, Sir," he replied.

I awoke coughing and sputtering; the owner was splashing water on my face. Muttering my thanks, and blaming the episode on those damn *vada pavs*, I beat a hasty retreat. I decided to stick to shady alleyways; at least if I meet muggers I can deal with there. I wandered about, making a mental list of what's available…

Microsoft wireless combo: Rs 3,850, but it uses 4 batteries that only last five hours.

Logitech wireless combo: Rs 3,150, and has a one-year warranty.

Microsoft optical wireless combo: Rs 5,400. Gasp! You don't win that much money at *Unreal* match-ups.

Samsung Multimedia keyboard: Rs 450, but oh, so boring.

McDonalds veg burger: Rs 30. Yummy!

That decided it, I really was hungry. I ordered a *sev puri* from a roadside stall, and noticed a tiny shop that was even smaller that this *chaat* stall. While my eats were being prepared, I walked in and looked around. The owner was polite and told me that he would recommend the Typhoon wireless combo.

For just Rs 1,450, I would get an RF wireless multimedia keyboard and an ambidextrous mouse. He also showed me a Neotech option for the same price, which comes with an integrated trackball. I was delighted, and was all set to buy it when I found that it was an infra-red-based keyboard. There's no way I want to always keep my PC in the line of sight of the keyboard—wireless without the freedom of movement is not wireless at all.

When I asked about the batteries, he said "*Nahi nahi*, no batteries needed". Not wanting to waste my money on peripherals that run on the energy of our souls, or on the goodwill of society—especially when the box says "4 AA batteries needed"—I went back out to eat my treats.

The *Mumbaiyya* snack gave me enough energy to continue this quest, and onwards I trudged.

I came across an iKey combo at the next stop, with a wireless keyboard and a wireless optical mouse for Rs 3,250. The receiver looked like a UFO, but the mouse wasn't ambidextrous. Since I'm a firm believer in the equality of handedness, I decided this just wouldn't do, and asked to see more.

He showed me a white Microsoft wireless combo for Rs 3,100, and a different Microsoft combo that looked much better because it was black, for Rs 4,150. The mouse that comes with this combo has horizontal scroll as well. He also had a Logitech model for Rs 3,200.

As soon as he told me that the Microsoft models carried a 3 year warranty, my mind was made up. With a little extra money, I could buy peace of mind. I decided to save what I could, and bought the Microsoft Wireless Optical.

This was still good enough to show off, had the option of either PS/2 or USB connectivity and was cheap enough to buy from my winnings. ◗

SHOPPING TIP

■ Remember that wireless input devices look cool, but need batteries. You'll go broke buying new AA batteries every five days.

■ An RF wireless solution is better than the infra-red version, as you won't have to worry about line-of-sight.

■ An optical mouse is better in the long run as it has almost zero maintenance and better precision.

■ Look for models with the maximum warranty. Microsoft offers three years, and it's advisable to spend that little extra for peace of mind.

Holiday Escapes

Mahesh Benkar

N eeraj gets up with a start. "Oh no! It's already 6:30 am. I'll never make it to the reservation counter on time." He pulls on his clothes and dashes out into the cool morning air. The sunrise is beautiful, but he doesn't have time to notice it. Quickly flagging down a taxi, while still buttoning his shirt he yells, "Station, *jaldi*!" He pulls up at the station at about 7:15, dashes to the booking counter and breathes a sigh of relief.

He's just about the 10th guy standing in line; his laziness hasn't cost him too much time—he'll only have to wait another hour and a half before the counter opens, and another hour for his turn. By about 10:00 am he's back home and already an hour late to work. "Oh well! It's worth it to finally be able to go on that family vacation after a month."

Some of us will relate to this, others will just laugh in disbelief. The fact still

Travel the world… but start the journey online

remains that this was a reality as little as five or six years ago. Back then, people had three options.

The first was to do exactly as Neeraj did, except that it usually took longer to get tickets. The second was to visit the local travel agent, but you risked getting a wait-listed ticket that would just never seem to get confirmed. The last option was, as all last options usually are, illegal. Buy tickets from a tout, hope and pray they have one for a 50-plus woman, so your mother doesn't have to travel as a

46-year old male, and learn to answer to your assumed name a few days before the journey.

Today, times have changed. The Internet has afforded us the luxury of being able to make it to work on time and use a little of our home or office bandwidth to book our tickets.

Of course, the touts still hover about the station, and the TTE still tries his best to catch those travelling on assumed names, but Neeraj outsmarted the lot. He sat at home on Sunday, surfed the Internet and booked tickets, hotel reservations and even a car with a driver to take his family sightseeing. The Internet is redefining travelling in the country.

Right from giving us a first-hand feel of the destination of choice, to selecting a package deal that fits our budget, the Internet offers everything you need to make your family's vacation memorable.

The first step

Priya Raje, 26, a consultant with an HR firm in Mumbai, discovered the potential of the Internet when she wanted to surprise her husband, Ravi, with an exotic holiday package for their second marriage anniversary. However, there was a slight problem. "I was distraught when my travel agent told me that my savings were barely enough to cover the travelling expenses for a week's holiday in Tioman Island, Malaysia, leaving nothing for boarding and other expenses. It really was a huge disappointment."

Actually, it turned out to be a blessing in disguise; a friend advised her to check out several Indian Web sites that give information on holiday destinations within the country. And she chanced upon, what was to be a 'perfect romantic getaway' for her in Lahul and Spiti Valley—places cradled in the breathtaking beauty and serenity of the stately Himalayas.

What's more, she could splurge like a queen and still be within her budget—it was a dream come true.

For exotic getaways within India, the first Web site that you should check out is that of the Ministry of Tourism (*www.tourismofindia .com or www.incredibleindia.org*). An

Find some interesting holiday ideas, exhaustive list of tour operators and more information at the official website of Ministry of Tourism at www.tourismofindia.com

interesting feature of this well-designed Web site is the list of useful phrases in Hindi, Kannada, Bengali, Punjabi, Malayalam, Telugu and their English equivalents that come in handy when you visit these states.

Another Web site worth exploring is Outlook Traveller (*www.outlooktraveller. com*). It's loaded with reams of information. It has holiday ideas and detailed information on several destinations. The travel news and articles segment is a good feature; these news stories and articles talk about the different experiences you can expect when travelling by road, train or air.

All India Travel (*www.all-indiatravel.com*) is a Web site that provides useful holiday ideas for almost all the cities in India. Find out all the details on various cities and tourist attractions such as bird sanctuaries, wild life preservations, etc, at IndiaE-Travel (*www. indiaetravel.com*).

Another interesting Web site is Travel Jini (*www.traveljini.com*). Apart from providing some very interesting holiday ideas, it also has a special honeymoon section for romantic getaways.

Visit the hyperlinks page at Tourism of India (*http://www.tourismofindia.com/ foot/links.htm*)for detailed information about a particular state in India. Here, you can find links to the official sites of state tourism departments. To assist you in finalising your holiday destination, there's Maps of India (*www.mapsofindia.com*), which has maps of all the states, their major cities and the connecting roads and highways.

Tickets, please

Cryptic station names and train codes notwithstanding, the functionality of the Indian Railways Web site (*www.indianrail.gov.in*) has improved immensely after its re-launch in May last year. The Web site not only gives you extensive information of train routes and timings, but also lets you check the availability of seats.

The Maps of India site gives you decently detailed maps of just about any holiday destination you choose

To book your train tickets online, you need to log on to the Indian Railway Catering and Tourism Corporation (IRCTC) Web site at *www.irctc.co.in*.

If you want to travel by air, it makes sense to plan ahead and avail yourself of APEX fares. Alternatively, you can also try the bidding options available at the Web sites of domestic airlines.

If you're really lucky, you can save as much as 50 to 60 per cent of the air fare. Log on to *http://indianairlines.indiatimes.com* to bid for Indian Airlines tickets. You can place a bid seven days in advance, but the bid will last for five days and is only available for selected routes. You can also buy the tickets directly from the official Indian Airlines Web site (*http://indian-airlines.nic.in*), but there are a few limitations—you can't book tickets within 96 hours of departure and can't book tickets on discounted fares.

Air Sahara also allows you to bid for tickets up to 15 days in advance. Visit *http://airsahara.indiatimes.com, or www. airsahara.net.*

Travel Jini also has a very useful feature called Flight Route Finder. Key in the origin and destination airport in India and it shows you all the possible routes. The site also gives you the route with the cheapest fares between the selected destinations.

Want to book a hotel?

"We have always stayed at the hotels of our choice, without paying a premium," claims Rupesh Shah, a south Mumbai businessman and a savvy traveller, who is as meticulous as ever when he plans his family vacation. Earlier, he would dig into travel brochures or guidebooks for advance hotel bookings. Now, he scours
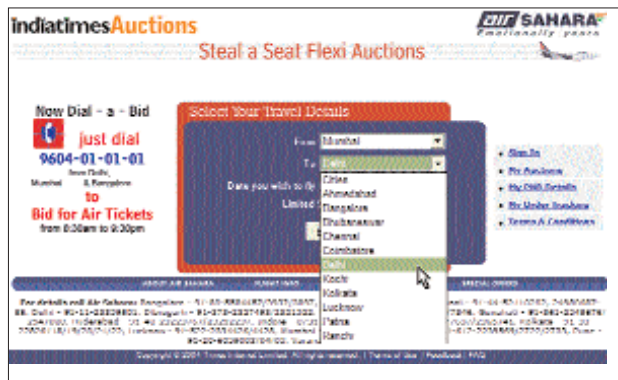
Bid for Air Sahara tickets online at **http://airsahara.indiatimes. com**, *and save up to 60 per cent of the airfare most of the times*

the Internet for the best deals available, even booking the rooms online.

Shah feels that Indian travel sites still have a long way to go before they can offer the best hotel deals. Most of the deals offered are expensive. There are, however, a few exceptions, such as the decent hotel choices offered by Make My Trip (**www.makemytrip.com**). For instance, if you want to stay in Mumbai, you can find hotels with fares ranging from Rs 2,200 to Rs 11,000 per night.

Likewise, Indian Hotel Booking (**www.india-hotel-booking.com**) is a good Web site to check for hotels situated in major cities in India. The Web site has a wide variety of hotels to offer—wild life resorts, ayurveda resorts, spas, heritage hotels, etc.

Some Web sites, cater to hotel accommodations in a particular city. For example, **www.hotelsindelhi.net** offers hotel rooms in Delhi, **www.bangalorehotels.net** lists hotels in Bangalore and **www.hotels-mumbai.com** for hotels in Mumbai.

Rent a car

So you've decided everything, got your tickets, booked the hotel, arranged for a airport pick-up service, but what do you do once you get there? Taxis in a strange city are always best avoided, unless you have money to burn. Well, you can always hire a car. Travel Jini lets you do so in any of the 50 listed cities. And the rates are affordable too.

Normal full-day rental charges for standard air-conditioned car are as low as Rs 800. Similarly, Make My Trip helps you rent a car in any of the 30 cities in the country.

One more Web site that offers car rental services is **www. carrental-india.com**. Here, you can book cars for a trip to any major city. For other cities, you will have to fill an online form and you get a reply with details. Not only does this Web site let you book cars, but also mini coaches, large coaches as well as tempos.

Package deals

The first Web site to check for package deals is Outlook Traveller. Click on a destination,

Hire a car online at www.carrental-india.com

and it will show you the deals available. Make My Trip also has a lot of good packages deals on offer for the Indian traveller. The Web site also lets you customise your package tour according to your preferences.

Travel Jadoo (**www.traveljadoo.com**) also lists customised holiday packages—you can choose the cities, the routes and the mode of travel.

Get up, and get going

Truly, the Internet has a plethora of addresses that you can knock at to get that perfect idyllic deal. So, go net your spot, pack your bags, and go surf the waves or search for the meaning of life—it's all a few clicks away!

UPENDRA SINGHAI
upendra_singhai@thinkdigit.com

Traveljini (www.traveljini.com) offers tour packages for national and international destinations. If you are not satisfied with the packages on offer, you can always customise your own

This watch tells time...

... and gives weather alerts, and news updates, and pings appointment alerts, and sends you instant messages, and manages your schedules. Soon, it may tell you which girlfriend to date this evening. Want to know how it works?

I t's not quite James Bond's watch. Yet. Agent 007's legendary Omega has laser beam metal cutters built into it, a two-way videophone and remote detonators for mines scattered about the country. However, one glance at the newest range of Fossil Wrist Netwatches, and you are convinced that they're a fantasy come true.

Put Microsoft's Smart Personal Objects Technology (SPOT) on your wrist and you get news and weather updates, stock quotes, sports scores, instant messages via MSN Messenger as well as alarms that work in coordination with Outlook. Of course, you can also use it to tell time with precision, since it's set using an atomic clock as reference.

Microsoft's SPOT initiative aims to see more intelligent daily objects providing useable information at a glance. The idea is to take something as ordinary as a watch, a keychain, or a refrigerator magnet, look at what its primary role is and see how this can be enhanced.

A little over a year later, that's what they have done with the first of their SPOT hardware, taking watches, and developing them into an entirely new computing platform. Microsoft worked with chip manufacturer, National Semiconductors, and communication experts, SCA Data Systems, to design the platform and the networking protocol that drives it.

Now, Microsoft has partnered with sports watch manufacturers, Fossil and Suunto, who use this new platform in their smart watches to provide customers in 100 locations in North America with content from Microsoft's MSN Direct service.

SPOT isn't going to be limited to watches. More intelligent everyday devices are on their way, but the watch is prime real estate to start from. Think fantasy devices, and watches are a part of the deal.

...This goes through MSN's content servers...

..and voila! Stock updates on your SPOT watch!

Send out Outlook alerts, IMs and content from MSN Direct...

..broadcasted via FM radio towers...
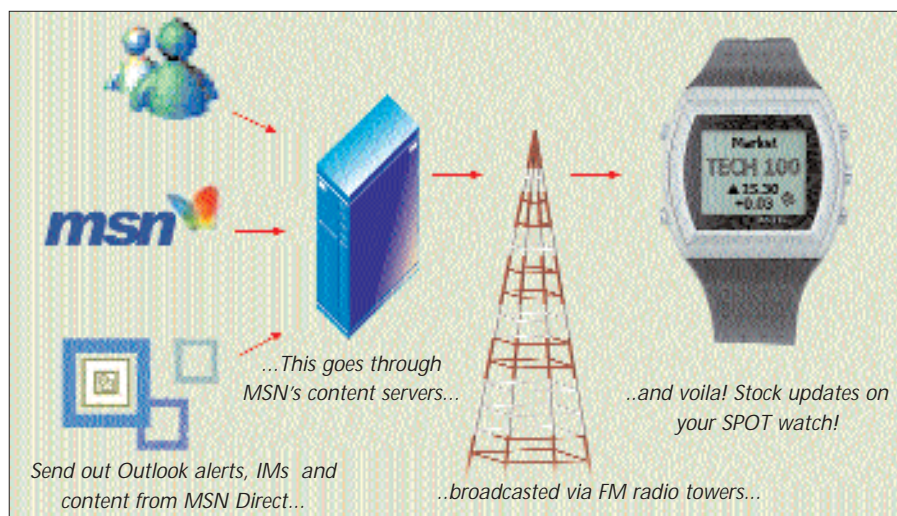
James Bond knows that, so does Mr India. Interested customers—called 'early adopters' in industry parlance—are signing up for the service in droves. Alan Reiter, wireless industry analyst and famed tech-blogger (*http://reiter.weblogger.com*—rated by Forbes magazine as one of the top five of its kind), is one such early adopter. Customers buy the watches from Fossil and Suunto—they retail for between $100 and $300—and then subscribe to MSN Direct (*http://direct.msn.com*) for $9.95 a month or $59 a year.

Indian customers will have to wait a while—Microsoft says they have no immediate plans of introducing the service in India.

When the service is off, or you go out of range, it's a normal watch; the rest of the time you get personalised content feeds straight from MSN Direct on the watch face. The watch receives data using an ingenious channel of data propagation, FM radio. This communication is strictly one-way; the watch receives data from MSN's content servers, but doesn't talk back to them.

Microsoft says that they researched the reactions of over 12,000 customers and found that most people prefer quick, glanceable information against two-way, immersive communication.

Binary tick tock

So what does a wrist-top fantasy look like? It has a slightly large build; it doesn't compete with the slim and elegant offerings from Swiss timekeepers, but it's not much different from the average sports watch. Reiter finds the watches to be slightly large

and clunky. He admits it's fun, but maintains that it's still for geeks and early adopters. Reiter should know, having used the Suunto N3 SPOT watch for quite a while now.

On the inside, the smart watch is actually a small wrist-top computer. The computing platform works on a seven-chip custom chipset, which measures 34 x 30 x 2 mm. Its main components are a baseband processor built on the core of an industry standard Arm7 processor that is commonly used in low-power applications.

According to National's Centrum Buero Information Telekommunikation (CeBIT) 2003 press release, the custom-designed integrated circuit (IC) runs at 28 MHz and processes the received signals. The baseband processors come built with digital signal processor (DSP) accelerators and have a unique 256-bit identification number etched onto the Arm7 core.

The other ICs on this system board include the sensitive Radio Frequency (RF) chip, which receives the FM radio signals. The RF chip can receive FM signals across the entire range of the commercial FM radio spectrum, from 88 to 110 MHz. The entire solution lives off 512 KB of ROM and 384 KB of RAM, which provides for several days of alerts and alarms apart from continuous updates of all

Info The Arm7 chips used in SPOT watches are designed at National's India Design Center, located at Bangalore.

sorts. Power requirements for the system are proprietary information, but we found that SPOT watches use a unique induction charging mechanism that needs the watch to be placed on top of the charger; a full charge should suffice for three to five days.

The SPOT system's transmission protocols and architecture are just as inter-
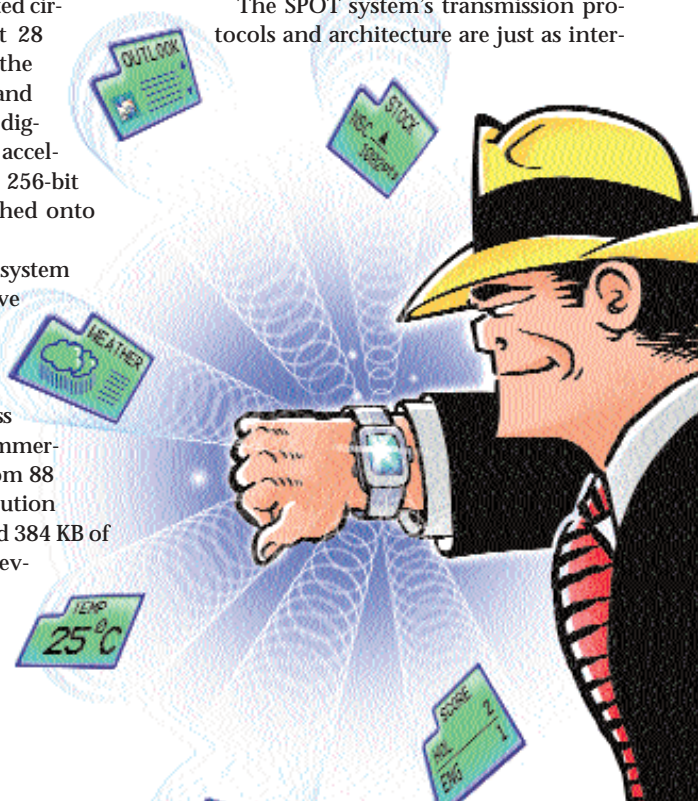
Watch's the future like?

Watches are no longer looked at as just time pieces, and probably every single watch manufacturer is planning on getting the unthinkable into a watch. Already, sports-watches have a variety of features—temperature sensors and altimeters, slide rules and tools for divers.

The Fossil Wrist Net and Suunto N3 are examples of what watches can become. Fossil has also worked towards making watch-PDAs, although they're expensive.

These are basically decent PDA-watch

Calling secret agent Xact, here's your next mission!

hybrids, with standard Palm PDA features—essentially, a personal organiser disguised as a watch. Cell phone-watch form factors have

also been tried out. Last year, for instance, NTT DoCoMo was looking at releasing the WRISTOMO, a watch that lets you make phone calls, send and receive e-mail and exchange data at 64 Kbps.

The good old two-way communicator may well be coming alive, with Xact Communications' Wristlinx two-way radio, which puts a radio transceiver into the watch. It seems that next-gen watches will either be personal communication devices or personal organiser devices.

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esting; SCA Data Systems and Microsoft worked on creating a noise tolerant, high bit-rate solution that uses the FM sub-carrier technology. The system currently has a throughput rate of 12 Kbps that is sufficient for data to flow continuously into the watch. Microsoft tells us the watches run on an embedded software platform that incorporates several .NET tools and has been optimised for miniaturisation and minimal power consumption.

Tuning in

Microsoft calls it DirectBand. The name collectively applies to the radio receiving units and the wide area network created over existing FM radio networks. Direct-Band works in association with US radio broadcasters, using unused frequencies in the radio spectrum for content broadcasts.

While signing up for the MSN Direct service, customers enter a unique person-alised reception code—the 256-bit identification register etched by lasers into the Arm7 core—and set up the kinds of personalised content feeds they want.

Currently, you can choose from public feeds such as news, weather, sports and stock tickers as well as private feeds such as Outlook alerts and instant messages, all of which, Microsoft says, are encrypted. A plug-in connects Outlook to the MSN Direct service. Then tasks and meeting alerts can be set to make the SPOT watch buzz you. To send instant messages via MSN Messenger, right-click on the username and choose to send messages.

All the information requested is routed in through MSN Direct's data centre and then transmitted out on the FM airwaves via local radio stations, en masse. The RF chip picks up all the radio content being streamed out, and sifts through all of it to pick up and display only the content specific to its unique personalisation code.

1656
Christiaan Huygens invents the pendulum clock

1914
Wrist watches become commonly adopted as World War I starts

1952
NIST announces NBS-1, first atomic clock using cesium molecules

1967
The 13th General Conference on Weights and Measures redefines the second on the vibrations of the cesium atom

1969
Seiko Astron, the world's first quartz watch debuts

1973
Introduction of the world's first LCD display watch, a Seiko

Late 70's
Quartz watches and clocks now have alarms, become multifunctional, have calculators built into them

1980s
Watches with calculators become common

1990s
Sports watches start coming with various additional functions

2000s
Watches now move on to become personal organisers

2004
SPOT debuts commercially

How good is it?

The service sports several cool features; one among them is the ability to get fun faces for each of the watches. Yet another is the roaming feature. If you happen to move out of one coverage zone and into another, you don't need to reset the time. MSN Direct automatically does that for you, so you always have the correct local time.

Customers are excited at the watch's ability to sync with Outlook's alerts and get continuous content on the move. There have been some teething troubles though: Reiter points out that several users have complained of network outages, with Microsoft's content servers also giving trouble.

Microsoft's official spin on this is that they are working on enhancing the Direct-Band network; the bottom-line is that such wireless networks are going to take a while to reach reliability.

First watches, then the world

Gauging the public reaction to the services, Microsoft looks forward to a point where common everyday objects are going to become smarter and more functional using software. The idea is to have innocuous, intelligent and pervasive devices existing side by side with the desktop. The future might be to have two-way communication.

The moot point is that of acceptability—would you junk your current watch and choose to buy this clunky, possibly more expensive watch? Reiter would tell you that if he'd get a slimmer watch, with a dependable, robust network, and more feeds, he would consider switching over for certain occasions. Until then, his handsome gold and chrome Cartier stays firmly strapped to his wrist.

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30Minutes Expert

Tag me if you can

Don't know the name of the artiste serenading you? Time to get your MP3 tags in place!

You may have an awfully huge collection of MP3s on your computer, and a majority of them may not be correctly identifiable. Whilst copying MP3s or ripping an audio CD, seldom does anyone bother to fill in information such as the artist name, song title, year, genre, etc, into the MP3 file. And if you don't fill in this info, called MP3 metadata, or tags,

Edit the tag information along with adding a small image to the MP3 file

you won't be able to use the tag-searching feature of some MP3 players, which support playlist searches by searching on tag information.

One of the many utilities that help you fill in tags is Tag & Rename 3.0.6. Use it to edit the tag as you play the file in your default mp3 player. Of course, many players such as Winamp have a feature built-in by which you can fill in the tag, such software make it easier.

After installing, start the application and take a look at the tabs in the open window. When you select your MP3 folder from the pane at the bottom, the first allows you to rename and tag a single file. The second one does a batch job of renaming and tagging a group of MP3 files ripped from an album.

Click on the first tab. Tag & Rename lists the files in the right-hand pane with or without tag information. It shows a column view of the MP3 files with the file name, title, artist name and

album fields. Right-click a file, and in the menu that pops up, click 'edit' to edit the tag. A window pops up wherein the 'General' tab displays song duration, bitrate, copyright protection, etc. Enter the title of the song, name of the artist, album name, year of release and genre in this window. Add the song's lyrics into the MP3 file by clicking on the Lyrics tab. Click on Save when you're done.

A cool feature supported is the latest ID3v2 tag system, which allows you to specify an image file to be integrated into an MP3 file. Thus, you can scan and resize the album cover and copy it into all the songs ripped from that album. Click on 'Find art file' within the 'General' tab, and browse to the image file. Click Open and then Save. The mp3 file is embedded with that particular image file. The size of the mp3 file size increases by the size of the image file, of course. Also, those players unable to read ID3v2 tags will not be able to read the embedded image file, but will play the MP3. Click on save to save this information.

Next, in the 'Rename' tab, after selecting the files of your choice, click Rename, and all the selected MP3 files are renamed using the default naming convention— 'Artist name - Title'. Customise the file-name format by changing the File name mask, using the ID3 identification mask list to the right of this field. For example,

Add the lyrics too into the MP3 file itself

change the mask to '%2 - %1 - %3 - %4' to rename files in the following format— 'Title - Artiste name - Album name - Year.'

Tick 'Replace underscores with spaces' if your MP3 files tags contain them. You can also change the case of the filenames to be generated. You can have the entire file name in capital letters or small caps. Alternatively, you may capitalise the first letter of each word or just the first word only.

Select a group of files in the multiple file tag editor, and fill in the information in the fields labelled artist, album, year, genre and click on Save Tags. This will fill in all the tags in the selected mp3 files.

For those unfortunates who have no idea which MP3 is the creation of which artist, there's a software known as Mood-Logic *(www.moodlogic.com)*. After installation, it asks for a login name for your account and a password. Registration is free. MoodLogic scans and saves all MP3s on your hard disk to its playlist. It then connects to the MoodLogic server and automatically updates the MP3 tags. The trial version allows you to update a limited number of MP3 files. You can sign up for unlimited access.

To update an MP3 tag, click on **Tools > Fix ID3 tags** and file names. A window showing the number of MP3s it can update pops up. Click on Continue. The window lists all the available information it can provide and update. Select the check box Fix file names and Fix ID3 tags to update the ID3 tag information and also the filename of the file to artist name - song title. Next, click on Fix All to complete the automatic updating of the selected files.

A plug-in also lets you use MoodLogic from within Winamp.

So, go tag your mp3 files all nice and proper, like you always wanted to, and stop nonsense such as 'Song%2025.d333" scrolling across Winamp when you're playing a song for the first time!

NIKETU SHAH

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G O D SPEED

Sloth! One of the seven deadly sins, and your PC is commiting it right now. Give it a shot of the steroid called upgrade, and start your life in the gigahertz world

Parag Joshi

Your PC used to be a rocket once, but that's all history now. All you can do now is consider putting this ancient tortoise out of its misery. Sounds familiar? Does your PC take over 45 seconds to start? Can you finish reading this entire article while waiting for Adobe Photoshop to open that 10 MB TIF file? It's time for an upgrade! And there's no need to call in a team of hardware engineers either—we'll help you do it all by yourself!

Enough talk—time to get those hands dirty.

1 First and most important, shut down the PC normally, and disconnect the power cord from the mains. Then disconnect all peripherals such as the keyboard, the mouse, the printer etc. from the cabinet. Set the cabinet gently on a flat surface on its side.

2 Before opening the side panel, ground yourself completely and get rid of any electrostatic charge on your hands, by touching any metallic surface. This is very important, as these random charges can damage the motherboard's delicate electronics.

3 After opening the side panel, look for the processor with the fan and heatsink sitting on top of it, which is usually somewhere close to the centre of the motherboard.

First, you need to disconnect the fan's power supply. To do this, just locate a thin group of three wires leading away from the fan, and gently pull out the connector linking these wires to the motherboard.

At this time, it might be a good idea to remove the graphics card as well, if there is very little room to manoeuvre within the cabinet. Now to release the heatsink-fan assembly, you'll find two clips holding it in place.

4 These clips swing in both directions, but to release them, the clamps have to be opened outwards in an anti-clockwise direction, till they snap open and release the plastic holding mechanism for the heatsink *(See picture Step 4)*.

5 Gently pull out the heatsink to expose the processor, using both hands *(See picture Step 5a)*. Pull the heatsink and fan out of the cabinet before you attempt to remove the CPU *(See picture Step 5b)*. Release the catch next to the processor's socket, and pull the CPU free from the socket *(See picture Step 5c)*.

6 Unpack the new processor and plug it gently into the socket. While doing so, look for a small indicator on the processor itself, and then match it with an identical mark on the socket below, corresponding to the pin layout on the CPU and the socket *(See picture Step 6)*. Do not apply any undue force, because if you find
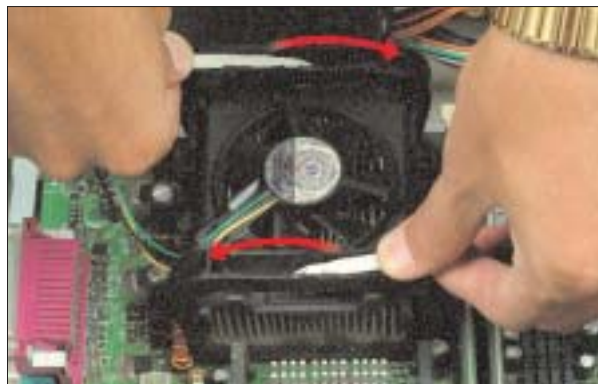
Step 4: Open the clips holding the heatsink, as shown above

Step 5a: Use both hands if necessary to get a good grip on the heatsink while detaching it

Step 7: Apply the thermal paste gently to form a thin film on the processor's surface

over the processor's core. This step should be done very carefully, especially for AMD processors, as their main core is exposed and is not shielded like those from Intel.

STEP 8 All the newer processors come packaged with their own certified heatsinks bundled, and these are usually sufficient. However, if you are an overclocking geek or a

you need to, you're probably doing something wrong. Push down on the latch to lock the new processor in place securely.

STEP 7 After plugging the processor in, apply a little thermal grease on the top surface *(See picture Step 7)*. You may not need to do this, as most heatsinks today come packed with paste already applied on them.

The thermal paste will absorb the heat from the processor's core and spread it evenly for the heatsink to dissipate. Apply the grease gently, and spread it evenly
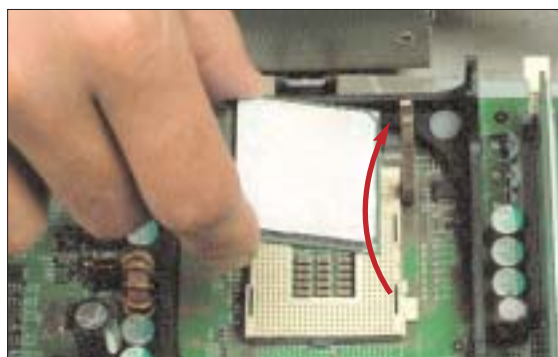
Step 5c: Remember to unlock the clip (shown with a red arrow) holding the CPU down, before removing it

heavy-duty gamer, you may require a larger heatsink and a more powerful fan.

STEP 9 Lower the heatsink carefully. Be very gentle, or you might damage the processor core. Now, lock the heatsink into place by swinging the holding clips *(See picture Step 9)*, this time in the clockwise direction. Finally, reconnect the fan's power cable back to its original location. If you can't find it, refer to the board layout diagram in your motherboard manual.

STEP 10 As against changing the CPU, upgrading the memory is comparatively a piece of cake, and doesn't take more than a couple of minutes.

The RAM slots are typically located close to the processor, next to the connections for the IDE cables. Unclip the latches—usually coloured white or beige—located on the ends of the slots, and pull the old memory modules free from the motherboard *(See picture Step 10a)*.

Of course, you may need to do so only if you don't have any free slots for the RAM you want to add. Now, take the new memory module and hold it at an approximate angle of 45 degrees, at one end of the slot *(See picture Step 10b)*. At this point, just ensure that the slit on the RAM module is lined up correctly with the corresponding spot on the motherboard's slot.

This slit is easy to identify, as its location splits the RAM module into long and short sides. Just press the module down until it slides in and fits snugly into its slot. Now, snap the clips back up manually to lock it in place.

Step 5b: Lift the heatsink clear outside the cabinet, before going for the processor

Checklist

For this all-important transplant onto your PC, you'll need only a few tools, namely:
✔ A Philips head (+) screwdriver for those pesky little screws
✔ A small box of thermal paste
✔ The most vital one—your motherboard manual. The manual will assist you by serving as a guide to the layout of the motherboard.

If you don't have the manual, there's no need to panic. There are dozens of free utilities on the Internet such as Motherboard Monitor and SiSoft Sandra, which can help you identify your motherboard. After identifying the component, you can simply visit the manufacturer's Web site, download the manual and print it out.

Step 6: Place the processor carefully, so as to not damage its core. Also line up the marking as indicated by the arrow

STEP 11 Now to mop up, just place any other components you removed back into their slots, before closing the cabinet. Reconnect all peripherals and the power cable after setting it upright.

After all that hard work , the efforts of your blood, sweat and tears—you get to press the Power Button to a

Things to look out for

Before you step into DIY mode, there are a couple of important things to consider.

First, if your computer is a branded model, you should know that by carrying out the upgrade, the service warranty offered by the dealer will cease to exist. Although some OEMs may allow for some minor upgrades such as replacement of keyboards and mice, any attempt to open the cabinet, and change the components within, is regarded as a violation of the service contract.

Therefore, it would be a better idea to carry out any upgrades after the service period is over.

When buying components, always insist on original box-packed CPUs and good quality RAM modules. An important factor that you must consider here is the type of pin arrangement your processor has, to connect with the socket on the mainboard, especially if you have an Intel-based system.

The older Pentium 4 processors (codenamed Williamette) had an arrangement of 423 pins, but beginning with the Northwood series and later, Intel has been using a 478-pin arrangement for the socket. In comparison, AMD CPUs have stuck to the tried and tested Socket A standard.

So if your motherboard will only support an older series of processors, upgrading the motherboard too would be a good idea.

The same recommendations stand while procuring the RAM modules. The prevalent memory standard is DDR RAM, faster than the older SD RAM, which has almost been phased out. RD RAM, too, is almost out of the scene—and besides, these memory formats are more expensive than DDR RAM.

Step 9: *Lower the new heatsink slowly, till it sits snugly above the processor*

Step 10a: *Press firmly on the white clips with your fingers to release the RAM*

Step 10b: *To insert the RAM module easily, hold it at an angle above the slot*

revitalised and re-energised computer, which will not only run your applications and games faster, but also more efficiently and effectively.

Hold on there

Before rejoicing, you need to listen for any warning beeps during booting. A single beep is healthy, but a series of beeps indicate that one of the components may be loose—open up the cabinet again, and ensure that the video card is placed securely, and the RAM modules are locked tight in their slots. One last step—before the OS loads, access the BIOS screen and check if the values for the CPU voltage and speed are reported correctly. For some BIOS versions, you may need to enter these values manually, but beyond that, you need only watch in wonder as your computer is transformed from a lumbering truck to a slick sports car.

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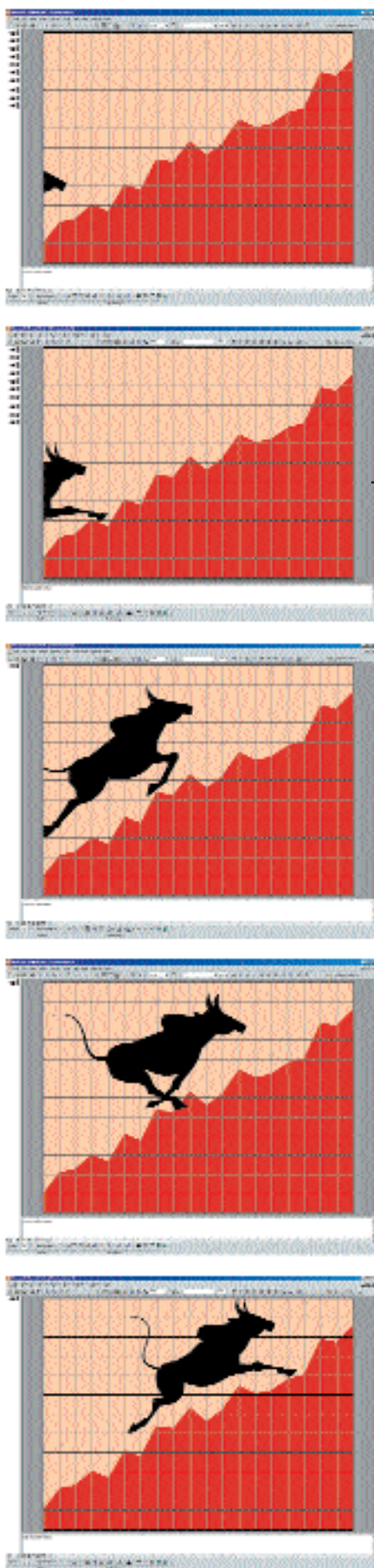
Power *up* *your* pQint

Throw in some animation and movies with the right noises and slide up the interest in your presentations!

Creating PowerPoint presentations is easy. However, presentations that drive the point home succinctly, need some finesse. If you like your presentations to be appealing and leave an impact on the boss and members of the committee, then you need animation or movies with some great audio in them that will make them sit up and take notice!

Animations

Slideshows with animated text, pictures and other content help you hold the interest of your audience, to emphasise important points and also make maximum usage of slide space by moving elements on the slide. However, do not overuse this element as it distracts from the main presentation.

You can have six types of animations in Power-Point. The first is Transition. This is the effect that you see when a slide is revealed. The other five types of ani-

mations apply to the individual elements of the slide such as title, body, images, etc. Entrance is how an element enters the slide and Exit is how it exits.

The third type is Emphasis—when you highlight something to direct attention to it, while Fading is used to leave an element and move on to next.

The fifth type, Motion Path, is probably the most interesting animation to work with. It defines the path along which an element moves.

Here come 12 cool things you can do to enhance your presentation:

Find it on the Mindware CD: In the April 2004 Mindware CD, you will find all the files we have used throughout this article. Play around with that presentation, or just see the power of Power-Point in action

STEP 1 Schemes
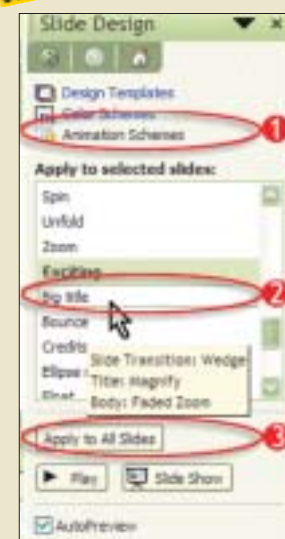
The easiest way to animate slides is by using preset Animation Schemes—sequences of effects that can be applied to any slide, or the whole presentation. Press *[Ctrl] + [F1]* to activate the Task Pane. Here, go to *Slide Design > Animation Schemes*, choose a scheme and click 'Apply to all slides' to use the the scheme for all the slides. Preset Animation Schems cannot animate individual elements. For that, you would require Custom Animation.

Custom Animations

Custom Animation lets you animate individual elements on the slide. The Custom Animation task pane provides you with many such effects. Once added, you will see a number that indicates the playing order (marked with a '1' in the screenshot), star symbol that indicates the type of effect (marked with a '2' in the screenshot) and a mouse or a clock icon that lets you know when the effect will start playing (marked with a '3'). Step 3 goes into the nitty-gritties of adding them to your presentation.

More Custom Options

Right-click on the effect to access the 'Effect Options…' menu. Here, you can change the settings for that button. You have three choices when it comes to setting the start time of the animation: 'On click' activates the animation only when the mouse button is pressed. Select 'With Previous' to start the animation with the previous animation. 'After Previous' causes the animation to commence once the previous animation is over. You can also choose the direction, speed and attach a sound to an effect as well. Jump to Step 5 to learn about another powerful way of adding animation—Motion Path.

Adding Custom Animation

Select a Custom Animation and click on Add Effect to bring up a pop-up menu. Here, choose an effect and then point to an option in the second pop-up menu. Click on 'More Effects…' to see all the effects available under that type. A preview of the effect is shown immediately. The text on the Add Effect button changes to Change if you have already added some effect to an element. Step 4 shows you ways to fine tune these customisable options.

Motion Path

A motion path is the track along which the element on the slide moves. To add the motion path to an object, select it and go to the Custom Animation task pane. Click the Add Effect button, go to Motion Path and click on 'More Motion Path' to choose a preset motion path. When you click on a motion path, the selected element on the slide shows you the preview of the animation, provided you enable the Preview Effect checkbox. You can also draw your own motion path. Simply, click on Add Effect and go to *Motion Paths > Draw Motion Paths...* To edit the motion paths, see the next step.

STEP 6 — Fine Tuning the Path
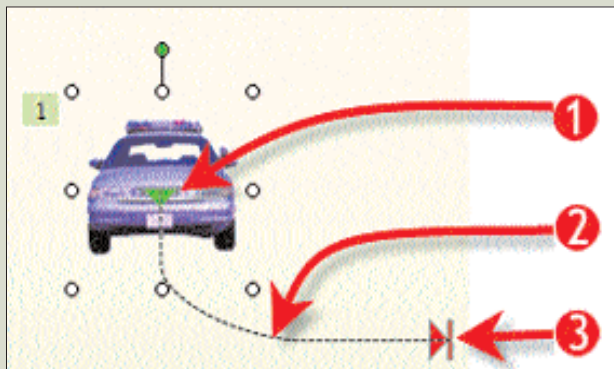
A motion path has three components. A green arrow (marked '1' in the screenshot) denotes the starting point, a red arrow ('3') denotes the end point and the path is shown as a dotted line (marked as '2'). Right-click the path for a shortcut menu with three options: 'Reverse path direction' that interchanges the green and red arrows, 'Close path' that draws a straight line from the red arrow to the green arrow, and thus closes the path, and 'Edit Points'. Click 'Edit Points' to view the points. Drag these to edit the path. Usually, it's easiest to apply a preset path and edit it according to your requirements. With motion, you do need sound. Here's how you byte them in. Presenting Step 7!

STEP 7 — Playing Sound

Inserting sound in a slide is simple. Go to **Insert > Movies and Sound > Sound from a File** and select the desired sound file. This done, PowerPoint will ask you whether you want to play the sound automatically or when clicked. After this, a small speaker icon appears on the slide. Now to tinker with these sound notes...
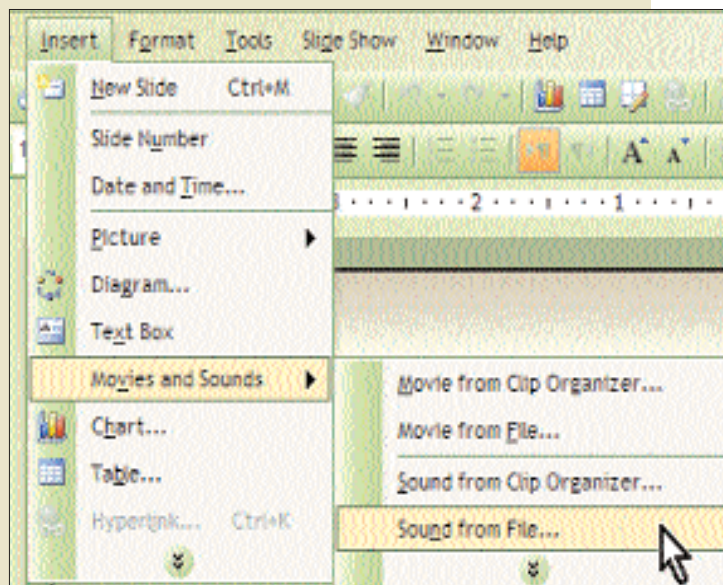
STEP 8 — Set Sound Options
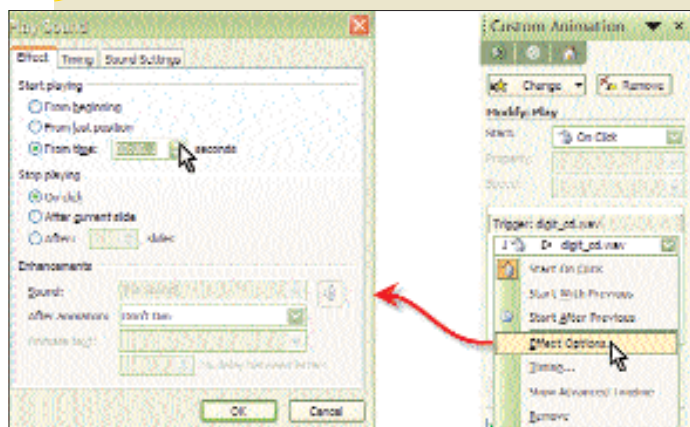
To set advanced sound options, go to the Custom Animation task pane, click the speaker icon, right-click the effect and choose 'Effect Options...'. Here, you will find options to set the Play and Stop, repeat, etc. You can also specify the number of slides for which the sound should play. You can access some of these settings by right-clicking the speaker icon and choosing 'Edit Sound Object'. If you insert a .wav file smaller than 100 KB, it's embedded in the .ppt file. Otherwise, they are just linked. Wanna play Audio CDs with presentations too? Go to the next step to learn how.

STEP 9 — CD Audio

Go to **Insert > Movies and Sound > Play Audio CD track...** and choose the Audio CDs. You can specify the start and end tracks and few other options here.
You want movies in too? It's possible. Here's how. →
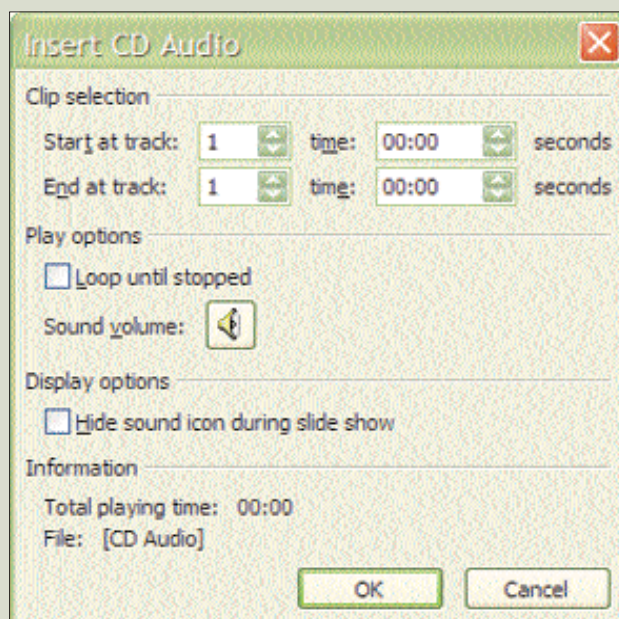
Playing Movies

Inserting movies into a slide is very similar to inserting audio. Right-click the inserted movie and choose 'Edit Movie Object'. Here, you find options to 'Rewind movie when done playing', 'Hide while not playing' and 'Zoom to full screen'.

Note that movies are never embedded, but always linked. Hence, while transferring the .ppt file onto a CD, you will have to copy the movie as well. Use the Pack and Go wizard found under File menu, to put all the linked files in one folder, which you can then transfer onto the CD.
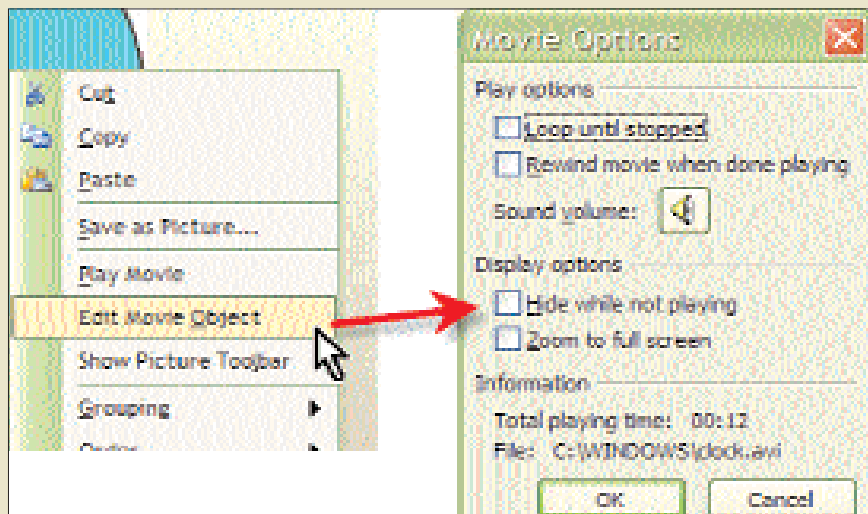
Creating Action Buttons
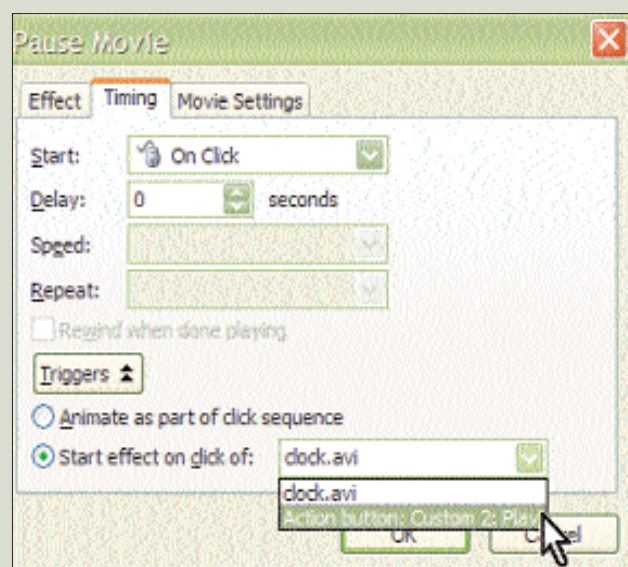
So far we have seen that the movie or the audio file that we have inserted plays when clicked. You can create buttons to play, pause or stop the movie or audio, thus giving your presentations a professional touch. To create an action button, go to *Slide Show > Insert Button*.

Here, click on a button that you wish to insert. Now, click on the movie and switch to the Custom Animations task pane. You will see an entry to Play and Pause the movie. Right-click Play and choose Effect Options.

Now switch to the Timing tab and click the Triggers button. Click 'Start effect on the click of:' and click on the button you just created. Click OK to close the dialog the box. Repeat the process for the Pause effect.

The Stop action needs to be added before you get the Stop button in place. Here's how that's done.

Add Stop

To create the stop button, you need to add this effect first to the movie. This is necessary because the Stop action is not added to the movie by default.

Click the movie and then click the Add Effect button. Go to Movie Actions and click Stop. You will see this entry in the Effects list-box.

Create an action button as explained above and assign it as the trigger to stop the movie. This process works for audio as well.
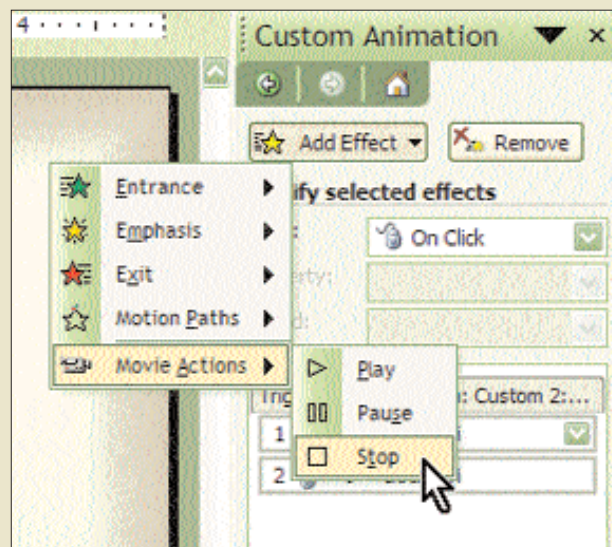
The last word

So that's the way you get your presentations to make their point with aplomb. Indeed, they are bound to go a long way in getting those much-sought smiles and nods of satisfaction at the end of the show!

UPENDRA SINGHAI
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LOCK n LOAD
LINUX

You just set up your Linux box, and think you're finally safe; well, think again. Use these standard tools to secure it

Arvind Chandrasekar laughs as he says, "If you don't like someone, just start packeting them...happened to me, many times over...". Chandrasekar has really good reasons to secure his network. Business development manager for AMD Far East, long time IRC user and a techie to the core, his many computers at home and a fat pipe to the Internet has made him a favourite target of cranks and phreaks. Even as we speak to him, he's being packeted, but he isn't worried; his stripped-down Debian Linux-based 386 provides him with enough protection.

Protection, of course, is key. When you go online, don't think of doing so without adequate protection. You might think a Linux box is immune to the nasties of the world, but there'll always be people ready to come and probe your computer, and use your network resources—it's like getting mugged in a dark alley.

The only way to make your computer truly secure is to stay off the Net, and even your LAN. But don't worry—we're here to help you avoid such drastic measures. We loaded up Red Hat Linux 9 on a test rig, used the default installation options, and configured it to connect to our LAN and to the Internet.

Your PC's downfall—its software

You are as vulnerable as the software that's installed on your machine. As soon as you install Linux, be sure to update all the packages you installed. This is especially important if you've installed an older version of Linux—several security issues would have arisen since its release, and addressed in subsequent updates.

By default, Linux tends to start up a whole bunch of unwanted services, and

The Service Configuration applet lets you start, stop and restart services

what's worse, having them running makes your computer more vulnerable to attacks. First, look for daemons—system services that are listed. These wait for a signal or connection and make a list of what you don't want or need. For instance, the Common Unix Printer System (cups) and Linux Printer Daemon (lpd) daemons are useless if you don't have a printer connected, either directly or via a network.

To look at all the services currently running, click on the Red Hat button and go to *System Settings > Server Settings > Services.* This opens up the Service Configuration applet, which lists out all the daemons that can run on the machine.

The left-hand pane lists out the services, and the description and status are listed on the right. To start or shut down a service, highlight it and select Start, or Stop, from the menu bar on top.

Each service listed has a checkbox next to it; if this box is ticked, the service will automatically start when the machine boots. Uncheck the box to prevent the service from automatically starting.

What you don't need
Here's a list of services that you might consider switching off:

APMD (Advanced Power Management Daemon)—Only needed if your power source is a battery, as in laptops.
atd (AT Daemon)—Used to start a job like cron does; it's not needed, as you can set the system to run scheduled jobs using cron.
cups and **lpd**—Only needed if you have a printer connected.
httpd (the Web server service)—Only needed if you run a Web server.
Sendmail (the mail transport agent)—Only needed if you run a mail server.

Chandrasekar points out that people routinely run Sendmail on Linux or Unix, and it doesn't take much to attack known vulnerabilities in Sendmail. Worse, people can exploit your computer by running port scans and using your computer as a mail relay to send spam.

These are just a few services that you can terminate for good, but there will always be even more that you're left in doubt about. Here's where descriptions come in handy. Highlight a service and read through its description on the right. For instance, telnet and sshd are both used to access the machine from

remote locations, so if you don't plan on doing so, turn them off—this will prevent others from doing it.

Although you're safest with a minimum of services or daemons running, make sure you have every service that's vital to the functioning of your machine turned on. To list out the whole set of services, type in '*chkconfig -list*'. This lists out all services, including those started by xinetd—a daemon that starts network services.

Chkconfig will also tell you which services start on which run-level. Think of run-levels as different modes of operating

ntsysv is almost as good as chkconfig, and is easier to work with because of the Curses interface

the machine—run-level 3 will not start with a text login, run-level 5 will start a GUI login, and run-level 1 is single-user, root-only mode for repairing your machine.

You can use '*chkconfig <service name> off*' to prevent a service from running at start-up—<service name> is, of course, the name of the service you want to stop, for example, '*chkconfig sshd off*'.

You can also use '*service -status-all*' to inspect and change the current status of all services listed. You can start a service using '*service <service name> start*', and stop a service using '*service <service name> stop*'. To stop and restart a service, and force it to read and implement any changes you made in its .conf file, use the '*service <service name> restart*' command.

Alternately, if you like the GUI feel, you can use the ntsysv utility to tweak services within the current run-level from its basic cursor interface, which is easier to navigate.

All fired up

Your Linux distro comes with its own firewall—the iptables firewall system. iptables is a 2.4 kernel feature, which was known as ipchains in prior distributions. Chandrasekar's router-and-firewall is based on ipchains, and though he has no

Secured Remote Access

Remote access services are perhaps the easiest way to attack a machine. Common remote access tools include Telnet, RSH, SSH and FTP. To secure remote access, use the following tips: First, disable access to your computer for Telnet, RSH, and FTP. If you want to keep FTP, at least disable anonymous login. Secured remote access is highly recommended, so make users SSH to your machine and use SCP for transferring files. Both SSH and SCP are built into Red Hat Linux 9.
While using SSH, here are some very important tweaks. SSH protocol 1 is not secure anymore; force the use of protocol 2, which also allows for FTP. Do this by editing */etc/ssh/sshd_config*. Change 'Protocol 2,1' to 'Protocol 2.' Next, prevent root logins via SSH. Enforce a two-step root login, wherein users first use a low-level account to login, and then *su* to become root. Change '*PermitRootLogin yes*' to '*PermitRootLogin no*'. Finally, don't allow any remote logins without passwords—ensure that the '*PasswordAuthentication yes*' and '*PermitEmptyPasswords no*' parameters remain unchanged.

problems with iptables, he prefers not to fix what ain't broken.

On Red Hat 9, iptables is standard, and we'll show you how to tweak it. Essentially, the firewall system is built into the Linux kernel, and is called Netfilter. iptables is the interface that controls Netfilter, and is relatively easy to configure, once you understand how it works.

As with any firewall system, iptables works with a set of rules; these rules will, for instance, allow all outgoing traffic, block inbound traffic for specific services,

etc. The default firewall (Medium Profile) that you can choose while installing Red Hat Linux 9 is pretty secure—for example, remote access techniques are closed down. This configuration works on the basis of accepting all connections, and then denying specific access. Of course, you can choose to be less, or more, paranoid.

We used the following sample configuration for the firewall on our Linux test rig—sourced from the book *Red Hat Linux 9 for Dummies*. The logic is simple—deny all connections, and then accept for specific services. Each of the following is a command that you can only enter when logged in as root.

You can check your current iptables rules by typing in '*iptables -L*'. Then flush out the current rule set using '*iptables -flush*'.

Next, set the firewall to deny absolutely everything—incoming, outgoing and forwarded traffic—by typing:
'*iptables -policy INPUT DROP*'
'*iptables -policy OUTPUT DROP*'
'*iptables -policy FORWARD DROP*'
This is ultimate security, but it also means you're cut off from the world. So, we need to start selectively accepting incoming traffic. You need to start out by typing in
'*iptables -A OUTPUT -j ACCEPT -o lo*'
'*iptables -A INPUT -j ACCEPT -i lo*'
These two commands allow the machine's loopback interface to work, thus allowing the OS to send and receive packets that originate from, and are directed to, the machine itself.

Use the 'iptables -L' command to check your setup, after you're done configuring the firewall

'iptables -A OUTPUT -m state --state NEW,RELATED,ESTABLISHED -j ACCEPT'

'iptables -A INPUT -m state --state RELATED,ESTABLISHED -j ACCEPT'

These open up the machine a little—allowing all outbound packets to get out. At this point, your machine will still not accept any other requests, such as those for ssh remote access. If you want to allow sshd to accept incoming connections on port 22, type in

'iptables -A INPUT -p tcp -m state --state NEW,ESTABLISHED -j ACCEPT -dport 22'

Similarly, if you're running the Squid proxy caching server on port 3128, you could use the following command to allow access to other machines:

'iptables -A INPUT -p tcp -m state --state NEW,ESTABLISHED -j ACCEPT -dport 3128'

Of course, this is if you're using the default configurations of the services. For example, if you need to run Squid on port 8888, you'll need to change Squid's config file, and also set your firewall to accept connections on port 8888 by typing in 'iptables -A INPUT -p tcp -m state --state NEW,ESTABLISHED -j ACCEPT -dport 8888.'

Remember, custom iptables commands work only as long as the computer is running; if you reboot it, you'll need to re-enter all these. Or, you can save the commands as a script. iptables picks up the initial script from the /etc/sysconfig/iptables file. Once you're done setting up your firewall, backup this file and then use the 'iptables-save > /etc/sysconfig/iptables' command to save your firewall settings.

If you don't fancy command-line interfaces, there are several GUI tools to use along with iptables. One of them is Firestarter (http://firestarter.sourceforge.net), which provides a point-and-click interface. Be warned, though—on Red Hat Linux 9, Firestarter isn't very stable.

The Toolbox

It's a little more fun securing a Linux-based computer than a Windows PC; there's just so many more good tools available—made by hackers of all sorts. Here are some powerful, essential tools that you should have. Read the man and info pages for all of them, to access detailed settings.

Chkrootkit (http://www.chkrootkit.org/): Rootkit is the term used for special tools by hackers, once they've gained access to a machine. A rootkit could be something like a tainted 'ps' program, which will never show a trojan or a backdoor; it could be any binary written to masquerade as a legitimate Unix tool, but it is malicious. Think of a 'ps' program that has 'rm -rf *' written into it! To scan for such well-known rootkits and backdoors, use chkrootkit. Once installed, run the program and check whether it detects any rootkits. The sad thing is, if there are rootkits installed, there's no guarantee that all will be found; your only option is to remove the ones detected, check your system logs, and as a worst-case-scenario, clean format and reinstall Linux.

Nmap (http://www.insecure.org/) is a tool that maps your computer's ports as seen by others. It has numerous features, and can be tweaked to show a lot of detail. It's available on the Red Hat 9 CDs, but you should download and install the latest version. Use Nmap aggressively from a remote computer to check for the presence of offending trojans and backdoors. Combine it with 'netstat' and 'ps' to take out all such offending processes. We detected trojans on our test rig using Nmap.

F-Prot (http://www.f-prot.com/): Don't kid yourself into believing that your Linux machine doesn't need an anti-virus program. Worms and viruses come for all OSes. Get F-Prot, install it, and run it regularly. It comes free for use by home users, and is a command line scanning tool. Be sure to update it as often as you would for a Windows PC.

Tripwire (http://www.tripwire.org/) is a tool that checks file integrity. It checks signatures and several binary attributes for security. If the essential Linux program binaries have been attacked, tell-tale signs such as a change in the signature of the programs are seen.
This is the sort of change that tripwire will detect.

PortSentry (http://sourceforge.net/projects/sentrytools/) is a tool that runs as a daemon and monitors TCP and UDP ports. PortSentry will block scanning hosts from making connections to your machine.
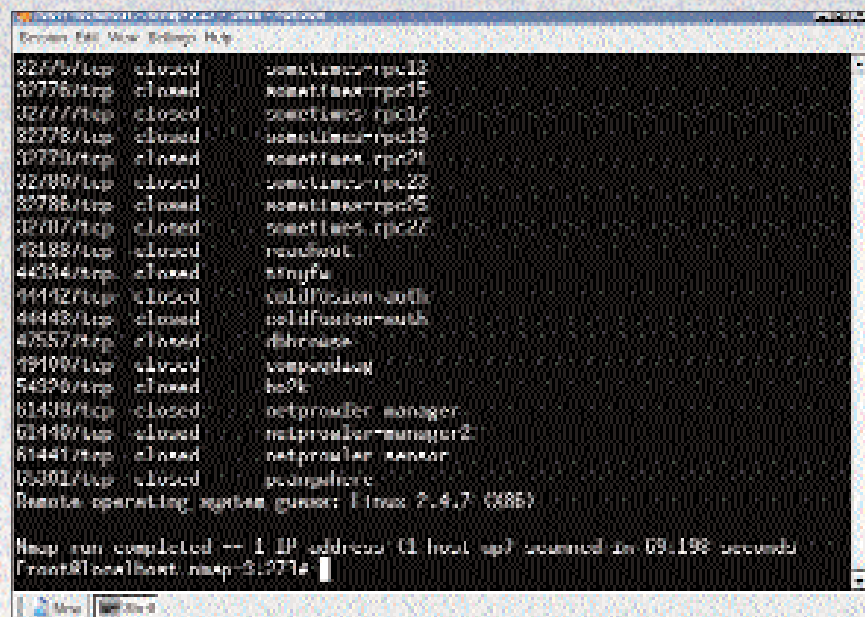
Nmap picked up numerous trojans in this scan

By invitation only

Your Linux install has two files located in /etc, which enable you to selectively allow and ban other computers and networks. Start with the **/etc/hosts.deny** file. Open it in an editor and add this line:

ALL:ALL EXCEPT localhost

This bans all services—the 'ALL' bans all hosts, and the 'ALL EXCEPT' exempts your own machine. Now, to allow access selectively, open the **/etc/hosts.allow** file, and allow selected hosts to access services. For instance, if you want all computers on your private network—like 192.168.*.*—to SSH into your machine, add the line:

sshd:192.168.

This will allow all computers on the 192.168.*.* subnet to access the sshd service. Remember, the hosts file alone is not sufficient. "It's too easy to spoof and gain access. It makes sense to tweak both this and the firewall", says Chandrasekar—which brings us to finding out how secure your machine really is.

Kernel support

There are a couple of kernel-level features that help you secure your rig. These prevent IP address spoofing, and also prevent a common DoS-style attack.

Using IP spoofing, an intruder sends out data packets that claim to be from some other host—this conceals the intruder's identity. The kernel supports Source Address Verification, which can repulse such attacks. By default, this is disabled; navigate down to **/proc/sys/net/ipv4/conf** and inspect the directory. All your network interfaces

will be listed here. Under 'all', Proc file settings common to all interfaces are found, so choose that. To enable Source Address Verification for all listed interfaces, type in

echo 1 > /proc/sys/net/ipv4/conf/all/rp_filter

To turn them on selectively, choose the right interface, say, eth0, and type in

echo 1 > /proc/sys/net/ipv4/conf/eth0/rp_filter

It's audit time

Linux features several tools that show you how secure your computer is. Start with the basic 'ps' tool to view all processes. After this, the 'net-stat' tool will show you all open and closed connections. The '-a' switch shows the status of all ports; the '-p' switch shows the PID and name of the program that accessed the port. You should see a full list of all the programs that are setting connections; use this with the 'Nmap' tool (*see box 'The Tool-box' on page 109*) and terminate all offending pro-

Use the netstat -punta option and get to know which program is talking to which server

grams. If the services need to be shut down, do so using the Service Configuration applet. Finally, make any required changes to the iptables, and save all your changes.

Play ball

Here's a little true story to prove that danger is not just limited to the Internet.

To check out the security of our test rig, we formatted our disk and loaded Red Hat Linux 9. Then we tweaked the firewall, and the machine was denied access to the Net.

We allowed sshd to run, and allowed the entire local LAN subnet access to it via SSH2. Within 12 hours of the install, the machine managed to attract four trojans. Even though there are over 200 hosts on the subnet, this machine was still targeted! Of course, setting the root password to 'rootuser' probably wasn't a great idea in the first place.

Moral of the story: it's entirely cloak and dagger, good guys perennially fighting the bad guys. So, secure your computer as you go online—and please don't use idiotic passwords.

SRINIVASAN RAMAKRISHNAN
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Dos and Don'ts

Dos:
✓ Ensure that you use a non-superuser account for everyday work
✓ Keep making regular backups
✓ Monitor your logs routinely—don't wait for security-related incidents to happen to start scanning them
✓ Update software regularly; at the least, install all security updates
✓ Keep the firewall, antivirus and other security software up at all times

Don'ts
✘ As far as possible, don't allow remote access; if you must grant remote access, only allow SSH-2
✘ Don't install binaries without checking the signatures that accompany them
✘ Don't set easy passwords
✘ Don't let unnecessary services run. Turn them on when needed and turn them off once you're done
✘ Don't tell anyone your root password

Q&A

PCs lying about their disk space?
Refusing to talk sans a password? Here's how you get them to behave!

Auto-power does not work

Q. I have a few problems. Recently, I installed Windows XP Professional alongside Windows 98. Now, I see three options in the boot menu: Windows XP Professional, Windows XP Professional and WINDOWS 98. How do I remove that extra Windows XP option? By the way, XP is loaded in C:\Windows.000 and 98 in D:\Windows.

Also, the machine doesn't power off automatically when using Windows XP. This is not so with Windows 98. As I have an ATX power supply, I guess by default it should turn off automatically. Please help me solve these problems.
Tapas Kumar Mahata

A. For your first problem, open the file c:\boot.ini using Notepad. You will observe that it has two rows with Windows XP Professional mentioned. Keep the following line:

multi(w)disk(x)rdisk(y) partition(z)\windows. 000="Microsoft Windows XP Professional"

Delete the other row, save the file and restart your PC.

As for your second problem, you need to enable Advanced Power Management (APM) for your system. To do so, go to *Control Panel > Power Options*. Here, click on the APM tab and select 'Enable Advanced Power Management support'. Once done, your PC should shutdown automatically.

Check the 'Enable Advanced Power Management support' option to take advantage of APM and at the same time save on electricity bills!

Files deleted by anti-virus software

Q. I have a Windows 98 PC that uses a Cyrix Media GX processor, 64 MB RAM and runs Norton AntiVirus Software. It deleted certain files while scanning for viruses. Soon after that, several programs failed to open and I get the following error:
'Program not found. Windows can not find SirC32.exe. This program is needed for opening files of type 'Application'. Location of SirC32 .exe.C://'. The error message box has three buttons: OK, Cancel and Locate. What should I do?
Ashwin Doshi

A. The filename is that of a virus that infected your PC. Norton scanned the machine and deleted it. However, its residue effect is still present and that is the cause of the error message. The simplest way out is to download and execute the virus fix. Norton has one such fix available at *http://www.sarc.com/avcenter/ FixSirc.com*.

Connecting computers in the same locality

Q. I have a Pentium 4 2.6 GHz, 512 MB RAM and a GeForce4 128 MB video card. My friend also has the same configuration. We would like to play multiplayer games, but our Internet connection is too slow. Is there any hardware upgrade possible that will connect our PCs directly? We would prefer something that does not need a telephone line. My friend's house is just a five-minute walk away from mine. Also, do let us know the costs involved.
Rahul

A. You will get a better performance if you connect to your friend's computer

directly using a telephone line. In this case, instead of you and your friend dialling out using two different telephone lines to connect to each other via the Internet, you use just one telephone line to dial straight to your friend. This cuts down phone bills by half.

Alternatively, if you and your friend stay within 150 metres from each other, consider using a cross-over cable. Beyond that you will have to make use of repeaters and you need to find a feasible intermediate location to attach the same. You will have to spend around Rs 900 for two LAN cards, about Rs 800 per repeater and Rs 10 per metre of cables used.

Opt for an 'Always On' service provider if your locality has one. These connect PCs to a small network and thereby provide Internet access to the PCs. In this way you could get connected on a LAN and then play games.

Another alternative is to set up a Wi-Fi network but this is possible if you and your friend stay in line of sight. This solution also depends on a lot of environmental factors. Typically, you will need a wireless LAN card plus a couple of high-gain antennas. You could buy a high gain antenna or make one yourself. You will find lot of stuff on the Internet in this regard. The total cost of this solution should be around Rs 15,000.

A VGA compatibility issue

I have a Pentium 4 1.6 GHz CPU and a VIA motherboard. Now, I wish to upgrade the VGA card, but I don't know which one to opt for? My friend also has a VIA motherboard and a GeForce4, but it causes a lot of problems while playing games. My dealer recommends the Max Force GeForce4; should I buy that?
Rohit Singh

Yes, there are a lot of issues with the VIA motherboard and the GeForce4, so before buying beware. To counter the problems that arise, you need to constantly look out for BIOS and motherboard updates and install them as soon as they are released. If possible, get the motherboard replaced and then think of buying a new VGA card.

DAT, .INI and .DLL

Of late, I've been facing several problems. My configuration is a Celeron 466, 128 MB of RAM, an 8.4 GB hard disk, and Windows 2000 Professional. Here's what's been happening:

I can't play .DAT files off my CD-ROM. They run from disk, though. I tried reinstalling Windows but it didn't work.

I can't find the boot.ini file on my hard disk. I'm able to open it in Notepad, but after I'm not able to save it after modifying it' it says that I "need to change the Read-only Attribute." In order to do this, I do a search for the file, but it doesn't show up in the results.

On a system with a VIA chipset Trident motherboard, 128 MB of RAM, a 20 GB hard disk, and a P-III 1 GHz, I'm not able to install three OSes. I have three partitions'

a 5 GB, another 5 GB and a 10 GB. On the first I have Windows 98, the second one is for Red Hat Linux 9, and the last is for XP. Without Linux, the other OSes used to run fine, but after installing Linux, when I try to boot into XP I get this message: "HAL.DLL is missing or corrupted." I tried the SFC on Windows 98, found the HAL.dll file, and extracted it from my XP CD to put it in the proper location, but it didn't work.
Any answers?
Mayukh Chowdhruy

If you are able to copy the .DAT movie file from a VCD to your hard disk and play it, the problem is clearly hardware related. Older CD-ROM drives may have problems reading non-original CDs properly. The drive must retry reading multiple times before it picks up error-free data. This means that the data flow is slowed, and the drive may get very hot. To play back a movie smoothly, data flow should not be interrupted in this manner. You may try a "Lens Cleaner" CD, but in all probability this problem will only be fixed by a new CD Drive.

There's no doubt that your boot.ini file is in C:\. You can't find it because it's hidden, and you can't save it because it's read-only. To view hidden files, start Windows Explorer, and go to *Tools > Folder Options > View*. Select 'Show hidden files and folders.' Now you'll be able to see the boot.ini file. Select the file, right-click it, and choose Properties. Here, unselect 'Read-only' and click OK. Now you'll be able to modify the file as well.

To recover the HAL.dll file, boot from your Windows CD and choose the 'Repair' option. This will prompt you for the Windows installation to use. Supply the Administrator password, and you'll be able to restore any file you want to. Now, execute the following command at the prompt:

expand x:\i386\hal.dl_ y:\windows\system32\hall.dll. Replace 'x' with the drive letter of your CD-ROM, and 'y' with the letter of your Windows XP partition. Restart the machine, and you'll be able to boot into XP.

Norton error

Whenever I install Norton AntiVirus 2004 Professional on either Windows Me or Windows XP, I get an error message saying "Norton antivirus has encountered an internal program error (4002,517)". I downloaded the 15-day trial program from


Negotiations between 98 and 2000

I have set up two Windows 2000 Professional PCs and two Windows 98 PCs on a LAN. I am asked for a username and password while connecting from a 98 machine to a 2000 system. This does not happen when accessing the Windows 98 PCs from a Windows 2000 PC. How do I get the Windows 98 computers to access the Windows 2000 computers?
Ashutosh Chatterjee

Create a user account on both the 2000 computers and specify a password for each. To do so, go to Control Panel and click on 'Users and Passwords', to add new users. Use these accounts to connect from the Windows 98 system.
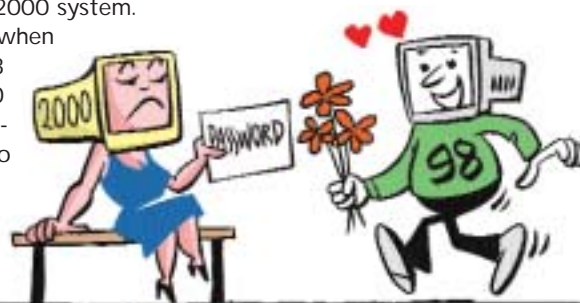
Illustrations: Mahesh Benkar

Symantec's Web site and activated it as well as updated the virus definitions. Now, what should I do?
Kabir

A This is a known issue and its solution was provided in one of the updates. To install the update, start Norton AntiVirus, run Live-Update, download all available updates, and then restart the computer when prompted.

If the error still persists in Windows XP, go to *Start > Run*, type *'msconfig'* and click OK. The System Configuration Utility appears. Here, click the Startup tab. Now look for the ccApp entry and ensure that it's checked. Next, click the Services tab and under the Service heading, locate Symantec Event Manager and Symantec Settings Manager and click the checkbox in front of these entries. Finally, click Apply and then OK. Restart the machine if prompted to do so.

For Windows 98/Me, go to *Start > Run*, type *'msconfig'* and click OK. Click the Startup tab, look for the entries for ccSetMgr, ccApp and ccEvtMgr and ensure that they are checked. Click Apply, and then click OK and restart the machine.

If the above process also fails to solve the problem, then download the Symevent installer file Sevinst.exe (*ftp://ftp.symantec.com/public/english_us_canada/symevnt/sevinst.exe*) onto your computer and execute the following command at the MS-DOS prompt:

C:\sevinst.exe /r

Finally, restart the computer. Get in touch with Symantec support if the problem still persists.
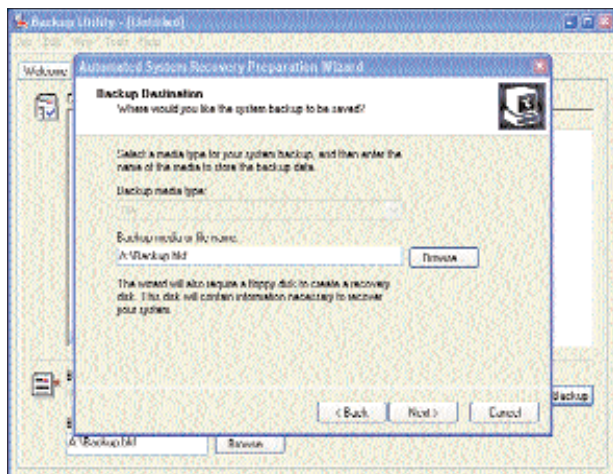
The ASR wizard helps you create a rescue disk in Windows XP

Why am I cheated on the size?

Q I have a Celeron 1.1GHz with 128 MB SDRAM, an 810BU Tomato Intel chipset motherboard and an 7,200-rpm 80 GB Seagate Barracuda hard drive. While creating a partition through Windows XP Professional, the drive capacity was shown as 80 GB. However, after the partition, it shows its space reduced to 74.5 GB. I am quite surprised at the loss of 5.5 GB. Where did it go? What is the real problem? Is it possible to recover this lost space?
Tsering Ngodup

A The problem is not with your hard drive. By default, it will report the disk capacity to be approximately 74.5 GB for an 80 GB hard drive, just as it shows 18.64 GB for a 20 GB and 37.26 for a 40 GB drive.
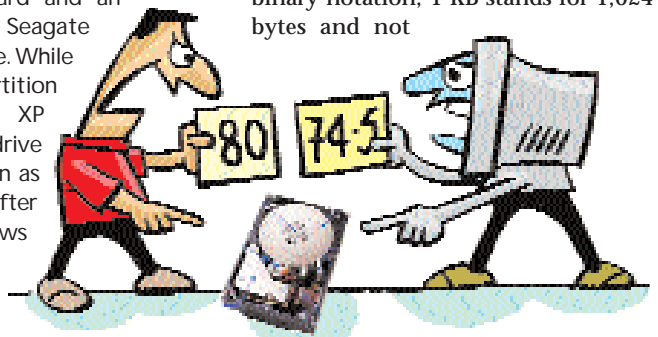
There are a couple of reasons as to why the hard drive loses some space. The manufacturers themselves specify the size in decimal notation instead of the binary notation used by PCs. In binary notation, 1 KB stands for 1,024 bytes and not 1,000 bytes, as is the case in decimal notation. Hence, the computer perceives the size to be lesser than the specified value.

Another factor that brings down the size of the hard disk is the file system overhead. As a result of both these factors you get approximately 95 per cent of the size specified by the manufacturer, which is the same in your case. Thus, you can't do anything to recover this space.

98 after XP

Q I have Windows XP Professional currently installed on my PC and I wish to install Windows 98 on it as well. How do I do that? My hard drive has two partitions.
Deepinder Singh Mann

A Ideally, you should be installing Windows 98 first, on one partition, and then Windows XP on the other partition. However, as you have already installed Windows XP, create a rescue disk for Windows XP by going to *Start > All Programs > Accessories > System Tools > Backup > Tools Menu > ASR Wizard*. Once the disk is ready, verify it by booting the computer with the floppy. Now, install Windows 98 on the other partition. You will not be able to boot to Windows XP once the installation is com-

plete. So, use the rescue disk to get back to Windows XP, open the boot.ini file residing in the C: drive using Notepad and add the following line under '[operating system]':

c:\="Windows 98"

Save and close the file, and that's it! You're done.

Data's encrypted

Q I had some encrypted data on my system running Windows XP, and I'm not able to use that data now. Please help!
Praveen Tanwar

A If you have used the encryption built into Windows XP, then there is hope, provided that you have backed up the private key used to encrypt the file. Visit *http://support.microsoft.com/default.aspx?scid=kb;EN-US;223316* for information on the encryption process as well as steps to decrypt the file. However, if you do not have a backup of the key, then all we can do is give you our condolences for your data loss! When you lock something away and lose the key, you are just as locked out as any potential thief!

FAQs

Machine auto-shuts down in a minute!

Q. I run Windows XP Professional, and I've recently gotten a broadband connection. I didn't have anti-virus software when I got the connection. Now, all of a sudden, I've started receiving a message that says, "NT Authority/system call, Remote Procedure Call service terminated. The system will shut down within one minute." I installed Norton AntiVirus 2003, but it isn't working at all. I then tried to run navdx.exe in DOS mode, but it doesn't detect a virus. What might the problem be?
Saptarshi

A The solution to your problem involves three steps. First, download the virus removal tool for the Blaster virus—this the virus that has infected your machine—available at *http://securityresponse.symantec.com/avcenter/FixBlast.exe*. Second, the virus may return if you do not patch your Windows, so install the Windows patch available at *http://download.microsoft.com/dowload/9/8/b/98bcfad8-afbc-458faaeeb7a52a983f01/WindowsXP-KB823980-x86-ENU.exe.*

The final step is to download the latest virus definitions, located at *http://securityresponse.symantec.com/avcenter/download/us-files/20040311-033-i32.exe.* If the shutdown error message occurs while downloading any of the fixes mentioned above, go to *Start > Run*, type *'shutdown -a'* and press *[Enter]* to get rid of it temporarily.

Reducing flicker

Q. Ever since I upgraded to Windows XP, the refresh rate of my monitor has become exceptionally slow. It refreshes slowly when I try to scroll down the screen. Can you help me resolve this?
Milan

A All you need to do is increase the refresh rate. Right-click anywhere on the desktop and select Properties. Go to the Settings tab, click Advanced and switch to the Monitor tab. Here, set the 'Screen refresh rate' to the highest possible value. For a 17-inch monitor at 1024 x 768, the maximum refresh rate is around 85 Hz while it is 70 Hz for a 15-inch monitor at 800 x 600. These settings do vary from model to model

and vendor to vendor.

Also, do use the VGA card drivers provided by the vendor for better hardware acceleration in the display, making it scroll faster. You may also reduce the number of colours your display is set to in the Settings tab.

Works in one, but not in the other

Q. Somehow my Riva TNT128 AGP card does not install properly in Windows 98. The display goes blank once I reboot it after the driver installation. I have a dual-boot PC that runs Windows XP and Windows 98 on a BXv98-AT board with 128 MB RAM. The card works fine with Windows XP, though. I am using the drivers CD that was bundled with the card.
Pradip Srivastav

A Ensure that the appropriate driver files are selected while installing the driver in Windows 98. If there is no wrong being done in the driver file selection, then probably the drivers themselves are corrupt. Download and install the detonator from *http://www.nvidia.com/object/LO_20010606_3499.html.*

Opening ISO files

Q. I have a Pentium III 866 MHz, Windows 98 SE, 256 MB of RAM, Award BIOS, and a 20 GB hard disk. I often save images of CDs on my hard disk using Nero 5.5. What software should I use for opening these image files, which are in the .iso format?
Abhinav

A There are many applications that open ISO files. Some of them are WinISO, available from *www.winiso.com*, UltraISO from *www.ultraiso.com* and WinRAR available at *www.rarlab.com*.

No display

Q. I have a Pentium III 800 MHz with Windows 98 SE and a Mercury 810 motherboard. My problem is that there is no display on my monitor. As I boot up my PC, the monitor goes into standby and there is no activity at all. Please help me.
Tejas

A First, verify if the monitor is working properly. Remove the display cable from the VGA port at the back of the cabinet. The monitor should then display a message that reads something like this:"No connection, Check signal cable". Older monitors may not display anything. Connect them to another working computer to test their functionality.

The next step would be to check whether the SMPS is working. If its fan is not working then the problem is with the SMPS. You will have to get it repaired.

If all's well with the SMPS, then check the internal speaker. To do that, remove the RAM chips from the motherboard and boot up the PC. The speaker should generate some sound, if not then get a proper working speaker, as it's an important component in the troubleshooting process. If the speaker works, and yet you hear no beeps indicating the removal of the RAM, then the motherboard or processor is at fault. Get them serviced.

However, if the speaker does beep then insert the RAM back into the slot and remove the display card. Now the speaker should beep again. If it doesn't, then there is a problem with the motherboard. If the speaker beeps then the display card is at fault; get it replaced or repaired, insert the new or repaired display card and the monitor should work fine.

The last step would be to check if the CPU fan is working. If it isn't, then again the motherboard is at fault. Verify the working of the fan using an alternate computer. ▣

tips & tricks

Atul Deshmukh

Animating
Instincts

So you want to be a graphics animator... You're definitely going to need these tips to to make Maya and 3ds max work for you...

contents

MAYA

Get the most respected animation software to create breathtaking animations for you

Farzana Cooper

Transfer unused channels into the NonKeyable attributes

'Use Default Button' option, set the Project as Current and save your working scenes. Transfer all file textures to the Source Image folder. Before you render, delete all unused nodes. To do this, go to *File> Optimize Scene Size.*

Clean the Channel box
Select Object and then go to *Window > General Editor > Channel Control.* Select channels that you won't use on your current object. Click on Move to transfer them to the Non Keyable attributes. Also, look out for Non Keyable attributes such as Shear, Ghosting, etc.—you can transfer them to the Keyable attributes with the Move button.

You can split an outliner in two to efficiently manage a number of objects. Click on the grey line at the bottom of the outliner and drag it upwards to do so.

Lock the camera
To the right in the channel box, select the channels by name, click on the one on top, drag it to the last, right-click and select Lock Selected.

General user tips
Manage your scenes
A project lets you group different files such as rendered images, needed for a scene or a group of related scenes. Go to Create Project and click the

Group different files needed for a scene into a Project

To revert to selections
Go to *Create > Sets > Quick Selection Sets* and name the selection. Next, go to *Edit > Quick Select Set.* This is handy when you have to revert to selected vertices in a complex mesh. Use the Lasso tool or go to *Edit > Paint Selection Tool,* to make Selections.

Modeling
Making polygonal Models
To keep a check on your polygonal count, Go to *Display > Heads Up Display > Poly Count On* to do so. Make a polygon smooth proxy by going to *Polygon > Smooth Proxy.* For symmetrical characters or models, model only one half, and when complete, mirror the other half. Do this by going to *Polygon > Mirror Geometry.* Here, choose the respective axis and select Mirror. You can also opt to 'Merge the Vertices' at this

time. Rig this LowPoly model, and keep checking the skinning results, the Outputs on the hiRes model, or the Smooth Proxy. Keeping the LowPoly and HiPoly on two
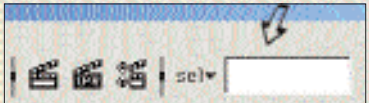
Use the sel box to name the selection

different layers is usually helpful, for files with large scenes, and also when you have to edit vertices—the fewer the better.

To make wires, tails for polygonal meshes
To create creatures, pipes, or get multiple appendages to protrude quickly, use the extrude process. To do this, select the edges or faces you want to extrude and the curve you want to extrude along. Go to *Edit Polygons > Extrude Face or Edit Polygons > Extrude Edge.* Here, turn on the

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'Use selected curve for extrusion' option and click Extrude. Press *[Ctrl] + [A]* to access the Attribute Editor and use its controls to edit the extrusion.

Use the Twist option to rotate the extruded polygons, and 'Taper/Taper Curve' to scale them along the curve. To control the taper exactly, open the Taper Curve section and use the graph control to set scaling along the length of the curve.

Nurbs at render time

To get rid of jagged edges of nurbs at render time, go to Attribute Editor and dropdown Tessellation. Check the Display Tessellation box and increase the 'Curvature Tolerance' by using the drop down menu. You can Increase the U and V divisions factor by typing in a higher value. This increases the meshcount when rendering, thereby outputing a smoother geometry.

Animation

Reordering inputs

The way the deformers or input nodes are assigned affect the object to a considerable extent. To reorder these, right-click on Object and go to *Inputs > All inputs*, click the middle mouse button on the input node and place it below or above another in the same stack.

Evaluate nodes

This feature is present in the Modify menu. It's great, especially when making a tiny change in a completely rigged character setup. Just put the

respective function on, make your changes, and go back to Evaluate All.

Smoothing weights

It's a bit unnerving to keep rotating the joints, or moving the Inverse Kinematics (IK) to check the influence of the joints and their weights on your skinned character.

Instead, simply animate the joints at their extreme positions. Set one key at bind pose at frame 0 and another at another pose, at, say, frame 50. Now, compare or adjust the weights as you scrub along the timeline.

Editing smooth skin bind

To change the weighting of the CVs, other than by painting weights, go to *Windows > General Editors > Component Editor* and under the Smooth Skin tab, type in the values for the selected vertices.

Ghosting

This is a direct translation of the classical animation technique of flipping through a handful of cell drawings to get a feel for the timing of the action you are working on.

You can control ghosting on each object in your scene with the 'Ghost Selected' and 'Unghost Selected' options windows, or with the Ghosting Information attributes. In addition to ghosting individual objects, you can now ghost entire skeletons or object hierarchies.

The appearance of ghosts in the scene view is also improved for Maya 5. The colour of ghosts before and

after the current frame or keyframe lightens as their distance from it increases. This is visible only when scene view Shading is set to Wireframe.

Move along rotation axes

Use the Move tool to move along the Rotation Axis option to orient the move manipulator to the local rotation axes of the object.

Freeze joint orientation

Maya 5 lets you freeze the local joint rotation axes to match world space. To do so, go to *Modify > Freeze Transformation* and turn on the Orient option. If this option is turned off, the local joint rotation axes are not affected by Freeze Transformation.

Parent constraints

With a parent constraint, you can relate the position—translation and rotation—of one object to another, so that the objects behave as if they are a part of a parent-child relationship that has multiple target parents.

An object's movement can also be constrained by the average position of multiple objects.

Maintain offset

Use 'Maintain Offset' to preserve the original, relative translation, rotation, and scaling of a constrained object. This option is present in all constraint option menus

IK/FK blending lets you apply keyframe animation to joints, and also control them with IK animation. In addition to blending IK and For-

ward Kinematics (FK) animation over multiple frames, a blend can occur over a single frame as well. This switches IK to FK or FK to IK instantly.

Indirect skinning

Here's how you can conform the shape of the skeleton through a lattice: Construct a shape in the form of a snake—draw a curve, create a circle, and Extrude on Path. Draw a skeleton of 10 or more joints inside the model. Create an IK handle that's the length of the skeleton. Select the skin and create a lattice with ample divisions. Select Skeleton and 'Bind Skin to the Lattice'. This lets you deform the hardest of objects convincingly.

Rendering

Pelting

Reduce the effort and time you spend on adjusting those UVs when texturising characters or models: The technique is called pelting. Take your mesh, for example, the face, duplicate it and flatten out all the CVs onto a single plane, almost as if you were to hammer them. Apply a planar map to it. Now, transfer the UVs back to the original face mesh and then open the UV editor. Isn't that something!

Paint FX

Flip Tube direction
Use this to switch the direction of the current brush between Along Path (ideal for canvas painting of plants) and Along Normal (ideal for scene painting of plants). This is available as a hotkey.

A 'Force Tube to be Along

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Path' checkbox is added to the Canvas section of the Paint Effects Globals. When checked, this causes brushes with tubes whose elevation-Min is greater than 0.5 to be drawn along the path rather than along the normal in canvas mode. Thus, the plant brushes draw in the expected direction when painting in the canvas.

Paint effects and polygons

You can convert Paint Effects strokes to polygonal meshes, including construction history, using *Modify > Convert > Paint Effects To Polygons.*

This allows you to: Render in any renderer, including the Maya Software renderer—mental ray for Maya—the Hardware renderer, and the Vector renderer. Also to have Paint Effects show in reflections, refractions and through transparent objects. Lastly, you can use other polygon-editing tools on them.

Turn on Quad Output, to output to quadrilaterals. The default is off, defaulting output to triangles.

Lights

Intensity and colour curves
Use a custom brightness decay rate to increase a spotlight's brightness, or a custom colour decay rate to change its colour with distance.

Intensity curves and colour curves are graphical representations of a light's brightness and colour with distance. Use the graph editor *(Windows > Animation Editor),* to view them.

The vertical axis represents the intensity or colour intensity value, and the horizontal axis represents distance from the light source. Intensity curves and colour curves are similar to animation curves, except that the horizontal axis of an animation curve represents time.

RampShader brightness
Use this Shader Type to create cartoon-style shading with the help of a ramp with stepped values. The right side of the ramp shows the colour output where the brightness of the diffused and translucent lighting is 1.0 or greater. The left side displays the colour with brightness set to zero.

3D Paint Tool

Edit existing textures
You can now edit both, the size and the file format of existing 3D Paint textures using the Assign/Edit Textures button in the File Textures section of the 3D Paint Tool settings. This button was pre-

viously named Assign Textures and used only for assigning new textures; it had no effect on existing textures.

The displacement attribute
Displacement is added to the Attribute to Paint drop-down list in the File Textures section of the 3D Paint Tool settings. It is now a paintable attribute.

Output

The Maya Vector renderer
Make good use of the Maya Vector to stylise renderings.

It offers cartoon, tonal art, line art, hidden line, wireframe in various bitmap image formats such as IFF, TIFF, etc. It also offers in the following 2D vector formats: Macromedia Flash (non-interactive) version 3, 4 or 5 (SWF), Adobe Illustrator version 8 (AI), Encapsulated PostScript Level 2 (EPS), Scalable Vector Graphics (SVG).

The Maya Vector to render in style!

Render layers

These are used to render huge scenes. Below the Channel box, there are display layers. Click on the drop down menu, and change to Render. Add the objects to the layers as you create them.

Now, go to *Windows > Rendering Editor > Render Globals.* Here, in the Maya software Tab, drop down Render Layers/MultiPass Control and turn on the option to Enable Render Layers. All objects are assigned to the default layers. Also, look for transparency throughout the layers at render time.

Fcheck

Access Fcheck by going to *Start > All Programs > Maya > Fcheck.* This utility is provided by Maya to view images and animation sequences. Use it to view high-resolution image sequences. If your RAM doesn't support playback of larger images—because the image sequence is too large—you can shrink it and reduce the image by 50 per cent. Fcheck is also used to re-number the sequence or rename it.
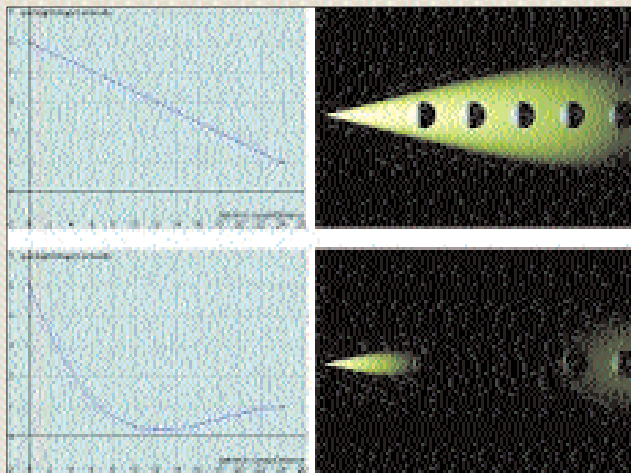
Adjust the brightness of a spotlight to suit your animated needs

3ds max

3ds max is one of the most sophisticated 3D software that makes your images come alive. Here, we take you through nifty tips that take your work to a new animated dimension


3ds max is one of the most popular 3D applications used in the broadcast and film industry. Its intuitive toolsets help you create professional-quality 3D models, photo-realistic still images, and film-quality animation on your PC.

The new channel, Pogo, has made excellent use of animation to package itself. We will use the Pogo logo as an example to help understand the plethora of features that are hidden in 3dsmax.

Creating the element

The basic element of Pogo is a square with its top-right corner rounded.

Let's create this shape: Click on the Front viewport to activate the viewport.
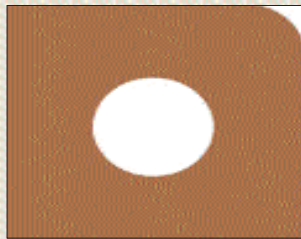
The basic form of the Pogo logo

Click the Create tab in the command panel. Click the Shapes button to display the Splines shape type.

On the Object Type rollout, click rectangle. Click the Keyboard Entry rollout to open it. Here, select a numeric field with the mouse and enter a value of 50 in the Length and Width field. Leave the Corner Radius value at 0 and click Create.

Observe the Front view-port. You now have a square of 50 units. Name this element as Pogo_element in the Name and Color field.

Create embedded shapes

We need to embed a circle inside the square, so that we can modify the size of the circle in animation. While there are many techniques to do so, 3ds max offers you a simple method to create this effect.
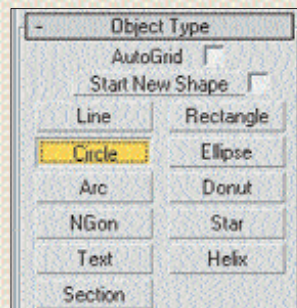
Select circle to get that shape in the animation

To embed a new shape, select the 'Pogo_element' that you have created in the Front viewport. Go to the Create panel and uncheck the 'Select New Shape' option in the rollout. Now, click the Circle button. Open the Keyboard Entry rollout. Enter 10 as the Radius value and click Create.

The new shape is a part of

View the shape from the Front viewport

the 'Pogo_element'. Move the shape in the Top Viewport, using the Select and Move tool, and both move together.

Dynamic mouse undo

If you are moving the 'Pogo_element' from the existing position to a new position by left-clicking and dragging the mouse, you can cancel this action by keeping the left-click pressed and clicking the right button once. This is a handy tool to check certain functions without committing your actions.

Animating the hole

First, convert the object into a mesh. Select the object, click on the modifier list and select Edit Mesh. Alternatively, press *[E]* after clicking on the modifier list to jump to the Edit Mesh modifier.

Expand the Editable Spline modifier controls and select the spline module. Click on the circle in the object and the selected spline is displayed in red. Click on the 'Show end result on/off' toggle button
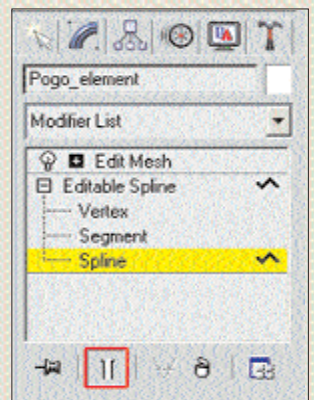
*The magic icon to preview the end result*

for the mesh preview when keyframing. You can see the mesh in shade view in the Perspective viewport.

Now go to Frame 1 on the timeline and hit the Auto Key button to activate it. Go to frame 20 and use the Select and Uniform Scale tool to scale the circle. Similarly, go to each successive twentieth frame and keyframe the circle using various scaling values. The best way is to scale up and down during keyframing. Remember to scale the circle within the square.

Now your basic shape is animated. Save this file as, say, Pogoanim_ master.max

The rounded corner

Use the Fillet option to create the rounded top-right edge. To get a better view, click on the 'Zoom Extents All' button. This fits the shape to the best size in all viewports.
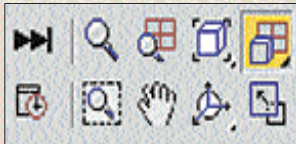
The magic button to fit views in all the viewports

Here's how you fillet the edge: select the 'Pogo_element' and click the Modify tab in the Command panel. Here, the selected object is shown as an editable spline object. Click on the '+' to open up the sub-object controls. Click on the 'Vertex sub-object' and then on the top-right vertex of the 'Pogo_element' in the Front
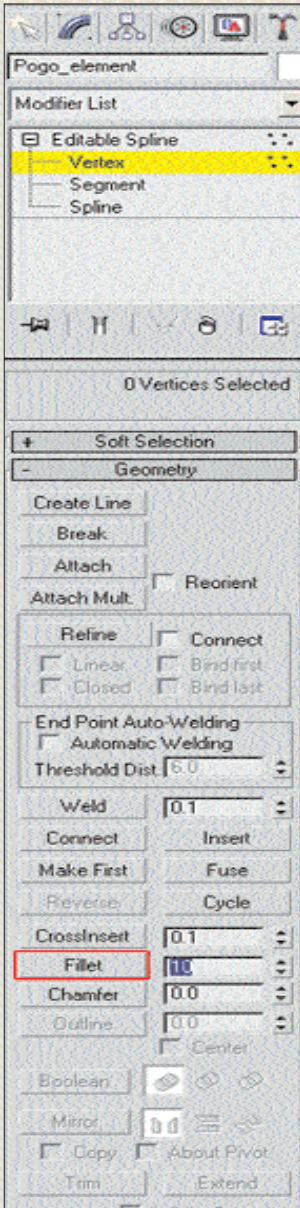
The Fillet dialog box helps you create those round edged corners

viewport. Now, enter '10' in the Fillet box and press **[Enter]**. Your Pogo shape is now ready. Save this file as Pogo_master.max. For other techniques, remember to

save it as a new file before starting a new project.

Creating an array of animated shapes

Use the array command to create duplicates of the basic shape. Remember to save as this file as tech2.max. Select the object, and go to the **Tools > Array** command from the top menu bar. We will now duplicate 10 copies on the X-axis. Note that the size of our master object is 50 units. In the Move incremental field, set a value of 50. Select type of object as
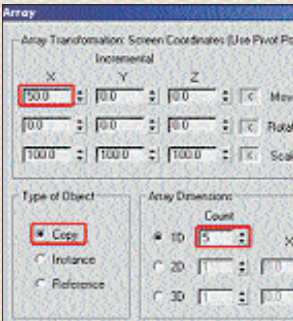
Make multiple duplicates in a jiffy

Copy. In the array dimensions, select 1D with a count of 5 and click OK. The shape is repeated across the X-axis with edge-to-edge accuracy. Move the slider on the timeline from 0 to 100 and you will find that even the animation parameters are copied with the object.

Randomising animation

Notice that all the circles are animated in a similar way on the timeline. We can now bring in some variation by selecting each object and shifting the keyframe.

The Play/Pause toggle controls playback

Select the second object in the series and move each keyframe marker that appears on the timeline to a different position. For example, move the keyframe marker 1 to frame 5, keyframe marker 20 to frame 35, and so on. This done, check the playback by selecting the perspective view and clicking the Play Animation button next to the timeline. Repeat this procedure for all the objects. On playback, the circles are animating at different time intervals.

Save this file as tech3.max.

Make an instanced array

Select all the 5 animated objects and go to the Tools - array command again. Click on 'Reset All Parameters'. Enter 50 as the value in the incremental Y Move field. Select instance as the type of object. Enter 5 as the array dimensions 1D and click OK.

Notice that this creates a new set of objects on the Y-axis. Go to the timeline and

The Perspective viewport shows the model with instanced arrays

30

hit 'Play animation'. All the vertical objects have the same animation. The base object keyframes can now be modified. Remember we had used the Instance option while creating an array. Let's see how to use this feature. Select the 3rd object in the bottom row. Observe that the keyframes are the same for the objects placed vertically above it. Modify the keyframe position of the base object. All the keyframes in the instanced objects above it are updated automatically. Group all the objects using the group command in the menu bar. Save this file as tech4.max.

Using Instance while copying, allows you to modify the parameters of the master object. All instances created from the master object are updated automatically. This is useful when developing animation—say, with a school of fish, where you modify one fish to update all instanced objects.

Camera animation

Create a free camera in the Front viewport from the camera command panel. Move the camera along the Y-axis so as to view the grouped objects. Select Camera view in Perspective viewport or press *[C]* while there. Your animation is displayed as seen through the camera.

Move the camera till the objects just fit to the extremes of the view. This is your view in Frame 1. Now, turn on AutoKey and go to frame 25.

Move the camera in the
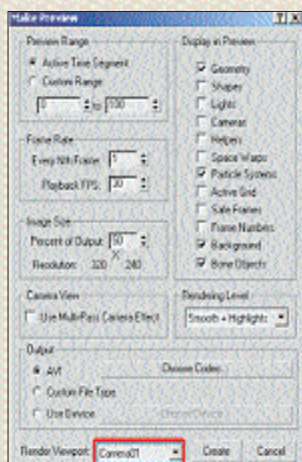
Quickly check your animations in Preview mode

left view along the X-axis closer to the object. Move it along the same axis away from the object in frame 50. Use your own creative camera compositions. Repeat the same for frame 75. For frame 100, copy the keyframe from frame 1 to frame 100 by clicking and dragging the frame 1 marker, while holding down *[Shift]*. Your basic animation is ready. You can preview your animation by selecting the *Animation > Make Preview* command from the menu bar. Save the file as tech5.max.

The Make Preview window has options that allow you to set the size and parameters of your preview. Ensure that you have chosen Camera01 from the Render Viewport drop-down option. You can also create multiple cameras in the same scene and animate them. You can name these cameras for your convenience. Set the camera name during preview in the Render Viewport dropdown.

Adding dynamism to camera animation

Regular keyframing gives you a very standard looking animation. You can add spice to your animation by using *Track View > Curve editor*.
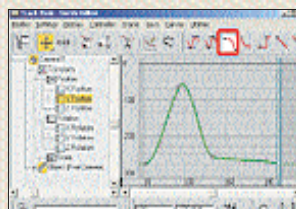
Select the camera and select the *Track View > Curve editor* from the Graph Editors menu to open the curve-editor window. Select the Transform Y position of the camera in the left panel of the editor window. A green curve defines the movement of the camera. It starts with an ease in, takes a peak and then ends with an ease out. This is the
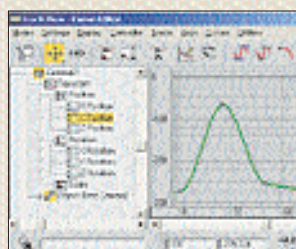
Curves that can set things right

default attribute assigned to animated objects in 3dsmax. However, we can assign different controls to change the nature of animation required.

You can modify the nature of curve in the graph editor to change the tempo of the animation. Click on the second node to display the

Adjust the curve to change the pace of the animation

Bezier control handles. Drag the left node vertically down to change the nature of curve. Preview the animation using the camera viewport.

Similarly, select the fourth node and select the Set Tangent to Fast icon on the curve-editor top panel. Preview it to see the difference. Save the file as tech6.max.

Handheld camera effect

Assign controllers to the X or Z-axis to make the camera movements look wacky or like the effect of a jerk when using a handheld camera.

Assign a controller by right-clicking on the X position of camera01, transform the position in the curve-editor, and select 'Assign controller' to open the Assign Float controller box. Select 'Noise Float' and click OK.

An irregular wave pattern appears in the Noise Con-
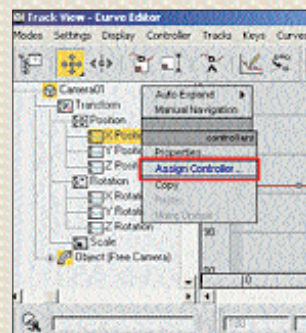
Tweak the curve controls to get that jerky look

troller property window. Preview the animation. Observe that your camera has shifted to the left and the movement is a bit jerky. Adjust the Group01 object

by moving it to the left of the X-axis in the front viewport. Use the camera viewport to move it till you are satisfied with the framing. You can also change the property of the noise strength by right-clicking on the X position name and selecting properties. Change the values of Roughness and Strength to get variations. A small feature called Ramp in and Ramp out allows you to smoothen the start and end movements. Preview your animation at this stage and save the file as tech7.max

Using Skylight

Now we can set up the basic lights required for the animation. Choose an Omni light from the lights pane. Position this to the right of the camera and in front of the object group. Reduce the multiplier intensity of the light to 0.5 in the light properties box.

To make your illumination convincing and softer, use Skylights. Click on the Skylight button in the Create lights rollout. Create this
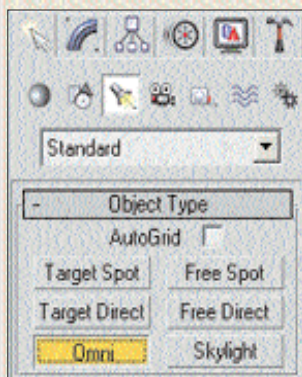
Let there be light

light anywhere in the scene since the effect isn't based on its position. You need to activate the Advanced lighting control to use the Skylight's lighting property. To do so, go to *Rendering > Advanced lighting*, and select Light Tracer.
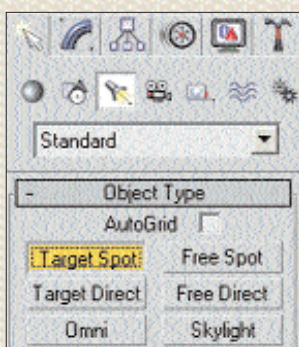
Next, create a spotlight using the create Spot Target
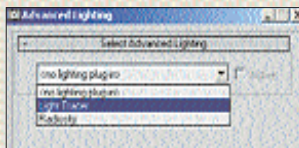
The magical light meter

in the lights create panel. Use the Top viewport to create light from the left of the camera, pointing towards the group object. From the Left viewport, move the target upwards, pointing to the centre of the group.

Here's a special feature that lets you project an

The focus beam light

image onto this object. Select the spotlight and open Advanced Effects from the Modify Light panel. Click None to open the Material/Map browser window. Select Bitmap and press

OK. Select a bitmap image file from your image resource and press OK.

Notice that the image name is shown in the Projector Map box. Open the spotlight parameters in the Modify Lights panel. Choose rectangle as the option for the shape of the spotlight. Use the Bitmap Fit button to automatically resize the rectangle of the spotlight to the rectangular proportion of the projected image. Click on the Bitmap Fit option and choose the projected image again.

You can also change the Hotspot/Beam and Falloff/Field values to adjust the coverage area of the spotlight.

Render the scene. You will see the projected image rendered onto the group object. To make the animation interesting, animate the spot target from the Front viewport on the X-axis and Y-axis. Save the file as tech8.max.

Texturing shapes for a colourful final animation

The animation will look very colourful and contemporary if we can assign a different colour for each square.

To apply colour maps, first open the group object. select it and go to *Group > Open* from the menu bar. Now, select each shape one by one and apply different colours using the Material editor.

Open the Material editor by pressing *[M]*. Select the first sample sphere and change the diffuse colour to blue. Select the shape at the extreme-left and top of the
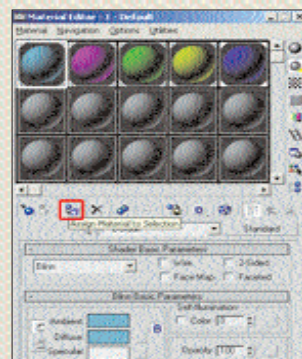

The ultimate makeup toolkit

opened group and click on 'Assign Material to Selection'.

Create 5 such colours in the Material editor and assign it to each object. Render a single frame to see the result.

You are now ready to render the entire animation. Select the Camera viewport and hit the Render Scene button on the toolbar. Select the Active Time segment of 100 frames. Select the custom file size of 320 x 200 pixels. In the Render Output section select the Save File option and enter the filename as render. Select MOV - Quick-
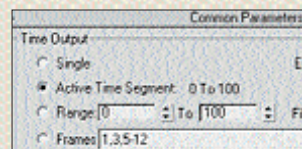
Ready to render

time as the Save As type. Hit the render button and enjoy your Pogo animation.

Remember to render in D1 PAL size, ie, 720 x 576 pixels for professional television-quality ouputs. Also, remember that the televison format requires 25 frames per second. Happy Animating! ◘

32

Dr Seuss: The Cat in the Hat
It's fun

This side-scrolling arcade game reminds you of your old Nintendo games. It's got characters created by Dr Seuss (of the poem *Green Eggs and Ham* fame), and is inspired from the movie with the same name starring Mike Myers (of *Austin Powers* fame). And it's fun.

The magical Cat decides to pay Conrad and Sally—a couple of really bored kids—a surprise visit. The strange next-door neighbour, Mr Quinn, persuades Conrad to open the Cat's magical box, letting all hell loose. To make matters worse, Quinn's now off to collect the magic and become all-powerful. So the Cat bravely volunteers to set off with the aim of capturing all the magic and bringing Quinn to book.

Since the game is based on a children's book, it's as family-friendly as can be. Bright colours, comic characters, funny one-liners, non-violent action. This might be a 'children's game,' but it'll take all your hand-eye co-ordination and lightning reflexes to master it. In that sense, it's as hardcore as it gets.

The action follows a fairly linear sequence. Several appliances in the house have been mutated by magic. You need to enter one that currently houses Quinn,

Calling the graphics colourful would be an understatement

fight your way across the level, and chase him out. To achieve this, you have a fabulous umbrella at your disposal. This multi-utility tool can shoot an endless stream of bubbles, capturing all monsters in its path. You can now pick up these entrapped creatures to blast other entities, or blow away obstacles in your path. The umbrella can also help you glide across short distances, act as a shield, and when held upside down, can be used to slam down upon creatures and buttons.

Along the way, you'll need to watch out for spikes, cuckoo clocks, lobsters, Cat-eating plants, steam blowers, hammers, and tons of other hazards. There's such a wide variety of ways you can die, you'll never get tired of it. But it isn't all evil. You can grab cake slices to boost your health, jump onto bubble-exhaust rockets to take you across long distances, and find little hearts to add to your cat lives.

Once you collect all the magic from the level, and chase out Quinn, the mutated area returns to its original self. You might not always get all the magic on your first pass, so you're free to come back whenever you want to have another go. You can go right up to the end, then turn around and go right back to the beginning!

The game isn't a side-scroller all the time. The camera viewpoint rotates around the character, and zooms in and out, depending on the twists and turns the 3D world takes. The world is extremely colourful, but the inability to change resolutions hurts. Often, you aren't able to see what lies a bit ahead of you, and this leads to your doom.

A jumping puzzle you do not want to mess up

The minuses: The interface is a real pain, full of bugs and unfinished business. Support for gamepads is half-hearted. The control options make no mention of it, but you can use one if you've configured it in Windows. Gamepads are supposed to let you lie back and enjoy the game to its fullest, but you'll often have to switch to the mouse to navigate the menu (which, in a very intelligent move, does not support gamepads). Bugs exist at several points in the levels themselves, resulting in the Cat falling off the map entirely in a couple of places. Then you have some nicely done movies that, instead of playing, leave you facing a grey screen. You'll have to tap the [SPACE] key a few times to get past it.

But all these niggles are overshadowed by the sound department. The soundtrack itself is nice enough, in a childish, frantic, and trippy kind of way. What takes the cake, though, is the voice acting—in particular, that of the Cat. The movie stars Mike Myers, and is therefore guaranteed to make you smile all through it. This extends to the game too. It feels like it's Mike Myers you're controlling, not a weird cat.

Max Payne 2: The Fall of Max Payne
Payne 2 The Max

Max Payne 2 is, of course, the sequel to *Max Payne* (2001). It was the most anticipated game at that time, and it raised the bar in third-person action games with cutting-edge graphics and gameplay. It sold more than a few million copies, and left gamers wanting more. This time, Max has weapons that would put Schwarzenegger to shame. The storyline is completely new, and includes another protagonist—Mona Sax—providing Max with a love interest. Mona is on a mission of her own, and helps Max in his quest to kill the bad guys.

Max is in the thick of action as an NYPD homicide detective. The story starts with you in a hospital bed, all injured; soon, things start happening, with people

Dangerous Liasions

getting killed in front of you. As you start moving ahead, bits and pieces of the story fit in like a jigsaw puzzle, making the picture crystal clear. The engrossing story and the new love interest in Max's life will keep any gamer going, not to mention the absolutely frantic and well-executed action.

The game engine and graphics have improved. The grenade launcher is missing, but there's a new secondary fire option, and you can throw Molotov Cocktails, or a grenade in tandem with firing your gun.

The game is not demanding on the system requirements front, and you'll be able to get decent frame-rates out of an old Pentium III too. Just make sure you have at least a GeForce4 MX running. Load times are bad, but this has been addressed in a patch available from the Web site.

Overall, *Max Payne 2* does not leave any space for you to complain. This game is right up there and surely deserves a strong mention for the manner in which it leaves you spellbound to the very end.

Genre: Action ■ **Developer:** Remedy Entertainment ■ **Publisher:** Rockstar Games ■ **Distributor:** Milestone Interactive
■ **Phone:** 022-28381614/28313501 ■ **System requirements:** 1 GHz CPU, 256 MB RAM, 32 MB 3D card with hardware transformation and lighting support, 1.5 GB free hard drive space, DirectX 9.0 ■ **Price:** Rs 2,999 ■ **Web site:** www.maxpayne2.com OR www.milestoneinteractive.com
Rating: ★★★★☆

Call of Duty
Not One Step Back!

It's the sheer intensity of *Call of Duty* (*COD*) that hits you—it simply sucks you in and doesn't let go.

The *COD* experience stems from the amazing sound effects—not in terms of quality, but in the sheer quantity. It's war played out on a grand scale. There are tens of units at any given time, all firing away their weapons. Add to that machine gun nests, mighty tanks, and mortar shells dropping all around you.

COD is an FPS, but it mimics life in that you're not the only guy around; you're in various battles, with people killing and dying all round you. Teamwork is the key here, and you'll have to co-ordinate your attacks if you ever hope to take out the enemy.

One Stuka down, God only knows how many more of them to go...

The developers used World War II instead of creating a story from scratch, and you're in various real episodes of the War. The most notable is the battle of Stalingrad.

Here, you're a young lad who's been conscripted into the army for the defence of Stalingrad. You're given five bullets with no gun, and told to take out the German positions. The beginning of the Russian campaign is, by far, the most intense experience this reviewer ever come across in any game, and it will be etched in your memory. Other campaigns let you take part in key battles in the American and British war effort.

In the harder levels, medkits are few and far between, and a couple of bullets are enough to kill you. Don't let your team become cannon fodder while you sit back and watch. You won't even live to regret it.

COD easily tops *Half-Life* as the best FPS we've seen.

Genre: Action ■ **Developer:** Infinity Ward ■ **Publisher:** Activision ■ **Distributor:** Milestone Interactive ■ **Phone:** 022-28381614/28313501
■ **System requirements:** 700 MHz CPU, 128 MB RAM, 32 MB video card with Hardware T&L, 1.4 GB free hard disk space, DirectX 9.0b
■ **Price:** Rs 1,499 ■ **Web site:** www.callofduty.com OR www.milestoneinteractive.com
Rating: ★★★★☆

# How to Do Everything with Dreamweaver MX 2004

Site building no more a dream

Gone are the days when Web designers had to keep a reference guide on their desk while typing away frantically in Notepad to design that 100-page Web site. No offence to the veterans who still swear by Notepad, but Macromedia has transformed the way you design Web sites, offering the What You See Is What You Get (WYSIWYG) solution for HTML designing. You can now build Web sites quickly, efficiently and with fun. With its latest incarnation, Dreamweaver MX 2004 is here to set new standards for Web designing tools, which naturally means the need for books to help lower the learning curve for new users.

This 449-page book is meant for beginners and intermediate users. It explains the interface options and features of the software, and describes the use of the various panels and facilities provided. The book shows you all that is needed to set up new Web sites as well as create simple ones. One of its strong points is the explanation of the CSS implementation.

The book is scattered with interesting and useful 'Did you know?' boxes that throw light on a fact and 'How to….' boxes, carrying tips and tricks on how to perform a particular task. Useful screenshots marked with appropriate labels help make the text more meaningful.
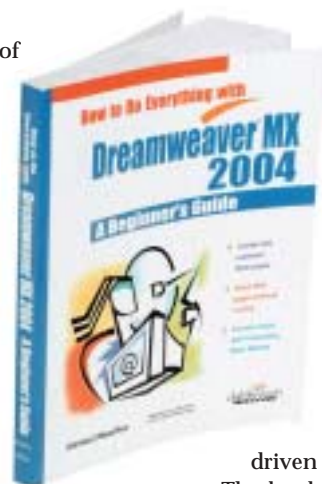
Apart from the basic tasks, the book also covers advanced topics such as templates and usage of productivity features such as snippets and library items. The features new to Dreamweaver MX 2004, such as the HTML layers, are marked with a special icon. The book also touches upon Dreamweaver's capability to generate dynamic data driven page using built-in wizards.

The book covers the subject comprehensively and is a good guide for anybody looking to dive into the magical world of Dreamweaver.
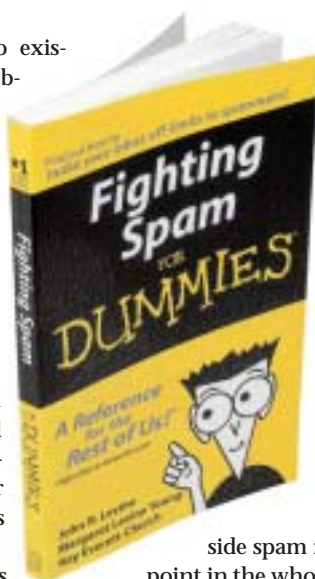
Fighting Spam for Dummies

Whamming spam

Ever since e-mail came into existence, spam has been a problem that nobody has been able to solve completely. But all hope is not lost. There are a number of filtering options available in existing e-mail software that can help cut down the spam that shows up in your mailbox. This book explains all these options in considerable depth for each of the popular mail clients (Outlook, Outlook Express, Eudora, Netscape and Mozilla mail). It also covers techniques used for various popular Web-based mail services such as Hotmail and Yahoo! mail.

A complete section focuses on various anti-spam software and services that informs the reader of the latest anti-spam programs (both free and commercial) that can be used independently or integrated with their e-mail software. The book then explains the installation and configuration of a few popular freely available ones (POPFile and Spam Bully) in detail.

The section on server-side spam filtering is the single sore point in the whole book though. It's completely out of sync with the book's overall concept (whoever said that sys admins were dummies!). Although not of any practical value, the lay user can read it to get a rough idea about how filtering is done at the server level.

All along the book gives information about various aspects of spam such as the first spam mail that ever went out, the origins of Bayesian analysis (used in many of the anti-spam software), etc, that makes it both interesting and informative. At places information about a few software that let you gain POP access to paid services (read downloading e-mail from Yahoo without coughing up money) is given as an added bonus. Overall, a very helpful book that lives up to its name (… For Dummies!).

Bottomless Pits

We didn't have time to write a leader because we spent one hour deciding what to order for dinner...

Oh no! Here they come again, like a horde of hungry monsters, hooting and screaming like the Cro Magnon man attacking prehistoric cattle. Why me? Why do I have to put up with them?

It's bad enough they make all this noise, but like clockwork they seem to celebrate this stupid monthly festival called 'issue closing'.

It's another 10 days of torture. Ten days of polluting the atmosphere, dropping disgusting things all over the place (mostly on me), and 10 more torturous days of listening to inane conversations about stupid things called computers and philosophy.

Here comes that rounded thing called 'Srini', though I've heard him being addressed as Srinivasan before.

He's the sloppiest, and messes up my beautiful brown coat with the precision of Tiger Woods hitting a hole-in-one. He's arguing with that queer looking fellow with the shiny head. What was his name again?… 'Raaabo' or 'Robert' or something… He's the one with the tool called 'bike', which everyone is always begging him to use.

"Come on man, I'm tired of that pizza guy. Let's get some real food for a change. Let's order from McDonald's," bellows Srini. "No way man, I ain't goin' that way again. Last time I spent 160 bucks for that flat tyre, and no one wants to shell out any dough for it," yells Raaabo. They both leave, thankfully, still yelling.

Aww shucks, it's only been 10 minutes and the next bunch of jokers is back. There's the podgy one called 'Upendra', the white, tall, slender one called 'Garfield', the one with the funny curvy design called 'Mitali', and that infernal duo of Srini and Raaabo.

Raaabo has this horrible habit called 'smoking', which pollutes the air around me and leaves this grey dust all over the place.

They're all talking about that gunk called 'food', each one trying to get in an opinion edgeways, and screaming their lungs out.

"Let's have Punjabi food," yells Upendra.

"No, I want pizza," screams Mitali.

"You just want to order from that pizza guy because he has a crush on you, and gives you loads of freebies," says Srini.

At this point, Mitali takes off her slipper and chases Srini in circles around me.

"Why don't we make Mitali order for all of us, and share the freebies," says Garfield.

"Great idea", "*Wunderbar*", "Let's do it", echo the mindless drones.

Raaabo promptly blows a puff of smoke at me, flicks his cigarette in the general direction of the ashtray, completely misses and gets ash all over me. Oh well! Better than last night when he 'accidently' stubbed a lit cigarette on me. Soon they all leave, and I have my few minutes of peace.

It's about an hour later, and they all come back carrying little packets of that deadly substance called food. Looks like most of them ordered pizza—that's ok, not to messy.

Oh no, here come Srini and Upendra carrying Punjabi food, with (gasp!) gravy. Man I hate issue closing! For nine hours a day I have to tolerate noise and second-hand smoke, and now for the next 240 hours, the nights won't be peaceful either.

"How much is the bill?," asks Raaabo.

"A cool 721 bucks man," whines Upendra. "Srini go bug 'deep pockets' to pay the bill," suggests Mitali. "No way! man, he'll kill me this time, I swear. We already owe him like over 1,000 bucks—and that's just for this month," complains Srini.

Like fuel to a fire, Sachin 'deep pockets' Kalbag (SK) is the cause of my misery. If it wasn't for him, these slobs wouldn't have the 'bucks' to buy food, and I would be saved a lot of mental anguish.

I have learnt from their conversations that he always pays all, or most of the bucks, and the monsters never pay him back. It's obvious he hates me!

SK paid the bill again. I would commit suicide; if only I knew how. There's mindless chitter-chatter for five minutes, while I can hear tearing noises of plastic and foil, and then, silence!

The only sounds are the gnawing on flesh, the slurping of fingers, the crunch of pizza crusts and the scraping of spoons against plastic. Each one of them is trying to do too many things at once.

Mitali wants to proof an article, while boasting about how the pizza guy gave more stuff free this time and stuffing her mouth with a salad.

Raaabo insists on smoking when eating, and drops sauce on me, blows smoke in my direction and stubs his cigarette out on me leg.

Srini and Upendra are playing the 'look-I-can-stuff-more-in-my-mouth' game, and dropping *makhanwala* gravy on me all the time.

SK just cannot live without caramel custard, and has to share it with me… by dropping the sugar water on me. Why are they always in a hurry? Who is this strange and invisible god called 'reader' they always want to please? Why don't I just get up and walk out?

Perhaps it's because I'm a lost soul damned to eternity sitting in the 'Smoker's / Hogger's bay', disguised as the table! ■
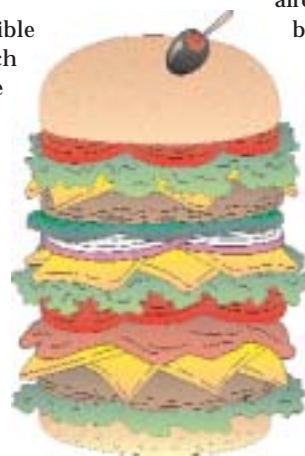
In 1982, Time magazine's choice for 'Man of the Year' sparked a controversy. Who or what was it?

a. Hitler
b. AIDS
c. The Computer
d. The Internet

2 The black-box is a device that stores events of aircraft and vehicles, providing valuable data about these technological beasts of transportation—especially after a mishap. What colour is it?
a. Black b. White
c. Orange d. Grey

3 What was the first ever video game?
a. Mario b. Pong
c. PacMan d. Paratrooper

4 A megabyte is bigger than a kilobyte, which is bigger than a byte. What is half a byte called?
a. Bit b. BiByte
c. Nybble d. None of the above

5 Jeff Bezos, when starting his business could not name his Web site Cadabra (as in 'abra-cadabra') due to copyright issues. What was the final name decided for his firm?
a. Amazon.com
b. Google.com
c. Ebay.com
d. Apple.com

6 What was the weight of the first electronic computer?
a. 30 tons b. 20 Kg
c. 100 tons d. 500 Kg

7 The country which got 150 billion junk e-mails last year,

8 Who founded one of the most successful computer manufacturing companies in 1984 out of his college dormitory with only $1000? Now, he also serves on the US President's Council of Advisors on Science and Technology.
a. Bill Gates
b. Michael Dell
c. Bernard Daines
d. Steve Wozniak

making it the second biggest target of spam
a. China
b. United States
c. India
d. United Kingdom

9 While reading silently without moving lips, the human throat, tongue and vocal cords twitch imperceptibly. Which

company is working on ways for the computer to pick up these signals directly from the person reading?
a. Apple b. Microsoft
c. NASA d. IBM

10 A cellular handset company has recently launched a phone with an inbuilt 1 megapixel camera. Which company is this?
a. Samsung
b. Nokia

c. Motorola
d. Siemens

11 Which search engine company recently added linear local search capabilities to its existing services?
a. Google
b. Yahoo!
c. Alltheweb.com
d. Inktomi

12 One of the most popular gaming machines in 2000 was the GameBoy. How powerful was its computing power?
a. More powerful than Intel Pentium 4 HT
b. More powerful that Param
c. Exceeded all computing power needed to put first man on Moon
d. More powerful than the human brain

Answers

? did you know

There are more than 200 satellites orbiting earth, just for private communications services—including pagers, telephones and computers

numberette

The US Navy spent **$375,000** on an "aerodynamic analysis of the self-suspended flare". The research proved that the frisbee was not feasible as military hardware!

digit QUOTIENT

1 to 5	Way to go...
6 to 10	Good, if you like being mediocre
11 to 15	Your next job could be with us!

Got an interesting question? Send it in with the correct answer to quiz@thinkdigit.com

Crossword with a Virus

Across
4. A new virus, which hides in a password protected ZIP or RAR file, sent from a spoofed e-mail address
5. The 19-year-old female virus writer recently arrested in Belgium
7. A virus claiming to be an anti-virus
8. Vital Information Resources Under Siege

Down
1. First documented virus after Fred Cohen's security seminar
2. In 1999, this exploit ranked even above the great Melissa virus attack in terms of security concerns, and infiltrated military systems
3. A new breed of virus capable of
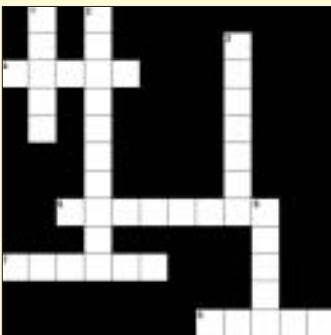
growing a P2P network of infected zombies
6. The code used to simulate a dummy virus to test if an antivirus is working