Price **Rs 150**

BAZAAR HIGHLIGHTS

ATI Radeon **5970**

HTC **Touch2**

Philips **42PFL5609**

HP TouchSmart **PC IQ528d**

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digit

YOUR TECHNOLOGY NAVIGATOR

Vol. 10 Issue 01

DIGIT WISHES YOU A **HAPPY 2010**

First look at the **Microsoft Zune HD**

INSIDE THE MACHINES OF TOMORROW

Tomorrow's technology | Cars of the future
Robotics in India | The future of sound

BUILD
Make an amplifier from scratch.
Make your own Chrome extension.

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Cheap gadgets you must have.
Google Go: A new way to develop.

COMPARE
Printers and HDDs tested.
DTH Services compared.

PLAY
Backyard astronomy for beginners.
Reviews: Assassin's Creed 2 | The Saboteur.

Agent001 finds comfort in ergonomics | Tips & Tricks: **Office 2010, Ubuntu 9.10, Thunderbird 3**

thinkdigit.com

"This year, *Let's build something*"

Asheesh Gupta, Publishing Director

So, what are you doing different this year? Depending on what matters to you, the answer of course could be dramatically different. It may also be 'nothing' for some. We would like to change that.

Exactly a year ago, I had promised you that all of us at Digit will work very hard to bring about new innovations and to enhance the quality of our content – in print and on the web. True to our promise, we made many changes – many of which you loved and some you asked us to change further: We've expanded content coverage, done a redesign, introduced a second dual-layer DVD, and changed, and based on feedback, changed again, the fonts we use. We've also revamped our customer and subscription delivery service, and created many new options for you to interact with us and your fellow community members – be it on our web site, or Facebook, Orkut and Twitter. We've started webinars and workshops on topics of your interest, which many of you attend with great enthusiasm, and also started Community Chapters, in June 2009, which are quite active in several cities, and offer an opportunity for you to meet each other, share and interact. **2009 was truly a year of change for Digit.**

What has helped us all along is the regular feedback we get from you – frank, brutal and mostly constructive – through letters and emails you write to us, your posts on the thinkdigit.com forum, and your participation in community surveys. You've given us a lot of ideas to work on — an example is starting the Digit fan page on Facebook. Please keep it this way, it is our biggest strength. **Your involvement is most precious to us,** and it makes us unique. You now also have a direct line to the Editor, on our forum (www.thinkdigit.com/d/editor/).

You will be happy to know that Digit has not only emerged yet again as the number one technology magazine in India, in the 2009 Indian Readership Survey (R2), but has also increased its lead significantly. The survey also indicates that **a lot of new readers have joined the community. Thank you for making us proud once again.**

Now, back to the question I asked earlier – what are you doing different this year? At Digit, when we look at the world around us: our community and its preferences, the trends in technology and tools for creating applications, the unprecedented economic upheaval, creating the need for new business models and skills, it all seems to shout out to us: **This year, let's build something.**

We've decided to offer more content to help you build things – build products, build applications, build careers and even build businesses. Hundreds of you participated in a survey on entrepreneurship we conducted recently. A large section of our community seems to want to start a business. Well the timing could not be better in my opinion. To help you get started, we are introducing a

"We've decided to offer more content to help you build things, build products, build applications, build careers and even build businesses"

new section on entrepreneurship from this month. It will provide you with practical tips, lessons from successful technology entrepreneurs – many of whom started like you, provide you with the opportunity to get your questions answered by experts, and much more. This month, we're featuring two successful entrepreneurs (pg 22) who started from scratch to build successful businesses. **We're also going to provide you with more DIY workshops** and articles – on both software and hardware, so you can build something for yourself, your family or for the place you work or study.

Let's also build more bridges to connect us this year, and make our community stronger than ever. We have recently constituted a Community Advisory Council representing a cross-section of our readers (you will find their names on pg 2) to help us with this. You can personally contribute to building the community by introducing new readers, participating in the thinkdigit.com forum, commenting on articles online, joining in our activities, contests, surveys etc., and spreading the word.

Together, let's build for a great future. A very happy 2010 to you!

Asheesh Gupta

digit

Tell us what you feel about Digit

Each month, Digit walks through the technology maze to bring you the most relevant, and the most researched stories. If you have an opinion about anything published in Digit, or about technology in general, please write to **editor@thinkdigit.com**

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TO ADVERTISE

ADVERTISERS' INDEX

PRODUCTS REVIEWED THIS MONTH

THE DIGIT COMMUNITY ADVISORY COUNCIL

If Yan can cook...

Robert Sovereign-Smith
Editor

I've found that geekdom knows no age or sex – I've had interesting conversations with octogenarians who share this magazine with their teenage grandchildren

Back in 1998, when Digit wasn't yet called Digit, and right through 2001 when it was re-christened, I used to be a faithful reader. To be honest, before I started reading this magazine, computers scared me. I was terrified of corrupting the hard drive, or doing anything that would cause the PC to crash — which actually used to happen quite often on Windows 98.

I spent a couple of years playing the occasional game, but doing little else on the PC, because I didn't know where to start. It was my wife who first bought me this magazine, presumably because she was tired of starting up her PC for me, and showing me how to access the Yahoo! mail account she had created for me.

Just like in school, where certain subjects become our favourites, more because we like the teacher rather than the subject matter itself, Digit became my technology navigator, and technology my favourite subject.

I found mIRC on the Digit CD, and became an IRC junkie, learning a lot from the hackers and virus writers that populated some of the IRC chat rooms back then. Some of those people even sent me viruses over IRC that crashed Windows, but thanks to Digit, I just shrugged it off, formatted, re-installed, and was back on IRC in no time flat.

Digit also introduced me to open source, and I promptly lost the Windows partition, and all my wife's data, to a rather stubborn Mandrake boot loader. In hindsight, I suppose I was the stubborn one, and perhaps should have left the boot loader's default settings alone; but where's the fun in that?

Then, a little over 7 years ago, I was tempted by an advertisement in Digit, which called for CVs of interested candidates. The requirements? A passion for technology, nothing more; and I've been here ever since.

The reason I bring all this up is because over the years, I've met a lot of people who still seem to be in awe of technology and the advancements we've seen. I've also seen people who don't want to try new things, like Linux, because they're too scared to experiment, or too comfortable to change – until they start reading Digit, that is.

I received a call recently, from a subscriber who had retired from the armed forces, and he was looking to get some instructions on how to use the Ubuntu ISO file on the DVD. Obviously, I decided to be careful, and reminded him that there was a chance that if he didn't choose the right options, he might lose his Windows partition. The answer I got was, "Oh I know that, thanks to Digit I backup regularly, so I'm not worried about losing anything."

He also told me later that after reading Digit, he now discourages piracy amongst his friends and colleagues by suggesting open source and free alternatives to them. He had just one request – to dedicate the back page of the magazine to beginners, who might find some of our more techy articles intimidating, and help them ease into the Digit world. Thus, Digit 101 was born.

Over the years, after speaking to thousands of Digit readers, over mail, phone and the Digit forum (thinkdigit.com/forum), I've found that geekdom knows no age or sex – I've had interesting conversations with octogenarians who share this magazine with their teenage grandchildren.

Now to explain the headline on this page...

I grew up watching Martin Yan, on his famous cooking show, where the line, "If Yan can cook, so can you," was made famous. That simple one liner sticks with you, because even if you replace the words "Yan" and "cook" with an appropriate proper noun and verb, it still makes uncanny sense.

So, the next time you see a family member, friend, neighbour or acquaintance struggling to understand technology, share your copy of Digit with them – and perhaps, ask them to read the back page first. Also remind them to persevere; because even if they're overwhelmed by technology at first, just as you and I once were, it does get easier, and fairly quickly, so long as you have your technology navigator for company.

Besides, remember, "If Yan can cook...". **d**

editor@thinkdigit.com

JANUARY 2010   VOLUME 10 \ ISSUE 01

Contents

QUICK NAVIGATOR

INSIDE THE MACHINES OF TOMORROW

Tomorrow's technology | Cars of the future
Robotics in India | The future of sound

032

PRINTER TEST

From high quality photos to lots of documents, there is a printer just for you

52

TRIED & TESTED

068 HTC TOUCH2
A sleek smartphone from HTC

068 SAMSUNG SERIES 6000
An LED backlit 40-inch wonder

069 ATI RADEON 5970
A dual GPU high end graphics card

digit DVD
OPERATING SYSTEMS, FREEWARE, VIDEOS, MUSIC, GAMES AND DIGIT TV EPISODE 3

CONTENTS LISTED ALONG THE SIDE

ON THE DVD

Tools
FREEWARE ONLY APPLICATIONS FOR A BETTER DESKTOP EXPERIENCE

Internet
• CYK Desktop Twitter Interface 1.05
• Darq Software Transmute 1.65
• Flickr Uploadr 3.2.1
• FrostWire 4.18.4
• GoodieBoxLive 1.2.0.8
• Ipswitch WS_FTP Home 12
• Pando 2.3.2.8
• PowerFolder 4.0.1
• Status Fairy 1.0
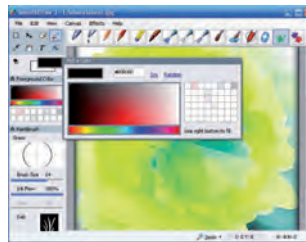
• Tixati 1.21
• Zultrax P2P 4.40

Multimedia
• Arclab Thumb Studio 2.1
• BullZip PDF Printer 7.1.0.1078
• CDBurnerXP 4.2.7.1801
• Contenta-Converter Basic 4.8
• Document3D Suite 2009 SP2
• FotoMorph 9.3
• FoxTag Editor 1.5
• Fresh View 7.84
• Hornil StylePix 1.0.2
• MediaCoder 0.7.2.4535
• MediaMonkey Standard 3.2
• PhotoViz 3.1
• Pictomio 1.2
• Soundbase 2009.12

Mobile Phones
JAVA, SYMBIAN, BLACKBERRY AND WINDOWS MOBILE APPLICATIONS TO ADD FUNCTIONALITY TO YOUR MOBILE DEVICES
• Chase Mobile browser 1.0
• dogWhistle 1.0
• UCWEB 6.3.3
• Facebook Mobile 1.0
• Nimbuzz 2.0
• Opera Mini 4.2
• SmartMovie 4.15
• Office mobile 2010 beta
• CameraToGo 0.3
• Loopt 3.1.1
• Mobipocket Reader 6.0
• Palringo Instant Messenger

Gaming
Trailers
• Blade & Soul
• Blur
• Class 3 Outbreak

Games
• Aces High
• Dirt 2
• Risen
• Wolfenstein

Patches
• Batman: Arkham Asylum
• Dragon Age: Origins
• F.E.A.R. v1.08
• GRID v1.3
• Call of Duty 4: Modern Warfare v1.7

LICENSED: TABBLES

Tabbles: forget where your files are, remember just what they are about. A "tabble" is a tag and a virtual folder at the same time.

KEY:
1-38T02-7081977-1-597

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Windows Professional

digit MINDWARE DUAL LAYER DVD
JANUARY 2010

LECTURES
Game Theory and Introduction to Computer Science

Free with Digit. Replicated by KRCD (In

inside

Enter

08 **Inside IBM**
We find out what's cooking at IBM from Dr.
Ponani Gopalakrishnan, VP, India Software Labs

10 **NVIDIA on Tegra**
A talk with Jen-Hsun Huan, Co-Founder,
NVIDIA on Tegra and other technologies

✉ The December issue was great. When compared to last year, its up several notches in value. Digit is the most promising technology magazine around. Content, presentation and reach – there's hardly any other tech mag in India that matches up on these fronts.

The print was near perfect and did away with all my previous gripes. So did the overall coherency and layout of articles, it was sweetly on time at the stands and DVD contents were well organised, kudos to the team!

Your TED coverage was a revelation, it's good to know that innovations and ideas do get the spotlight in these days of commercial gimmicks and sales pitches. Eagerly awaiting its video coverage.

Zero 1 awards were convincing, although the all-Apple PMP ensemble and all-AOC monitors were quite fiddling (Cowon S9, Sansa Fuze, Clip+ and monitors from Dell and Benq should've deserved a mention).

'Enterprising ideas' was really inspiring and I encourage more such topics.

Digital media distribution in India is plagued with unjustified revenue schemes and poor delivery infrastructure. But it's good to see reliable movie rental services are now available and affordable. Though an Indian iTunes is still way down the line, such initiatives towards simplified media availability is always welcome. Interesting to note the caption at the start of the article stating "converting and storing rented movies is illegal". Though one wonders how the legality here is enforced or even ensured? Since the copy protection encryption (CSS) these movie disc employs can be easily bypassed (unlike the types of SecuROM in games) and thus sails the pirates! To find the balance between effective revenue generation and non-restricting rights protection policy, a reboot of existing irksome DRM formats is really needed.

Something for Agent 001 – is any 'hardware encrypted' portable hard disk available in India? If possible, do include such drives in your shootout in January.

I think a 'proper' *Fast Track to Photoshop* is due, despite earlier attempts such as

Imaging and *Photography* which were just the basics. *Visual Studio* and *Web Designing* can also be detailed in future editions.

Lastly, I miss the old 'ESC' as I find the new one a bit hokey!

Keep up the good work guys. Have a great new year!

Bhupati Baboo

d Hardware encrypted drives are difficult to find in India, especially in the portable storage market. Seagate, for example, has hardware encryption on some of their enterprise desktop and laptop drives. It would be difficult to do a comparison test of a niche product category, but we can surely do standalone reviews of such products.

We've been receiving requests for *Fast Track to Photoshop CS4* for quite some time now. We'll keep that in mind. We've tried to add a little more to our Escape section this issue. Hope you find it interesting.

Rossi

✉ I am a 15 year old reader who is fascinated by your tech magazine. I have no words to thank you. You guys have done a great job. I have been reading Digit for over two years now. I've read many tech magazines, but Digit is the best one. I've heard Windows 7 has great features, performance and security. I wanted to try it out. I tried to download the beta version, but it takes a long while. Please provide it

in the January issue. Also, include a free internet speed booster as I'm experiencing low internet speeds. I'm keen to know about the top 5 desktops, laptops, LCD monitors and pen drives in terms of performance and features.

Siddharth Shankar

d Thanks for writing in. You can try out Windows 7, which is included in this month's DVD. Free Download Manager is a great way of experiencing downloads at high speeds on your connection. You'll find this on this month's Mindware DVD the Essentials section. Keep reading these pages for informative comparison tests. We have printers and storage solutions in this month.

Aditya

✉ I'm planning to buy a new LCD for my dual-monitor HTPC (22-inch/24-inch for work and 32-inch for movies and racing). I don't want a TN panel. I want good contrast ratio, so probably MVA should be my choice. But I'm confused and so I referred to the LCD test in the August issue of Digit. Surprisingly, all I can see is TN panels in the review. Only one astronomically priced MVA and IPS panel was in the 22 inch and 24 inch category. Dell has a 22 inch eIPS for around Rs. 20,000. Other brands should also have a few models around that price mark. Please don't forget us

12 **Buzz**
A roundup of the latest tech news
powered by www.thinkdigit.com

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DVD Contents, write in to DVDcontent@thinkdigit.com

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who want quality products. Yes you have to follow market trends, but you can also conduct a test only on high-end LCD panels featuring MVA, IPS and PVA panels (where TN panels are a strict no-no). You're doing the same in graphics card testing (the armour clad beasts don't show up when you are reviewing entry-level cards).

My next request – please review audiophile grade speaker systems. No, not some occasional review of Bose or Klipsch in the Bazaar section, but a complete review of 15 to 20 high end 5.1 speaker systems. Although most of these brands are unavailable in India, please test the ones that are available. Please tell us why we shouldn't go for Bose, how to assemble a good home theatre set-up comprising AV receivers, sound cards, amplifiers, woofers and speakers, hardware and software decoding. I am sure most Digit readers don't have any knowledge about this technology segment. I know this one is tough, but please make it happen somehow.

Digit is my best friend and I really don't want to read online review sites. Most of them are in some way biased. I am reading Digit for years and I've realised that most of the reviewers prefer AMD more than Intel and I can bet my money on the fact that they dream of crushing Intel on 2011 (just like I do). But while recommending, you tell us to choose Intel as that's the best option right now. That's why I love Digit.

One last thing, I started reading Digit when I was in school (2000) and I still read it. I selected my Creative Inspire 5200 based on the speaker test you conducted somewhere in 2002. I still remember the cover. The model was so cute. I remember people asking Digit for her contacts. Oh yes, please bring the models back.All the people who said it's cheap are... men? Digit looked way cool then. But the school boy of 2002 now works in office and earns money and Inspire doesn't inspire him any more. He wants Klipsch, he wants Denon, he wants Bose and he's so confused. That's the only part Digit hasn't ever taught him. I hope you understand...

Debayan Das

d Like you, many of us like to use high-end LCD screens based on MVA and IPS panels. Almost all LCD monitors sold are based on TN panels. They are affordable and good for most of us. Manufacturers too, find it cheaper to make these displays. That's a trend and it doesn't look like it's going to change anytime soon. We do test high-end displays every now and then in Bazaar, so you'll have to keep an eye out for those. It's the same case with speakers. You can go with Bose products. They're pretty good most of the time, just not affordable. So, obviously they lose out in value for money. If you want something even better, go for a Genelec setup. The general rule of the thumb when it comes to audio products is that the more expensive, the better it gets. Your suggestion for an article on setting up a home theatre setup is noted. We could cover it in one of our entertainment issues.

Rossi

✉ Guys, you're doing a great job. I really liked the December 2009 issue. I was surprised that you had entirely removed the Buying Guide section, but was pleased to find a great compensation in Agent's very own Fast Track.

Please provide *Far Cry* patches in your DVDs because I don't have a net connection and my *Far Cry* mod requires 1.3 patch or 1.31. Also, please do provide game wallpapers.

Abhishek Anand

d The *Fast Track* to product purchasing tips was Agent's ideas. We're glad you liked it. We'll try and carry the *Far Cry* patches you need in the February issue. We carry game wallpapers every now and then. The last lot of game wallpapers can be found in the Playware disc of December 2009.

✉ Thank you very much, and Congratulations for a great December issue! First

of all, I'm really very glad, along with other readers, I'm sure, of getting back the old Digit Archive. Your magazine content is really very helpful. The new attraction – Digit TV is really cool. The sound quality should be better though. But overall, it's informative and interesting. The Fast Track of the issue is full with colourful images and the page quality is better than previous issues. The issue contains info about BD Players which I think is what we need to know.Thanks a ton and all the best.

Debraj Rakshit

d Thank you for the feedback. We're trying to rectify the audio problems in Digit TV. As months go by, I'm sure you'll see more and better content. Stay tuned. There's more to come.

Siddharth

✉ Happy New Digit Year to Team Digit, and all the Digitians. It picked me up when I was a child, nourished me with all the tech and helped me survive in the 21st century. Today's technology is very complicated, and I have picked up a few tips and tricks over time to handle it, and I can stand tall today in this world, all because of Digit. I thank all those guys behind the pages for providing cutting edge content that gives sheer pleasure to the readers. I also want to congratulate you people for your success and my best wishes are always with you who pioneered the computer age.

Jaydeep Chakrabarty

d The team was very pleased to read your heartfelt mail.

Michael

Industry Connect

Big Blue
Is the nickname IBM has been given for its official corporate colour

Patent mania
IBM registered 4,186 U.S. patents in 2008, becoming the first company ever to have more than 4,000 U.S. patents in a single year

Inside IBM

Digit has a one-on-one with Dr. Ponani Gopalakrishnan, VP - India Software Labs to find out what's cooking at IBM.

Q Tell us about IBM's smarter planet initiative with a few examples of the technology used.

A Let me give you a background first. Today we're at an intersection point. Device level instrumentation as well as system level instrumentation – things like RFID (Radio-frequency Identification) tags as well as sensors – are everywhere. Even your cell phone is a sensor, with the help of which your location can be triangulated. As these systems are getting interconnected, the reach of the information network has become broader. This is what we believe is helping us build a smarter planet, where things are a lot more instrumented, interconnected, and intelligent. An example is Singapore, where we can predict traffic conditions, thanks to RFID tags that are put in place in cars. The same RFID tags can help you track movement of your goods through the supply chain.

Cities can be built in a smarter way too. Let's take security as a case in point. Today, we have video surveillance technology that is able to automatically detect key events that are going on in a scene under surveillance. Cameras distributed through the city observing street feeds can analyse suspicious activity automatically. Commotion, mob gathering, objects being left unattended that have not moved for a while automatically raise alarms in the system. Physically manning so many feeds otherwise is impossible. Patterns are defined, and our algorithms look trough feeds frame by frame. We've deployed this in Chicago and in India Hyderabad international airport has implemented this system as well.

Dr. Ponani Gopalakrishnan, VP - India Software Labs

Q What are the other interesting projects cooking at IBM software labs? What can we hope to see in the future?

A In a geography like India, we believe that accessibility and the internet will find more takers in the mobile phone platform. So we're working on technology that will translate the experience of the web to the mobile phone platform. Spoken Web is a project where people can speak and interact with web information through voice. A pilot system has already been deployed with Amul – one of the largest dairy distribution systems in the world. Their suppliers are members of small co-operatives that are not literate and far flung. How do you get them to participate in your network for information sharing? Prices, availability, quality standards etc are the information points that are needed. With Spoken Web, voice sites are put up to publish latest prices. A farmer can call up a

number and the system will prompt him to press/say a number for the price. Say a collection truck hasn't arrived, the voice site will link the farmer to the voice page of the nearest available truck. Business Finder is another innovation coming out of our research organisation. This will utilise our service delivery platform which we have built for our telecom clients such as Airtel.

With Business Finder, for example, we can get a taxi to come right here where we are now, based on a single request or SMS, without giving any location specifications. The taxi company gets my location and dispatches the closest driver. Business Finder combines location based services, capabilities that smaller service providers have, and links it into the service delivery platform. So if you are a taxi fleet owner, you can register through the service delivery platform and have network subscribers routed to you. End users get to know which service providers are available in a location, who are the most reputed ones through a notification mechanism, and who are the most cost effective.

Q How does the predictive algorithms work in the traffic regulation technology that you spoke about?

A We take real time information – volume of traffic and so on that comes from installed cameras and RFID tags in cars. We also take static information such as the distance and type of roads along with historic data such as peak traffic during certain days and times. This data is integrated and churned to predict traffic movement. It can be used to manage traffic lights, send alerts to the consumers (citizens) via SMS, and it can also be used for planning in the future. **d**

Industry Connect

Tegra
NVIDIA claims to have built a devkit for its next generation Tegra for use on Chromium OS

AMD in the lead
AMD now holds 57 per cent market share for mobile graphics beating NVIDIA which was at the top in the beginning of 2009

Carry on computing

We met up with Jen-Hsun Huang, Co-founder, President and Chief Executive Officer of NVIDIA and got him to talk about Tegra and computers in general. Excerpts…

Jen-Hsun Huang, CEO, NVIDIA

Q. How long did it take to develop Tegra and how much of Tegra was developed in India? How much did NVIDIA spend on its development?

A. Tegra took us 5 years to develop. We wanted to create a computing platform that has as good a mobile experience and better a multimedia experience than existing PCs, at 1/50th the power. It cost us half a billion dollars to develop. We have 3 design centres Pune, Bangalore and Hyderabad. Hyderabad's entire design centre is working on Tegra, and a lot of the work on Tegra has been done there, chip design, algorithm development and software. The Pune centre has also done some work on Tegra.

Q. Are there any more Tegra devices being worked on? Do you have any Tegra prototypes out here? What would you say is the chip's forte?

A. There are some 50 Tegra projects we're working on. There are prototypes, but nearly all of them are in-house working samples. There are several things that the Tegra is very good at – computing performance is very good - that is

running the OS, the browser, its almost as good as a PC, its also very good at HD and HD graphics, the graphics is better than most PCs. Compared to the competition we can support HD video, HD video streaming from the web, Flash 10 streaming and Flash 10 graphics very easily. We're a visual computing company (as you know) and so our focus is building devices with great visual computing experiences.

Q. What would be the power consumption of Tegra compared to Atom? What was the thought behind the dramatic reduction in power consumption?

A. If Atom gave you eight hours in a netbook, Tegra would go a week. And the performance is comparable. The Tegra 650 would consume a few hundred milliwatts at full load – negligible. In a typical PC the display consumes around 10~20 per cent of the total power conusmed. With Tegra in a PC, the display would consume 95 per cent, nearly. And that makes sense – because your display is the only thing your eyes can see and what is really important to you. Your eyes don't see electrons moving inside your PC, do they? If you can't see it, why are you paying for it?

Q. Quite true…so would you say Tegra is the Atom killer?

A. You know, we don't think about killing. At least I've been brought up believing that killing is wrong. What Tegra is, is a mobile computing enabler. Creation is what we're looking at, not destruction.

Q. What platforms will Tegra support?

A. We're working very hard with support for Google Android and Windows Mobile.

Q. No plans for Symbian?

A. No. It's just too old. You need a real OS to support a real computing platform and Symbian support is not on the cards.

Q. After making such great devices aren't you worried about them reaching masses? The Microsoft Zune HD and Samsung M1, for example, are not available in India

A. Maybe it's because the Zune HD has sold out (laughs). Seriously, I think the solution to that problem is to simply make more devices. Eventually some of them will filter down, as market acceptance picks up, prices will fall too, especially given competition. If Samsung, for example, doesn't want to sell devices like the M1 in India, it just creates an opportunity for someone else.

Q. Is there any device in the pipeline from NVIDIA, based on Tegra?

A. Not really, and the reason for that is every time we develop a chip, we start from the device and work backwards. We really imagine the device and then get down to building a chip to get us there. If nobody's willing to build it, we'll build it.

Q. Intel has plans for "Moorestown", a similar SoC chip, slated for 2010. Any thoughts?

A. You can try to make a truck a smaller, but it'll still be a truck. If you want to build an electric car, don't start with a truck…just build an electric car. The only reason you would want to start with a truck, is if you feel there is no market for electric cars, and you don't want to over-invest. But if you feel there is a huge market for it, you just go out there and build the best electric car; anything else is just bad strategy. **d**

Buzz

The HD Arms Race
Broadcom's Crystal HD and NVidia's Ion are fighting head to head to dominate the Netbook HD market, and Intel prefers Broadcom

#Business
Finally, a Business model for Twitter has emerged with enterprise accounts and adverts. Not that they need it right now, post the Google and Microsoft Search deals

Bad news for grandma

Mobile numbers may soon have 11 digits

If a proposal by DoT goes through, we may all see an additional digit added to our mobile numbers. While India wasn't expected to reach the 500 million subscriber-mark till 2030, it seems to have beat that deadline by a good 21 years.

As is obvious, a ten digit numbering scheme can support only a limited number of phone number combinations, and while a plan was in place to have the transition by 2030, it seems that we are bound to run short much sooner than that.

The proposal would have all current cell phone numbers appended with a '9', instantly granting the country ten times as many phone numbers, and hopefully solving the problem for another few decades, or till foetuses decide to have their own dual-SIM mobile phones, whichever is sooner.

While 500 million subscribers are active, as many as 800 million might have already been used up, as people often change service providers and numbers, and operators often discontinue operating such numbers. Interestingly, it seems 20 per cent of allotted numbers are never even used.

While the DoT seems to be pushing to have this change ready by January 2010, operators claim they haven't received any intimation of the same, and are only aware of the long standing proposal. Additionally, they say this change will require extensive changes to their software and hardware, and is not some-thing that can be done in such a short period. Why not get 20 digit phone numbers and save us the trouble for another couple centuries?

YouTube launches a Made for India feature

The internet is hurtling along at a fast pace moving from GIF animated images to full HD video. However, for us Indians, the wonders of the internet are still one long progress bar away.

The new Feather feature in YouTube, especially for Indians

While YouTube happily launched 1080p HD video support, we've just started putting away our VCDs. Finland may have made 1 Mbps connections a legal right, but we have to pay through our nose for even half of that.

Google with the noble aim of shaving a few seconds of loading time, has now done us Indians a favour by adding a new "Feather" experiment on their TestTube. TestTube for YouTube is the equivalent of the "Lab" features you find on GMail and allows you to participate in Google experimental features for their products.

The new "Feathers" experiment makes the YouTube interface much lighter, by putting focus on the most important thing people use YouTube for, the videos. With the "Feathers" experiment enabled, your videos will now default to standard quality, and the video page will only show a limited number of comments, and related features.

Good work Google! This will keep us busy till we get affordable 16 Mbps connections here too. Of course, by then, the world would've moved on to ultra high super duper resolution.

Acer launches new multi-touch, 3D products

On December 2, 2009, Acer launched a new range of products utilising some of the hottest concepts today – 3D and multitouch. Their new products include notebooks, projectors, and all-in-one PCs.

In their multi-touch segment is a new Acer Aspire 5738PzG series notebook which comes with a large 15.6-inch multi-touch screen, and comes with Windows 7 to make full use of the feature. The laptop is priced at Rs. 43,500 excluding taxes.

Another interesting product they have launched which used multi-touch, is their new Aspire 5600 series All-in-One (AIO) PCs. The AIO comes with a full 1080p HD enabled 23-inch multi-touch screen, with a powerful configuration: a Intel Core 2 Quad processor 2.33 GHz (Q8200), 4 GB of RAM, a 1 TB HDD, and a 512 MB graphics card.

The AIO PC will also come with an inbuilt DVD RW, and TV Tuner. Loaded with Window 7 Home Premium and a suite of Acer applications to help ease users into their new touch environment, the series is priced at a starting point of Rs. 60,000, excluding taxes.

Among their new 3D-enabled products is the new 5738D 3D Notebook, and the X1261 3D-ready projector.

The new notebook uses a combination of a special 3D "coating" on the screen, and polarised glasses to bring you

Hungary mandates Open Source
The Hungarian Government has embraced and adopted Open Source formats for all official purposes. Open Source advocates are campaigning for the same in India as well

Bing! sues Bing
Microsoft is facing litigation by a little known design company, at www.bing.biz for using the Bing! trademark

Buzz

a 3D experience. It will also come with a software which will allow it to display videos, images, and games in 3D. The notebook is HDTV ready and comes with a connector that will allow it to be used with an external screen – although you will most certainly lose the 3D functionality in this case. The notebook will also come with 4 GB memory, and an option of either a dual-core Pentium, or a Core 2 Duo processor. The netbooks will start at a price of Rs. 43,000 for the Aspire 5738DzG.

The new X1261 porjector showcases "2500 ANSI Lumens brigtness, a contrast ratio of upto 3700:1 a native XGA resolution & a lamp life of upto 4000 hours." It is capable of displaying 3D images by projecting both right-eye and left-eye images which can then be viewed using an appropriate 3D glasses to get a 3D effect.

Google upgrades search with real-time and mobile features
It was bound to happen, but is quite exciting nonetheless. Google Search has now added support for real-time search results.

Now when you search for any topic, you will see a search section that is constantly being updated with new results. The real-time search section shows results from sources such as blogs, news, Twitter and FriendFeed. They've also revealed their partnership with Facebook, MySpace, Jaiku, and Identi.ca other than FriendFeed and Twitter for realtime search.

So searching for a trending topic such as "GM" is sure to give you a feed of people mentioning it in Twitter or on their blogs. By showing only the latest search results you get a full page with just a stream of real-time updates.

With this, they are also graduating Google Trends from Labs after adding a new "Hot Topics" feature that shows some of the trending topics on Google search.

For mobile devices, Google is redefining the way searches are conducted by utilising additional data available with such devices. On mobiles, besides just a text query, more data can be utilised to get a more context sensitive and accurate search result.

On mobile devices, Google Search can now conduct voice search in Japanese. Google Maps has also added a feature that can take into account your location and perform a search of "what's nearby".

One of the most exciting new search features would have to be Google Goggles, a new feature for mobiles that lets you search using images instead of text. With Google Goggles, you merely point your camera to the object in question, whether it be a book, a monument, an artwork or logo and Google will look it up for you. With this new feature, you can simply point your camera at a landmark and click a picture and find out its name, and other search results.

Google can also keep a "visual search history" similar to web history feature that lets you see all the images you've searched before.

Intel reveals information about future Atom chips
Intel's next range of Atom chipsets seem to be ready to take NVIDIA Ion head on. The new lineup will be smaller, faster, will reduce the average power consumption by as much as 20 per cent, and are expected to be available as early as January 2010. However, the best feature of these chips is the integration of a GPU.

The three new processors will all come at 1.66 GHz and will come with an integrated Intel NM10 Express graphics chipset. With the integration of the CPU, GPU and memory controller on one chip, the outcome is a reduction of size by 60 per cent for a netbook footprint and up to 70 per cent for a desktop.

Of the three new processors, the N450, D410 and the D510, the N450 is intended for netbooks, while the D410 and D510 are

For a more detailed report, camp at
http://www.thinkdigit.com/d/mw2

intended for low-end desktops, (nettops / HTPCs). The N450 comes with a 512 kb L2 cache and a total TDP of 7 W, increasing the battery life on netbooks.

The D410 has the same 512kb L2 cache size as the N450, at a total TDP of 12 W. The D510 is a dual core Atom processor with features a 1 MB L2 cache and a TDP of 15 W.

By providing a more integrated solution than NVIDIA's Ion Platform – which offers NVIDIA's mobile graphics chipsets with the Intel Atom processor, it's clear NVIDIA has some tough competition ahead. **d**

Connections

16 **Google goggles**
Another Google service, this one's available only
for those with an Android phone for now

18 **Whacking Wave**
We introduced you to Wave last month.
This month, we're telling you of options
other than Wave

Signing off

This month we check out among other things Google's entry into real time search, and as a prelude to our security issue a look at innovative web security measures from VeriSign

Security has moved beyond software

Online security

Security on the internet, especially when it comes to online transactions, has always been a major concern. Passwords can be stolen, phished or simply lost and hence, experts have long been trying to create a better way for authenticating one's identity on the web. One of the ways in which security can be upped is by introducing another layer of security over and above the username and password. This is known as two-factor authentication (2FA). It has proven itself quite effective for averting unauthorised transactions. The way 2FA takes place is pretty simple – a hardware token or a card sized device generates a code that users need to enter along with their passwords on web sites. Earlier netbanking web sites that had opted for 2FA security authentication, would provide these hardware devices to their customers.

VeriSign, a company otherwise best known for SSL certificates and it's check sign, has brought 2FA to a new form factor – the mobile phone. Rajiv Chadha, VP, VeriSign India, gave us a demo of this format at a special briefing in Mumbai. The process is quite simple. Users have to register once and acquire a unique credential ID. This number is locked to a J2ME application that can be downloaded for free on any compatible phone. Further, this credential can be linked to a number of user ids on different sites that use VIP (VeriSign Identity Protection). The app generates a six-digit code that changes every 30 seconds. The credential is registered with a relying party web service - and every time you initiate a login session to your web service, in addition to entering your easy to remember userid and password, you also enter the six-digit code from your credential as a second password. This service is also available via SMS.

Many web sites such as PayPal and Ebay have this as an optional layer of security. "In fact PayPal in the UK has already made this mandatory," says Chadha. So the next time you're logging in to even your favourite social networking site, don't be surprised if you find yourself reaching for your phone. Even if it's non-mandatory for now, users should probably opt for this service voluntarily. With this added layer of security, a hacker will not only have to steal your password, but physically reach into your pocket to steal your phone too – quite an unlikely situation. There are currently about 70 web sites where VIP is available. To get a full list head over to www.vipmobile.verisign.com/wheretouse.v. In India, several brokerage and banking web sites are already in talks with VeriSign to implement this soon.

Phantom of the new Opera

Opera has always been somewhat the preferred browser of the uber geek. It's the only browser to get 100 on the acid3 test, and for long had the reputation of being a stable browser, always on the cutting edge of innovation. Recently, we came across a web rumour that the new build of the Opera browser would feature hardware acceleration.

Turns out, the alpha build for the new version (10.5) code named Evenes has been leaked. The browser is all about speed says a blog post from Opera. It might feature the Carakan Javascript engine, making it 250 per cent faster than the current build. In terms of UI improvements, it will feature a lot of elements we've seen in competing browsers such as Chrome, Safari and Firefox.

Opera is now expected to have a new skin featuring a merged tab bar – a Chrome rip off – the top of the screen won't have the title bar but tabs. Those annoying dialog boxes for saving passwords and other information will be integrated into the UI and will now appear discreetly just below the address bar. There is going to be a improved find feature. This was something that was rather annoying with Opera. In the existing build, you need to jump from one search term to another. In the new avatar it will follow the screen darkening and highlighting that Safari has. There is going to be better integration with Windows 7, meaning jumplists and task bar thumbnail tabs. Incognito browsing is being ported to opera too. Rounding up the changes is the new rendering engine – presto. Still, we couldn't find a mention of hardware acceleration. If it does happen the power if

Demonoid is back from the dead, we don't know for how long though **d** Google launches its very own short URL service – goo.gl. The service is currently available for

14 Digit | January 2010 | www.thinkdigit.com

Zoomin has a new look
The photo printing web site that won our web award in September, has a new look. Stay tuned for our full review at thinkdigit.com

Nerrot.com
If your bored looking through a page full of a hundred torrent listings try this web site. It's the equivalent of Google's "I'm feeling lucky" option for torrents

Web watch

the GPU could be used to fire up your browsing. We'll have to wait and watch.

Google goes real time

After staying out of the real time search domain for a long time Google has finally entered the fray.

Now when you search for topics you will see a section of search which is constantly being updated with new results. The realtime search section shows results from realtime sources such as blogs, news, Twitter and FriendFeed. Google have partnered with Facebook, MySpace, Jaiku, and Identi.ca other than Friend-Feed and Twitter for realtime search. The partership with Facebook means that information from Facebook pages, or any other public listing such as events, will also soon be available to Google.

We ran a few searches to test this upgrade and it seems like only a few search terms get the real time updates. These search terms are only the ones currently in the 'hot topics' section of Google Trends (found under More Services). Clicking on "Latest results" brings up a full page consisting of real time results.

Google is not the first one in this space. Bing had beat Google to the punch by launching this service before them. Prior to the biggies entering realtime search, if wanted to know what's happening on the internet at any point in time, you had to head over to icerocket.com to search for blogs and blog trends. Another one is collecta.com; this displays your search results as a continuous flow that gets refreshed every few seconds. oneriot.com or scoopler.com too are great sources for the latest trending topics in the web 2.0 world from sources such as twitter.com. These web sites neatly

Privacy settings in Facebook

sort topics into categories like business, technology and music etc. Why would one use google or bing anyway? Well perhaps when this gets built into all search terms and not just "hot topics" from google trends, this will prove to be useful to even the regular researcher to get an idea of the mood of the people around the world regarding the topic in question.

I wantz.it

Now here's a service that lets you broadcast what you want to the whole world. Wantz.it is a free web application that lets you create lists of what you want and then share them with friends via Facebook, Twitter, email and blogs.

One of the better things about this wish list service is that you can add anything on the web to it. Just enter the URL and it gets added to your wishlist. From twitter and delicious just put @dowant. Wantz.it is a way to make sure that your friends know what you have your eye on. If you choose to link your Facebook account, the items you add on the list appear on your friends' feeds too. Our suggestion couldn't have come at a better time too – your friends and family won't have to scramble around guessing what you'd like for New Years! So go ahead and put the HD 5970 on your wishlist. If you've been good all year,

maybe Santa will steal a piece for you.

Facebook: Privacy?

Almost everyone from your grandmom to your local milk shop guy is using Facebook these days and worse – adding you! With family and random people getting hooked to the ever popular social networking site, it has become increasingly essential that you know how to keep certain parts of your profile concealed from certain people. You might recall the famous case of a woman who got sacked from her job because someone put up pictures of her at a party on a day that she was supposed to be sick at home. The way to control what you share, is through privacy settings in your account. This month Facebook made long overdue changes to it's privacy settings. We say "long overdue" because a lot of users wanted the privacy settings to be simpler.

Instead of focusing on usability, Facebook has tried to nudge users towards opening up their accounts. This brings up the eternal debate – whether to be open or not on social networking sites. The argument is if you're there to network, why not share more content with people? Either way, Facebook's changes brought them complaints from several privacy groups in the US. They say the default options after the Privacy settings revamp, point towards sharing stuff with everyone, and not with 'only friends' as was the case earlier. **d**
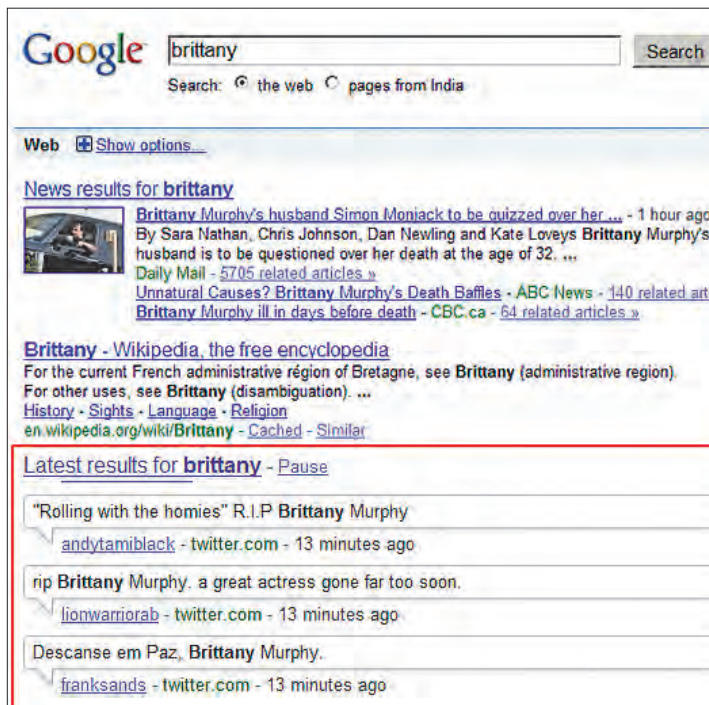
Google search results now include real-time tweets

Google products and not for broader consumer use **d** Reports suggest a Mozilla employee told Firefox users to move to Bing citing privacy concerns **d**

Digit | January 2010 | www.thinkdigit.com 15

Mobile watch

Just like Goggles
Nokia to bring Augmented Reality mobile
devices to India by 2011

Infosys launches Flypp
Flypp is a back end platform for mobile service
providers, to provide a variety of content to users

Google Goggles Goes Live

There have been demo videos of Google Goggles at work for some time now, and the service finally went live last month. Google Goggles is an application that you install on your mobile phone that uses an image as the basis for searching images online. This follows close on the heels of Amazon's iPhone app that essentially does the same thing. However, Google's other services offer a range of interesting mashups with Google Goggles. Right now Google Goggles is available as a free application for the select few who are using Android based devices. This means that if you spot a product in a supermarket, and snap the bar code, you will get competing deals from nearby locations, using a combination of Google Search, GPS and Google Maps.

Photographing an object is the same as entering the same entry into search engines, so a book or a painting will get you background information as if you entered the search manually. This means that users can search for things they cannot

A demo of what Google Goggles does

describe in words, or don't yet know how to. Clicking a business card, scans the information allowing you to add the information to contacts or to dial a number immediately. A live search feature allows a user to point the camera around, without even clicking, and related results scroll along the bottom of the screen like a ticker. This works well only for areas covered well by Google Street view though.

Some of the applications planned are a little unbelievable though, including recognising particular trees based on a single leaf. Head out to http://www.google.com/mobile/goggles/ for more.

Nokia's Booklet 3G launched

The Finnish mobile giant has just stepped up into new territory by releasing the Booklet 3D, and nobody is really sure what to call it. This will probably be the first of the new wave of Smartbooks to hit the streets, something that is a cross

The Nokia Booklet 3G

between a Smartphone and a Netbook. Officially called a "mini laptop", the monickers for these kinds of devices are getting increasingly diverse and confusing. The device has a 10.1-inch HD screen and a QWERTY keyboard, with a hinge in between, so calling it a laptop wouldn't be too off the mark. The Booklet 3G is built with a range of connectivity options including Wi-Fi, WLAN, a 3G modem, on board GPS and a hot-swappable SIM card that goes directly into the body.

The Booklet 3G incorporates some of the sensibilities of their mobile phone range, in terms of build quality and feature mix. There is an impressive 12 hour battery life, which is supposed to last through at least one heavy work day without the need to be connected to a plug point. The Booklet 3G is powered by an Atom Z530, 1.6 GHz processor on a fanless chipset, with Windows 7 installed by default. In terms of memory, the device sports 1 GB RAM, and 120 GB hard disk space, which is an ample amount for such gadgets. There are a bunch of software bundled too, which is supposed to make connectivity simple for users, the Ovi suite featuring prominently. Strangely enough, the device

also has an accelerometer, we don't really know why, but usages are bound to emerge.

IMEI fiasco does not dent China made phone sales

The Government banned phones without IMEI numbers from December 1. While this effectively put a lot of cheap mobile phones out of circulation, the wide open gap in the market was taken up by "Indian Brands" of mobile phones, which are highly local mobile phone manufacturers, providing impressive feature list and imitation devices along the lines of established mobile phone manufacturers. While these do have IMEI numbers, be wary of such devices as they have the same low shelf life and bad design quality of the Chinese mobile phones. In fact, although the mobile phones have an Indian local brand on the packaging and the casing, these mobile phones are still produced in China and imported into India. So the "Indian Brand" is nothing but a rehashed versions of the Chinese Mobile phones.

The official mechanism for converting an illegal, IMEI-less device into a legal one has ended in the month of December itself, and despite what local advertisers or service providers might tell you, there is now no official way to get an IMEI number to your phone if it already does not have one. The best thing to do in case you own such a device is to trash it, and pick up a legitimate model with a legal IMEI code. **d**

Bespin
Named after the gas giant of the Star Wars universe, this is a real time collaboration tool aimed at coding in HTML 5

QuickTopic
Ever felt the need to start a message board for a couple of friends or colleagues to discuss something? Head over to quicktopic.com and flame away

hacking wave

Siddharth Parwatay
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Wave is perhaps the most talked about web technology in recent times. The ostensibly impressive collaboration and unified communication platform was launched a while back in typical Google fashion – under a closed, perhaps permanent beta, invitation-only release. Even with the initial 1,00,000 invites, it had tons of mixed coverage and reactions. Some are calling it a confusing jumble of non-linear communication, resulting in something even less productive than email itself, while others are sitting on the fence reserving their judgement for later. Many more are embracing the beta preview and even more still are desperately waiting for their invites.

Not jumping to conclusions about the usefulness of Wave seems to be a more logical approach, because clearly Wave is an on-going work in progress. Besides, since Google has made it an open source protocol, developers can design their own interface and you never know who will leverage the API to come up with a revolutionary idea.

Coming to what Wave does, it has put instant messaging, email and wiki-like collaboration on the same platform – with the added twist of doing things in real time. Email, the web's primary means of communication and makeshift collaboration, has been around for donkey's years. And much like the thought behind Chrome OS (Google's browser-based operating system), the guys at Google Wave too, seem to have got up one day and decided "hey email is so 90s, let's come up with something better". Google Wave aims to do just that – create an all new protocol that goes away from mailbox-to-mailbox email. In Wave, you have a hosted form of communication where metaphorically you have one email opened to which you can invite others. This should theoretically create a world without the dreaded "Reply all" button, which causes so much confusion in large email threads. Additionally, the Wave protocol is entirely open source, so developers can create their own interface and put it to better use through the API.

Even so, the idea of unified communication has been around for quite some time. In fact, there are several initiatives out there that have been doing exactly this in some form or the other. Some have been around a long time too. Many of these alternatives have been locked up in the enterprise-level commercial sphere while some are free,

Although Google Wave is the buzz lately. Believe it or not, this is not a new concept

but unheard of. Some are online following a similar hosted format to collaboration, while some like Gobby or SubEthaEdit require a client. Sure, Google Wave has managed to take enterprise-level software, juice it up, put a nice user-friendly shell around it and bring it to the ordinary consumer. But here we will look at other not-so-hyped options, and surprisingly some might even appeal to you more.

Etherpad
Unified collaboration, project management, leverage file sharing – they're all heady jargon. At the root of it all, Wave is primarily a document creation tool – much like wikis – but in real time. You thought Wave was the only to do that? You're wrong. When Wave demoed for the first time in the hour and a half long video, people gasped at the sight of being able to see what your collaborators are typing in real time. But it's not the only web app out there that can let you do that. Take Etherpad. It gives you everything – right from real time editing of documents, to rich text to a small chat window docked in the side bar. All this power-packed functionality in the simplest easy to use interface – which strangely until now, Google was renowned for. The current state in which Google Wave is functioning, with hundreds of people "collaborating" on waves which don't really have a direction or goal, gets confusing really quickly. The picture/video sharing functionality does get a thumbs up, but collaboration cannot really be centred around picture sharing – it remains just an added tool. Instead, the focused, minimalist form of document creation restricted to eight users offered by Etherpad, is better in most collaboration use case scenarios.

Etherpad offers some very interesting features. You can save any number of revisions which act as restore points. After you are done creating the write-up, there are multiple options to export the document as a Word, PDF, text and open document. There is even an undo/redo function, the lack of which is quite a pain in Google Wave, as we've mentioned in the past. Time Slider,

WHY WAVE MIGHT ACTUALLY WIPE OUT...

There are a couple of things working against Wave in terms of usability. Firstly, the ability to comment and annotate any part of the Wave is a good feature for sure, but it makes things all the more confusing. In your Inbox, you have a Wave showing 13 unread messages denoting 13 instances of people making changes to the Wave but you don't know in which part of the wave the action happened. (Yes you can use the playback option, but that too leaves a lot to be desired). This brings us to the second problem with the way things are currently going in the Wave universe. Making public Waves with hundreds and thousands of users is perfect for popularising a platform, but does it really make sense in terms of productivity? You end up with just another tool with a lot of clutter which was supposed to reduce your communications clutter in the first place. People will eventually have to come down to small focused groups. Let's not confuse collaboration with community people.
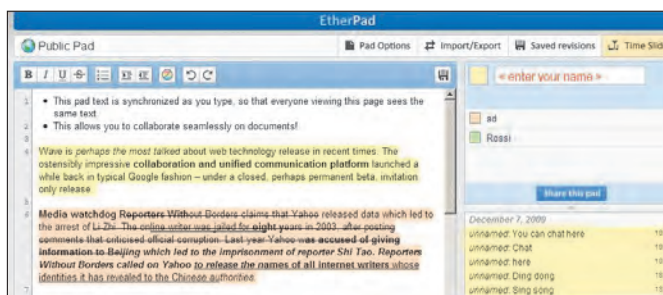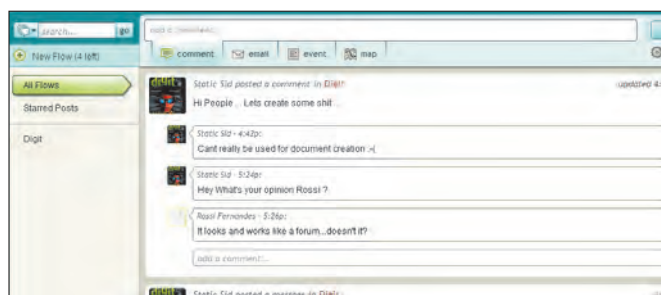
Surf's up!
Don't know what to do with Wave? Read our coverage on Google Wave in the December 2009 Collector's Edition of Digit

HTC Touch HD2
HTC's popular Touch HD2 comes to India with a price tag of Rs. 30,000

EtherPad in action

Shareflow with near real time conversations

the Etherpad equivalent of the Timeline feature of Google Wave is absolutely smooth. It literally plays back the process of creating the document smoothly, almost like a movie. The process of getting in collaborators is also very simple – just mail or IM them a link. And the best part is that the interface is light and hence really fast. Also, work can begin instantly – no sign ups, registration or invites!

It's no surprise to us that Etherpad's official blog recently announced that they have been acquired by Google.

beWeeVee
"Why work alone?" is their motto, and it's quite true. This is a similar tool following a server hosted format for collaboration. Built on Silverlight, it is more basic than Etherpad, but definitely more stylised. It has done what Adobe's Buzzword did to a simple concept like Google Doc's word processor – putting a jazzy shell around a simple technology. It has standard functionality like saving revisions, but you can't export. Use this little tool if you want to start off quickly and the work you are collaborating on is not long and cumbersome.

Scribblar
Scribblar is yet another online collaboration tool which allows sharing images and video much like wave, but it's better classified as a white-boarding app. It strictly does not compare to the others featured here so far, because document creation is missing. Scribblar does feature a whiteboard and so in brainstorming use cases it comes of great use – more than Wave, in fact. The format followed by Scribblar is pretty simple. You can register or start off with a single click. The application creates a room for every team and that URL can be shared with others for calling other

collaborators to that room. With live chat, whiteboard, and file sharing, and no user limits, it makes for a fun web utility.

notepub
notepub is an online note taking app that allows for public collaboration. Its drag and drop features for adding images to a note comes the closest to Wave. You can start a note easily from the home page. Once you've created a note, you can share it by making it public and sending the link to those whom you want to collaborate with. If you were to create a note describing pictures from a recent holiday with friends, you can share it directly via twitter or Facebook. You can also link notes to other notes and hence there is a considerable amount of community play that comes into the picture. Still, this one is pretty low on usability and won't engage you as much as some of the others.

ShareFlow
This one is touted as perhaps the closest one can get to a Google Wave clone, and has been around for quite some time. ShareFlow debuted after Wave burst on to the scene last May at their developers' conference, so it's not quite clear who copied whom. Perhaps ShareFlow just beat Google to it by making their service available to the consumers sooner than Google – without those coveted invites. ShareFlow works beautifully as a replacement for sending group mails for decision making or sharing files. It has support for events, calendar events, and even a unique email address where you can send stuff that you want pinned to a particular flow. A focused environment is called a flow (like a Wave) and can be thought of as a folder containing all your files and conversations. It fails when it comes to document creation as unlike in Google Wave wherein at the end

of the wave when you collapse all comment bubbles, you're left with a usable document.

Synchroedit
"SynchroEdit is a browser-based simultaneous multi-user editor, a form of same-time, different-place group ware. It allows multiple users to edit a single web-based document at the same time, and it continuously synchronizes all changes so that users always have the same version.", says the web site. Sounds familiar? Well it is... And it's probably the oldest player in this game and hence retains that jaded web 1.0 look. But the interface itself looked quite good featuring rich text options. However, at the time of testing the server was down (and may even be permanently so, by the looks of the cob-web ridden home).

TextFlow
Based on Air, Text flow is perhaps the most aesthetically pleasing and yet powerful document collaboration tool out there. Apart from simple collaboration that can be achieved in near real time, it also offers version management of documents. It analyses multiple versions of a single document, conveniently highlighting changes in each version compared to the original, and allows you to chose and refuse through suggested changes to the document. Currently sign-ups are frozen on the textflow web site and it is invitation only.

Greener on the other site?
While all of these apps featured here serve you in most use cases, at times even better than Google Wave, they lack Wave's extension and gadget-ability. With that Wave can be put to use in virtually infinite scenarios. But do you really want everything? Or would you rather be focused on the need at hand? **d**

Feature

| **Yellow Pages** | **10 million calls** |
| GETIT Infomediary Limited introduced the concept of Yellow Pages in India in 1986 | Just Dial receives over 10 million calls every month from its 4 million registered customers |

How I Did It: VSS Mani

The brains behind the phone-based information service reveals how he wants to make Just Dial as omnipotent as Google. It all started with the move to Mumbai with just Rs. 50,000 in his hands. As told to Supriya V

I was born in Jamshedpur and brought up in Kolkata in a traditional middle class family. My future career had been chalked out for me right from my childhood – try and get into IIT or at least become a chartered accountant. Being an entrepreneur was unheard of.

By 1987, I needed to get a job and contribute to the family income. I took up a sales job with a yellow pages company called United Database India (UDI). While I was worked there, I kept wondering if it was possible to offer a service like this over the phone. Unlike the West, Indians always had the habit of banking on friends, relatives and neighbours for information in their everyday life. So I thought, why not launch a service to cater to this need?

In 1989, I got some like-minded people to start a company called "Ask Me". This was before the telecom boom. The idea was well appreciated but with the downward trek of the economy that followed, we became easy victims. When I look back at what went wrong, I realise we were much ahead of the times. In early 1992, I walked out of this venture. But I promised myself that one day I would start the service again and make it a huge success.

Between 1992 and 1995, I worked on different ideas to survive and also save some money to give my phone directory business one more shot. In 1995, I landed in Mumbai with Rs. 50,000 with which I had to find a house and an office space. What I did find were some generous relatives who offered me an empty flat for a nominal rent in one of Mumbai's far-flung suburbs. I rented a two-seater office in Mumbai's financial district, Nariman Point, for Rs. 5,000 a month.

I had learnt from my "Ask Me" days that I had to have a phone number

V.S.S Mani, Founder, Justdial.com

for my service that was very easy to remember. In 1996, the Kandivili Telephone Exchange in Mumbai was coming out with its new 888 series. I thought 888 8888 would be the easiest to remember. I spoke to the general manager and told him about my idea.

In those days, a phone line used to cost Rs. 15,000 under OYT, or else, you had to wait for a few years. I didn't have Rs. 15,000 so we applied by paying Rs. 3,000 and we got the number a year later! When I got the number, I didn't have enough capital to start. We finally started Just Dial in a small 3x5 feet garage, with the number 888 8888, some borrowed furniture, rented PCs and a capital of Rs. 50,000!

While I was waiting for my magic number, I had begun collecting names and telephone numbers of small and medium-sized companies through a team of data collectors. There was a lot of raw data available, but this needed to be validated. I got a team of telemarketing executives to validate this data. I managed to convince some establishments to be my sponsored clients by paying a flat fee.

As time went by, the number of sponsored clients multiplied. That model then gave way to a premium fee model where sponsored clients paid a sum according to the category of their

products and services. We then introduced lead-based payments, where a client pays according to the number of customers he gets through Just Dial. Today Just Dial draws from a database of three million establishments – of which 100,000 are sponsored – to feed information to callers. Even though we make money based on leads, we have never ever given out our database to telemarketers.

We kept our prices low for our sponsored clients. Though we couldn't pay our staff well at that time, we evolved a performance-based incentive scheme to keep morale high. Callers were happy since their calls generated quick response.

It is important to constantly upgrade services and explore new mediums. In 2007, we launched justdial.com, which now registers more than 1,85,000 hits a day. We send close to six lakh SMSs every day and 15,000 messages through WAP.

Today, this pan-India service receives over 2,00,000 calls every day from 240 cities in India. All this mad rush for information is tackled by eight call centres spread across the country.

I have been thinking of taking the service global for some time. Right now, I'm working on the launch of Just Dial in North America.

My dream is to make Just Dial as omnipotent as Google. When I look back at the last few years and think of the challenges I have overcome, I wonder if my venture could have been timed better. But I think we benefited from being the first mover. I also wonder if the venture could have grown faster if I had some more capital, but again you need more than capital to start something on your own – you need creativity and gumption. **d**

High education spendings
India Education sector is expected to up its IT spending to an estimated $704 million by 2012

Planet Vidya
Planet Vidya is India's first 24x7 education portal and online K-12 community to share multimedia content

Feature

"We are not out to make our millions overnight"

Pooja Kothari talks to Vineet Ladia, an ex-software engineer with Infosys, who sells multimedia content to schools in South Africa with his partner Aravind V

I was born and brought up in Baroda, a small town in Gujarat. I went to school there, and later did my engineering there. I joined Larsen & Toubro for five months after graduation, but left to start a manufacturing unit. I built it into a business with a turnover of Rs 3-4 crore in less than two years. After a while, my contribution started stagnating. I had no commercial understanding. So, I decided to do an MBA. I joined the Indian Institute of Management, Ahmedabad, the top business school in India, in 2004.

Those two years built confidence more than business skills. I knew from the beginning that I did not want a cushy job at the end of those two years. I also discovered that I really enjoyed the entrepreneurship course run by Sunil Handa, who took on only 30 students and invited entrepreneurs to talk about their experiences.

I met a like-minded student, who is now my business partner, Aravind V. We explored various sectors and zeroed in on education. First, we thought of starting a school, but then decided to provide services to all those schools that were coming up.

During our free time, we took on an independent project to find out gaps in the education sector. We wanted work that had potential and would allow us to make money. We also realised that not many professionals joined the education sector.

Around this time, both of us got selected for an exchange programme in Canada that was hosting students from 40 countries. We met this guy from South Africa, who told us about the deficiencies in the education sector there. They got a lot of aid for education, but had to return it for want of avenues.

In April 2006, we went to South Africa. We met ministers, private schools, public schools, educationists, et al.

Aravind and I opened an office in July to sell the concept of multimedia content and animation. We were highly conservative with our money. We did not build content first. We simply got brochures done for client meetings. It was only after we met at least a thousand people that we launched our first product.

In fact, at the seed stage, we were offered Rs 2.5 crore for a 30 per cent stake in our business. We refused that. And that was a great decision in hindsight. We did not even spend 10 per cent of our revenue on marketing in South Africa. We would have unnecessarily parted with one third of our equity for money that we didn't need.

We started developing content. Being in Ahmedabad, we got in touch with people at the National Institute of Design, who helped us create good quality animation. From the beginning, we used the one measure that is used by parents all over the world – marks and grades. We are now the only Indian company with statistical data on how multimedia content is improving grades.

We got small projects at first. We were tempted by the money coming in, but we stayed focused on developing our own product. We only sell software. When things looked very bad, we would look at the map and say: every school in the world will use our product. It is just a matter of time.

Aravind showed more courage than me. I was financially stable due to my manufacturing business. But Aravind, despite family responsibilities, would not give up.

Vineet Ladia

I got my motivation from him.

We looked at other channels of sale, such as NGOs and corporate social investments, which had clear, objective briefs. They were clear about getting a return on their money, so our proposition worked. Slowly, we built acceptance for our product related to school-level science and math.

We now work with 700 schools in South Africa. We launched our services in Baroda three months ago and are working with 18 schools now. We have bundled our software with computers in Mexico. We are looking at developing countries, such as Turkey and Egypt

A lot of players have shown interest in licensing our content, since Indian players have traditionally not invested in developing high-quality content.

What eggs us on is the knowledge that only 1 per cent of schools in India have access to digital content. We are not in a hurry. We have learnt our lessons well in the last few years. Instead of achieving Rs 5 crore in one year, as was our first business plan, we reached there in three years.

We are not out to make our millions overnight. We have been approached by venture capitalists time and again, but we are clear we will not shell out more than 10 per cent of our equity. We are in the midst of some real breakthrough technology, which has a lot of potential for the education sector.

For the time being, we are going with the flow. People create a lot of hype around things. Our purpose is to simplify them using multimedia. We simply want to introduce fun into learning – just as we are having fun building this business around education. **d**

Digital life

26

Motor Marvels
Read about the innovations in
car design and what's to come

Fennec coming
Fennec, Mozilla's Firefox browser for the Nokia
N900 device is very close to release

Pocket Technologies >>

Touchscreens will go a long way on portable devices, as the technology is getting increasingly cheaper. The keypad might be replaced even on lower-end candybars, and the back surface of the device is an untapped area for further interfacing. This will allow for versatile devices for a wide spectrum of activities, from gaming to communication. Modularity may be another trend, with gaming pads or high quality video recorder plug-ins available for your hardware. The processing power will soon reach that of desktops in the begenning of the millenium, and being online won't be a problem at all. If all you want is a functional mobile phone, you may get it as a ring, an earpiece, a bracelet, or even a disposable one where the sim, circuitry, and buttons are all printed on in vending machines.

Fast Forward >>

We look at current concepts and prototypes peek at which devices we will be drooling over in the not too distant future

Wearable Technologies >>

Bluetooth and Wi-Fi T-Shirts and Caps are passe, we'll soon be putting on much more than clothes. Embedded within the fabric or as strap-on gadgets are a wide range of input and output devices. A lot of these will easy plug in to existing systems. The utilities range from easy to use cameras, wafer thin, glove-like cell phones, keyboards that are wired to your fingers and searching for information on the go. Consumer exoskeletons to boost the physical strength and agility of the body are under massive development, with military and industrial applications as well. Augumented reality devices, like MIT's Sixth Sense showcased here will be a major landmark, as this will blur the lines between the digital world and the real world. All of this is without the gadgets getting beneath our skins.

Thinnest TV
LG has claimed to have made the world's thinnest
LCD TV panel at 2.6mm which will be showcased at
CES 2010 in January

Max Payne 3
Max Payne 3 to be released in the last
quarter of 2010 and is expected to be set
in Sau Paulo, years after the last game

Droolmaal
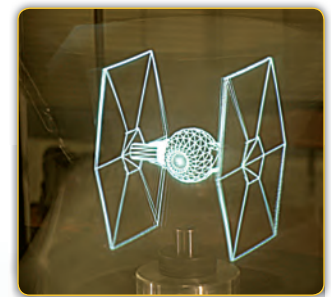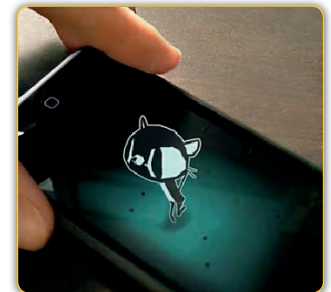
Display Technologies>>

Getting a cheap, flexible electronic display is one of the major challenges that labs around the world are trying to meet. This will save a lot of space and allow for easy mobility. This has been achieved to an extent using LCD technology, but right now only monochrome displays are possible, not great looking HD displays that is the rage right now. 3D and holographic displays have been in the works for a long time, and will probably be a long time coming. 3D requires a lot of efforts on the production front, as well as glasses. Current Holographic technologies involve large spinning mirrors that occupy more space than the hologram itself. What you will be seeing around are portable and immersive entertainment systems such as the MYVU crystal ev.

Input Technologies>>

There are a bunch of major trends when it comes to input technologies. Roll up keyboards are passe, the rage now is flexible, water-proof and food-proof keyboards, that are pretty lightweight. Ultra-portability is achieved by pen-sized projectors that can throw out a keyboard on almost any surface, and these are already on the market. Touchable surfaces with tactile feedback is another area of focus. Be prepared for inputs to invade all kinds of surfaces, from tables, toll booths, advertisements in newspapers, even the roads are not ruled out. The sky is however, the limit, which will probably be saved up for displaying the tweets you send in about the food in a restaurant using a digital napkin. Wires will soon be stone-age technology.

Recreating Da Vinci
Scientists in Florence, Italy, successfully created a working model of Da Vinci's automobile in April 2004

DB5
The first DB5 prototype used in 'Goldfinger' was later stripped of its weaponry and gadgetry by Aston Martin

Madhusudan Mukerjee
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The self-propelled vehicle – or automobile – has come a long way since Karl Benz first patented his 'horseless carriage' in 1885. Simply attaching a motor to a wheel has, since then, led to an altering of our perception of time and space and creating, among other things, cities, suburbs and growth of an international motoring community.

With the use of artificial intelligence, new design technology and innovations in materials, scientists, entrepreneurs and researchers from different parts of the world are striving to create new and improved vehicles that can be used by the masses. In the 21st century, then, perhaps we are on the threshold of seeing Hollywood fantasy cars turn into fact. It is quite possible that we may soon have to change our definition of the 'car' as we know it. Let's take you through some of the most interesting advances in automobiles that are likely to change the way we commute in the not-so-distant future.

Beyond the road

Roads were made to enable automobiles to travel quickly between distant settlements. Over the last few decades, much effort has been put in to literally, 'getting the show off the road' for automobiles. New automotive Research and Development seems to hint that the road might soon become just a point of access to another mode of transportation for your car – air, or even water.

Cars on the wing

Several attempts to fuse an aircraft with a car have been made throughout history. The Hovercraft – a car that runs on a cushion of air – was once much-touted by science fiction writers like Arthur C. Clarke, but was eventually proved impractical due to the high level of noise and fuel consumption. The Aerocar by Moulton Taylor in the 1950s was made of wings, a tail and a power plant – a single engine that powered the road wheels as well as the propeller. Henry Smolinski's 'Mizar' was built in the 1970s by Advanced Vehicle Engineers (AVE) by fitting together the rear part of a Cessna

The Motor Marvels

Recent R&D in automotive technology is literally *getting the show off the road*

Time travel
The 'Back to the Future' series of movies by Steven Spielberg featured a car with the powers of time travel

Patents
There are nearly 80 patents filed at the USPTO for flying cars. Most of these have never really taken off

The Skycar looks great but is yet to prove its mettle

Skymaster and a Ford Pinto. This one, however, was a car that you drove to the airport and could be bolted into the aircraft before flying away. Besides, the project collapsed with the death of Henry Smolinski when the Mizar disintegrated mid-air during a test flight. Though none of those mentioned below resemble '*The Fifth Element*' kind of flying cars, they do come pretty close.

Terrafugia's transition
The most significant effort in the creation of a 'Flying Car' is by a company called 'Terrafugia' set up by MIT graduates in Massachusetts in 2006. But this one is a 'Roadable Aircraft' called 'Transition'. The Transition is so designed to fold its wings when not flying and to be used as a legal 'car' – or a 'street-legal airplane', as they state in their web site http://www.terrafugia.com/. There are no bolts and nothing to put together or dismantle but you'd need to be a driver as well as a pilot to be able to use one of these. Terrafugia hopes to launch its first commercial model in 2011 and has already received 70 orders as of September 2009. This one will be a two-seater, which can travel 725 km at a speed of about 115 km/hr in air.

Moller International's Skycar
Paul Moller's invention is the 'Skycar' – a personal Vertical Take Off and Landing

With the Transition you could drive to an airstrip and then fly to work

(VTOL) 4-seat aircraft which, uses four pairs of Wankel Rotary engines, and, it is claimed, can hover 15 feet above the ground. It has four ducted fans with covered propellers to increase safety. Although it is, quite evidently, a small aircraft, it is projected as a 'car' since it has the potential to be used to commute over short-distances. This 'flying car' has been several decades in the making and Moller has had to postpone projections of its launch more than twice. The present craft under production is the M400 which is planned in single as well as 6-seat versions.

Labiche's FSC-1
Mitch Labiche's Labiche Aerospace has designed the FSC-1 which is basically a car that can open out into an aeroplane with the push of a button, or conversely, an aeroplane that can fold up to become a car. When it comes to flying cars, people

Parajet skycar

would prefer something that is more of a car and less of a plane – a conclusion Labiche reached after asking about 3000 people. So, unlike the Moller M400, this can actually be driven on roads.

Skybike
Samson Motorworks' Skybike is a three-wheeled motorcycle that can be flown or driven on the streets with equal efficiency. Led by Sam Bousfield, an inventor with several patents to his name, this Sacramento-based company hopes to launch a radio-controlled model of its attractively

The LaBiche FSC-1 is the perfect hybrid flying

titled 'Switchblade' flying bike up for display in a few months.

Parajet Skycar

The Parajet Skycar actually flew and drove its way from London to Timbuktu in January 2009 without a hitch and has been declared the world's first legal flying car. It has a top speed of 180 kmph and a maximum range of 400 kilometres. The car is basically constructed from a dune buggy combined with a paramotor (one of those paragliding contraptions which have a set of motorised propellers at the pilot's back) for greater thrust and propulsion and a parafoil (the flat sail of a paraglider) to increase the lift.

Hoverpod

Entecho, an Australian company has combined a new rotor technology with unique lifting surfaces to create a flying machine that looks like a typical flying saucer. A centrifugal fan causes the air under the car to move radially from the centre towards the outside, generating lift as the 'skirt' – the airtight flexible membrane beneath the level of the rotor – blows up, directing the flow of the air downwards.

Automotive amphibians

Want to avoid the traffic jam on the bridge? No sweat. Just press a button and glide across the water at the speed of a motor boat. If you think this sounds like a James Bond movie, here is a list of amazing amphibious vehicles to make you think again.

Aquada

Using High Speed Amphibian technology (HAS), Gibbs Technologies led by Alan Gibbs has launched the Aquada in the USA. The HAS is a technology that has been developed over a period of seven years and can now even be applied to vehicles weighing up to

10 tonnes. The Aquada can travel at a maximum speed of 160 kmph on land and of about 49 kmph on water. Unlike the Volkswagen Schwimwaggen launched in 1942, it does not create bow waves to hinder progress over water, but proceeds smoothly like a typical motor boat. The Aquada is a three-seater with only one seat in front. You step into it like you would in a boat but steer it like a car. It uses a 175-horsepower, V6, 2.5-liter, 24-valve engine that enables it to accelerate from 0 to 96 kilometres per hour in less than 60 seconds. Once it enters the water, the wheels can be retracted, like in an airplane, thus significantly reducing the drag. With the press of a button, the wheels retract, the car senses it is in water, activates the jet to propel it in water and changes the headlights into marine lights. It is buoyant and cannot sink. Priced at almost $3,00,000, it still lies beyond the average person's buying capacity. Gibbs Technologies is also working on the 'Humdinga' – a concept four-wheel drive car that aims to seat five people and hit speeds of 160 kmph on land and 64 kmph on water .

Sir Tristram

Peter Martin of Northern Ireland, in October 2009, used an outboard motor, welding equipment and waterproof sealant on a Renault Laguna he had purchased for 100 pounds sterling and converted it into an amphibious vehicle. This car-boat, named Sir Tristram covered about 20 miles over sea from Ireland to Scotland, in 7 hours. This one, however, is not a prototype and seems to be a one-off. Martin's vehicle is to be auctioned on eBay for the benefit of the Help for Heroes charity that assists wounded British soldiers.

No more cruising on the highway

Python

WaterCar.Inc was founded by Dave March in California. The company hand-makes customised amphibious vehicles in two designs, viz. the Python and the Gator – both of which are said to achieve 60 mph or 95 kmph on water and achieve the same speed in 4.5 seconds on the roads. It offers hundreds of colours to choose from for exteriors as well as interiors, making each car exclusive enough to pay the hefty price tag of 200,000 $. You can see the car in action at www.thinkdigit.com/d/carvid/

Riding on air

According to Praveen Nahar, Head of the Transportation and Automobile Design at NID (National Institute of Design, Ahmedabad), sustainable design is the inevitable future of the automobile. While the Copenhagen summit may not have seen any significant breakthroughs for environmental conservation, car

Fly like an alien

designers and manufacturers all over the world have been quietly working to ensure that our automobiles cut down on harmful emissions. One of these options is the compressed air car – or the car that runs on air – or hybrid versions of the same.

Air Car

In an extraordinary tie-up with Luxembourg based MDI (Motor Development International), Tata Motors (India) has been working hard for the last two years, to put the finishing touches to a technology that will enable their cars to run on air. With fossil fuels diminishing, fuel prices skyrocketing and global warming threatening us, this couldn't have come at a better time. The only trouble with air-compression engines is the extremes in temperature. When compressed air is released, these engines become extremely cool, making it difficult to operate

Feature

OScar
Read more on the open source car project
– OScar in the August 2009 issue of Digit

Car-Fi
Ford's new cars are going to be WiFi hot spots as
an extension to its SYNC systems

Tata's new Air Car

them in cooler climates and necessitating heating mechanisms like heat exchangers. While these cars are all set to hit the roads of France by 2011, it's their features that make you sit up and pay attention. Compressed Air cars usually use a motor powered by compressed air – or combine them with gasoline, diesel, electric or ethanol engines – to help gain higher speeds. France's MDI plans several such hybrids to tide over this bug.

Tata's vehicle, called the 'Minicat', is purely run on an air-compression engine, is a zero-emission vehicle and might even be launched this year, as the first batch has already completed production at its Uttarakhand factory in Pantnagar. The company claims that the vehicle can reach a speed of 96 kilometres per hour and cover a range of 300 kilometres on a full tank of air.

Pneumatic technologies

Cars like Toyota's Prius and Honda's Insight use a petrol engine and braking energy to generate on-board electricity which adds to the power of the vehicle. Engineers led by Prof. Hua Zhao at Brunel University, West London, England, have discovered another way of adapting a regular petrol engine to run on compressed air. The unique aspect of this technology is that the compressed air is generated by using the braking mechanism. Whenever the car brakes, the pistons compress air and push it into a compressed-air tank. If this comes through, it is sure to lead to greener, cheaper and healthier cars.

Automobile add-ons

There's much more happening on the automotive innovation front than flying, floating or greening-up. With current digital technology, nanotechnology and new materials, car designers seem to

have received a license to take their creative ideas into overdrive. Here are a few examples to make your jaw drop.

Shared personal cars

Led by Praveen Nahar, Coordinator of the Transportation and Automobile Design programme at NID, Ahmedabad, three students of the same institute have come up with three unique designs for the Royal Melbourne Institute of Technology (RMIT). These designs, which are going to be used by the Australian car-sharing firm, Flexicar. "Instead of owning a car, we might be sharing a car in the near future," says Prof. Nahar, referring to the concept behind these cars which entails that several drivers use a single car at different times on a regular basis.

These designs involve an incredible level of personalization: When you use a swipe card to enter the car, the car resets all your personal preferences to optimise your driving experience – and this includes the steering wheel, the seat arrangement and your favourite music.

The team includes three students, viz. Sameer Malkhare, Lalit Yaduvanshi and Gautam Nair. Prof. Nahar hopes that, in future, civic administrative bodies may even decide to allow such shared vehicles to receive priority on the streets, once they realise their benefits.

Chameleon Cars

Using a special treatment called Feint-Paint by the Spanish company Payola Forlids, BMW's MINI Chameleon changes colour with the weather. The paint on the car is treated with microscopic magnetic iron oxide particles, which, once a minor magnetic field passes through it, changes colour in a matter of seconds. The car is sensitive to both, temperature as well as moisture. This should be seen on the streets of Singapore sometime soon.

Robotic car companion

MIT and Audi have come up with the AIDA (Affective Intelligent Driving Agent) which is a robot head set up on your dashboard, with a 'neck' that allows it to swivel and laser colour projections on its surface to give it expressions. The

Riding high

AIDA is connected to sensors all over the interior and exterior of the car, which gives it information about the driver's state of mind (strength of the grip on the steering wheel, etc.), and the status of the seat-belt is off. It also helps the driver get to the destination quicker using alternative routes with the help of GPS.

Augmented Reality System

Imagine this: you're driving around a corner and you can't see what's coming round the bend; but your car shows you the entire scene from behind the wall, even before you've reached there.

Denso, a car part manufacturer in Japan, along with Yaser Sheikh of Carnegie Mellon University – and his team - have been researching a camera system that enables a driver to see through walls. While this is still in the nascent stage, the team hopes to put a video processor on the dashboard, which would receive a wireless signal from a roadside camera and project the scene from behind the wall directly on your windscreen, preventing the risk and bother of having to move your eyes from the road to a screen.

The road ahead

Of course, the question is, whether we'll be able to see any of these contraptions in our lifetimes. But then, did you ever dream you'd see battery powered scooters whizzing around silently on the streets of Indian cities? Hasn't GPS – once the stuff of science fiction – now become an integral part of thousands of cars in the developed world? Similarly, several of the technologies discussed above are already way beyond the concept stage and are already in use by people like you and me. Don't be surprised, then, to see your neighbour fly his car into his garage, one fine day. Who knows, you might even beat him to it. **d**

Scitech

34 **Cloudburst**
Is Google Wave only hype and
is it the only one of its kind?

38 **The second lap**
The future of computing - the transformations
and what to expect in the years to come

What makes a tablet

We look deep inside the Wacom Intuos 4 to discover how it manages to be both wireless and battery-free...

Modulator
The modulator acts as a link between the processor and the resonance circuit positioned at the tip of the pen.

Pressure Spring
The spring in the stylus measures the amount of pressure being put and transmits that information up to the modulator and then the processor. Tilt of the pen is also recorded. A Wacom Intuos4 tablet for example, can record 2048 levels of pressure.

Coil
The sensor panel generates a field. The coil within in the pen oscillates and generates a current which is used to power the stylus when it is brought within close range of the panel. This is what makes the Wacom stylus cordless and battery-free.

Controls
In addition to the controls present on the stylus itself, the main platform on a typical Wacom tablet has a few controls that can be used to pan and zoom into images in software and also to select different levels

■ The actual sensor circuit and panel without the outer shell

Processor

The processor in the stylus keeps track of the pressure levels, the tools being and the also the switches. It gets this information and sends back this information through the modulator.
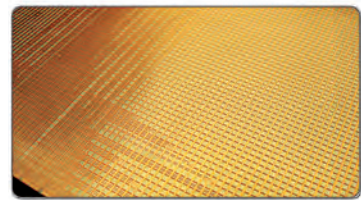
■ A closeup of the panel of the magnetic field generating panel

Switches

The switches are basically the left and right-click buttons. They are used to control the brushes in a typical painting software and also with the operating system
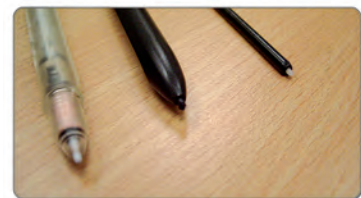
■ The different versions of stylus nibs from Wacom. The one on the extreme right is one of the newest most compact ones they've ever made.

Magnetic panel

This is the one of the key components which generates the field and is connected to your PC. The field both helps generate power within the Stylus and also helps in tracking the location of the stylus. Newer models from Wacom allow touch using multiple fingers as well.

■ A transparent stylus with the pressure spring, coil and switches in view

Nokia's Booklet 3G, a netbook launched in the European markets, runs Windows 7

On Dec 17, Intel's Indian branch unvieled a prototype 48 core processor meant specially for cloud computing

Cloudburst

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What is Chrome OS?

Chrome OS is Google's attempt to bring it's minimalistic sensibilities to the Operating System. Operating Systems are designed to run on a wide range of hardware, support a large number of devices, and run on constantly changing configurations. This means that the code used for the Operating System generally has a ton of checks to utilise each and every piece of hardware to an optimum level. This is just in theory, and we all know how buggy this is in practice. Chrome is probably one of the few Operating Systems where everything is stripped down to the bare essentials. Designed for a narrow range of hardware, this compromise is in favour of performance. Chrome is designed for the particular niche of netbook users who spend most of their time in the clouds. One of the primary guiding philosophies of Chrome is that you are on the internet when you turn your computer on. This explains the almost startling sub 7 second boot time (It's true, we checked), and the fact that your Google username is also your account name on your system. There is almost nothing on the operating system apart from the Chrome browser.

Chrome OS is not a competitor to other companies that make Operating System for the netbook segment. Chrome OS is just one of the many exciting new platforms for Mobile Internet Devices (MIDs). Moblin, a Linux distribution by Intel for it's Atom processor, eyeOS, a cloud-based OS to be distributed with IBM machines from this month, and Google's own Android are just some examples. The web is growing at such a pace that there is enough room for everyone, including the smaller players to get a hold on different aspects of the web.

In fact, the way things are going, services by Google, Microsoft and others will very likely be intercompatible with each other. A demo video of Chrome had a Google employee quipping of a "new application for Chrome by Microsoft", which was an online version of Microsoft's office suite. In fact, all the competition is better for Google. Even if there is a netbook based cloud OS that gets more popular than Chrome OS, Google still stands to benefit, simply because of it's strong hold over the internet. Chrome OS is open source, and the reason Google is investing efforts into it, is that their primary aim is to get people online. As long as people are online, they will probably be using a Google service, which is the reason for a lot of generosity on Google's side, including free Wi-Fi access to a lot of American airports. Google is dramatically not venturing into some other areas of the web, an example would be back-end platforms for cloud applications, such as Microsoft's Azure operating system.

At this stage, Chrome OS is the browser Chrome installed on a skeletal Ubuntu system, with a few bells and whistles. This is all that Chrome looks like it will ever be, and Chrome is barely an operating system in the traditional sense. For the break-in period, Chrome OS will very likely be bundled with a "normal" OS, either another Linux flavour, or with a Windows installation, as is done with Android net-

Google's Chrome OS is not even on the horizon, but the hype has reached an almost rabid frenzy. Here, we separate the facts from the faff

books now. Chrome OS is still very much in the development phase, with code being put in regularly. The source code is available for anyone to download and use. While Chrome OS is not the first cloud operating system, it is the most widely publicised, and a hands-on reveals that there are many things that users will end up doing differently.

How to get Chrome OS

Do you want to test drive Chrome OS for yourself? Here is how:

1 It is best to start with an Ubuntu system. Go to http://www.thinkdigit.com/d/14984/. Download the latest source code, which will be in a tarball or ZIP archive.

2 Download scripts from the Google Chrome OS site that let you compile Chrome OS on a USB drive, then boot from it. Complete instructions are available at http://www.thinkdigit.com/d/83057/.

3 Plug in the USB drive to your computer, hit [F12] to enter the boot menu, and select boot from USB drive. Enter your Google account details.

4 Alternatively, you can search for a pre-compiled Chrome OS disk image, then load the image in a virtual machine such as VirtualBox. Download a torrent file from http://www.thinkdigit.com/d/15730/, and unzip it to a directory. Then, start up VirtualBox, and choose an existing disk image, and load the file you downloaded.
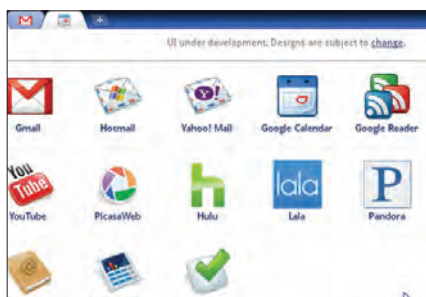
Bada OS
Samsung's new offering for mobile devices is heavily dependent on Cloud compatibility

VMware vSphere
There are a number of enterprise Cloud OS being deployed around the world, including the vSphere

The Chrome OS equivalent to the Start Menu, which is just a web page with glorified hyperlinks

Working on Chrome

Once you login, you get a start menu which is basically an array of different web sites. Conventional web services are treated as applications in Chrome. Gmail is an application at par with Google Docs, a radio streaming service and a flash chess game on a web site. Basically every tab you open on a web browser is no longer considered as a "page" within Chrome OS, and instead is a "window". There is no desktop to speak of, as everything is within the Chrome browser window. The equivalent device for shortcuts or icons are compressed tabs that are always on irrespective of what you are doing. Some applications like the Lala streaming radio and GChat are given a unique treatment as "panels" that can be minimised when needed. These are always hovering along the bottom of the screen, to be called when needed. This new way of working may seem like it gives you no control, or freedom with your device, but this is not necessarily a bad thing.

You cannot install your own applications on Chrome as yet, as the root folders remain locked. A Linux OS with the Sudoers account disabled is about as secure as current technology is going to get, so no matter what happens, the operating system simply cannot get messed up. This means that the OS remains as fast and responsive as it was, even over prolonged use, as the underlying system is not changing at all. The flip side is that you will have to depend on the web for providing with all the applications that you need. There are some pretty neat web 2.0 applications out there, for everything from photo-editing to audio transcoding, but these are not as fast or as convinient as the desktop alternatives.

As soon as you plug in an external storage device, Chrome OS treats the folder structure as just another web page. You can click through the directories, and open up any file as long as there is something on the web that can read the file. As of now, this is not really a lot, the most exotic format that Chrome OS can handle is an MP3 file, which it opens in a player. Some of the more obscure, or even mundane items does need you to work backwards though. An .xml document will open in the browser itself, for example, but not with an editor web application. Chrome OS tries to make the concept of "downloading" old-fashioned, but does not really succeed at it.

Multimedia is a problem as of now, but between YouTube, Vimeo, Last.fm, Grooveshark, and the tons of other streaming options out there, this should not be much of an issue, by the time Chrome OS actually comes into circulation. Serious gaming is outright impossible, unless a dedicated hacker comes up with some elaborate mechanism (we are sure to see this), but the web is full of flash games for the casual gamer. Keep in mind the usage scenarios, and the kind of devices that Chrome OS is likely to show up on, and these are not really major disadvantages.

That said, there is not much to get excited about, unless you are already drooling over the Chrome browser, which would only be possible in a parallel universe without Firefox. The unbelievable start-up time is the single most impressive thing about Chrome OS. The browser

Pinned applications (top left) and Panels in Chrome, minimisable and persistent windows

as an OS model is great, but needs a lot more to offset the advantages of a traditional operating system – the ability to write out a document offline, for example.

Life in the Clouds

Chrome OS is just a part of a larger trend. While a Cloud OS may be a little too premature for the entire planet, the general direction that Chrome OS is working towards, is more or less the future. The strict hold over formats and standards that companies enjoyed so far, belongs to an age that is passing by the day. Data intercompatibility and portability will be important for a lot of reasons, and we are likely to see stable, long lasting ways in which to create, store and share data. Open APIs that everyone can use are a part of this, which ensures that applications to use data and content can be designed by independent sources. Facebook and Twitter are shining examples of this trend at the moment. The way things are going, it would be relatively simple to drag and drop a photo from a mail attachment into your Facebook profile. While an OS based entirely on the cloud may not be an answer, a more hybridised approach, will not only work, but is already here to some extent. Adobe's Kuler for example, is a Web 2.0 swatch application that works with Adobe's Creative Suite 4 installed on the desktop. The lines between what is a web application and what is a desktop application has began to blur.

The biggest roadblock to this transformation is the internet itself. The world wide web sits on a network of wires almost three decades old now. These wires use hideously outdated protocols, and it is here, the back end of the web, that needs a major upgrade. The web was meant to be an academic endeavour, an agent for the sharing of information. It has grown to be much more, with the invasion of e-commerce, social networking, and now full fledged operating systems. The cloud right now really is wisps of data without any real support, The internet needs to be much more secure before users can move completely into the cloud. **d**

Tomorrow's Tech

Light computing
Photonic Computing which will be based on the transfer of photons instead of electrons, is bound to increase the speed of computing to unimaginable levels

Future interface
SixthSense developed by MIT's Pranav Mistry is a wearable gestural interface that will let us interact with information using natural hand gestures

The second lap

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Forget 2012, and the singularity. We're going to try and envision the future of personal computers and technology beyond 2015.

To start off with this feature on future predictions, which will only deal with certainties, we would like to assure our readers that world is not ending in 2012. NASA, in fact had a news release dismissing claims about a phantom planet or galactic alignment that could bring the end of the world. "Even if these alignments were to occur, their effects on the Earth would be negligible", says a news release. "Each December the Earth and sun align with the approximate centre of the Milky Way Galaxy, but that is an annual event of no consequence."

However, it is difficult to gaze into a crystal ball, and project a grandiose vision of future technologies. Five-year plans are best left to socialist governments. However, given that we live in India, and only got 3G close to a decade after Japan got it, it should be fairly easy to predict the future of technlogy in India, by looking at what is happening around the world.

The future is the past
This is an industry where intellectual property, software and interface patents, and walled gardens help retain precarious monopolies. It's hard not to be cynical, when you realise that we're yet to see a $100 laptop or a Rs. 10,000 Android. Our bandwidth is capped at 10 GB, while countries like Finland have declared bandwidth a birthright.

Basically, the future of computing in India is the past in many developed countries.

Tablets and touch devices
Francis Ford Coppola's movie, *Tucker: The Man and his Dream* tells the tragic story of a man who tried to take on the big auto companies in the US in the 1940s, but failed spectacularly. In mid-2008, Michael Arrington wondered aloud why there wasn't a $200 "Macbook Air-thin touch screen machine that runs Firefox and possibly Skype on top of a Linux kernel. It doesn't exist today, and as far as we can tell no one is creating one." Arrington later outlined his manifesto and philosophy behind the $200 CrunchPad. The design, specifications and software would be open source, allowing anyone to build one. The last prototype, sporting a 12-inch capacitive touchscreen could run Chrome OS and Windows 7, and was expected to be launched early 2010.

Sadly, in December, Arrington declared the project dead, spilling out the gory details of "greed, jealousy and miscommunication" on TechCrunch.com, which has over three million followers on its RSS feed. He filed a lawsuit a fortnight later. The CrunchPad is now reincarnated as JooJoo, and is available for pre-order in the US for $499 from Fusion Garage. Hopefully, he will not give up, and follow his vision through to give us a $200 tablet by 2015.

Memory resistor
Memristor technology could lead to computer systems that can remember and associate patterns in a way similar to humans

VIS 4D
Ethereal Technologies' Volumetric Imaging System or VIS4D can be used by gamers to visualise 3D images in real time without glasses

Tomorrow's Tech

Smartbooks?

At a recent round-table in Mumbai, NVIDIA's CEO, Jen-Hsun Huang was in good spirits, reflecting that balloons in the movie *Up* wouldn't brush a certain

In case you're lost, use Layar

way, if it weren't for NVIDIA's contribution to graphics technology. None of the journalists present were willing to question that statement.

On that particular day, Intel had just agreed on an out-of-court settlement, to a lawsuit filed by AMD, for a sum of $1.25 billion. Jen-Hsun opined that when compared to the profits Intel made during the period of the lawsuit, it was the equivalent of paying for a parking ticket.

On display at the meeting were a wide variety of Tegra-based devices – e-book readers, smartphones, netbooks, and a large touch tablet. "The beauty of low-power design is that the form factor can be exquisite. The hi-def movie was streaming off a tiny Mobinova netbook. It can play hi-def movies for 12 hours, and gives week long battery life otherwise", Jen-Hsun said.

The netbook has been attributed as an Asian innovation. Starting from the EEE PC, it has provided a low-power and low-cost computing option to a large section of society, and is currently available for $300 to $600. This platform has been dominated by Intel so far, who have also broadly defined the specifications and limitations of a device of this form

factor, to prevent it from overlapping with the laptop market. Not everyone is happy with this particular arrangement.

Unlike Intel, ARM puts no limitations on the size or form of the products that are made using it. The Tegra, five years in the making is based on the ARM11 core. "We wanted to create a computer that is as good at 1/50th the power", said Jen-Hsun Huang.

Crystal gazing into the future of handhelds/netbooks, or at least the processors that power them is not that difficult. The ARM 11 SOC (system on a chip), which powers a majority of Android devices and the original Apple iPhone, was first announced in 2003. In Anand Shimpi's column titled Core Values, he explains that the Cortex A8, which debuted in 2005, took four years to be incorporated into a product, first on the iPhone 3GS and Palm Pre. It takes time, because ARM does not manufacture processors like AMD or Intel, but licenses its design to players like Texas Instruments, Samsung, Qualcomm, and NVIDIA, who make their own customised SoCs.

We can safely predict a new product lineup called smartbooks this year, with emphasis on touch-based computing,
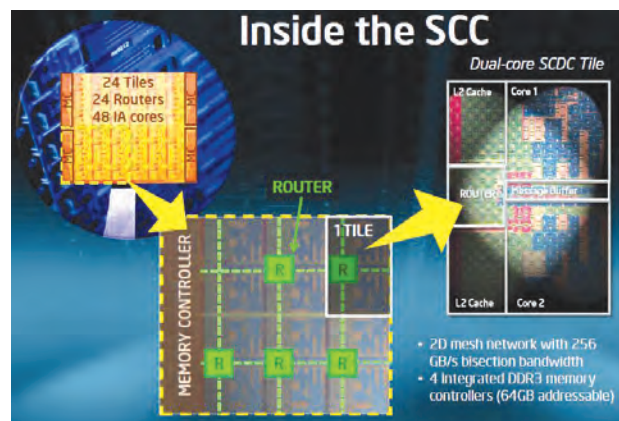
Processor cores are increasing by the day

and as a communications tool with data stored on a cloud. At less than Rs. 10,000, these will be cheaper than Intel's Atom netbooks, or in a different usage model, likely to be bundled free with a wireless internet telecom service provider.

Tegra 2 is expected this year. Over a five year lifecycle, we are also very likely to see implementations of the Cortex A9, which will be produced by AMD's spinoff GlobalFoundries. These will power not just touch-based smart phones and tablets, but netbooks and laptops as well. While these devices will offer an entirely new user experience compared to Windows PCs or Apple Macs, they will be able to run Google's Chrome OS, and store data on a cloud. They will boot in seconds, always be connected – either via inbuilt 3G or wireless connectivity – and have a much longer battery life. And you don't have to every worry about backing up your data.

Interfaces

In a TED talk about simplicity and design. NY Times columnist David Pogue mentions how Palm Inc. used to have an employee whose job designation was that of a "tap counter" – to ensure that all their applications achieve their desired outcome in three taps. Of late, everyone seems to have embraced this aesthetic. However, two companies, Swype and First Else, have come up with new interface designs this year that seem like the next evolutionary leap. In terms of speed and elegance, they leave the iPhone, the holy grail of UI design in the dust.

The First Else phone has been made by an Israeli design house and draws comparisons to sci-fi user interfaces seen in *Minority Report*, *Fifth Element*, and *Terminator*. The device does away with icons, and tries to adapt to you, instead of the other way around. One just slides the finger, letting the menu options fan out. The highlighted item gets selected once you lift your finger. The radial fan-like menu spreads out options based on thumb position, contacts are sorted by call frequency, First Else also claims to provide cross platform search, and backs up all your contacts and information on the cloud.

Atomic computers
A group of researchers going by the name Nanotechnology Dream Team say they will unveil a revolutionary computer made out of atoms on November 1st, 2011

Future data storage
Holographic data storage is an emerging technology which will enable high density storage of data (500 Gbit/in) and faster data transfer speeds

First Else has a convenient "thumb-based" interface

Swype, a Seattle-based company has launched a new way to type on touch-screen phones without ever lifting your finger. You just slide your finger across the letters at top speed. The software was created by the inventor of the T9 predictive typing system, and is able to predict what word you are typing by tracing your path and the letters that come under your slashes and swipes. In a comparison video on YouTube, the Swype-enabled Samsung Omnia II beats the iPhone by a healthy margin. The web site claims that one is able to achieve an unheard of speed of 40 words a minute on touch screen devices. For us Indians, this will probably mean entering our unique names into the dictionary by tapping traditionally, before we will be able to Swype. It's releasing on Android phones next year.

Reality++
Mobile Augmented Reality is already a reality in the Netherlands. An Amsterdam-based company, SPRXmobile, has come up with an application called Layar – a mobile augmented reality browser that currently works on the Android and the iPhone. It displays real time digital information on top of the reality that the mobile camera sees. While looking through the phone's camera lens, a user can pan around the landscape, and look for houses for sale, restaurants, jobs, healthcare providers and ATMs.

Here's how it works: Starting up the Layar application automatically activates the camera. The embedded GPS automatically knows the location of the phone, and the compass determines in which direction the phone is facing. Each partner provides a set of location coordinates with relevant information, which forms a digital layer that is presented on the phone. "Eventually, the physical and the virtual worlds will become one," said Raimo van der Klein, co-founder of SPRXmobile.

Layar derives information from a variety of location based services – the developer SPRXmobile has partnered with local banks, a realty web site, a social networking web site, an employment agency, and a healthcare provider to provide their location coordinates and other information. Technically, any mobile phone with a camera, GPS and compass should be able to do the same. The company has opened up its platform for developers, to enable third parties to create and publish digital layers within the Layar mobile application.

Greener pastures
Neal R. Armstrong, professor at the US-based University of Arizona, which does a lot of research on solar power said this about the world's most popular music player: "You burn about a quarter of a pound of coal per charge of your lithium ion battery, and you generate about half a pound of CO2 per charge, per battery, per day." Apparently the room got really silent after he said that.

Laptops will soon offer you three hours of battery life, some will give seven to ten, others promise a week. Even if consumers aren't interested in going green, it is likely that we will see increased adoption by people who use renew-

able energy to power their infrastructure. These will be consumers who will drive a shift in performance metrics and the benchmarks being used. Homes and offices that run on green or renewable energy would care very much about a monitor that uses 20 per cent less power than its contemporaries.

We are also likely to see more environmentally conscious components that will be free of mercury, arsenic, PVC and BFR. Some of the leading consumer electronics
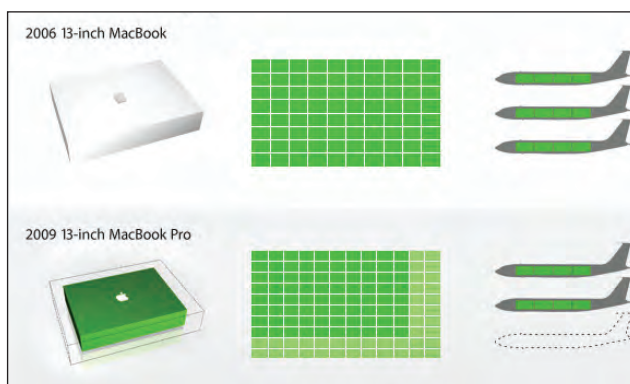
Reduction in packaging

companies try to make products that are recyclable. Many of them collect a product after its lifecycle, and take care of its reuse and disposal.

The gigahertz race pushed the power consumption of desktop processors to outrageous levels, but lately, power efficiency has been given the emphasis it deserves. To a fair extent, computer manufacturers have begun to close in on the gap between
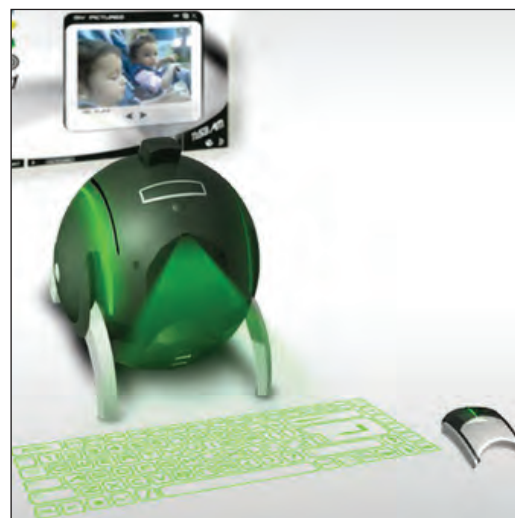
Ready for use

Future of gaming
The Emotiv EPOC headset is a Brain Computer Interface (BCI) device that will let gamers play games by mind control techniques

Nanotech batteries
Researchers at Maryland Nanocentre have developed a nanotech battery that has a storage capacity, 10 times more efficient than present day technologies

Tomorrow's Tech

power and power efficiency by making their desktops more energy efficient when idle.

Energy consumption is coming down across the board and is not just relegated to the CPU powering your system. Google.org, a philanthropic branch of Google is developing PowerMeter, which taps into smart meters and helps track energy consumption through PCs and smartphones. The service will eventually be rolled out in India through Reliance who have partnered with them this year. According to Google's Ed Lu, they aim to save a "socially relevant amount of energy" through these means.

Mobile-internet
Rumours of Symbian's death have been greatly exaggerated. Nokia made an announcement recently that they would be working on only one Linux (Maemo) phone a year, so Symbian remains.

We are very excited about Fring, the unified mobile app that can be used to conduct video calls with other users on Skype using the phone's Wi-Fi or 3G connection for free. "This is a two-way video call!" says an enthusiastic

developer showing a demo of the application on YouTube. It's the world's first application to make mobile video calls over Internet protocol (IP). The company has a history of bringing free calls and Twitter over the Internet for phones, and Fring works with any kind of internet connection – 3G, Wi-Fi, GPRS, EDGE &WiMax.

"We have a responsibility to continue breaking the mobile-Internet barriers" said Avi Shechter, CEO of Fring.

Fring also supports iPhone/iPod touch, Android, and Windows Mobile handsets, but will roll out similar features for these platforms at a later date. We wonder how it will work on them without a front facing camera. We are also looking forward to number portability, which will be rolled out this year in India. That should give consumers the freedom to opt out of an operator that has a "non-fringing service" plan. **d**

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The Robotic Age

The world around us is constantly evolving in unprecedented ways, at an unimaginable speed. The robotic age, something we're used to reading about in science fiction is finally becoming a reality. The result? Hopefully, a robot in every house. Robots have a long history, from fictional characters (Isaac Asimov's novels and motion pictures), to industrial robots and mobile robots.

Industrial robots have taken a long stride and are well established, but newer domains and research has got most of the limelight. Roboticists are now taking the robots out of their fixed base (industrial applications) and are imparting mobility and intelligence. There are a number of mobile robots deployed in the real world.

Robotics is an exciting, multi-disciplinary area that integrates intelligent control, communications, computer vision, mechatronics, sensor fusion, design and many other aspects on a single platform. Although the vast majority of robots today are used in factories, advances in technology enable robots to automate many tasks in non-manufacturing industries such as agriculture, construction, health care and other services.

India is now emerging as a destination for the production of industrial robots. In fact, the size of the Indian robotics market is large with sales figures hovering around Rs. 3,500 crores. Most of this (around 70 per cent), is in the automotive industry. The robotics industry in India is expected to grow substantially in the years to come. Several new players

ROBOTICS, INDIA AND THE FUTURE

are venturing into this space. The Indian manufacturing arena is poised to grow larger in the coming decades, thereby increasing the demand for robotic solutions. As far as the industry is concerned, India contributes significantly as far as research / intellectual property (IP) generation to converting LISP codes to C codes for industrial robots is con-

cerned. A large volume of work centred around these domains is outsourced to India. Being an agrarian society, our nation has opportunities in automating agricultural related activities.

Industrial robotics is mature as a technology, and is well established. However, the mobile robotics space is expected to witness significant growth in the coming

Karel Capek
The Czech writer who first used the word "Robot" in the 1921 play RUR

Unimates
In the early '50s, George Devol and Joe Engleberger created the first modern industrial robot

Robotics
The word first appeared in 1942 in the short story "Runaround" by Isaac Asimov

From the labs

years along with social / interactive, consumer and medical robots.

Mobile robots are utilised in industrial, military and security environments. There are several consumer robots meant for entertainment purposes, and some designed to perform certain domestic tasks such as floor cleaning. Autonomous robots with reasoning capabilities and the ability to move around freely will be in demand in the coming decades. Designing autonomous mobile robots in any meaningful degree has become possible only with the recent surge in computational, communications and sensing technologies. Teams of smart micro-robots could do regular maintenance in nuclear power plants and other hazardous environments.

Personal robots will change our lifestyle altogether by assisting us in our disabilities and nursing us in sickness. Artificial dogs or robot-pets with emotions can soothen many, especially children, and the aged and disabled.

While all this is exciting to experience, behind the scenes, there are several issues that crop up – where am I (positional information), where should I go (situation awareness and target identification), what should I do (target identification, object manipulation and reactive capabilities). These are issues that should be addressed.

When it comes to real-world operational conditions of mobile robots, the level of accuracy is also important. The most advanced species on this planet (humans) perform well out there with less precision and accuracy. Of course, it is desirable to have mobile robots that are capable of pin-point accuracy, which will depend on the application areas. Human capabilities around "tracking" and "following" are commendable, though precision and accuracy are not major concerns as we are comfortable in continuously adjusting our actions. There is a long way to go in bringing robots to the level of human-like capabilities.

Humanoids

We have built the environment that is suitable for two-legged systems. It is predicted that robots will be with us in our daily life sharing our space and resources (power, bandwidth and space). Nature has shown the way where the most successful species on this planet has two legs. And, the robots that may have to live with us in due course of time should preferably be two legged, or else, we'll have to redesign our living space to suit wheeled robots.

The most challenging issue with humanoids is balancing on two legs. Humans are capable of doing all kinds of acrobatics with two legs. We have muscles to assist us in coordinating various activities and the body is flexible. Research along material science (flexible body, muscles, actuators), nano technology (smaller and lighter sensors and

Robots (and humans) enjoying a game of soccer

actuators), computational intelligence (fuzzy logic, neural-networks, learning – genetic algorithms, evolutionary algorithms), should be assimilated into and mastered to design better systems.

GENUS

This 21 degrees of freedom humanoid robot is marketed by Robhatah Robotic Solutions, Bangalore. A single DSP-based controller board drives the servos. A camera, accelerometer and digital compass are connected to the DSP board for sensory feedback. The on-board accelerometer is used as a tilt sensor that allows the robot to detect a fall or dive and autonomously recover back into an upright standing posture. Trajectory-based gaits for the humanoid is generated in real time by reading predefined joins data and interpolate using cubic polynomial trajectory planning.

The CREO

The Mechatronics and Automation laboratory of National University of Singapore developed this humanoid robot, and supports a wide range of research in robotics, including intelligent system, image processing, kinematics and dynamics, real-time control system, wireless communication and energy efficiency in biped locomotion. CREO stands tall at 540 mm with 26 degrees of freedom.

A double knee joint configuration based on closed kinematics is utilised. The actuators can be configured with different response profiles to fully maximise motion efficiency and effectiveness. The actuators use the daisy chain network topology. The humanoid sparks an open architectural platform in which the processors can be customised. It is armed with a 1.3-MP camera and an inertia measurement unit consisting of a three-axis accelerometer and two-axis gyro.

Traditionally, humanoid robots are often built with a lower centre of gravity (for better stability performance) and larger foot. CREO has a foot-body ratio closer to that of the humans and higher centre of gravity. A great deal of studies can be conducted in CREO on generating motion similar to that of a human in terms of dynamics, control and stability performance since the physical system is now closer to that of a human (ratio and weight distribution aspects).

Cooperative robotics

Cooperation / coordination among members was so much the need of the hour,

Kevin Warwick
The Cybernetics professor who calls himself the world's first cyborg, with computer chips implanted in his left arm

as they had to compete with other (hostile) communities. Present industrial systems are more complex and multiple mobile robots are increasingly preferred. Multiple mobile robots are not spatially constrained and performance benefits are manifold. Robots/agents equipped with knowledge, motivations, reasoning and planning capabilities may communicate each other and, share data and information. Cooperation protocol by distributed control, effective communication and fault tolerance while having efficiency of cooperation, adaptation and robustness are some of the research directions associated with multi-robot / agent systems.

Robot soccer

The robot soccer platform serves as a test bed to study and research on the issues pertaining to cooperative mobile robots. A robot team needs to coordinate its actions while competing with another team. The robot soccer system also has an explicit performance measure, the match score. Cooperation, decision making, planning, modelling, learning, robot architecture, vision tracking algorithm, sensing and communication are some of the directions of study. Organisations such as FIRA (www.fira.net) are promoting robot soccer as a competitive platform to push technology. In robot soccer, teams have to coordinate and compete while chasing an indivisible resource (the ball). Robot soccer, therefore, is a benchmark problem to study various issues along coordination / cooperation and competition, giving insights into problems in social / life sciences.

International robotic competitions have played an important role in pushing technologies leading to a number of technology starts ups. The FIRA Robot World Cup and Congress Bangalore 2010 (www.fira.in) is expected to act as a catalyst in these directions where the advancements in robotics will be showcased. FIRA India aims to propagate and popularise robotics and international-level robotic competitions across India. The objective of the competition is to promote the spirit of science and technology among the younger generation. It serves to bring together skilled researchers and students from different backgrounds to challenge one another in developing better robots for technologies of the future.

Robotic soccer competitions have emerged as benchmark problems for the integration of several technologies required to build sophisticated autonomous robots. These competitions are meant to stimulate research and serve as a platform for the exchange of ideas for the researchers involved. We've set 2050 as our target to pitch a team of humanoids against humans to play the game of football. Although many of us are sceptical of this deadline, primarily because technology is yet to reach the needed threshold for this to materialise. What these deadlines do, is help us work towards its accomplishment and push ourselves.

The path ahead

We expect robots will be utilised in the 21st century for household applications. This will pave the way for advanced robotic technologies to dominate in the 21st century. Some day, personal robots will be as popular as personal computers!

Due to the restricted growth in recent times, robotics, as a sector is expected to witness an exponential growth rate

There are opportunities in industrial robotics space for further development specific to Indian requirements and expansions along manufacturing. Mobile robotics is relatively new, and has higher potential growth in the coming decades, where a variety of applications right from consumer products to medical robotics are expected to usher in avenues.

Higher education in India is often neglected and as a result, there's an acute shortage of skilled man power in specialised areas, especially in the robotics and intelligent systems industry. The number of institutions imparting courses related to robotics design is limited in India. According to a recent NASSCOM study, 75 per cent of Indian engineers are not employable and IT firms reject about 90 per cent of Indian graduates. The employability of graduates is directly related to the quality of education, availability of state-of-the-art facilities and the assessment methodologies adopted. Timely reforms in the educational sector can assist India to ride the robotics wave and to position better. Japanese and Korean domestic robotic markets are able to sustain their growths from within. Governmental support and push along niche areas of research in interactive and intelligent robotic systems can help India to position itself better and to tap into the immense potential that lay ahead. **d**

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If you haven't spent as much time obsessing about sound as you have in the pursuit of the best HD (or not) picture in the last few years, you are forgiven.

For whatever reason, the sound technology we've come in contact with reached the level of "good enough" some years ago, and that's where we've stopped. Case in point: performances.

The concept of surround sound and multiple-channel audio has been...well...surrounding us since the 1940s, with Disney's Fantasia. And now we have the technology, so here we are. And this is the story with rock concerts too. We've been up close and personal with the sound setups at our share of performances, and for all their sophistication, they really just boil down to "put speakers in room, and turn up the volume".

But a few years ago — somewhere near Mark Knopfler's performance in Mumbai — in a casual conversation, someone brought up this crazy idea: instead of using ten big speakers and hoping that they're loud enough to cover the entire auditorium, why not just use a hundred smaller speakers all around the auditorium? This way, you don't wake the neighbours, and you give everyone — even the cheapskates in the back — a better overall experience. Win-win. It's highly possible that this someone threw the idea at the scientists at the Fraunhofer Institute, because at CeBIT 2007, we saw it in action.

IOSONO

In its physical form, Fraunhofer's IOSONO technology is exactly what we just described: a continuous band of small speakers running along all four walls. The result, however, is the most immersive experience we've ever had, including all the expensive tech we've been around in these offices. Also — and this is more significant than one would think — we could walk up

GET UP AND LISTEN

Spoiler Warning: the future of sound technology has been here all along

From the labs

Wafer-thin Speakers
To work with IOSONO, Fraunhofer also developed speakers
that can use walls as an integral part of the system and can
be constructed with thin panels

Audeo
A neckband that will read neural impulses on their
way to vocal cords, and generate speech for you

to the speakers and not have our ears blown off. If you've ever walked up near the speakers at a club or concert, you'll appreciate this.

IOSONO's secret is the big sweet spot — unlike traditional sound setups, you get the best audio experience all over the stadium, rather than the tiny, centre-of-the-hall sweet spot we hunt for all the time.

Perhaps we must dial back a bit and elaborate a little more on this sweet spot business. But first...

The wavefront

We hear sound because of the disturbances it creates in the air around our ears. If you think about this in slow motion, you can picture the sound leaving a speaker in expanding spheres:

These spheres are called *wavefronts*, and when you're in their way, you hear sound. And sound gets less intense with distance, so you want to be an "optimal" distance from the speaker — too close and your eyeballs may burst, too far and, well, why bother? We're building up to a point here...

The sweet spot

Picture yourself in, say, a movie theatre. The speakers, like your household 5.1 system (if you are in such a household), are placed on the four corners of the room, and right in front with the screen. Each of these speakers is sending out sound in wavefronts, and at the point where the wavefronts for all these speakers meet, you get to experience all the goodness of 5.1-channel audio — you're in a "sweet spot". Unfortunately,

YOU, IN THE SWEET SPOT

YOU, NOT IN THE SWEET SPOT

Most people watch their movies and concerts from outside the sweet spot

this sweet spot is usually tiny — you may be one of only ten people in a theatre getting the full experience.

There's a bit of advice you didn't expect from this article — when you're headed to the movies, pick seats in the centre of the theatre.

Obviously, if more of us are to enjoy our outings, we must all be in the sweet spot. One option, would have been to place speakers really far from the audience space. In an alternate universe, maybe they do have enough real estate to do that. In our world, we must find another way. It's called wave field synthesis.

The simulation

Imagine this: you're about ten feet away from a large speaker, looking (hypothetically) at the wavefront. This may be the optimal non-eyeball-melting-but-still-loud-enough distance, but what if you don't have ten feet to spare? What if you live in a high-rent dingy studio in the wrong part of the wrong metropolis, cursing your sad, pathetic...sorry, sometimes we get carried away. Anyway, when you're pressed for space, like say,

a new multiplex in a crowded metro, it is possible to use an array of smaller speakers and a mathematical algorithm or two to simulate that same wavefront, just inches away from you.

Creating the simulated wavefront
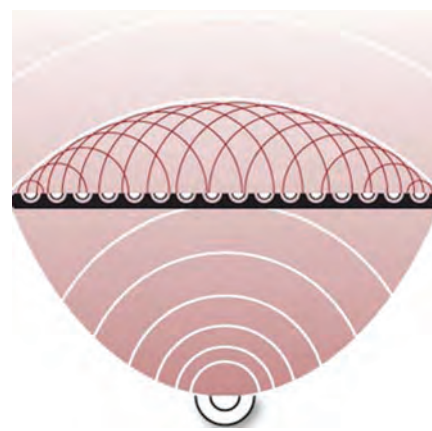
The array of speakers (in front) can create a wavefront that simulates the effect of a speaker far behind

is simple enough. The speaker in the centre starts emitting sound first, the ones on either side next, and so on. And there you are — if the speakers simulate the wavefronts at the sweet spot, suddenly the sweet spot becomes every spot that's at least six inches away from

Yes, there's a reason volume icons look like this

Nanotubes
Like so much else, Carbon Nanotubes may end up in speakers of the future, letting even laptop speakers dish out loud, concert-like music

WebEar Headphones
Andy Kurovets and Kris Dekeijser have designed a futuristic headphone that doubles up as a webcam

From the labs
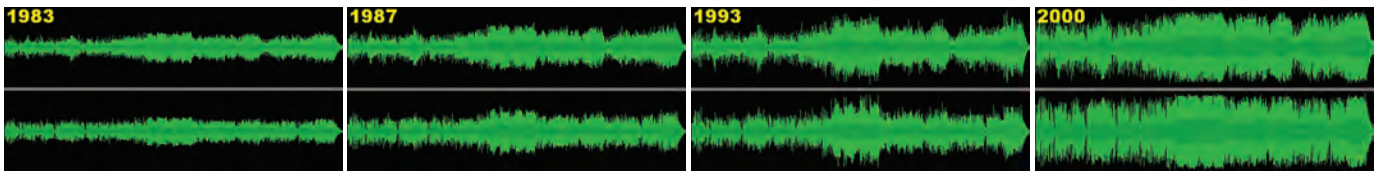
The sound wave for "Something", by The Beatles, from its original(ish) form in 1983, to what it became by 2000. You'll notice that not only has the song been made much louder, but it's been boosted disproportionately. The original has a few quiet and a few not-so-quiet bits, which have now been turned into annoyingly loud or annoyingly slightly-less-loud

the wall. And the big selling point here is that this works even with regular 5.1 audio as well, so it even makes business sense. Right. Here we are, then.

Interlude

We don't normally do this, but permit us, if you will, to get up on our soapbox and yell for a bit. You see, as the beginning of this article plainly suggests, the "future" of technology already exists. With lossless formats like FLAC, and gigabytes of space available for peanuts, it's entirely possible for us to enjoy music exactly as the artists recorded it. You'll have to part with many months worth of family income, but it's there. We don't get to enjoy this because of good old human idiocy.

Here's how we got the idea for a "future of sound" article: we've gone from CRT monitors to 22-inch HD capable screens in almost no time. We've gone from lugging around CDs and a portable CD player in a backpack, to

dumping entire music collections on to a PMP and still have place left over. Our experiences with audio, on the other hand, haven't changed in decades. Whether today or in 1979, there's only one way to bring a "concert experience" home — get the music in its purest form (no, not by kidnapping the band), put it through the best equipment money can buy (ideally the kind that the studios own), and turn up the volume. With IOSONO, our concert experience may come closer to the experience of being in the studio with the artist. And if you can set up an IOSONO system at home, you can bring that experience home as well.

But the real problem — the rotten banana skin that even the most agile technology will slip on — is what's known as the "loudness war". At some point in the jukebox era, recording industry executives decided that consumers were such brain-dead twits that they couldn't be asked to get up and turn up the volume when the noise

in the bar/café/establishment-of-your choice was drowning out the song. And so they decided to make "hot" masters — recorded audio whose volume is artificially boosted to make them stand out more when they're played. This came to be regarded as a really good idea, so they kept doing it. We've laboured under the impression that the audio on CDs is as good as it gets, but in reality, they're shining examples of artificially loud music — the boosted track requires less digital space, and so it made sense to use this technique to cram in as many songs as possible.

The worst part is that even though the audio CD, for all practical purposes, is dead, this practice continues. So even though you can get yourself the best equipment, the old garbage-in-garbage-out rule applies, and all that money would be spent for naught.

But does this matter? When we take into account economics, the demands of consumers, and other such factors that have nothing to do with technology, we come to one key phrase...

Good enough

If you, like so many of us, like your music in your pocket while you travel, do you really think — even with sound-cancelling headphones — that you've ever cared that the music is artificially "enhanced"? Or do you just kick back and enjoy? A sound-gasm may be highly desirable, but its lack isn't really going to tear the world in two. If you can get joy out of sound without caring what bitrate it's reaching you at, then you probably aren't even bothered about what this article is saying.

If we demand great technology, it may or may not come. At least there'll always be great music. **d**

THE AUDIO SPOTLIGHT

Since we have already touched on the subject of performance audio, we should also mention another form of audio in public places — obnoxious public advertising. If you've been in a mall or supermarket and heard the repeated wail of an announcement or advertisement you didn't really care about, you'll be interested to know that it's possible they'll be obsolete soon.

Like most audio innovations, the "audio spotlight" has been around for ages — in fact, we read about it in Digit way back when we were readers ourselves.

An audio spotlight prototype by the Kakamura Laboratory at the University of Electro-Communications, Japan

The basic principle is this: instead of transmitting audible sound waves, transmit ultrasound waves that will degenerate in the air in such a way that they turn into regular sound waves by the time they reach your ears. This degeneration can be controlled quite precisely, too.

Ultrasonic waves are directional — they don't get transmitted everywhere, just in the direction the speaker is pointing in. This means that you could sit right in front of your TV and watch your soaps on full blast, while the rest of your family could sit as little as a foot to your right and not hear a thing, leaving them free to think about what a disappointment you've become.

Unscrambled advice

With so many DTH operators vying for your attention, how do you choose?

Recently, in some areas of Mumbai, customers have a choice when it comes to basic utility service providers. Even when it come to their electric supply, which has for long been public sector controlled, consumers can now choose between two providers, and many are exercising that new found freedom. So when it comes to cable TV entertainment, naturally we will tend to be more picky. With several new entrants in the market, the already crowded Direct To Home (DTH) space now has more than enough contenders; namely, Dish TV, TataSky, BigTV, Airtel Digital, Sun Direct and Videocon d2h. The battle is getting fierce, while the consumer is spoilt for choice. Who's complaining?

More choice means more confusion. So many players, so many packages, so many plans – how does one choose? It's so overwhelming some-times, that we wouldn't mind hiring a consultant to spew out a solution suited for our needs. There are various factors one needs to consider when making a choice about DTH providers. First, there is the question of whether a cable set-top box is sufficient for you. Next, when you've decided to go in for DTH, there are various factors one needs to consider like picture quality, transmission during rough weather, how suitable are the package bouquets, pricing, and, of course, value added services.

Since the services are dependent on signal strength, geographical variances have to be considered. If a particular provider has excellent reception in one area it may not necessarily be the same elsewhere.

When it comes to choosing DTH providers, some go strictly by price – the cheapest being the default winner. But most people go by what their friends and relatives have to say. We asked the Digit reader community what they felt about the various players out there. We conducted an online survey where we asked readers to rate their DTH service on each of the parameters mentioned. But before we get to them, let's iron out some of the basics.

The DTH story

DTH can be defined simply as the transmission mode by which satellite TV programming can be received at home. It began in India, a few years ago, with Dish TV who was awarded the country's first DTH licence in 2003 and began operations in 2004. DTH is the primary alternative if you don't want to depend on local cable operators, who, let's face it, have a lot of problems when it comes to service delivery. Tier 2 and 3 towns frequently face Cable TV outages and breakdowns and service is not dependable. Since DTH signals come directly from the broad-cast satellite to the consumer's dish, it can reach remote places. With the widespread implementation of CAS (Conditional Access System) throughout the country, DTH is a good alternative. As of now, there are primarily six main players in this space with Videocon being the youngest entrant. Each player has more popularity in certain zones. For instance, Sun with its bouquet of south Indian channels is strong in the south. As of late 2008, Dish TV had about 59 per cent market share followed by TataSky. But within three months of its launch, Reliance BIG TV gained 15 per cent of the share.

Key parameters

In the current scenario, DTH players are offering a host of services to attract consumer attention. Here are some of the features you should consider before you decide which service provider you would opt for, from the ever growing list.

Framing anyone?
Macroblocking is a glitch where the smooth video flow temporarily dissolves into blocks

DTH losses
Sun Direct suffers huge losses between the August - October period

How old is TV?
The first successful public television broadcast happened in January 1928 in the USA

DTH Comparison

Picture quality

A DTH service is only as good as the picture quality you get. Some players offer MPEG4 picture quality, while others offer DVD quality digital transmission. A newer standard is the MPEG4 with DVB-S2 which stands for Digital Video Broadcasting - Second Generation. This standard was developed at about the same time as the H.264 video codec. The standard has provision for HD quality, but it has to be implemented. It also allows for enhanced interactive services with access to the internet. Only the outgoing data needs to be sent by other transmission methods. Currently, going by information on their web sites, only Airtel and Videocon offer MPEG4 with DVB-S2.

Packages

Each DTH provider has packages with channels bundled together. This seems unfair, since you should be able to pay for only those channels that you want. But it's a small price to pay for digital quality and value added services.

The base pack of almost every provider contains free-to-air channels and a few other channels thrown in. The first level of categorisation in packages happen in two large geographies – South-specific packages and Rest of India packages. Some providers like TataSky schemes are structured in a way that you can add

another add-on package to the base pack to make it more comprehensive. Others have fixed plans according to different prices of the packages. Dish TV, for example, has plans such as Silver, Gold and Platinum. In addition to these, providers allow you to add channels *à la carte* (order on an itemised basis). For instance there may be a movies *à la carte* add-on that will activate few foreign movie channels. Almost each DTH provider has special packs for the southern region that has packs specifically designed to include regional language channels. Another option is the all encompassing package. In such a package, DTH providers will give you all channels available for a lump sum amount. These packs are given grandiose names such as Mega-Pack or Titanium Package. On an average, the monthly charges for such a mega pack comes to about Rs. 350. Depending on the provider they will even throw in a couple of free movies on demand and perhaps access to active services. The mega packs give the most value for money when it comes to a price per channel. However, if you don't want to go in for jumbo schemes, you need to prioritise which channels are most important. The simplest way to do this is to make a list of the channels you want, and go ahead with the service or package that gives you most of them for the least amount. While looking at a pur-

PACKAGE PRICING AT A GLANCE			
	Package	**No of channels**	**Cost per month**
dishtv	Titanium pack	193	332.5
	Child pack	190	165
	Platinum	190	312
	Gold	165	210
	Silver	145	125
	South Platinum	190	312
	South Gold	155	190
	South Silver	145	125
	+ *à la carte* channels that can be added to any pack		
d2h	Gold Pack	125	150
	Diamond Pack	165	275
	+ Add-ons ranging from Rs. 5 to Rs. 60 that can be added to any of the base packs		
Airtel	Super Value	110	127
	New Value	118	160
	Economy	155	221
	Mega	177	304
	Ultra	184	364
	+Top ups from Rs 15 to Rs 75 that can be loaded on to any of the packages		
BIGTV	Value Pack	81	90 + Taxes
	Bronze Pack	111	135 + Taxes
	Silver Pack	123	180 + Taxes
	Gold Pack	138	225 + Taxes
	Diamond Pack	152	270 + Taxes
	Platinum Pack	156	315 + Taxes
	+ Add on packs from Rs 25 to Rs 40		
TATA SKY	Super Hit Pack	63	160
	Super Value Pack	103	200
	Super Value Kids Pack	104	225
	Super Saver Pack	124	275
	+ Add on packs Rs 15 to Rs 112 + three *à la carte* channels		
SUN DIRECT	Shine Pack + 1 free top up	130	120
	North Jumbo Pack	30	300
	+ 41 Add on packs from Rs 6 to Rs 155 + *à la carte* channels		

chase decision, the number of channels offered is not as important as the relevance of those channels and whether you're getting the desired combination in a pack. There are even interesting entry offers by the DTH providers which include the cost of installing and the hardware. In the entry offers, these providers bundle a particular package for free in the initial months. To make sure you're getting your desired channels, it's best to look through listings on the provider's web site and brochures carefully.

User Interface

The user interface is important. You'll be using it to interact with your service. The Electronic Programming Guide (EPG) helps you navigate through all the programs you can watch. Some EPGs allow you to narrow down channels as per genre. BIG TV's guide, for example, allows you to reorder channels alphabetically or as per numbers. Videocon offers the interface in multiple languages and allows you to customise the on-screen display to a certain
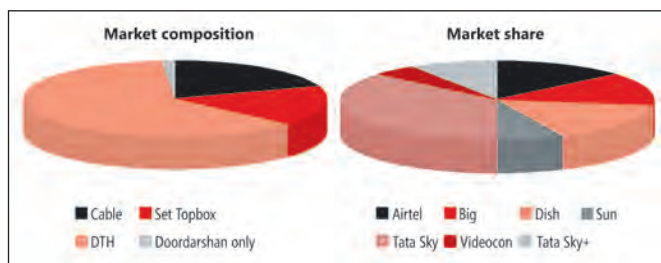
Market share and market composition as per our survey respondents

extent. The more user-friendly the interface the better. The interface should let you access a lot of information in a comprehensive manner.

There are several things that go into this – brief write ups available about upcoming programmes, how far ahead does the guide show updates, does the guide show what is currently playing (preview), and so on.

Movies on Demand

With DTH comes the added advantage of playing movies on demand. There are specific channels where movies play at scheduled start times.

These schedules can be accessed through the service interface or some DTH operators even put it up on their web sites. It's important to note here that the number of channels showing movies on demand is not as important as the kind of movies. Some players source latest content, while others show movies that are not as recent.

Interactive services

Many providers with the exception of Sun Direct offer interactive services. These services let you interact with the TV. For example, while watching a cooking show, there may be a pop up which says press the red button to see other such recipes.

Widgets-based data

Some DTH providers such as Dish source content from online sources like matrimonial or job services. Others like Airtel allow you to set up widgets that give information and news snippets, weather, stock updates, breaking news on the press of a button without moving away from the main screen.

Survey findings

We asked members of the Digit community to rate their DTH service on a scale of 1 to 5 on a few parameters such as Picture Quality, Overall reception quality, Package composition and structuring, Pricing and Value Added services. They were even asked to comment on specifics that appeal to them as users and their thoughts while choosing a particular DTH provider. Big, Dish and Airtel received the highest number of votes for being chosen based on pricing.

We also got an idea of which services are more popular. As expected, TataSky was the most popular and formed the largest part of the respondents.

FEATURE SNAPSHOT						
	TataSky	Dish TV	BIG TV	Airtel Digital	Sun Direct	Videocon d2h
Quality – MPEG4	DVD	DVD	Yes	Yes	Yes	Yes
DVB-S2	No	No	No	Yes	No	Yes
Interactive Services	Actve Topper	Gaming	iStock	iNet	NA	Active Darshan*
	Actve Learning	News Active	iCricket	iLearn		Active Cooking*
	Actve Stories	Bhakti Active	iAstro	iNews		Active Travel*
	Actve Mall	Astro Active	iCooking	iMatinee		Active Health & Fitness*
	Actve English	ICICI Active	iCare	iTravel		
	Actve Wizkids	Sports Active	iGames	iAstro		
	Actve Games	Multilingual Services	iNews	iSports		
	Actve Darshan	Shaadi Active				
	Actve Cooking	Jobs Active				
	Actve Astrology	Travel Active				
	Actve Starnews	Mobile Active				
Packages Model	Base Pack + Add on Pack + Few alacarte	Base Pack + Alacarte	Base package + Add on packs + regional packs	Base Package + Adding next package or Topups	Base pack + Add on + Alacarte	Basepack + Add on
Movies on Demand Channels	7	6	21	6	4	Coming soon
Favourite Channels lists	1 with 20 channel	8 with unlimited	8 with unlimited	4 with 15 channel	No	4 lists with 20 channels each
Naming Favourite list	No	No	Yes	Yes	No	Yes
Top 10 list	No	No	Yes	No	No	No
Parental control	Yes	Yes	Yes	Yes	No	Yes
Parental control with rating	No	No	Yes	Yes	No	Yes
Language for interface	Single	Single	Single	Single	Single	2 Languages out of 9 available
Customisable hud	No	No	No	No	No	Yes
Ticker/Widgets	No	No	No	Yes	No	Yes
All feature listings as per information on service providers website. Acutal differences may occur.						
"Some of these features & services may not be currently available, to be introduced shortly"						

Mission: Transmission
MPEG-4 is a standard to compress still images, audio and video coded files so that it can be streamed on cellphones, broadband as well as digital television

Future of DTH
DTH market is projected to grow by over 30 per cent by 2012 according to reports

DTH Comparison

It received a good rating on picture quality, but scored lowest on pricing and package structure. The highest average rating for picture quality went to BIG TV, followed closely by Airtel. Similarly, both BIG and Airtel received the highest user rating for package pricing. Since Videocon is the newest entrant in this space, it received very few votes to be considered in the comparison of specific parameters.

The survey also revealed some secondary findings as well. About 60 per cent of the respondents who took the survey were on DTH, while 20 percent were on regular cable. Cable set-top boxes were preferred by 17 per cent of the respondents. About 73 per cent of the respondents still own regular CRT TVs, while 15 per cent have HD ready and 11 per cent have full HD LCDs.

promising and are directed at kids. TataSky seems to be the most trusted of the lot. Rahul Choudhary from Haldwani Uttarkhand says, "It has good service and the Tata quality." But since it's the most popular

TATASKY+
Currently it is the only DTH service that offers DVR (Digital Video Recording), which means that you get to record 90 hours of TV content in it's internal hard drive and watch it at your convenience. This is truly the wet dream of any hardcore TV buff. In addition to recording, users get to record one programme while watching another, pause a live telecast and even rewind a TV programme that you are watching. This way those unexpected interruptions don't mean missing out on that crucial part of your favourite soap. All this doesn't come cheap. The hardware itself will set you back by Rs. 8999.

it got a lot of criticism as well. A few complained the interface is slow. Rahul Mathur from Bhopal says, "Tata Sky, even after many software updates, seems to be very slow and hangs couple of times". How-

going places. The DTH provider has armed itself with a lot of innovative interactive services and some exclusive features such as a Univeral remote. Saravana Pradeesh from Tirupur says he "chose Airtel for the universal remote and customer service". On the interactive front, Airtel has some interesting innovations. With their iNet feature, customers can get updates on the latest news, stocks from your portfolio, Bollywood gossip and the latest weather with widgets. "We have partnered with NDTV for our News widget and CNBC for Stocks", said Mr. Sugato Banerji, Chief Marketing Officer – DTH, Bharti Airtel. As for plans, the structure is decent. If say you're a music buff, you could go in for a base pack of 110 channels for Rs. 127 and go in for a music top up for Rs. 25, which has a few channels and World Space radio thrown in.

Dish TV
Dish is the oldest DTH provider around. You can access content from Shaadi.com and search for potential partners through the ShaadiActive service. The content is not live but is updated every week. Similarly you can access content from monster.com and ICICI Bank.

As for packages, they've got three packages that cover an assortment of everything, while *à la carte* channels can be ordered as per preference. Respondent Anil Kumar, says "The packages are good", however he adds, "I've had but poor reception during rainy days".

BIG TV
BIG has been quite big on our user-based score charts. It scores high in picture quality, thanks to MPEG4. It also has good start-up plans, with three months subscription clubbed with the hardware cost. BIG is focussing heavily on pay-per-view movies, but we couldn't find any interesting titles playing. "Big TV has its issues but it does provide me with many options. There are more channels, in more languages (and in the original languages), and the picture quality is definitely better. And it is reasonably priced", says Kirtana Krishnan from Thane.

Sun Direct
Sun has a strong presence in the South. It also has packs for other regions and languages. This way, you can opt for the Marathi pack (depending on your language) if you're from Maharashtra.

Videocon d2h
Videocon combined its electronics and consumer goods background to bundle LCD TVs and DVD players with in built DTH receivers. They've even come up with DVD players that have in built DTH. It also has some interesting features on the interface. For example, a 12 picture in picture mosaic to browse channels rather than using the EPG. It also has tickers for stock, cricket and news updates that form an overlay over the programming being viewed. Their packages are decent but as per the web site information even their Diamond pack which is their highest end offering needs an English movie add on priced at Rs. 25 to make it complete. Like Sun Direct, Videocon d2h also has packs for every region. 🅳

USER SCORES
- Picture quality
- Overall reception quality
- Packages
- Pricing
- Value added services

(Airtel Digital, Big TV, Dish TV, Sun Direct, TataSky)
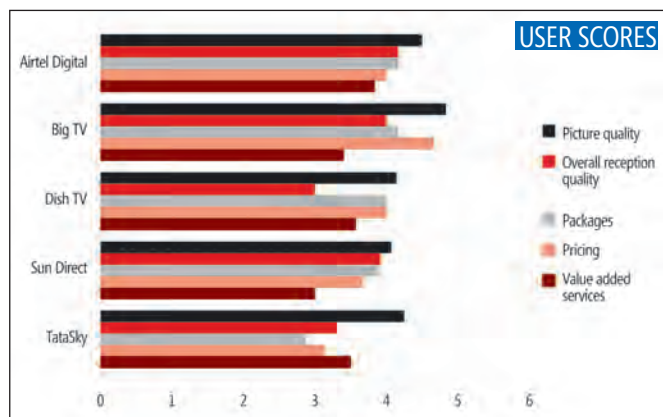
TataSky
TataSky has been around for quite some time. Among other things, TataSky provides customers with 24x7 support in 11 languages. Their channel packages seem to be a tad on the more expensive side. However, they have the maximum number of interactive services – many of which very

ever on the positive side, we got comments like this one too. "Their customer service is good" Narendra from Meerut says "its customer support is also very responsive and supportive".

Airtel Digital
With its Saif and Kareena campaigns, Airtel seems to be

B-50

Nothing is still quite as impressive as reading off paper...

Rossi Fernandes and
Nimish Sawant
readersletter@thinkdigit.com

There's nothing quite like reading a letter on paper instead of on a bright screen. Even if you feel that's not the case, you'll always have so many things that you have to print – airline tickets, forms, letters, documentation, directions to a theatre, an invite for a concert...

It's a luxury that most people don't really need, but still want nonetheless. However, home users aren't the only ones who need to print. Every single office place needs a fast printer, something that 10 users or even 100 can print from. What's most important is that the printer

should be dependable and hassle-free. So, which is the best printer for you? For homes, for workplaces?

We received some 14 printers in all. Instructions were clear – everyday printers only! We'll have MFDs and photo printers for you in other months, because we feel that they are different enough to attract buyers for different reasons.

Entry-level inkjet printers for home

While testing printers in this category we were basically looking at affordable inkjet colour printers which could give out decent photo quality prints. This category is aimed at home users, who mostly print documents and web pages,

and the occassional photo. As we were looking at entry level printers, the ones that matched our requirements were the two Canon printers – the PIXMA iP1980 and PIXMA iP3680.

Canon PIXMA iP1980

For home users, who are looking for an affordable photo printer, the Canon PIXMA iP1980 comes as a boon. It's a very basic inkjet printer which is similar to the iP3680 in some ways.

The build quality is not that sturdy, as the plastic appears quite weak and has a tendency to bend in certain areas. The hinges are not steady either. The absence of a paper-out tray means you're going to have to play catch with printouts if this printer is at the edge of a table.

Setting up the printer is pretty easy though – with just two cartridges to be installed after powering it on. The software installation is also simple and quick, and the user interface is easy to navigate. There are settings to select paper options and also ink levels of the cartridges are shown.

There's a "quiet mode" option that allows you to print as quietly as possible, but at the cost of speed – useful if you're printing at night. The fast printing mode compromises a little too much on quality for us.

Canon PIXMA iP3680

This printer is targeted at photography enthusiasts. It looks good with its shiny glossy finish, and features an input and a rear tray to make managing paper easier.

3D printing
Pad Printing is a process of printing images on 3D objects using a flexible rubber silicon pad to pick up the image from an inked plate and transfer it to the object

Vitraglyphic process
A team of engineers working at University of Washington have developed a technique to create a glass object using a normal 3D printer

Printer test

BEST BUY
digit
JANUARY 2010

Canon PIXMA iP3680

Setting up this printer is easy, but installing the ink tanks is pretty painful for first time users. Since the printer has five ink tanks, they are first installed on to a printer head, that, in turn, is placed in a specific groove. You then need to watch for a red light to indicate successful installation.

A good feature is the Pict-Bridge port that will let you print photographs directly from camera memory cards. This is good for home use.

The printer is quieter than the PIXMA iP1980. It doesn't have the option of duplex printing, but instead prompts you to manually move the pages to the rear tray.

Performance

Under the magnifying glass, the Canon PIXMA iP1980 and iP3680 models had comparable quality. The iP3680 had better pronounced edges in the text print outs, as the iP1980 had some residue around the edges of the text in all text sizes. There was also fine blotting of ink seen. Printing times were also almost identical. In economy/speed modes, there's no difference in quality.

In the fast mixed prints, the iP3680 had visibly saturated colours. Speeds were pretty identical, again. There was a fine yellow noise all over the yellow text in black background areas. Greys are noticeably lighter. The lines of text are heavily broken at smaller fonts.

The iP3680 has a little more detail in its photo prints. As for colours, the iP1980 showed more neutrality, but was still not able to produce complete accuracy. The iP3680, on the other hand was a little heavy on reds. In the highest photo quality setting, the iP3680 wins.

Mono laser printers – under Rs. 10,000

The printers here are targeted at small to medium size offices that have a lot of text to print. Since cost is an important factor, we split mono lasers into two categories – under Rs. 10,000 and over Rs. 10,000.

Canon Laser Shot LBP2900B

Canon's LBP2900B is a fast monochrome laser printer which can be used in homes as well as offices. It's quite attractive and very compact. To setup, all you have to do is slide the laser cartridge into position.

The software user interface for the LBP series is different from the PIXMA series, however navigation through the basic options is just as easy.

The paper feed tray located at the base is very strong, but the output tray, though attractive, is quite weak. It might not be able to hold too many printer pages.

There's no duplex printing facility, which could have added a feather to its cap. On the whole, the LBP2900B is ideal for users who mainly print text documents, and is quite fast at spewing out a print or two. However, it suffers when you print, say, 15 pages. It took a whole minute and twenty two seconds to do the 15 page print test.

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Canon Laser Shot LBP3300B

HOW WE TESTED

The printers were all tested on a very basic Intel Pentium 4 system with 2 GB of RAM. All the printers were allowed to calibrate themselves via software, and a few test prints were taken before the actual testing began. Good bond quality A4 paper was used throughout the test.

Print quality was obviously one of the most important components of the test. Each of the prints were rated accordingly and compared to other printers of its category. Time was also recorded for every print taken. There were different prints taken. Since this isn't a photo printer test, we only had a basic photo print test while the major chunk of the test was for text and documents with images in them. Neutral and natural colours was the key component along with accurate crisp prints. We also looked for flaws such as banding instead of smooth gradients, grain and uneven edges in text at different settings. Mixing of colours and uneven edges to text because of spreading ink was also looked at.

Features were also noted and weight given for each of them depending on their important and the category of product. For example, a printer for SoHo or medium sized businesses should have network access, a cheap home printer need not. We looked at how easy it was to replace the cartridges, toners and also how to restock the paper trays. Build quality of the printers and the multiple tray assembly was equally important. Of course, there were other things like noise, the printer software user interface, easy of setting up the printer on the network and many other finer aspects that were thoroughly explored and scored.

Not all printers require the same level of performance and quality. Each type of printer is made with a completely different purpose in mind. Different tests were given different weights for every category of printer. In the end, all of it taken into consideration and a final verdict given.

Printer languages
Adobe's Postscript and HP's Printer Command Language which depict a page to be printed in vector form

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INKJET PRINTERS FOR HOMES		
BRAND	**Canon**	**Canon**
Model	PIXMA iP1980	PIXMA iP3680
Price	Rs. 2,695	Rs. 5,595
Grand total (out of 100)	50.60	53.55
Features (out of 40)	11.12	13.84
Performance (out of 60)	39.48	39.71
FEATURES		
Maximum print resolution (dpi)	4800 x 1200	9600 x 2400
Power saving mode (Y/N)	N	N
Duplex printing (Y/N)	N	N
Ink saving mode (Y/N)	N	N
Zoom / fit to page (Y/N)	N	N
Colour correction on printer (Y/N)	N	N
Size of display on printer	NA	NA
Number of cartridges used	2	5
Cartridge colours	Black and Colour	CMYK and Black
CONNECTIVITY		
PictBridge support (Y/N)	N	Y
USB flash drive support (Y/N)	N	N
Network printing support (Y/N)	N	N
Wi-Fi support (Y/N)	N	N
Bluetooth printing (Y/N)	N	N
Memory card support (Y/N)	N	N
Miscellaneous		
Bundled cables	Power cable, USB cable	Power cable, USB cable
Software supplied	Easy PhotoPrint EX, My Printer	Easy PhotoPrint EX, My Printer
Dimensions (W x D x H) (mm)	442 x 237 x 152	431 x 296 x 153
Weight (kg)	3.3	5.6
PERFORMANCE		
Text print (eco)	4.50	4.50
Text print (time in seconds)	10.00	9.00
Text print (quality)	6.00	6.25
Text print (time in seconds)	10.40	10.00
Mixed document print (quality)	6.13	6.38
Mixed document print (quality) (time in seconds)	34.80	26.00
Mixed document print (speed/eco)	5.25	5.25
Mixed document print (speed/eco) (time in seconds)	20.50	21.00
Mixed document print (speed/eco) 15 copies (time)	268.00	290.00
Photo (eco)	7.25	7.13
Photo (eco) (time in seconds)	94.00	122.00
Photo (quality)	7.38	7.38
Photo (quality) (Time in seconds)	181.00	168.00
Build quality (out of 10)		
Body	5	7
Folding / hinges	4.5	6
Tray quality	5.5	6
Buttons	6	7
Ease of use (out of 10)		
Hardware connections	7	7
Cartridge installation	7	5
Paper loading	7	6
Software user interface	6	6
Ink levels	7	7

Canon Laser Shot LBP3300
This printer has a plastic matte finish body, with good build quality. It has four indicators on top, and no moving flaps, which gives it a sturdier build.

A quick driver installation, and the printer is ready for installation, which is painless – detach the front, put in the cartridge and you're good to go. It also takes this printer very little time to warm up.

The input paper tray has a capacity of 250 sheets and is at the base of the printer. An interesting feature here is a notch that indicates the level of paper in the input tray. There's no output tray, and a small secondary tray is located above the main base tray, but it's flimsy.

This printer supports duplex printing, and output is quick. It doesn't take long to warm up, and is ideal for home and office use. It's also great for printing books, because it's one of the faster printers around.

Brother HL 2140
Brother's a brand known for its multifunctional devices. The HL2140 was one of the four printers they sent across. An entry level monochrome laser printer, the HL 2140 is very plain looking printer . The all-plastic body is strong and it has rounded edges on all sides. There is one input tray located at the base, and a face down output tray with a small manual feed paper guide. There are status lights for Toner, Drum and Error and a power button on the side.

We encountered problems like paper jamming when we used glossy paper for a photo printout. The printer tends to take in two papers simultaneously, thus getting jammed in the process. For this printer, the photograph test was carried out on normal paper. The printer is fast, taking as little as 11 seconds for a normal text printout.

Brother HL 2150N
On first glance, the HL2150N looks exactly like HL2140, but on close observation one notices a major addition. While the HL 2140 has no network connectivity, the HL 2150N does.

The body structure is very similar to the HL 2140. The tray is quite strong even though its not as smooth as we would like.

Like the HL 2140, this printer also performs poorly with glossy paper. Not that it's meant to print photographs, but paper jams are inexcusable.

However, printing on plain paper is a smooth process. This is ideal for home networks or for use in small office setups with bulk document printing.

Extreme photo printing
The Epson Stylus Pro 9880 comes with as many as 8
colour ink tanks to produce high quality photo prints

Printer spying?
Invisible tracking codes are printed across every
print out coming out of a color laser printer

Printer test

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Brother HL2170W

Performance
One thing that was very clear with mono laser printers – they had excellent text quality. With the exception of the Canon IP2900B, all of them gave excellent text prints.

Taking photo prints isn't a great idea but we tried it anyway with the mono laser printers. The first thing you notice are the horizontal lines across the images. The Canon LBP3300 was far better in this aspect with almost no lines – slightly brighter images.

Mono laser printers – above Rs. 10,000
Brother HL 2170W
The HL2170W is a monochrome laser printer which comes with the 802.11b/g wireless functionality along with network connectivity. This means that not only can the printer be connected to a wired network but can also take a print command from a system that is wirelessly connected to the network. This option is the USP of this printer.

The build is very similar to HL 2140 and HL 2150N which features a strong tray at the base.

It has 32MB of internal memory which allows you to queue more documents than the previous ones from Brother.

Setting up the wired port connection is easy but the wireless setup is quite tedious, especially if you have multiple WiFi routers in the area. Moreover, the resetting can be annoying for some. The efficiency of the USB interface and wired network connection is almost the same.

Brother HL-5240
The HL-5240 has a really basic and somewhat boring design. It's built well, and the paper tray doesn't feel as smooth as some of the more expensive printers out there. There are two side fans on this device, to aid cooling.

Although we didn't expect a lot when we first saw it, the HL-5240 impressed us with its blazing speed – there was noticeable folding of paper though. Things get noisy, but only for a while. There aren't too many controls to bother with either, but there are status lights for toner, drum and paper levels. There's even a parallel port connection for those using really old PCs.

Ricoh SP3300DN
This is the first printer that we have tested that has a facility to join an extra paper tray to the base input tray. his uniqueness is offset by an oddity — it does not have a USB cable bundled.

The body is quite strong and it has just one button and two light indicators. The SP3300DN comes with 32MB of onboard memory, which is extendable to 160 MB.

The SP330 is ideal for organisations that have a large document printing load. The printer also has a LAN port for network connectivity, which makes it more versatile.

Ricoh Aficio SP 4100NL
Ricoh's SP4100NL is a high-end monochrome laser printer which is super fast as far as performance goes. It has a strong body with an equally sturdy input tray at the base.

The printer has a small monochrome LCD display screen on top along with buttons for the various menus. The screen is very small and does not do justice to the features it offers.The only thing that works in favour of the screen is its bright backlight.

This printer has has an onboard energy saving mode which puts it in a sort of hibernation mode when not in use. This is an important feature for large offices as laser printers are known to be heavy power users.

The small LCD screen makes matters worse when any errors shows up on the menu. Absence of a user manual or a trouble-shooting guide is sorely felt, and no USB cable bundled just adds to your woes. Printing on glossy paper resulted in paper jams.

The printer is ideally suited for large offices and meant for bulk text printing. Our tests found that graphics and image output isn't great.

Performance
With the more expensive mono laser printers, quality didn't necessarily improve drastically. The

CONTACT DETAILS				
Brand	**Contact**	**Phone**	**E-mail**	**Web site**
Canon	Canon India Pvt. Ltd.	188-345-33-66	info@canon.co.in	www.canon.co.in
Brother	Brother International (India) Pvt. Ltd.	+91-22-4098 8922	info@brother.in	www.brother.in
Epson	Epson India Pvt Ltd.	+91-80-3051 5023	NA	www.epson.co.in
Ricoh	Mr. Kiran Pai	+91-11-4161 3010	ril.info@ricoh.co.in	www.ricoh.co.in

Laser Printer emissions

According to a study by the Queensland University of Technology, laser printers can emit clouds of ultra-fine particles that compare to cigarette smoke and motor vehicle emissions

same banding was present even with these range of printers. The Ricoh SP4100NL for example had a lot of this. This printer is also a perfect example of something else – ridiculously fast printing speeds.

We were impressed to see it print in 5.8 seconds. A 15-copy print order took just 38 seconds! This is the fastest of all the printers in this test. The cheaper SP3300DN model and Brother's HL5240 aren't too far behind either. If you want speed, then you're only going to find it in the monochrome laser category over Rs. 10,000. Quality of prints is almost identical – to the naked eye, that is.

Color laser printers

As this category usually caters to office users who print bulk documents with both text and images, it's priced higher. There are savings to be had in the long run though.

Canon Laser Shot LBP7200Cdn

At 24 kgs, this is the heaviest printer we tested this month. It has a matte finish body, and sports indicators that prompt you to load paper or check for paper jamming. There

are lights to indicate status of the CMYK cartridges. All four cartridges are placed in a single compartment, with instructions on how to install the cartridges clearly visible.

Installing drivers is not a straightforward affair. We selected USB, and then had to switch off the power, reconnect the USB cable and then power the printer back on before the PC recognised the printer and started installing drivers.

The printer takes a long time to warm up for individual prints, but is a lot faster with bulk prints.

The duplex printing option is impressive, and outputs are quick. This is because printer pulls the next page in while the second side of the first one is still printing.

Canon Laser Shot LBP7750Cdn

The LBP7750Cdn is a really huge printer and one that's designed for large offices.

The body design is great and use of metal in many areas of the printer makes it sturdy. The hinges aren't extremely sturdy, though, and are slightly loose. It's heavy, and requires two people to carry it around.

Canon Laser Shot LBP7750Cdn

INKJET PRINTERS FOR OFFICES		
BRAND	**Canon**	**Epson**
Model	PIXMA iX5000	B-500DN
Price	Rs. 18,995	Rs. 22,999
Grand total (out of 100)	48.88	72.66
Features (out of 30)	9.62	15.48
Performance (out of 70)	39.26	57.18
FEATURES		
Maximum print resolution (dpi)	9600 x 600	9600 x 600
Power saving mode (Y/N)	N	N
Duplex printing (Y/N)	Y	Y
Ink saving mode (Y/N)	N	N
Zoom / fit to page (Y/N)	Y	Y
Colour correction on printer (Y/N)	Y	N
Size of display on printer	NA	NA
Number of cartridges used	4	4
Cartridge colours	CMYK	CMYK
Print memory	256MB	16MB
Connectivity		
PictBridge support (Y/N)	N	N
USB flash drive support (Y/N)	N	Y
Network printing support (Y/N)	Y	Y
Wi-Fi support (Y/N)	N	N
Bluetooth printing (Y/N)	N	N
Memory card support (Y/N)	N	N
Miscellaneous		
Bundled cables	Power cable, USB	Power cable, USB
Dimensions (W x D x H) (mm)	601 x 317.6 x 193.2	480 x 489 x 312
Weight (kg)	9.3	10.7
PERFORMANCE		
Text print (quality)	6.50	6.00
Text print (time in seconds)	9.40	9.50
Mixed document print (high quality)	6.6	6.1
Mixed document print (quality) (in seconds)	26.30	13.30
Mixed document print (speed) 15 copies (time)	272.00	81.00
Photo (quality) (time in seconds)	128.00	33.80
Build quality (out of 10)		
Body	7	7.5
Folding / hinges	6	6.5
Tray quality	7	6
Buttons	6.5	7
Ease of use (out of 10)		
Hardware connections	7	7
Cartridge installation	5.5	6.5
Paper loading	6	7
Software user interface	6	6.5
Ink levels	7	6

Mag+
Bonnier's Mag+ digital magazine reader is the latest concept taking off from the ebook readers.

Printer test

COLOUR LASER PRINTERS		
BRAND	**Canon**	**Canon**
Model	Laser Shot LBP7750Cdn	Laser Shot LBP7200Cdn
Price	Rs. 99,995	Rs. 47,995
Grand total (out of 100)	76.03	58.02
Features (out of 30)	13.50	12.44
Performance (out of 70)	62.53	45.58
FEATURES		
Maximum print resolution (dpi)	1200 x 1200	1200 x 600
Power saving mode (Y/N)	N	Y
Duplex printing (Y/N)	N	N
Ink saving mode (Y/N)	N	N
Zoom / fit to page (Y/N)	N	N
Colour correction on printer (Y/N)	N	N
Size of display on printer	NA	2 line 16 character
Number of cartridges used	1	1
Cartridge colours	Black	Black
Print memory	32MB	192MB
Connectivity		
PictBridge support (Y/N)	N	N
USB flash drive support (Y/N)	N	N
Network printing support (Y/N)	Y	Y
Wi-Fi support (Y/N)	N	N
Bluetooth printing (Y/N)	N	N
Memory card support (Y/N)	N	N
Miscellaneous		
Bundled cables	Power cable, USB cable	Power cable, USB cable
Software supplied	Easy PhotoPrint EX, My Printer	Easy PhotoPrint EX, My Printer
Dimensions (W x D x H)(mm)	517 x 530 x 374	409 x 490 x 331
Weight (kg)	35	24.8
PERFORMANCE		
Text print (quality)	7.00	7.00
Text print (time in seconds)	14.00	22.30
Mixed document print (high quality)	6.5	6.63
Mixed document print (quality) (time in seconds)	17.00	22.80
Mixed document print (speed/eco) 15 copies (time)	44.00	63.00
Photo (quality)	6.88	7.13
Photo (quality) (time in seconds)	17.00	56.00
Build quality (out of 10)		
Body	8	7.5
Folding / hinges	6.5	6.5
Tray quality	7	7
Buttons	6.5	6.5
Ease of use (out of 10)		
Hardware connections	7	7
Cartridge installation	6.5	6
Paper loading	7	6.5
Software user interface	6.5	6.5
Ink levels	7	6

The printer has two paper trays – one at the front and one on the side like you would normally see in a copier. It also has something least expected in printers – a hard drive. It performs exceptionally well, and offers excellent control over the many features, thanks to the display and buttons.

This is obviously a no-frills printing machine for a busy office. It doesn't support A3 paper, however, which some of you might need.

This colour laser printer uses four separate, and huge, toner cartridges – you won't have to change them often.

A few things are unique here; the LBP7750Cdn's power switch, which is usually placed at the back of a printer, is found behind a protective cover on the top, and paper loads sideways!

One expects speed over everything else in a printer of this class, and it doesn't disappoint. Double-sided printing speeds are excellent, and the synchronised paper flow around the printer is truly a joy to watch.

Canon PIXMA iX5000
Canon iX5000 is the only A3 size printer that was tested and

is ideal for small office setups. The printer is built well, but looks very ordinary. The front and rear tray are well put together, with enough extensions to support A3 paper.

Setting up the ink tanks in the printer head is similar to the Canon iP3680, but with four ink tanks in this case.

This is a fast printer, and even A3 colour prints on plain paper take under a minute to complete. It's also quick to cancel a print, stopping immediately when you press the Cancel button.

However, when printing 15 copies, we noticed that, like some of the other Canon's, this printer

Epson B-500DN

pauses for a bit, unexplicably, after 10 or 11 pages are printed.

Epson B-500DN
This is an attractive inkjet printer from Epson, and has an unconventional design.

All the elements of the printer are compartmentalised, and stick out – literally. There is a separate section for the front tray, the cartridges and the rear tray, all of which jut outwards.

There is a 2 line LCD display, which is quite ordinary, as it has no backlight. However, operating the menus is easy and intuitive.

Torrents hit

Mininova traffic has dropped by a whopping 66 per cent after it went legal and took off all the illegal torrents from the site.

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MONO LASER PRINTERS								
	Under Rs. 10,000				**Above Rs. 10,000**			
Brand	Brother	Canon	Brother	Canon	Brother	Brother	Ricoh	Ricoh
Model	HL 2140	Laser Shot LBP2900B	HL 2150N	Laser Shot LBP3300B	HL 2170W	HL 5240	SP 3300DN	SP 4100NL
Price	Rs. 5,990	Rs. 6,595	Rs. 9,990	Rs. 9,995	Rs. 12,990	Rs. 15,490	Rs. 21,500	Rs. 29,600
Grand total (out of 100)	30.04	27.47	33.79	35.46	35.80	34.54	37.01	47.39
Features (out of 20 / 25)	4.36	4.59	6.48	8.37	8.08	4.70	6.53	8.91
Performance (out of 80 / 75)	25.68	22.88	27.31	27.09	27.72	29.84	30.48	38.48
FEATURES								
Maximum print resolution (dpi)	4800 x 1200	9600 x 2400	1200 x 600	600 x 600	1200 x 600	2400 x 600	1200 x 600	1200 x 1200
Power saving mode (Y/N)	N	N	N	N	N	N	N	N
Duplex printing (Y/N)	N	N	N	N	N	Y	N	N
Ink saving mode (Y/N)	N	N	N	N	N	N	N	N
Zoom / fit to page (Y/N)	N	N	N	N	N	N	N	N
Colour correction on printer (Y/N)	N	N	N	NA	N	N	N	N
Size of display on printer	NA	NA	NA	NA	NA	NA	NA	NA
Number of cartridges used	2	5	1	1	1	1	1	1
Cartridge colours	Black and Colour	CMYK and Black	Black	Black	Black	Black	Black	Black
Print memory	NA	NA	8MB	2MB	16MB	8MB	32MB	16MB
Connectivity								
PictBridge support (Y/N)	N	Y	N	N	N	N	N	N
USB flash drive support (Y/N)	N	N	N	N	N	N	N	N
Network printing support (Y/N)	N	N	N	N	Y	Y	Y	N
Wi-Fi support (Y/N)	N	N	N	N	N	N	Y	N
Bluetooth printing (Y/N)	N	N	N	N	N	N	N	N
Memory card support (Y/N)	N	N	N	N	N	N	N	N
Miscellaneous								
Bundled cables	Power cable, USB cable	Power cable, USB cable	Power cable, USB cable	Power cable, USB cable	Power cable, USB cable	Power cable, USB cable	Power cable	Power cable
Dimensions (W x D x H) (mm)	368.3 x 360.6 x 170.1	369.8 x 216.7 x 250.5	368 x 361 x 170.5	369.7 x 375.7 x 257.7	368 x 361 x 170.5	371 x 384 x 246	363 x 368 x 209	388 x 450 x 345
Weight (Kg)	5.8	6.4	6.8	11.8	6.8	9.4	8.8	17.5
PERFORMANCE								
Text print (quality)	7.00	6.50	7.00	7.00	7.00	7.00	7.00	7.00
Text print (time)	11.00	12.00	11.00	10.00	11.00	10.00	9.00	5.80
Mixed document print (quality)	5.25	5.6	5.5	4.6	6.2	6.2	6.0	6.0
Mixed document print (quality) (time)	15.00	14.00	14.00	13.40	14.00	13.00	13.00	8.60
Mixed document print (speed/eco) 15 copies (time)	57.00	82.00	51.00	55.00	51.00	45.00	44.00	38.00
Photo (quality)	4.6	5.0	4.3	5.2	5.8	5.7	6.1	600
Photo (quality) (time in seconds)	21.00	26.00	12.00	11.40	13.00	11.00	13.00	7.00
Build quality								
Body	6	7.5	6	7.5	6	7	7	7
Folding / hinges	5.5	6	6.5	6.5	6.5	6	6.5	6.5
Tray quality	6	6	6	7	6	6	6.5	7
Buttons	5	6.5	5	6	5	6.5	5	6
Ease of use								
Hardware connections	7	7	7	7	7	7	5.5	5.5
Cartridge installation	6.5	6	6.5	6	6.5	6.5	6.5	6.5
Paper loading	7	6	7	6.5	7	7	7	6
Software user interface	7	6	7	6.5	7	7	6.5	6

Canon PIXMA iX5000

It features network connectivity, which adds to its versatility.

The B-500DN is quite noisy, but quick, and is great for photo printing on glossy paper. Printing quality of documents with lots of text and graphics is also excellent, but colours could have been better.

Check out all the printer photos at www.thinkdigit.com/d/1001printers

Performance
It was a one-on-one in the case of the Epson B-500DN and the Canon PIXMA iX5000. The Canon had really impressive colours and quality, but was slower. In most office scenarios, where quality isn't as important as speed, the Epson would steamroll the Canon.

The Canon's prints were a little over-saturated, but not as much as the Epson. Blues were too prominent in photos, but a little colour adjustment could fix this.

The laser printers from Canon didn't stand much of a chance against their mighty inkjet comrade – the iX5000 when colour saturation and photo quality was compared. If you are in some kind of a studio and need excellent photo quality, inkjets such as the iX5000 are the best solution.

If you're looking for speed and cheap prints, lasers like the Canon Laser Shot LBP7750Cdn and LBP7200Cdn are your best options – they aren't cheap though. There is a big difference in both perform-

ance and features. The LBP7750 throws out a photo print every 17 seconds. To give you some idea of how fast this is, the iX5000 takes more than two minutes!

Conclusion
Starting with the most impressive performer of the entire test, the Canon Laser Shot LBP7750Cdn. It happens to be the most expensive one of the lot, and also has the best features. For a colour printer, it's really fast and the photo test was exceptionally quick – 17 seconds for a A4 sized photo print. Sure, the quality of the photo print is not as good as the iX5000, but it's equally matched everywhere else.

The Epson was the next best, mainly because of its feature set. For a colour inkjet, it's really fast as well. We weren't very impressed by the slightly darker colours in the photo prints but the detail was good. It makes good sense when you consider the price tag – Rs. 22,999. It gets our Best Buy award.

Of all the mono laser printers, we recommend the Canon Laser Shot LBP3300B. At just under Rs. 10,000, it's perfect for most small businesses with some 10 to 15

Canon PIXMA iP1980

employees. It might be the most expensive of the Under Rs. 10,000 segment, but it's a worthy winner.

If you're like most of us and just want a simple printer for simple everyday use, the Canon iP1980 is the most sensible choice. Even though it isn't as good as the iP3680, it's a lot cheaper at Rs. 2,695.

Photography: Jiten Gandhi

Larger hard drives, faster, cheaper solid-state drives — there's a lot of hope for storage junkies. We've tested some of the best solutions around.

Silicon and Steel

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L et's face it — storage is a boring product category for most. And you'll notice the judicious use of the term "storage". We've gone used to the term hard drives, but with the coming of solid-state drives, (SSDs hereon), we've had to adjust. SSDs are faster than traditional magnetic storage and also run cooler. All this love for flash seems to leave good old hard drives

Solid state drives

SSDs initially created a lot of hype, but this has simmered down as people realised that prices are prohibitive. Although SSDs have become cheaper (as has all flash-based storage) they are no replacement for hard drives at the moment. There is the longevity of flash to be considered, for while flash memory itself is longer lasting than traditional magnetic recording, there is a finite number of write operations that can be done to flash memory, or a block of flash memory to be more specific. Exceed this number of writes and the flash becomes unreliable, as does the integrity of the data. Therefore, people who consider SSDs for use as a primary OS drive need to also consider the cons of maintaining a swap file on the drive for obvious reasons. This, coupled with the prices has been a killjoy and continues to be. We were surprised to see Kingston actually offering a 64 GB SSD for Rs. 8,999 — which in our opinion, is pretty good. People demanding terabytes of storage will obviously scoff at the notion of a paltry 64 GB, but for discerning users who want the goodness of flash we feel this is a decent option.

High performance flash is costlier than regular flash memory; although most SSDs will have higher read speeds than HDDs. But the write speeds are often at par, or even slightly below par HDDs, but high performance flash is typically 60 - 70 per cent faster. This makes them ideal for use as OS drives, or a place to install all software. We received four SSDs, three from Kingston and one from Intel. All of these used the same 2.5-inch form factor, although the Kingston SNM125-S2/80GB featured a USB casing. We find

the thought of using an SSD as an external drive quite funny. After all, why take something capable of 150 megabytes per second in terms of read speeds and choke it on a tortoise-like USB bus? Even writes would be bottlenecked, and external solutions are primarily meant for storage, not speed. This drive was obviously made by Intel and rebadged by Kingston; understandable since Intel is a big SSD OEM.

Kingston's SNV225-S2/64GB is pretty impressive, and not just the relatively affordable price tag. We found it to have equally good performance, something rarely seen in any product. It offers pretty good write scores, and it competed fiercely with Intel's SSDSA2SH080G1GN, which was slightly larger, offering 80 GB. Intel's drive was the better performer overall, though the individual results tend to seesaw. The last SSD was Kingston's SNV125-S2/128GB, which was the largest capacity drive in this category, but also lagged behind the others in terms of performance. Priced at Rs. 15,555, this 128 GB SSD doesn't exactly offer much, given the performance. It's a perfect example of a higher density, lower-speed SSD.

When it came selecting the fastest drive, Intel's

80 GB SSD edged out the Kingston SNV225-S2/64GB, albeit by a hairsbreadth. Intel wins our *Best Performer* award for its overall sterling performance. When it comes to

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in the cold no? Not quite, for while SSDs were getter cheaper and somewhat faster, hard drives were focussed on getting larger, currently to the tune of 2 TB.

We wanted only larger drives and would not accept anything smaller than 500 GB. Why? Well, a Seagate 500 GB hard drive costs around Rs. 2,600, while a 1 TB version is priced at Rs. 4,200, this is a virtual no-brainer in terms cost per gigabyte of storage space, the bigger HDD wins.

The market is also getting segmented For example,

Western Digital has a clear demarcation for their drives — Black Editions represent the best performance, Blue Editions represent a mix of performance and price while Green Editions represent power saving.

SSDs represent a breath of fresh air to a category that was becoming predictable, if not boring. They promise to lose their gilded status by becoming more affordable. We already know they have the potential of being really fast, but they're not five times faster, in case you were wondering.

More NAND

Toshiba Corp. this week announced the launch of a 64GB embedded NAND flash memory module, the highest capacity yet achieved in the industry

Seagate Pulsar

Seagate announces their first enterprise grade SSD storage, based on SLC storage, the drives are available as OEM drives and are not available in retail at the present

BEST PERFORMER
digit
JANUARY 2010

value, it's hard to fault the second fastest drive — the SNV225-S2/64GB — it comes within 5 per cent of the Intel offering, but importantly does so at nearly half the price. We're awarding it our Digit *Best Buy*.

Hard Disk Drives

The good news for all hard drive owners — SSD is still a fair bit away from making serious inroads into HDD sales and there are perks of buying into a reliable, proven technology that has gone through numerous refinements and optimisations. What you do get is a product offering unmatchable cost per gigabyte, which is the most effective way of rating a hard drive. After all, 90 per cent of users will not be concerned with a 10 or even 30 per cent difference in performance if they have to spend 40 per cent more to reap it. WD and Seagate have different ways of classifying products, WDs method is easier to understand. In fact, we're told Seagate is in the process of making such verticals within their hard drives to clearly demarcate performance drives from value and power saving ones.

Large 2 TB hard drives have become available though the cost per GB value remains higher than any

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Stay tuned next month as we test the external counterparts of these internal storage solutions

1 TB drive. This is due to the higher areal density of the drive, where each platter is packed with more data. At the moment we're seeing platters with up to 500 GB of data.

Comparatively, platters last year had reached 333 GB. There does seem to be a stagnation of sorts happening and we're not going to see 6 and 8 TB hard drives very soon, but to be perfectly honest, there's hardly a market in India until broadband penetrates to smaller areas and what is available in metros becomes faster. Exceptions exist, and data gluts do demand more, but 2 TB is all you're going to get this year, and you pay pretty penny for owing one at the moment.

Western Digital has outdone itself when creating the 2 TB Black Edition — this drive was actually faster than a single Velociraptor, no mean task especially considering the 10,000 rpm spindle speed of the latter. In fact, in terms of speed and storage, this drive is pretty much unbeatable, if only it were priced more competitively — most

BEST PERFORMER
digit
JANUARY 2010

users will flinch at the prospect of shelling out Rs. 18,000. Admittedly, street prices will be much lower than the mentioned MRP, but the Black Editions aren't really cheap. The WD 1 TB Black Edition seemed to have some physical fault, though we could detect no noise (which is common for damaged hard drives). The low scores meant something was really wrong, especially when the 2 TB version was blazingly fast. Unfortunately, WD couldn't rush us a replacement in time, so we tested the one piece we had. Seagate's Barracuda XT seemed interesting, until we set it up. Sadly, this drive did not do anything with the SATA 3 interface and shockingly the scores in SATA 2.0 mode were actually faster. This doesn't make sense, except that for SATA 3 mode, we were forced to use a non-Intel controller as Intel's ICH 10R does not support SATA 3.0. However, this comes as no big surprise, since given our experience, neither are SATA 2.0 HDDs really faster than their SATA 1.0 equivalents, except in benchmarks involving measuring bandwidth in burst mode. In fact with the best drives barely touching 130 MBps for read scores, which is still below the 150 MBps offered by SATA 1.0, and miles away from the 300 MBps that SATA 2.0 is supposed to deliver hard drives, in general are lagging far behind the interfaces theoretical limits. Similarly we feel it's SSDs, not HDDs that will be able to exploit SATA 3.0 when it becomes mainstream. Basing

SSD Real World Scores (Read and Write)

Legend:
- Sequential Writes
- Random Writes
- Sequential Reads
- Random Reads

	Sequential Writes	Random Writes	Sequential Reads	Random Reads
Kingston 64 GB V+	142.72	73.01	195.51	165.49
Intel 80 GB	72.37	68.15	217.29	180.04
Kingston 128 GB V	82.08	46.52	98.34	100.64
Kingston 80 GB M	68.44	53.82	199.32	156.34
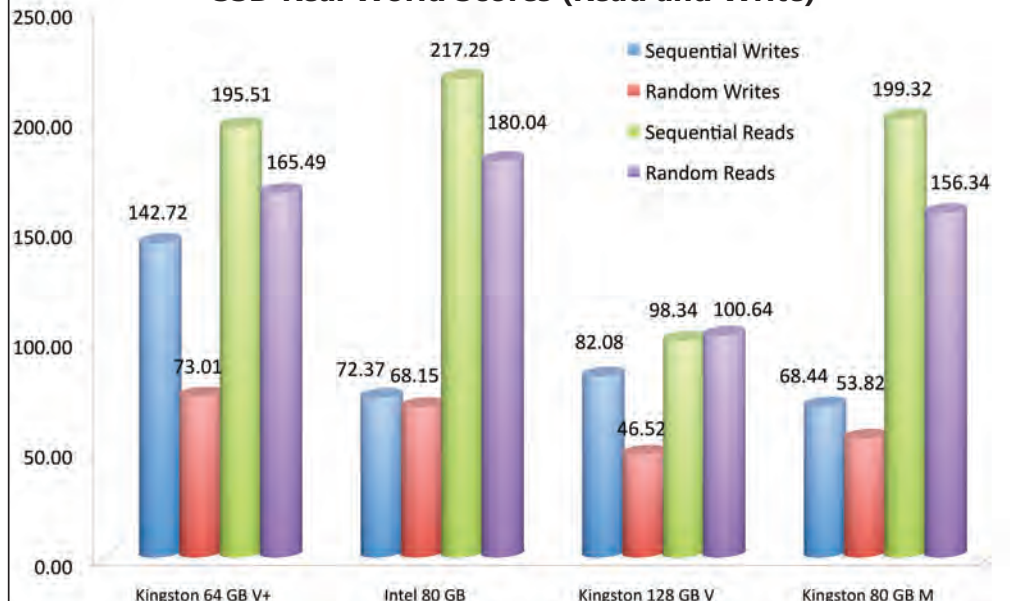
Tegra 2
NVIDIA is all set to make a major announcement at CES about the future of the Tegra family, including Tegra 2, which is rumoured to be two times as powerful as its predecessor.

Buffalo unveils the DriveStation HD-HXU3 USB 3.0 External Hard Disk Series in India

Storage test

HOW WE TESTED

We decided to segregate all drives on the basis of pricing, effectively doing away with the traditional divisions based on technology or capacity. After all, users want the best solution for any given price. Higher performance drives will generally tend to be costlier than power saving drives, so this slight inverse delta (performance/price) works well. We did distinguish between SSDs and HDDs to avoid comparing the proverbial apples to oranges. Typically we use a single test rig for any test to ensure uniformity of results. However, this time we had a

motherboards support SAS connects, so we ended up with three different rigs.

The Barracuda XS was tested under both SATA 2.0 and 3.0 conditions, and the results (spoiler!) surprised us. We credit ASUS and Western Digital in particular — the former for supplying us their typically excellent boards for use in this test and the latter for providing us with Velociraptor drives to use as references. Intel also deserves mention for their provision of three of the best processors on their top three platforms.

access, such as System Restore, File Indexing and a few unused services were disabled. Post installation of benchmarks, each partition was cleaned, defragmented and then we run a disk scan.

For theoretical benchmarks, we used HD Tach 3.0.1.0 and SiSoft Sandra 2010 with the latest update pack. Both benchmarks require unformatted drives to perform write testing. After these benchmarks were complete we formatted the test drives and created two partitions of equal size.

For our real world tests we used an 8 GB .RAR file to simu-

while a copy back to the RAID 0 array simulates a read.

We also did these tests intra drive, that is copying from one partition of the test drive to the other. This is a read + write operation, which is more taxing and slower as you will see. Finally we used Adobe PhotoShop CS 2 to test the amount of time taken to load a 1 GB image. Both the image and the scratch disk were kept on the test drives, on the same partition, effectively simulating file access. In case of hard drives, we gave no weight to Features,

TEST RIGS			
	Main Rig	**SATA 3.0 Rig**	**SAS Rig**
Motherboard	ASUS P5Q3 Deluxe	ASUS P7P55D-E Premium	ASUS P6T Deluxe
Processor	Intel Core 2 Extreme QX9650 (3 GHz)	Intel Core i7 870 (2.93 GHz)	Intel Core i7 975 Extreme (3.33 GHz)
RAM	2 x 2 GB DDR3 1600 MHz (1333 MHz @ 8-8-8-20)	2 x 2 GB DDR3 1600 MHz (1333 MHz @ 8-8-8-20)	3 x 1 GB DDR 2000 MHz (1333 MHz @ 8-8-8-20)
HDD	2 x Western Digital Velociraptor (RAID 0)	2 x Western Digital Velociraptor (RAID 0)	2 x Western Digital Velociraptor (RAID 0)
Graphics Card	Palit GeForce GTS 250	Palit GeForce GTS 250	Palit GeForce GTS 250
OS	Windows Vista Premium 32-bit	Windows Vista Premium 32-bit	Windows Vista Premium 32-bit

couple of unique contestants, both from Seagate. The first, their Barracuda XS drive is based on a SATA 3.0 interface, a new standard promising theoretical transfers up to 600 MBps. Naturally we had to use a SATA 3.0 board, and there are precious few of those. We also got Seagate's 600 GB Cheetah based on an SAS (Serial Attached SCSI) connectivity. Few

We continue to use Velociraptors over SSD, because of the high write speeds these drives give in RAID. Clean installs were done on each of the platforms and two partitions created on the RAID 0 array, the primary one of a size of 100 GB, while the second partition consisted of the remaining space. All extra Windows functions that potentially slow down

late sequential operation to the disk and a folder of size 8 GB consisting of a whole lot of different types of files of varying sizes; this to simulate an random or non-sequential operation. These files were copied to and fro from the second partition on the RAID 0 array to the test drives. A copy to the test drive simulates a write operation,

since there were none that need considering before buying an HDD. For SSDs, we gave points for SSDs that featured Trim, a command that basically allows the SSD controller to zero in on clean blocks and add them to the pool of free blocks. These blocks represent deleted files, making Trim somewhat of a "trash compacter" command.

our assumptions on present HDD spindle technology we reckon manufacturers can squeeze out another 10 per cent of performance in real life scenarios, given the same spindle speeds, meaning there's very little headroom to exploit a theoretical limit of 300 MBps, let along 600 MBps (SATA 3.0).

But there was one other solution that crushed

the WD 2 TB Black Edition and the mighty Velociraptor WD3000HLFS — Seagate's Cheetah 15K.7 ST3600057SS, was a shocker, and one of the meanest things this side of a platter that your cash can buy. To be honest, it's a little unfair to compare what is, essentially an enterprise-grade

device to these drives, but Seagate has been smart to offer this drive on an SAS-interface, rather than the de facto SCSI interface that such 15,000 rpm drives regularly feature. SAS drives are rare, as are SAS controllers (especially on desktop boards), but we dug one up, the ASUS P6T Deluxe. The Cheetah lives up to its namesake when it comes to raw throughput, particularly the write tests, where the faster spindle speed is defi-

nitely speeding up things. The read scores are no less impressive and this drive a sequential read score of 180 megabytes per second — very impressive, and by far, the fastest hard drive we've come across. While people will claim that this figure is child's play for SSDs, the write speed of 142.2 MBps proves its mettle — if you want the fastest drive out there for a desktop system, this is the one to go shopping for, although you'll

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HDD										
Brand	**Seagate**	**Seagate**	**WD**	**WD**	**Seagate**	**WD**	**WD**	**Seagate**	**WD**	**Seagate**
Model Name	7200.12	Barracuda 7200.11	Black Edition 1 TB	Green Edition 1 TB	Barracuda LP	Green Edition 2 TB	Velociraptor 300GB	Barracuda XT	Black Edition 2 TB	Cheetah 15K.7
Model Number	ST31000528AS	ST31500341AS	WD 1001FALS	WD 10EADS	ST32000542AS	WD 20EADS	WD 3000HLFS	ST32000641AS	WD 2001FASS	ST3600057SS
Price (Rs)	4600	7000	7200	10950	11500	14950	16500	17500	18250	35400
Grand Totals (Out of 100)	58.58	58.41	54.65	46.66	57.17	47.54	67.44	61.56	70.10	84.80
Performance (Out of 100)	58.58	58.41	54.65	46.66	57.17	47.54	67.44	61.56	70.10	84.80
Cost per GB (Rupees)	4.94	5.01	7.73	11.76	6.17	8.02	59.04	9.39	9.80	63.34
FEATURES										
HDD formatted capacity (GB)	931.51	1397.26	931.51	931.51	1863.02	1863.02	279.46	1863.02	1863.02	558.91
Interface	SATA 2.0	SATA 2.0	SATA 2.0	SATA 2.0	SATA 2.0	SATA 2.0	SATA 2.0	SATA 3.0	SATA 2.0	SAS
Number of Platters	2	4	3	3	4	4	2	4	4	2
Rotational Speed	7,200 rpm	7,200 rpm	7,200 rpm	5,400 rpm	5,900 rpm	5,400 rpm	10,000 rpm	7,200 rpm	7,200 rpm	15,000 rpm
Buffer Size	32 MB	32 MB	32 MB	32 MB	32 MB	32 MB	16 MB	64 MB	64 MB	16 MB
PERFORMANCE										
Synthetic Tests										
HD Tach 3.0.1.0 (8 MB file)										
Average Read (MBps)	106.4	108	89.3	75.7	97.1	80.3	106.9	117.2	121.2	132.6
Average Write (MBps)	102.1	104.1	87.8	76.9	97.3	79.3	107	69.2	114.1	93.1
CPU Utilisation (%)	2	3	1	1	1	2	2	2	2	3
Random Access Time (ms)	13.9	15.3	12.3	13.8	14.9	17.3	7.5	16.3	11.5	5.6
Read Burst Speed (MBps)	223.4	240.7	231	234.4	221.6	233.2	250.4	238.2	245.7	173.2
HD Tach 3.0.1.0 (32 MB file)										
Average Read (MBps)	106.5	107.6	89.6	76.9	97.3	79.9	106.9	116	120.4	132.6
Average Write (MBps)	101.8	107.6	89.5	75.9	96.8	79.8	106.1	89.9	119.9	120.1
CPU Utilisation (%)	2	3	2	2	1	2	2	2	3	2
Random Access Time (ms)	13.9	15.1	12.3	13.7	14.9	17.2	7.1	16.5	11.6	5.7
Read Burst Speed (MBps)	224.2	238.4	231	235.9	221.7	232.9	251.3	212.5	245.4	163
SiSoft Sandra 2010										
Drive Index, Read (MBps)	102.49	103.47	86.36	72.5	93.87	76.86	101	112.38	114.88	141.3
Access Time, read (ms)	14	15.26	12.36	13.87	14.41	16.58	7	16.47	5.73	3.2
Drive Index, Write (MBps)	89.5	95.47	83.12	69	87.84	74.51	91.75	103.8	111.73	127.4
Access time, write (ms)	5	5.7	4	5	5.4	5.85	1.64	5.33	4	2.9
Real World Tests										
File Write 8 GB Single File (MBps)	119.77	123.00	101.51	86.41	117.03	94.05	118.55	129.01	141.24	156.04
File Write Test Assorted 8 GB File (MBps)	98.94	98.70	87.71	74.74	95.15	79.61	103.70	95.59	117.20	132.56
Read Test Single 8 GB File (MBps)	121.36	131.28	99.30	85.78	115.06	93.09	117.36	133.42	134.30	180.04
Read Test Assorted 8 GB File (MBps)	113.62	113.78	96.04	83.59	107.23	88.75	111.61	89.63	131.07	142.22
Intra Drive Test (Read/Write) Sequential (MBps)	31.80	26.16	28.61	22.24	29.33	21.42	45.23	24.87	34.54	58.85
Intra Drive Test (Read/Write) Assorted (MBps)	33.87	28.63	32.32	25.31	28.05	25.91	45.28	34.64	40.94	56.34
Photoshop CS2 (1 GB File, in seconds, less is better)	63.2	52.5	47.9	54.7	54.6	57.8	41.2	33.5	39.1	37.2

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SSD				
BRAND	**Kingston**	**Intel**	**Kingston**	**Kingston**
Model Name	SSD Now 64 GB V+Series	SSD 80	SSD Now 128 GB V Series	SSD Now M Series
Model Number	SNV225-S2/64GB	SSDSA2SH080G1GN	SNV125-S2/128GB	SNM125-S2/80GB
Price (Rs)	8999	14000	15555	17500
Grand Totals (Out of 100)	78.08	75.42	53.53	69.17
Features (Out of 5)	5.00	0.00	5.00	0.00
Performance (Out of 95)	73.08	75.42	48.53	69.17
Cost Per GB (Rupees)	150.9	187.8	130.5	234.8
FEATURES				
HDD formatted capacity (GB)	59.63	74.53	119.24	74.53
Interface	SATA 2.0	SATA 2.0	SATA 2.0	SATA 2.0
Buffer Size (MB)	128	16	64	16
Trim Support	Y	N	Y	N
PERFORMANCE				
Synthetic Tests				
HD Tach 3.0.1.0 (8 MB file)				
Average Read (MBps)	187.4	219.4	111.2	189.5
Average Write (MBps)	140.2	73.7	79.2	61.2
CPU Utilisation (%)	3	4	2	2
Random Access Time (ms)	0.3	0.1	0.2	0.2
Read Burst Speed (MBps)	251.6	256.2	125	207.1
HD Tach 3.0.1.0 (32 MB file)				
Average Read (MBps)	176.9	215.6	111.2	148.9
Average Write (MBps)	106.7	78	85.8	64.7
CPU Utilisation (%)	3	4	2	3
Random Access Time (ms)	0.1	0.1	0.2	0.1
Read Burst Speed (MBps)	250.9	256.8	124.8	209.3
SiSoft Sandra 2010				
Drive Index, Read (MBps)	211.35	241.54	117.72	202.24
Access Time, read (ms)	0.24	0.08	0.04	0.12
Drive Index, Write (MBps)	85.27	76.27	58.6	54
Access time, write (ms)	0.17	0.01	21.1	0.01
Real World Tests				
File Write 8 GB Single File (MBps)	142.72	72.37	82.08	68.44
File Write Test Assorted 8 GB File (MBps)	73.01	68.15	46.52	53.82
Read Test Single 8 GB File (MBps)	195.51	217.29	98.34	199.32
Read Test Assorted 8 GB File (MBps)	165.49	180.04	100.64	156.34
Intra Drive Test (Read/Write) Sequential (MBps)	53.09	53.61	45.77	50.54
Intra Drive Test (Read/Write) Assorted (MBps)	43.81	50.95	27.05	47.63
PhotoShop CS2 (1 GB File, in seconds, less is better)	52.80	31.80	72.70	28.60

need a board with an SAS controller, which is something of a rarity, but hardly impossible to acquire. Western Digital's Green Edition drives run cool, but their performance isn't too hot either. These are not intended for performance junkies, but those needing storage. Seagate's Barracuda LP ST32000542AS was better in terms of performance, and nearly embarrasses its supposedly faster sibling, the Barracuda 7200.11 1.5 TB ST31500341AS, surprisingly so, considering this is a 5,900

BEST PERFORMER digit JANUARY 2010

rpm drive and the latter is a 7,200 rpm one. This is an unusual speed, for most drives are either 5,400 rpm or 7,200 rpm ones, but whatever the change, it's evidently working for Seagate. The LP stands for Low Power, meaning it's aimed at WDs Green series of drives.

With the Cheetah 15K.7 ST3600057SS strutting its stuff in the performance charts we were pretty clear who our performance pick would be. But it's not a desktop drive, at least not one that you can just go out and buy and plonk it in and get started. For one, SAS controllers are found on hardly 2-3 motherboards at the

Seagate diet drives
Seagate unleashes the world's thinnest hard notebook drives, available in 250 GB and 160 GB capacities at spindle speeds of 5,400 rpm. These are only 7 mm high

Nokia and SatNav
SatNav Technologies, pioneers in GPS Navigation in India since 2005 through the brand SatGuide, today launched a FREE version of GPS Navigation Software and Maps for Symbian OS phones by Nokia

moment, secondly this drive gets pretty hot; in fact it registered 65 degrees even in our air-conditioned environs. With this in mind, we're awarding it a joint *Best Performer* award along with Western Digital's 2 TB Black Edition, which was equally impressive, managing to beat even the 10,000 rpm Velociraptor despite a slower 7,200 rpm spindle speed. The *Best Value* award undoubtedly belong to Seagate's 7200.12 1 TB drive — at Rs. 4,600, it's just what the doctor ordered for those who need big storage at a shoestring.

The platter of the matter

Once the test was done, we had a bit of time to think, and contemplate. Sadly, hard drives haven't really become the speed demons we hoped they'd be when SATA 2.0 came along and promised double the bandwidth. Computing has become faster by miles, just think back five years to the Pentium's, three years back to the first Core 2 Duos and now, the Core i7s. The same performance delta can be found in the graphics domain, if any of you recall the ATi Radeon X800XT, it was the fastest card of its time, but will trail the Radeon HD 5870 by at least a 10x factor. The same cannot be said for HDDs, in fact it's been three years and they're still struggling to utilise the bandwidth made available by SATA 2.0. SSDs promise to play saviour to those craving speed and we've seen the fastest SSDs actually come pretty close to the theoretical SATA 2.0 throughput limit, but as we know, they're not exactly affordable. We foresee a period of transition and the next year should see us at its cusp. SATA 3.0 becoming mainstream will be the first step. Hard drives will not be able to take advantage of the improved throughput and this is where flash will step in. Flash manufacturers have promised flash chips rated at 450 MBps for writes and 500 MBps for reads. That's a whole new dimension of speed, and something even 4 x SCSI drives in RAID 0 will not give you. Imagine two such 128 GB SSDs in RAID 0, at a price of under Rs. 20,000! Dare to dream... d

HDD Real World Transfers (Read Scores)

HDD Real World Transfers (Write Scores)
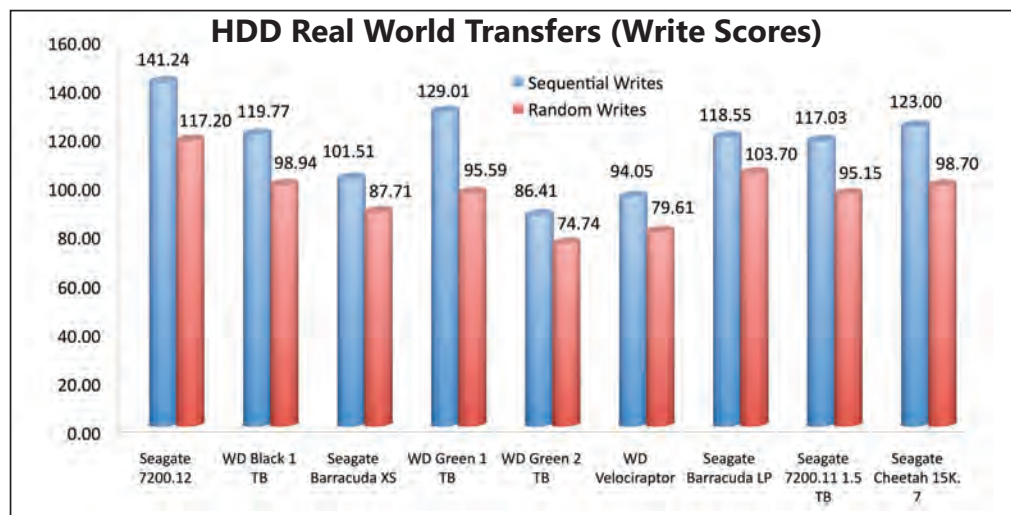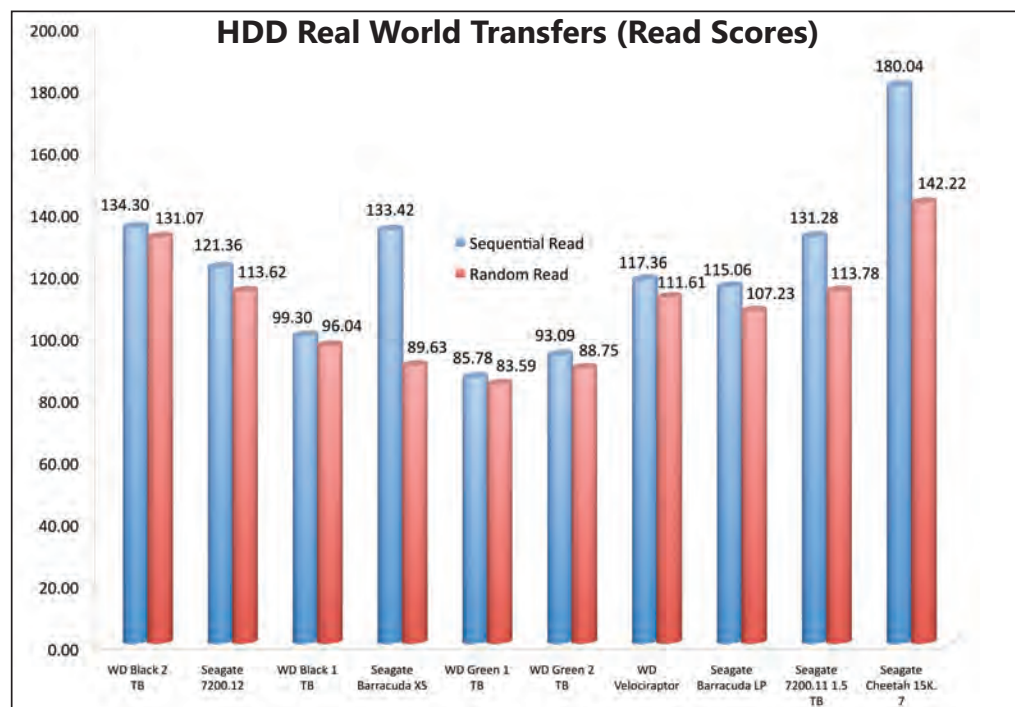
CONTACT SHEET				
Brands	**Company Name**	**Email Address**	**Phone No**	**Website**
Intel	Intel Corp	apacsupport@mailbox.intel.com	080 2854 2105	www.intel.com/in
Kingston	Kingston Technology	sales_india@kingston.com	022-26592963	www.kingston.com
Seagate	Fortune Marketing (Seagate Distributor)	sales@fortune-it.com	011 - 26414468, 26472491	www.fortune-it.com
Western Digital	Western Digital Corp	Amarjeet.singh@wdc.com	-	www.wdc.com

HD Tweeting
An application for Twitter arrives on the Zune HD, we're hoping to see Facebook next

iPhone grows
Apple's iPhone outgrows Windows Mobile sales in the US, meanwhile, we're hoping to see the iPhone 3GS here

Intel in hot water?
NVIDIA proclaims itself victim of Intel's business conduct. It says that the FTC's lawsuit will help expand the GPU business

FIRST LOOK

Read the complete review online www.thinkdigit.com/ d/1001zunehd

Touchingly different

One of the most positive initial reactions to the Zune HD was that we haven't seen a better OLED display. At 3.3-inches, the display (480 x 272 pixels) is crisp with great colour. The device is built well and owing to its slimness and a brushed metal rear cover feels pretty solid. There are only 3 keys on the device, a flush-fitting power button on the top, a (very useless) media navigation button and an elongated menu button just below the display. Start up is quick, thanks to some new hardware courtesy NVIDIA. There's an HD video processor, an audio processor, two ARM cores and a graphics processor. The specific Tegra solution used is the APX 2600 and this system-on-a-chip (SoC) is based on a 65-nanometre fabrication process. This particular Tegra solution Thanks to this there's an HD video out capable of 720p, although the cable

for the same is a separate purchase. Thanks to Tegra, the Zune HD is amply powered for every multimedia usage scenario one can think of, and menu responsiveness and activity animations are super smooth with no delays whatsoever. Microsoft has promised 3D games for this platform, which means what we're seeing in terms of performance is probably a cakewalk for the APX 2600, and it is only 3D applications that might better utilise the jaw dropping hardware under its hood.

The interface a lot more complicated than Apple's simplistic one and you will take an hour to get your bearings. The device itself has a good clean menu system. Compared to the iPod Touch, its obvious competitor, Apple has a much simpler, defined menu structure where it's difficult to go wrong. But to some, this soon becomes boring as it involves mostly list-like menus. With the Zune, you will perform a

lot more gestures. For example in the music menu, you will be swiping your way to glory moving between artists, playlists, albums, genres and so on.

The Zune HD ships with a tweaked version of their Internet Explorer for WM devices, pretty much necessary for a device with Wi-Fi support.

Videos look sweet, with good colour, detail and contrast. In terms of audio quality, the bundles earphones mediocre, but audio quality of the device is good. You can directly download songs to the device, without the need of a computer. Tracks can also be sent to friends' Zunes by entering their email IDs or Zune tags. Now for the serious downside, the Zune HD isn't available here! Sad, for this is surely Microsoft's best attempt yet, to nuke what can only be described as Apple's utter domination of a segment.

Price: Zune HD 16 GB – $219 and 32 GB – 289 US$ **d**

LCD remote control
Silver PAC 5500 Universal Remote Control comes with a 4.3 inch LCD display and Windows SideShow technology

iPods in the deep
Swimman has worked on the iPod Shuffle by waterproofing it and enabling its use up to 25 feet below water

HTC Touch 2

Small and elegant

When you first take the Touch 2 in your hand, it looks like an impressive little gadget with a lot of promise. The gunmetal matte finish on its plastic body looks elegant. WinMo, even in the latest 6.5 flavour is bound to put off most people, but HTC's own TouchFLO UI augmentation makes this phone more usable. The phone is fast and we found the scrolling shortcut bar at the bottom of the home screen to be quite handy for quickly launching certain applications. Getting into deeper options within the phone is still a pain. Those familiar with WinMo will find it an improvement but someone not so adept will have a hard time performing simple tasks. The resistive screen, although nice looking, is not very responsive to finger input. The dedicated hardware keys will come of use. The camera is not very impressive either. It distinctly had trouble handling different lighting conditions, resulting in a sepia-like colour tone in many shots. The inbuilt GPS and preloaded applications such as Facebook, YouTube and Office Mobile definitely earns the phone some points. We find the price tag to be tad on the outer side. HTC has better offering around that price point.

Specifications
Processor: Qualcomm MSM7225 528 MHz
Screen: 2.8-inch QVGA
Network: 850/900/1800/1900 MHz; **Memory:** 512 MB ROM; 256 MB RAM; **Weight:** 110 g; **Connectivity:** Bluetooth, Wi-Fi, 3.5-mm audio

Contact
Phone: +91-98108 32373
Email: sanjay sharma@htc.com
Web: www.htc.com
Price: Rs. 24,490 (MH & MP), Rs. 22,490 (Rest of India)

7/10

Features...........................8
Performance 6
Build quality..................9
Value for money...........6

Samsung 40-inch LED TV

Sleek... needs something more

The extra wide bezel of this 40-inch HDTV not withstanding, it's a quite a stunner. Thanks to LED backlighting, the display is really slim and the large stand is made of glass embedded with red highlights – Bordeaux style. The material used imparts a very upmarket look and feel. Even while setting up, the blackness level is pretty good and the HDMI ports face sideways, which really makes setting up easy.

The contrast ratio is very good, in DisplayMate, we got great scores for the grey-scale intensity check. Colour rendition was good, but we felt the gamut for red should have been a bit wider. Movies are pretty good, with minimal banding. There is a lot of noise and banding in really dark areas of the screen while watching video content, but this is not very serious. There were some really bad issues with the backlight response and this spoilt what could have been a decent gaming experience. There is noticeable input lag as well, noticeable in games and with desktop use. Text clarity, when connected to a PC is also an issue. Priced at Rs. 1,25,000, this Samsung 40-incher is overpriced. However, it's stunningly good looking and will make a flaunt-worthy addition to your designer home.

Specifications
Scree size: 40-inches, **Resolution** – 1920 x 1080p, LED-backlit, Contrast ratio – 30,00,000:1 (Dynamic, stated), weight (with stand) – 23.2 kgs

Contact
Alok Pathak
Phone: +91-11-4151123
Email: alok.pathak@samsung.com
Web: www.samsung.com/in/
Price: Rs. 1,25,000

6/10

Features.... 6.5
Performance 6
Build quality..................8
Value 4

Exotic photography
LEICA M7 Edition Hermes Camera marries
photography with luxury costing 9,500 Euros

Mind control robot
Robotics scientists have developed a robotic arm
that can be controlled by mere thought processes

Bazaar

ATI Radeon HD 5970

AMDs return to high-end competition

ATI's Radeon HD 5970 is an extreme high-end graphics card which comes equipped with a dual GPU thus making it the best performing card in their lineup. The 5970 has a 512-bit bus with a core clock of 725 MHz and memory clock of 1000 MHz along with 1 GB of DDR5 memory.

Design-wise, it's very similar to the slower HD5870 and HD5850 cards. The card runs on a 6 and 8-pin power connector configuration. It has a single fan cooling system, with two air-inflow compartments beside the fan.

The card was tested on an ASUS P6T Deluxe motherboard with an Intel Core i7 975 processor. The card delivered the goods during performance. In general, it is a good bit faster than the dual-GPU NVIDIA GeForce GTX295.

The only thing that is of concern is the heating up of the card. Due to the closed design, it tends to heat up a lot. It's also a little cooler than the GTX295 under load though. The cabinet is a key component and has to be chosen to provide enough air-flow to enable quicker cooling of the card. Considering this is a high-end product, the price of Rs. 42,000 is quite steep. The DX 11 compatibility is an added advantage even though there are no DX11 compatible games around for now.

thinkdigit.com Complete results of the Radeon 5970 at www.thinkdigit.com/d/1001_rad5970

Specifications
Engine Clock: 725 MHz
Memory Clock: 1000 MHz
Memory Interface: 512 - bit
Video Memory: 2 GB DDR5

Contact
AMD
Phone: 1-800 425 6664
Email: fusion.india@amd.com
Web: www.amd.com
Price: Rs. 42,000

8/10

Features...........................8
Performance 9
Build quality..................8
Value for money...........7

Sony DSC-TX1

The Sony touch

The Sony DSC-TX1 comes in an uber-slim solid metal shell and is one of the sturdiest cameras around. This is a 10.2-MP, 4x optical zoom portable camera.

One of the key features of the TX1 is the touchscreen used for almost all of the features on the camera. The zoom trigger feels poorly designed – it's too small and has too little travel. The front is protected by a metal sliding panel. The piece we received had some fine scratches from the slider movement.

The screen quality isn't great. The user interface is basic and easy to use. The lens is placed away away from the corner of the camera, so your finger won't block the view. The touchscreen is decent, but display a little laggy. It has variable focus points and you even choose which area you want the camera to focus. It even does HD video. Although, it lacks the features and performance, the compact size is something that will appeal to many. It'll fit into any pocket size, so you can take it anywhere you go. If that's what you want, the price of Rs. 20,990 should not be an issue.

Specifications
10.2 MP CMOS sensor, 3-inch touchscreen, 4x optical zoom, video resolution: 1280 x 720, Dimensions: 93.8 x 58.2 x 16.5 mm, weight: 119 g

Contact
Sony India
Phone: 1800-103-7799
Email: sonyindia.care@ap.sony.com
Web: www.sony.co.in
Price: Rs. 20,990

7/10

Features.......................6.5
Performance 6
Build quality..................8
Value for money....... 6.5

Philips 42PFL5609

Can't hold a candle to its older sibling

6.5/10

Features...........................6
Performance 6
Build quality.................7
Value 6

Philips' 42PFL5609 initially comes across as the 42PFL7409's poorest pal. Part of the 5 series, the build quality is okayish, with the plastics being lower grade than its higher-end sibling. The panel also appears to be suitably scaled down, and this is not to nitpick, because the display isn't bad – it's just we had the 42PFL7409 at hand, and the difference, is very noticeable. The native resolution for PC is set at 1360 x 768 pixels, while the display itself goes up to 1080p.

Using DisplayMate, the contrast ratio is immediately noticed to be deficient. This shows up in movies, especially darker scenes. Input lag is not noticeable. There is also a tendency to over saturate reds. Picture quality is good, but there was some minor banding noticeable and the display does not work with non-native resolutions as well. On the whole, movies are fun, especially higher resolution stuff.

Gaming is a little less involving, owing to the deficient contrast. Use on a PC should be avoided as text crispness and overall display clarity is a problem, unless you're willing to run it at 1360 x 768 pixels. At Rs. 64,990, it's pretty overpriced, but better than the Samsung 40-inch LED display in terms of value.

Skullcandy Skullcrushers Black Checker

Blows the mind... literally

The Skullcrushers Black Checker model is undoubtedly one of the boldest looking headphones we've seen. The design might be attractive to some, but those who want simple yet elegant looking headphones will hate this. Although the build quality isn't great, there's a lot of flexibility to fit your head. Those with really big heads might find it uncomfortable as well.

The key feature is the bass on this thing. To power this overly powerful-for-a-headphone speaker, an AA battery is required. The battery holder block also has bass-level control. The bass is excessive and is so much that you can feel your ears and the headphone vibrate. We used it at 10 per cent overall capacity.

Audio quality isn't great – the bass is overkill. It kicks into the music at the wrong time all the time. Without any bass, the quality is decent. For games and action movies, the bass can be fun.

These cans are crude and they're like a toy. But they are loads of fun with all the crazy vibrations in games or movies.

6.5/10

Features...........................7
Performance 7
Build quality.................6
Value 6.5

Compro VideoMate IP50W

Your neighbourhood watch

The Compro VideoMate IP50W is a security camera system that uses a network camera to remotely monitor areas of your office or home. The camera has a good sturdy design, but it has a steady flashing blue light at the front that draws attention.

The installation is supposed to be pretty straightforward, but we had some issues with automatically detecting the network camera on the network using the software provided.

The camera and the software together has several features. The software and web interface on the camera allows resolution and frame rate settings to be managed. The ComproView software has support for multiple cameras and the system allows for motion detection and recording as well.

You can access the camera over the web on desktops as well as mobiles. In that aspect, it's extremely versatile. There's even Wi-Fi and two-way audio streams.

All the features work flawlessly and the remote access to the camera over the net is good. The Compro VideoMate IP50W is a great security solution. If it doesn't grab pictures of intruders, just knowing that it's present is sure to keep them away. A built-in battery would have been a nice thing to have in case of power outages. The

market price of Rs. 7,000 (MRP is Rs. 10,000) is a little high if you think of it as a gadget, but not when you think of it as a serious security camera.

Specifications
1/4-inch colour CMOS VGA sensor, resolution: 640x480, maximum frame rate: 30 fps, **Dimensions:** 84 x 124 x 91.5 mm

Contact
Creative Peripherals & Distribution Pvt. Ltd.
Phone: +91-99877 84010
Web: www.comprousa.com
Price: Rs. 10,000

7.5/10

Features..........................8
Performance 7.5
Build quality..................7
Value for money.......6.5

Autodesk Maya ECS 2010

Be your own 3D CG studio

The concept of suites is somewhat new. We look at the Maya Entertainment Suite 2010, which is a bundle of Maya 2010, Motionbuilder and Mudbox.

This suite is huge and has tons of possibilities. Maya is best known as a 3D modelling tool and is compared to 3d Studio Max. Some key improvements have been made to include better stereographic camera support for 3D movies. The interface hasn't changed a lot and modelling is still most comfortable for those well versed with it.

Artist: Marius Jursys

Motionbuilder allows for intensive character rigging and animating features once the model is complete. The user interface is very simple because of the use of colour and easy-to-understand controls for the rig itself. Tweaking of physics and animations in real-time is also very well done.

With close integration in Maya, Motionbuilder and Mudbox, it's easy to move models and scenes from one package to another seamlessly. The new avatar of this package from Autodesk allows independent artists and studios to be able to have a complete 3D content development suite that integrates and therefore works well as a package.

Requirements
Windows XP/Vista 32 and 64-bit versions, 2 GB RAM, 5 GB disk space, 512 MB OpenGL / DirectX 9.0c card,

Contact
Autodesk
Web: www.autodesk.com
Price: $4,995. (Rs. 233,000)

7/10

Features..........................8
Performance 8
Build quality..............6.5
Value 5

ready with WiMAX enabled laptops for the Indian market by January 2010　Synology launched economical Disk Stations DS210j and DS410j having

Digit | January 2010 | www.thinkdigit.com 71

Bazaar

Impatient surfers
Four of five viewers leave a stream if it rebuffers according to a study carried out by Tubemogul, a video distribution and analytics startup

CES 2010
Over 2700 technology companies expected to take part in the International Consumer Electronics Show (CES) in Las Vegas in January 2010

Amkette WF-301

A dual function device — keyboard with a trackball

Desktop users can enjoy the flexibility provided by the Amkette WF 301, which is an integrated wireless keyboard with a trackball that packs in the dual functionality of a keyboard and a mouse.

The keyboard can be used at a distance of up to 10 metres, but without any barrier between the receiver and the keyboard. Ideally, the RF receiver should be connected to USB slot in front of the CPU for smooth performance. This feature is great for users having HTPCs as it eases controlling the system or browsing the web while watching a movie or while making presentations on big screens in executive offices or in boardrooms. The absence of a dedicated number pad makes mathematical calculations an uphill task.

It takes a while getting accustomed to using the trackball with a finger. The placement of the mouse click buttons and the scroll key just below the trackball is inconvenient. The two additional click buttons on the left-hand side of the keyboard provide immense flexibility. Power saving mode of the keyboard is an interesting feature, which takes the keyboard to a sleep mode if it's not used for over 4 minutes. It exits the sleep mode as soon as any key is pressed. A light above the trackball blinks when the battery is running out.

A retail price of Rs. 2,995 is a bit on the steeper side.

Specifications
2.4 GHz RF, mouse speed 800 dpi, Power source - 2 AAA batteries, Minimum RAM – 256 MB, USB port 1.1 or later, Works on Windows 98/Me/2000/XP/Vista/Win 7, Linux , OS X
Dimensions: 365x 156 x 22 mm

Contact
Amkette
Phone: +91-93106 75585
Email: rahul.gandhi@amkette.com
Web: www.amkette.com
Price: Rs. 2,995

6.5/10

Features.......................6.5
Performance 7
Build quality..................7
Value for money...........6

HP TouchSmart PC IQ528d

Touch me not?

Specifications
Processor: Intel C2 Duo T6600, Memory: 4 GB
Graphics: GeForce 9300M GS
HDD: 640 GB SATA
TV: PCIe mini-card, TV tuner card

Contact
HP India
Email: ketan.patel@hp.com
Web: www.hp.com
Price : Rs. 89,990

6.5/10

Features..........................7
Performance 6.5
Build quality..................7
Value for money...........5

This all-in-one offering from HP is not your ordinary run-of-the-mill PC. This sleek device is more a gadget than a PC and features a 22-inch touchscreen. This means you get to interact with it in more ways than just your mouse and keyboard. The piece we got had Windows 7 and a set of touch applications that form part of the TouchPack.

While it gets full points for coolness, touch becomes cumbersome when used as your primary method of input. Issues such as arm fatigue and finger prints on the screen do creep up. The build quality is solid – the wireless keyboard features pseudo isolated keys, while the mouse looks surprisingly like the magic mouse from Apple. It also comes with an MCE remote, so you can operate it from a few feet away. There is slot loading dual layer DVD writer optical drive on the side. Of course a hoard of ports lie underneath a removable panel at the back, including LAN, SPDIF and TVin. The audio quality of the speakers is quite decent, very suitable for personal listening.

As for the internals, it features Intel's Core 2 Duo T6600 2.20 GHz processor with 4 GB of RAM. The GeForce 9300M GS graphics solution is more than enough for running touch apps and playing HD video. However, serious gaming is out of the question. Our standard benchmarks for PCs revealed a decent performance. It's overpriced but if you want a conversation piece you might want to opt for it.

Windows Mobile 7 soon
Windows Mobile 7 will be coming out late next year according to Microsoft UK Mobility head Phil Moore.

Apple Lala
Apple acquires Lala, a paid online music streaming service, that bypasses the need to download iTunes

Bazaar

ZOTAC GeForce GT220

A cool entry level graphics card, literally

ZOTAC GeForce GT 220 is an entry-level graphics card that provides quite a punch with its limited features. Armed with a 625-MHz core clock and a memory clock of 1580 MHz, the GT220 has a 1-GB DDR3 memory.

It comes with an HDMI port which makes it deal as an HTPC graphics solution. It does not need any additional power.

The card was tested on our graphics card test bench – an ASUS P6T Deluxe motherboard on a Core i7 975 processor. For an entry-level graphics card, the GT220 performs well. It was better off than the ZOTAC GeForce 9500GT.

Get the full benchmark scores at www.thinkdigit.com/d/1001_zot220

The GT220's advantage is that it does not tend to heat up a lot. We only saw a 4 to 5 degree difference between load and idle temperatures.

Priced at Rs. 5,500, the GT220 is slightly expensive, considering that XFX GeForce 9600GSO, one of the winners in our entry-level graphics card test is marginally better and is also available at a lower price. If you're planning to buy a new card, it's better to wait a while.

Specifications
GPU Clock: 625 MHz
Memory Clock: 1580 MHz
Memory Interface: 128-bit
Video Memory: 1 GB DDR3
Dimensions: 365 x 156 x 22 mm

Contact
Aditya Infotech Ltd.
Phone: +91-93106 75585
Email: sales@adityagroup.com
Web: www.zotac.com
Price: Rs. 5,500

6.5 / 10

Features...........................7
Performance 8
Build quality..................8
Value for money...........7

Corsair HX850W

Large, lovely but overkill

The HX 850W comes snuggled inside loads of styrofoam and a huge package. The PSU is well constructed and heavy and the finish is a matte powered coating that seems rugged. Being modular, cable clutter is minimal since you only use the cables you need. The cables themselves are sleeved in a nylon jacket and pretty long, certainly enough for larger chassis or bottom-mounted configurations. A 140-mm fan handles air circulation and this fan is touted to be ultra quiet till the load on the PSU crosses 70 per cent.

Try as we could, we couldn't load the HX 850W to anywhere near its maximum potential. Even with a Core i7 975 Extreme, 6 GB of DDR3 memory, 2 x Western Digital Velociraptors and 2 x ATi Radeon HD 5870 graphics cards, everything was rock steady. Needless to say, there were no hiccups whatsoever. It has an unheard of six PCIe power connects and each of these are 8-pin connects, meaning this PSU is totally future proof. We feel running two Radeon HD 5970 cards should also be possible .

For most people, this is a gross overkill. Still, it's remarkably well built and remarkably efficient and it's built from premium spec components. To top it all, it has an unbeatable seven-year warranty.

Specifications
Power – 850 W, connects – 12 x SATA, 12 x 4-pin molex, 6 x PCIe, active PFC, single rail 12 V design

Contact
Tirupati Enterprises
Phone: +91-93392 07519
Email: sales@adityagroup.com
Web: http://www.tirupati.net
Price: Rs. 10,750

8 / 10

Features......................8.5
Performance 6.5
Build quality..............8.5
Value for money.......6.5

Bazaar

i6500 after i5700 Spica
Samsung i6500 is the going to be its next
Android phone after i5700 Spica

High-speed data links
Google to be a part of consortium to install the $400
million Southeast Asia Japan undersea cable that will
greatly increase internet access globally.

D-Link DIR 685
Costliest home router ever?

7/10

Features...........................8
Performance 6
Build quality..................8
Value for money...........6

The D-Link DIR 685 Router is a high-end feature-rich router. Its body with a smooth finish and a 3.2-inch LCD screen makes it one of the better looking routers in the market.

It comes with two USB ports for external storage devices and it also has a slot to attach a 2.5-inch SATA hard drive (up to 500 GB) on the rear side. It can

tons have a definite delay in the response time. The LCD is crisp and it displays information such as internet speeds. The router provides unique features such as FTP server and file sharing on the network. There's even Bittorrent downloading capabilities.

thinkdigit.com Check out the performance figures of the D-Link DIR 685 on www.thinkdigit.com/d/1001_dlink685

also be used as a photo frame although we would like a larger screen. The router is easy to set up, although it takes a long time to start up. The touch screen but-

The router was tested for wireless performance in three zones. It runs quite smoothly with the wireless connection in the same

room but the signal quickly weakens in the adjoining room and so does the performance. For all the grand features provided by the router, there is a grander price to pay. At Rs. 21,000, it's one of the most expensive routers we've tested.

Samsung ST550
A path breaking dual-screen compact camera

The Samsung ST550 is the first ever compact camera to have a 1.5 inch display screen embedded in the front panel, thus allowing easy capture of self-potraits.

The design is very simple with only three buttons and a zoom notch. The touch screen works well. The wide touch screen enables ease of control, but navigation will definitely take some time.

The photographs are quite rich and even at ISO 1600, the noise effect is not that prominent. The camera lacks a viewfinder. The preview button just below the zoom notch also allows the user to make on-the-spot image editing which is an innovative feature.

The face detection feature of ST550 is quite impressive. For a compact camera,it has various options to focus a subject. The Smart Touch AF and One touch shooting modes provide the user enough freedom to choose any focus point within a frame.

Priced at Rs. 24,990, it's expensive for a compact camera in spite of the many features.

7.5/10

Features...........................8
Performance 7
Build quality..................8
Value for money...........7

Fyoocher DDR2 2 GB
A new comer that we'll remember

Fyoocher is a new player in the entry level memory market and have launched a range of memory modules for laptops and desktops. We're looking at their DDR2 desktop memory.

This value memory is pretty much like any other value memory – no heatsinks or fancy coolers on it. We ran the tests with the memory forced to run at its speed of 667 MHz. Timings were set to 4-4-4-12 and we faced no sta-bility issues whatsoever.

The memory was tested on a X38 chipset board running an Intel Core 2 Duo Q9650 proc-essor. It performed quite well in the benchmark tests. The RAM gave a memory bandwidth of 4.42GBps in SiSoft Sandra which was similar to the Cor-sair Dominators 2 GB DDR2 RAM kit running at the same speed and timings.

The RAM memory is best suited for everyone building PCs within lim-ited budgets. Gamers who want to overclock might not be pleased with the overclocking performance of this memory.

At Rs. 2,500 (MRP), it's a good VFM buy. Market prices are bound to fluctuate.

Specifications
Memory: 2 GB DDR2
Speed: 667 MHz

Contact
Phone: +91-22-4275 4545
Email: info@fyoochertek.com
Web: www.fyoochertek.com
Price: Rs. 2,500

7/10
Features............................7
Performance 7
Build quality..................7
Value for money...........8

GlacialTech X-Wing R1
Generously large cooler, but a tiny fan

The X-Wing R1 is one of the few decent looking notebook coolers around. Some might find the bright red accents loud, but we feel it complements the black body. It's well built and the top is entirely mesh with a rather small fan enclosed. The centre of the rear is vented. Two pegs are provided for further inclination towards your body, if the need should arise. Even without these, the cooler is pretty high and the palm rest on your note-book is at least 1.2-inches higher than normal. Towards the end of the notebook, the height is only slightly more at 1.8-inches, using the foot-pegs raises this by another 0.5 inches. The cooler has a rubber strip running across the mesh and this is better than the traditional pegs used, since it will prevent both big and small notebooks from sliding.

Up to 17-inch notebooks can fit on this cooler.

The wrist support has a quite a few blue-LED backlit buttons, for varying fan speed, displaying the tem-perature and fan RPM via an integrated two digit, mono-chrome LCD. There are also multimedia buttons along with volume controls. Thank-fully your wrist will not acci-dentally activate anything, because you have to apply extra pressure to engage the buttons. The fan is a low RPM one, and has a pretty low CFM thanks to its size, meaning the speed control doesn't do much, we'd prefer a larger fan that covered a greater surface. While this won't cool down notebooks with heavy-duty GPUs, it does okay with regular notebooks that have venting on the rear. While it affected the temperature of an Acer notebook we tested, it had no effect on Apple's Mac-book Pro. A niche product, and a mediocre one at that, in terms of cooling.

Specifications
Fan size: 70 mm, body – plastic with metal mesh
Speed: 667 MHz

Contact
GlacialTech
Phone: +886 2 2244 1227
Email: icarol.chiu@glacialtech.com
Web: www.glacialtech.com
Price: Rs. 2,738

5.5/10
Features............................7
Performance 6
Build quality..................7
Value 4

Toolbox

81 Heard of Microsoft Office 2010? We have useful tricks around it. For more go to page 81

Fun with electronics
89 If you buried that desire to make your own electronics project for lack of knowledge, it's time you let go of all apprehensions

Your problem is no problem to us!

Problem with compilers, system rebooting randomly? Write to us and we'll give you the fix to it!

C/C++ coding on 64-bit Windows 7

I have a Sony VAIO VPC-CW15FG laptop with Windows 7. I use a 64-bit operating system on it. I want to code in C and C++ and need help with a better programming software. I have Turbo C++ 3.0 which doesn't work any more with this version of Windows. I need some software that is compatible with Windows 7.

Tousif Bandaly

You can try running Turbo C/C++ using compatibility mode in Windows 7. You can also try using the virtual PC

Turbo C++ running within the DOSbox emulator

feature on Windows 7. Also, try using DOSBox (www.dosbox.com), a free DOS emulator.

If you want a program that runs on Windows 7, try Dev-C++ (www.bloodshed.net) and Eclipse (www.eclipse.org).

More Memory?

My PC has 2 GB of memory, which is under utilised. It always uses virtual memory on the drive instead of the RAM. My RAM usage is usually less than 1 GB and the hard drive page file is always above 1500 MB. Why is the available memory of RAM underutilised? Whenever I launch any application, only the page file consumption usage increases and not the RAM usage. I want to know this is because my hard drive is very slow. Because of the virtual memory file, everything takes time to load and I don't get the performance that

I should get with this kind of system configuration.

My system configuration: Intel Core 2 Duo E7400, Intel DP45SG motherboard, Transcend 2 GB DDR3 1333 MHz RAM, XFX GeForce 9500GT
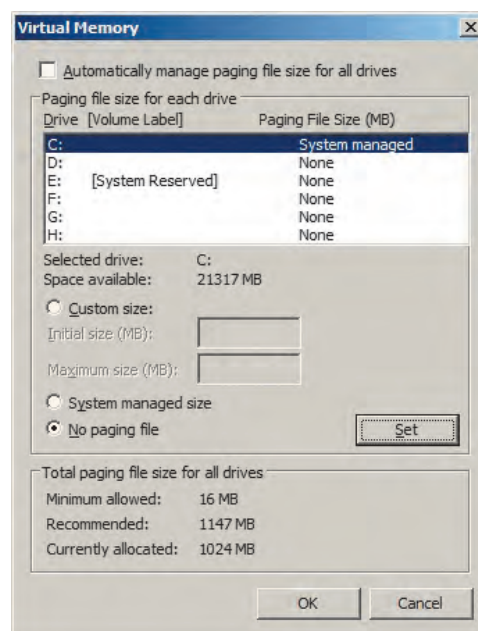
Graphics card, 1 TB Seagate HDD running Windows Vista Ultimate.

I often browse Youtube and other video sites. I leave around ten videos to buffer fully before I watch them. Every time I click the play button, it takes a long time to load from my drive and my video play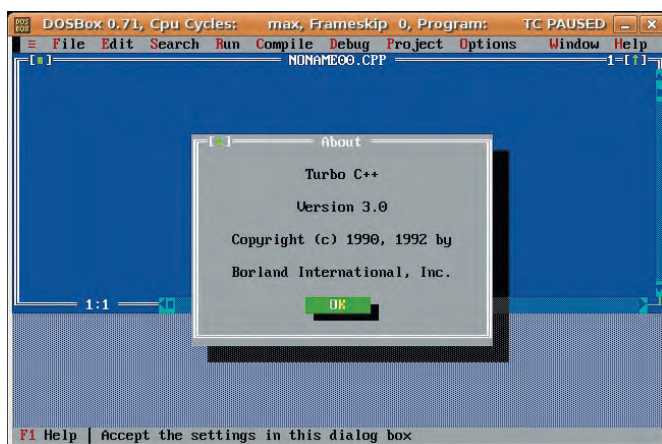back performance suffers. Sometimes, the video plays without the sound. This really annoys me! I have to close all the application and reopen it again for it to work again.

Why does my system not utilise the entire memory? Will a memory upgrade to 4 GB reduce the virtual memory usage? Is it recommended for a user like me? I have tried Ready boost and USB VM options, but the result is even poorer performance. The worst part is that I updated to Vista SP2 last week and the performance got worse.

Can you please help me out with all these issues. I tried different things to resolve this problem, but I haven't found any solution. It will be helpful

Disabling virtual memory entirely on Windows

if you could write an article in your future issues regarding RAM, virtual memory explaining all the terms shown in the task manger.

Karthik R

If you want your memory to be used better, you can disable the paging file completely. Press [Windows] + [Pause]. Go to Advanced system settings, Performance, Advanced. Set it to Use no page file. You'll have to reboot after this.

If you're trying to buffer ten Youtube videos at once, it might still slow down a bit. Flash can be pretty menacing and use a lot memory. Upgrading to 4 GB won't make things a lot better.

Facebook!
Yahoo! adds integration with popular
social networking site Facebook

Torrents. Legal?
Mininova has now done away with
all illegal content on its servers

Google DNS
Google's new DNS service uses
IP addresses 8.8.8.8 and 8.8.4.4

QnA

Try a different browser and also look at the applications using the most memory.

Windows time

I'm using Windows Vista Home Edition on an HP laptop. I am not able to update the system time using the Internet time update feature.

Prof. K.C. Raveendranathan

Try clicking on `Start > Run` (or `[Windows] + [R]`). Type `cmd`, press `[Enter]`. In the prompt, type `ping time. nist.gov` while connected online. If don't get a reply to your ping, the server might be down. Try later. If the server address doesn't resolve, there might be some kind of DNS problem on your ISP end.

Will Windows 7 run on an older PC?

I have a three-year old PC powered by an AMD Sempron 2600+, Gigabyte GA-K8VM800 motherboard, 1.5 GB RAM, 80 GB hard disk. Can you tell me if Windows 7 will run on this PC? If it won't, what can be done for it to run Windows 7. Please suggest a good graphics solution. 3d Studio Max and Maya are my favourite applications.

Said Fazil

Yes, Windows 7 will run just fine on your system. But you won't be able to run Windows Aero theme, although the OS itself will run perfectly fine. You should upgrade if you want to game or do intensive work on your system.

Simply upgrading your graphics won't improve the performance of 3dsMAX or Maya. It will also need an overall upgrade - CPU, motherboard, RAM and more.

The graphics card will only help while working in

the viewport and on high-density wireframes - it will be smoother than it is now with all kinds of mesh and turbo-smooth modifiers turned on. The rendering, however, is done only by the processor and memory. When you upgrade, don't look for a graphics card any slower than a GeForce 9600GT.

System goes blank during bootup

Recently, I have been having some problems booting my computer. It starts fine but goes blank when the boot screen shows up. It does not restart or show a BSOD. If I restart with the reset button, the same problem comes back. When I tried to install a fresh copy of Windows XP, it boots fine from the CD but goes blank just after loading all files. One of my friends suggested that it could be a problem with my RAM. Is it so? Should I go to my vendor with the memory or is it a fault with some other component? I was using Windows XP SP2.

Mayukh Biswas

Your friend maybe right. Try using Memtest86+ (www. memtest.org) to make sure that the memory doesn't have any errors or faults. The problem could be with some other component too – run a disk scan to check the drive for any bad sectors.

Internet bandwidth disappearing

I like your problem solving section. It's very helpful. I wanted to ask you one of my problems. My system configuration is an Intel Core 2 Duo, Intel GCCR945RY motherboard, 4 GB memory, 450 GB SATA hard drive. I use the internet connection but I've found that I have
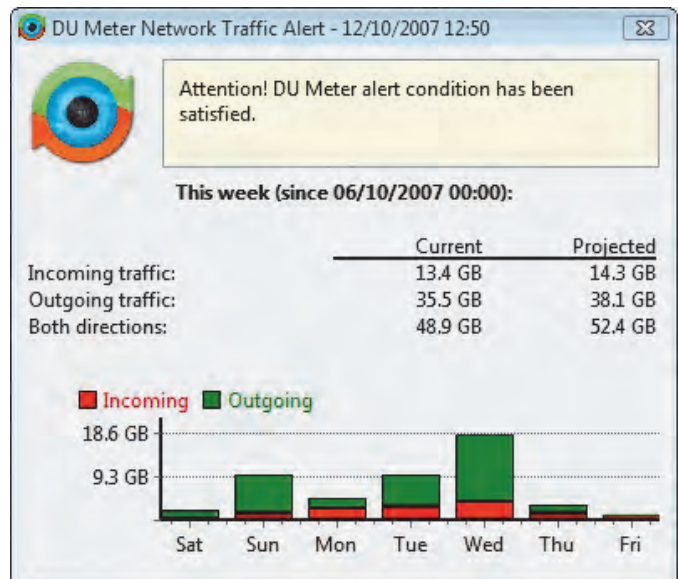
Dumeter is a good bandwidth monitoring tool

extra data uploaded and downloaded. I have even disabled all the update options including ones for the Windows XP SP2 and all other installed software like codecs, anti-virus definition updates, security updates, etc. I have also disabled auto-updating of software. But still, I have a lot of extra data transfer. I calculate data usage using my download manager, browser and other using statistics. But when I check internet connection properties, it shows approximately 35 to 50 per cent extra. As I am using my mobile phone connection, it not only wastes my time but also makes a hole in my pocket. I need some help - is there any application that shows all the data being accessed by any software application or any type of update?

Vikram Paliwal

There is always some network traffic even with no browsing or downloading on. It definitely can't be 30 to 50 per cent more than your usage though. Try using a software called DUmeter (www.hageltech. com/dumeter/). The software also

tracks the total amount of data sent and received. Alarms can also be set. A free alternative to DUmeter is Netmeter (www. metal-machine.de/readerror/). It lacks many of the features of DUmeter though.

Blue screens and viruses woes

My PC configuration is as follows – Motherboard: MSI P45 Platinum, Processor: Intel Core2 Duo E8400 3.0GHZ (overclocked to 3.15 GHz), Memory: 2 x 1 GB Corsair XMS 2 800 MHz, Hard Disk: Seagate 7200.12 500 GB, Graphics Card: Sapphire Radeon 4670, OS: Windows XP SP2.

I had installed drivers for the graphics card, but when I install Catalyst, a blue screen shows up whenever Windows starts. I undid the process of installing Catalyst through system restore. Games such as Grid, NFS and Assassins Creed run perfectly fine, but I want Catalyst as well.

Also, CPU-Z And GPU-Z analyses my graphics card and shows the speed to be 200 MHz. Getting this card replaced is not an option for me.

QnA

WiMAX laptops
MSI plans to launch WiMAX-enabled laptops in India

Offline email
Popular and open source email client Mozilla Thunderbird 3 gets ready to launch

Change at Ubuntu
Canonical CEO Mark Shuttleworth to step down

Recently, I removed a virus called `killvirus.vbs` using USB Disk Security and Threat Fire. Even then, a message keeps coming when Windows starts saying `Could not find the script file kill-virus.vbs`. I want to get rid of that pesky message.
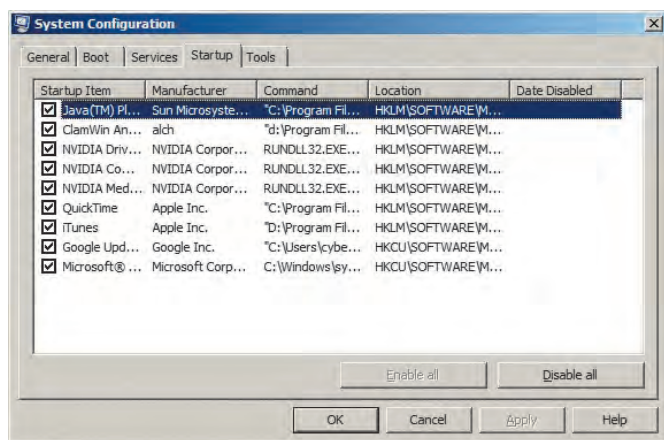
Avash Bista

One of the solutions might be to format your hard drive and install Windows altogether. Using System Restore

Disable any suspicious programs from loading during startup

to uninstall drivers isn't the best way to fix the issue. The wrong graphics card details might also be because of corrupted drivers. If possible, try installing your graphics on another system and check for similar errors. In case they are similar, you have to get the card repaired or replaced.

To get rid of the error message, go to Registry Editor by clicking on `Start > Run` and typing `regedit`. Browse to `HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Run` and look for an entry for `Killvirus.vbs`. Delete any relevant entry you may find. You can also start `MSCONFIG` and disable the entry under the Startup tab.

BIOS update for booting into BIOS

My motherboard is Micro Star Model No: MS-6577 Ver: 4.1. My current BIOS is Phoenix Award BIOS v6.00PG through which I cannot boot from neither bootable DVD nor USB drive. How can I upgrade my BIOS so that I can do the above and if possible, run a SATA Hard Disk as primary master Hard Disk using a SATA to USB cable.

Parnold

Not all boards support booting through USB and very few had the feature added through a BIOS update. You have to first identify the exact model number of your motherboard and then look for the BIOS updates on the MSI web site. Look for the list of changes to find the USB boot feature. Most newer boards will let you select a USB device as a primary boot disk.

Long list

I have a long list of problems. My PC configuration is as follows. Operating system: Windows XP Pro SP 2, Memory: 512 MB DDR2, Hard disk: 80 GB, Processor: Intel Pentium 4, Motherboard: ASUS P5GD1-TM Series Rev.105.01.

1) My PC is infected with Autoit.VQV. It has created a folder within a folder (eg. folder name "New folder" with a file "New folder.exe" is present of capacity of at least 300 KB in every folder in the PC). Please suggest good anti-virus to remove this virus. I had to format my C partition, but it didn't help. This virus uses up a lot of space on my drive.

I can't install anti-virus such as Avast, Kaspersky or Norton. It gives me error messages. When I double-click on the installer, nothing happens.

2) Before formatting, I could play games such as *GTA San Andreas*, *Max Payne 2*, *Half-Life*, and *Soldier of Fortune* which are installed on the D partition. After formatting, my games can't find their folders so I delete their folders by pressing `[Shift] + [Del]` and then reinstall them. But I can't play them when I double click the game executables.

3) I can't play games such as *GTA Vice City* and *GTA Myraid Island*. It gives me a `Unhandle Exception : c0000005 At address : 006f6330` error message. All these games mentioned work fine on my friend's computer.

4) I can't install Nero 8, but Nero 5 works. When I double-click on it, Nero extracts some files but gives me a `MSI engine cannot updated, Please update manually` message. I also can't install Adobe Photoshop CS4 because when I double-click on it, nothing happens. I can't install Bittorrent, but I can install uTorrent. It gives me some error messages.

5) My DVD drive can't read any of your DVDs (When I insert your DVDs it doesn't display anything). I have to boot several times, but it can

read some of my blank DVDs/CDs or DVDs written on my PC.

6) My CPU is also making a lot of noise.

All software/games mentioned worked properly before formatting the C partition. I kept my user name and password same. Please help me guys as I don't want to format my entire drive.

Abhishek Gupta

Most viruses will disable the task manager and registry editor. Some of them won't let you install anti-virus programs or even update them. You can try using online web scanners to stop of these problems, then install an anti-virus.

If you formatted the C drive, then the saved games folders from the Documents and Settings folders might have also been erased. The game crash also is because of some kind of corruption. Try reinstalling the game. The MSI engine error might be because you're using an older version of the Microsoft Windows installer application. Update it from Microsoft's site.

Try using a different DVD drive to read our discs. There might be a compatibility issue with the drive. Look for any firmware updates on the manufacturer's web site. The PC might be making noise because of either a faulty fan on the SMPS or the processor or graphics card.

If you have a poor quality cabinet, the panels on the sides or the base might be making the sound you're hearing. Do a thorough cleanup of the interiors and put some padding to reduce any vibrations.

A clean format and reinstall is also recommended. Try and use a different system to clear any viruses or worms on the remaining partitions before you do so. **d**

Office 2010

Before we could recover from the surprises packed into Windows 7, Microsoft released the Office 2010 Beta version. Full of new and convenient functions, the new Office can be downloaded for free at http://www.microsoft.com/office/2010/en/default.aspx with the foreknowledge, of course, that it's only going to work till October 31, 2010.

Word screenshots

No more using [Prt Scr]. You can now take a screenshot from within Word. This is great for writers who need to add images between their text documents.

If you want to take a screenshot, click on the Insert tab in the now familiar ribbon above, and you'll notice a button that says Screenshot. Run the mouse over it and you'll see a drop down window that tells you how to use it.

If you click on the screenshot button, it'll give you a preview of all the windows already open on your computer. It will not show you the windows you've minimised to the taskbar, so make sure they're all active behind the window you're working on.

Click on the one you need and it'll be inserted into the page you're working on in Word.

Please note this feature will not be available if you're working on Word in Compatibility Mode, but you'll still see the Screenshot button in the ribbon when you click on the Insert tab. To activate it, you'll need to click on File > Info > Convert so that the document gets out of the 1997-2003 format and lets you make use of the new features.

You probably noticed the Screen Clipping button at the bottom of the window that drops down from the Screenshot button. This allows you to crop or clip any part of a screen image and instantly include it into your Word document. Click on the Screen Clipping button and your document window minimises itself to show you the next open window behind it.

Remember to close all other Windows except for the one you need to take the image from, since this function only takes the one directly next to the one you're working on. This screen then takes on a white pallor and the cursor turns into a + sign. Click and drag the mouse over the portion of the image you wish to capture. Once you're done, the window automatically disappears to reveal your selection on the page of your document.
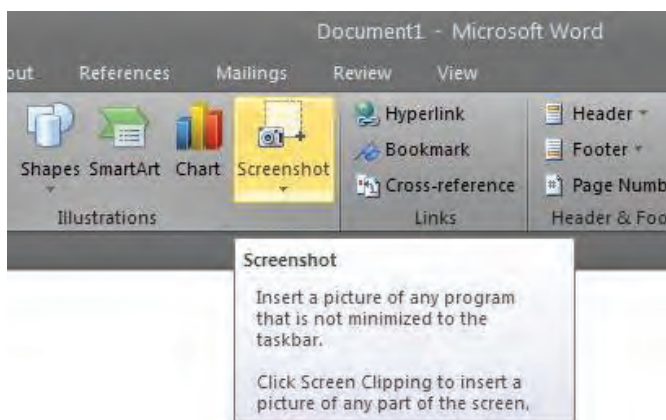
You could do the same with OneNote (Insert > Screenclip) and PowerPoint (Insert > Screenshot).
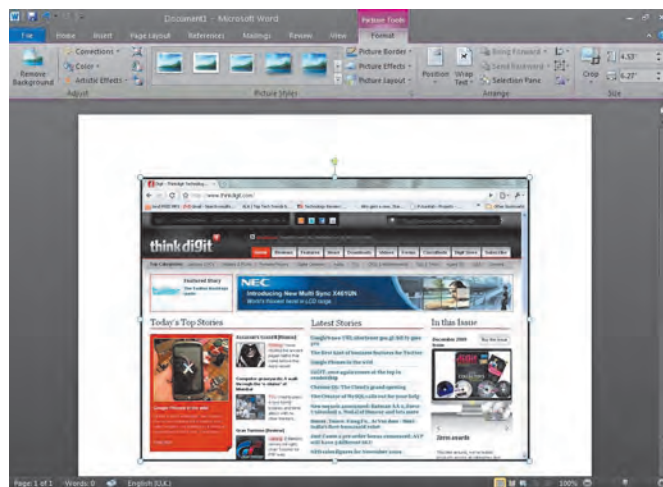
Blogging with Word

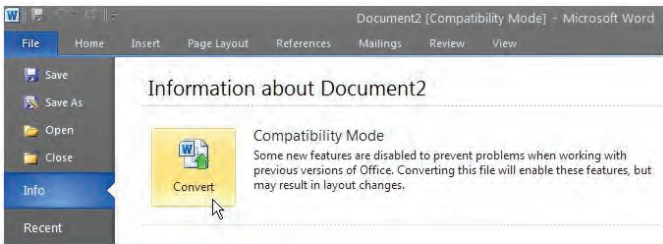Fed up of copying/pasting or uploading into your blog? Word
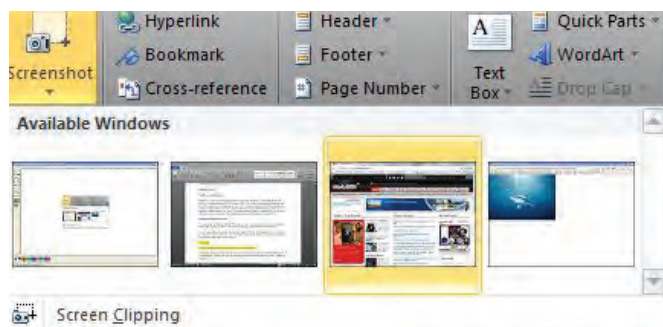
Don't minimise the screen you want captured

You can use this to insert full screenshots into text documents

The screenshot adjusts to the parameters of the page

Convert to get the best out of Office 2010

Add images to your notes

2010 allows you to post your literary outpourings straight from your document, without having to go through the process of opening a browser, logging in and uploading.

Just click on the Office button on the top left above the ribbon (File). Click on the New tab and choose the Blog post button. Click on the Create button on the right. You need to register your blog. You can choose from the most popular ones such as WordPress and TypePad.

All you have to do then, is fill the User ID and password for your blog. Once you're done with your blog post, simply click on the Publish button on the top left of the ribbon.

Video in PowerPoint
Until now, if you wanted to show your audience a relevant or interesting video, you had to create hyperlinks on your PowerPoint slides and temporarily *move out* of your presentation for the purpose.

PowerPoint 2010 lets you insert videos (or audio files, as the case may be) directly into the presentation itself.

When you wish to put a video into a slide, just click on the Insert tab above the ribbon on top of the page. Click on Video on the right side of the Insert ribbon and the drop-down menu asks whether you wish to embed the video from your own PC or from a web site.

If you click on Video from file…, a browse dialogue box appears for you to locate the file. Once you select the file, PowerPoint will embed it into your presentation.

You can even insert videos directly from YouTube, Daily Motion or any of your favourite video sharing site. When you click on Video from Web site, simply paste the embed code directly into the text box that appears and the video is
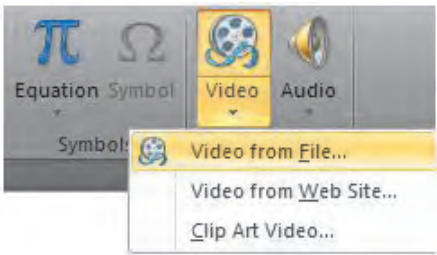
Video embedding made easy
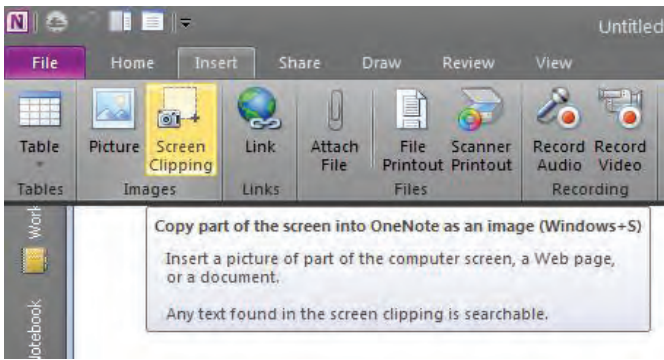
visible in the middle of your slide. You can then change the size of the video using the variety of Video Tools that appear in the ribbon above. With the same procedure, you can embed audio files directly into your presentation, using the Audio button next to Video, on the Insert ribbon.

Konfabulator
Getting started
To use Yahoo! Widgets on either your PC or Mac, you first need to grab the installer online (widgets.yahoo.com) and install it. Download the program, install it and go through the initial few options.

Photo streaming
The photo viewer that comes built-in with Yahoo! Widgets is actually the best tool when it comes to browsing pictures stored on your hard disk. When you first click on it, you will be asked to choose between loading pictures from Flickr, Yahoo! Photos or your PC.

Choose My Computer, right-click on the little pane and click on widget preferences. A small window will open where you can customise the settings for your pictures. You can choose the folder to monitor for photos in the Select Picture Folder. By default, it is set to My Picture. You can set the images to randomly or chronologically appear through the Sort Pictures option. You can set a transition interval of every minute, five minutes, 15 minutes, half hour or hourly. The second tab of the settings, Frame, will let you choose the style of the frame and the maximum size to display any picture. It's a cool way to keep looking at all the photos you have on your hard disk without having to browse through them manually.

If you store your pictures on Flickr, these settings can be used to configure default Yahoo! Widgets photo application for the photo-sharing service as well. To browse through pictures in online photo albums, WebImages (http://widgets.yahoo.com/widgets/webimages) offers better customisation and lets you save those web images on your hard drive.

To check out cool photos of the day from Flickr or National Geographic, there are two great tools. For Flickr, check out Flickr Explor'r (http://widgets.yahoo.com/widgets/flickr-explor39r) that show-
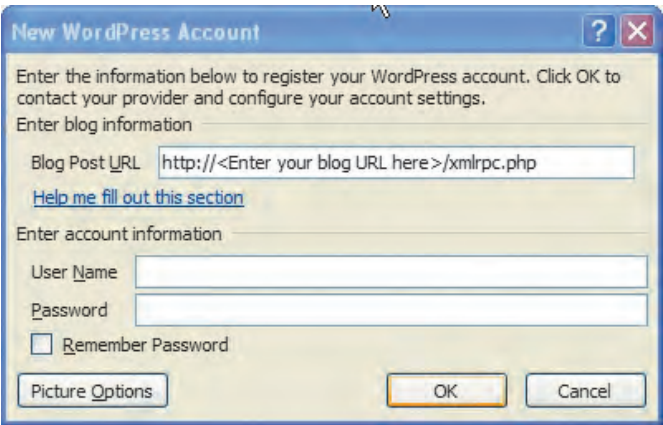
No browsers required

Yahoo! Widgets or Konfabulator, all your fun things at one place

cases the 500 most interesting photos from Flickr each day. And for nature lovers, the National Geographic Picture of the Day widget (http://widgets.yahoo.com/widgets/national-geographic-picture-of-the-day) promises to satiate your thirst for great scenic photographs every day.

Weather

If you wish to know the weather outside while sitting in your comfortable, insulated office cubicle, the default Yahoo! Weather widget is by far the best of the lot available. Its simplicity is what makes it so useful.

Click on it once in the Yahoo! Widgets dock to start it up, and you will see the weather settings for Sunnyvale – the international headquarters for Yahoo!. Click on it for a drop-down bar to change your location. In the ensuing box, just type the name of the city you're looking for, such as Mumbai or New Delhi, in the first blank bar. Yahoo! Weather recognises most international cities and will update your information accordingly.

The Weather widget itself is quite useful as in its mini mode, it will show you the current temperature outside and whether it's cloudy or sunny with an image representing the same. A drop-down icon in the bottom-left corner will give expanded information such as weather forecast for the next four days based on readings from Weather.com, as well as details of the current climatic conditions such as humidity, pressure, sunrise and sunset.

While Yahoo! uses Fahrenheit by default, Indian users might prefer to have their temperate readings in degrees Celsius. To change this, right-click anywhere on the widget, choose 'Widget Preferences' and check the box for 'Use metric units'.

Clock

The default analogue and digital clocks provide all the functionality you could want from a clock. They are both skinnable as well, with extra skins available at their respective pages in the Yahoo! Widgets gallery.

If you are looking for a great timer countdown widget, the best one we have come across is the Atomic Timer (http://widgets.yahoo.com/widgets/atomic-timer). Feature-rich, incredibly customisable and yet easy to use and configure, you will not need to even look at any other timer.

RSS reader

Without a doubt, the biggest flaw in Yahoo! Widgets is the lack of a good RSS reader. We tried out eight different RSS readers and tickers, but not one of them managed to impress us. The best option for those who absolutely want one is the RSS Reader widget (http://widgets.yahoo.com/widgets/rss-reader). It will let you add, remove and manage several feeds, as well as customise your font and the look of the widget. However, for some inexplicable reason, it does not support Word Wrap and keeps making you resize the window to read headlines that are larger than the width of the window. If you have a large screen and plan to keep this elongated all the time, it's

a worthy choice. Otherwise, we would strongly suggest sticking to a standalone RSS reader or ticker.

Webcomics reader

Just like with RSS readers, reading comics through a widget faces a similar issue of lack of contenders, when it comes to an all-in-one solution. The only decent option is DailyDose (http://widgets.yahoo.com/widgets/daily-dose), but it lets you monitor only three comics at a time. To add the comic strip of your choice, you will have to go to the Widget Preferences and copy-paste the web link to your desired comic. There are ample customisation options available for the comics through the widget preferences for the same, which are explained through an example comic already loaded.

However, if you must have your fix of daily comics through Yahoo! Widgets, most of the popular comics already have great individual widgets ready, including the likes of Calvin and Hobbes, Penny Arcade, Dilbert, Garfield, Ctrl+Alt+Del and XKCD. Just search for your favourite comic in the Yahoo! Widgets gallery and you should find it easily.

Mozilla Thunderbird 3

After spending 15 minutes with Thunderbird 3 (TB3), our first reaction was one of delight: Mozilla is back! Just like Gmail made Thunderbird 2 seem silly and archaic, TB3 makes Gmail seem utterly limited. The biggest reason for this is that at the end of the day, Gmail is an online email client; Mozilla has made Thunderbird 3 into what can best be described as a 'communication management' tool.

Google Calendar

Mozilla developer Bryan Clark has come up with an awesome extension that allows users to use Google Calendar in a separate tab in Thunderbird 3.

To get Google Calendar running as a separate tab in your TB3, head over to Clark's blog (http://clarkbw.net/blog) and scroll down to the entry on running Google Calendar in Thunderbird Tabs (November 23). Clark has provided a link to download his extension in XPI format. Once you save the file to your hard drive, open up Thunderbird and go to `Tools > Add-ons`. Navigate to the `Extensions` tab and click the `Install` button at the bottom-

> `Google Calendar` tab. Clicking on it will open a new tab prompting you to sign into your Google Calendar. Do so and you are ready to start using Google Calendar from a tab within your Thunderbird 3!

Google Wave

The new Google Wave service has been getting a lot of media attention, especially with its invitation-only policy. However, while it is touted as "what email would have been like were it to be invented today", Wave is not compatible with Thunderbird 3 or any other email client.

Thankfully, the web is full of clever little hackers who are

```
tor;1'].getService(Compo
nents.interfaces.nsIWind
owMediator).getMosRecent
Window("mail:3pane").doc
ument.getElementBy
Id("tabmail").
openTab("contentTab",
{contentPage: "https://
wave.google.com/
wave/?nouacheck"});
```

Click `Evaluate` and Thunderbird will open up a new tab with Google Wave running in it. Sign in and start waving! Cool, eh?

Browse links

One of the biggest complaints people have with email clients (and so do we, to be frank) is that when you get a link in an

you don't have to switch the browser window at any time and every link just pops up in an adjoining tab.

But that's where Thunderbird differs. Thanks to its large open-source community, the program has an extension called ThunderBrowse that lets you browse through sites and links right from inside your email client.

You can grab the extension from the add-ons manager or download it to your PC form thunderbrowse.com and install it. Once installed, ThunderBrowse will give you lots of options such as using autocomplete, enabling Javascript and cookies. The add-on is highly customisable and you can go through the options to tweak it to your favoured settings.

Running web apps

The method used to run Google Wave was inspired by Bryan Clark's source code for the Google Calendar Tab. Clark has also listed another cool work around for users to run any web app they want – be it Twitter, Facebook or Orkut – from a tab in TB3.

First, you go to `Tools > Error Console` in TB. In the box, type the following code: `Components.classes['@mozilla.org/appshell/window-mediator;1'].getService(Components.interfaces.nsIWindowMediator).getMostRecentWindow('mail:3pane').document.getElementById('tabmail').openTab('contentTab',{contentPage:'http://ABCDEFGH.COM'})`

To browse to a web app of your choice, simply replace the `ABCDEFGH.COM` to the site address such as `Twitter.com` or `Facebook.com`. Once you hit `Evaluate`, you should get
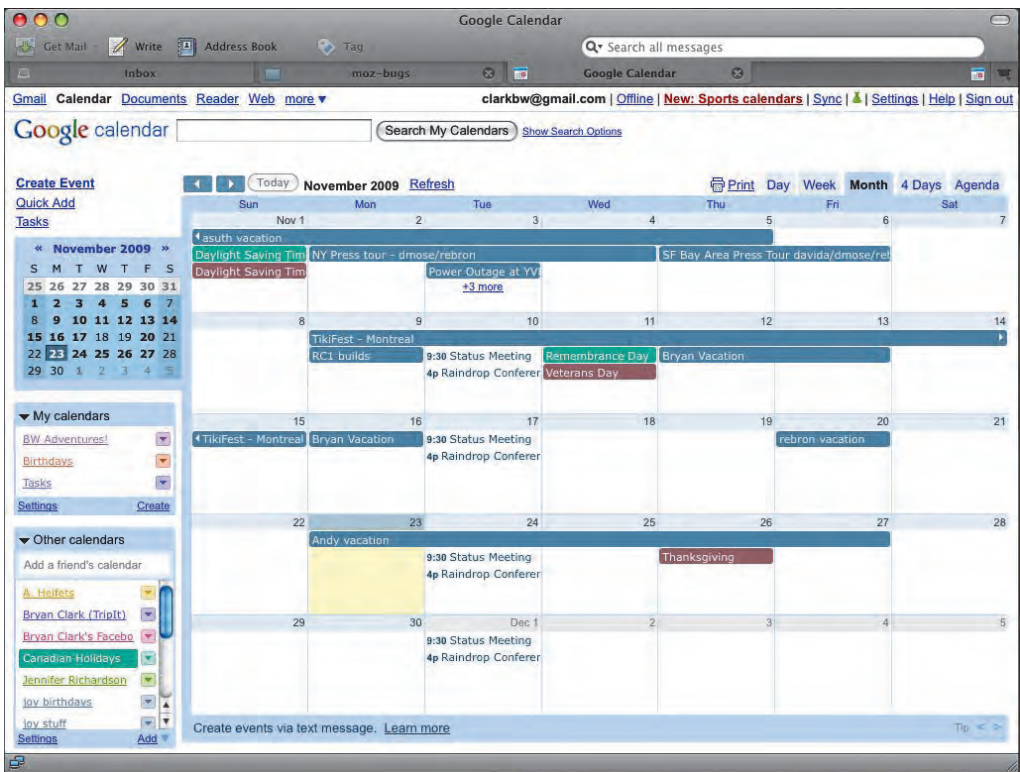
You can now use Google Calendar from within your Thunderbird client

left corner. In the pop-up box that follows, browse to where you have saved GoogleCalendarTab.XPI and open it to install the same in your TB.

After restarting your Thunderbird, head to `Tools`

ready with a way to run Google Wave in your Thunderbird 3. First, go to Tools > Error Console. There, in the provided box, type the following code `Components.classes['@mozilla.org/appshell/windowmedia`

email, you invariably have to go to a different application – your browser – to open it. This is annoying, tedious and one of the main reasons so many people prefer to use an online email client like Gmail, since

Google Wave on Thunderbird? That's a surprise

a new tab with the service open in it.

Knowing the robust Mozilla community, it won't be long before someone comes up with a great add-on or extension that lets you browse sites and web apps easily. But even as it stands right now, for a techie, Thunderbird 3 is an amazing communication management tool.

Another way to browse the internet or open web apps in TB3 is by using Thunder-Browse. Just create and save a draft email with all your favourite links in it. Open the draft and click on the links to start a tabbed session of ThunderBrowse within your client.

Autohide Tabs bar

If you aren't using any of the tabs and just have your inbox open, it does not make sense to waste any of that vertical screen realty. So let's go about auto-hiding the tabs bar, shall we? First, go to `Tools > Options > General Tab > Config Editor`. A warning will prompt you that this shall void your warranty (Thunderbird has a warranty?), so just accept that and click through it. In the filter box, type `mail.tabs.auto-Hide` and hit `[Enter]`. If the value of the entry is set to false, double-click on it to change it to `true`.

Download images automatically

Thunderbird 3, for some reason, does not download

images sent with emails automatically. There are quite a few newsletters and other important mails we receive, as well as fun forwards, which depend heavily on these images. So how do you bypass this annoying feature?

First, go to `Tools > Options > General Tab > Config Editor`. The program will warn you that you are about to void your warranty; accept that. In the filter box, type `mailnews.message_display.disable_remote_`

ThunderBrowse at work

image and hit `[Enter]`. If the value is set to false, double-click on it to change it to `true`.

Sync contacts

Thankfully, Mozilla has configured TB3 such that all your messages are synced brilliantly with Google's email service. However, a lot is left to be desired when it comes to the Contacts list.

To sync Google contacts with the address book for

your Thunderbird, there is a handy extension that can help you out. Called gContactSync, the experimental add-on is available on the official Thunderbirds add-on page at https://addons.mozilla.org/en-US/thunderbird/addon/8451.

Once installed, click on the extension in the add-ons pane and enter its Options mode. In the Accounts tab, click on the `Add Login` button and provide your user details, and hit `OK`. From here, gContactSync will take over, and within ten minutes, you should have your TB address book synced up with your Gmail contacts.

Import address book

If you use Yahoo! Mail, Hotmail or some other email service, then grabbing your contact list isn't as easy a procedure as installing an extension. In this case, first go to your email account's contact list through your browser. Select all your contacts and look for `Export`

in the various options available on the page. For example, with Windows Live Mail, the option is situated in the drop-down list when you click `Manage`.
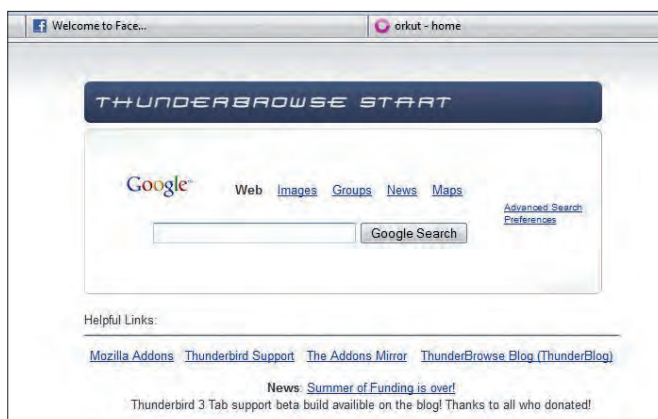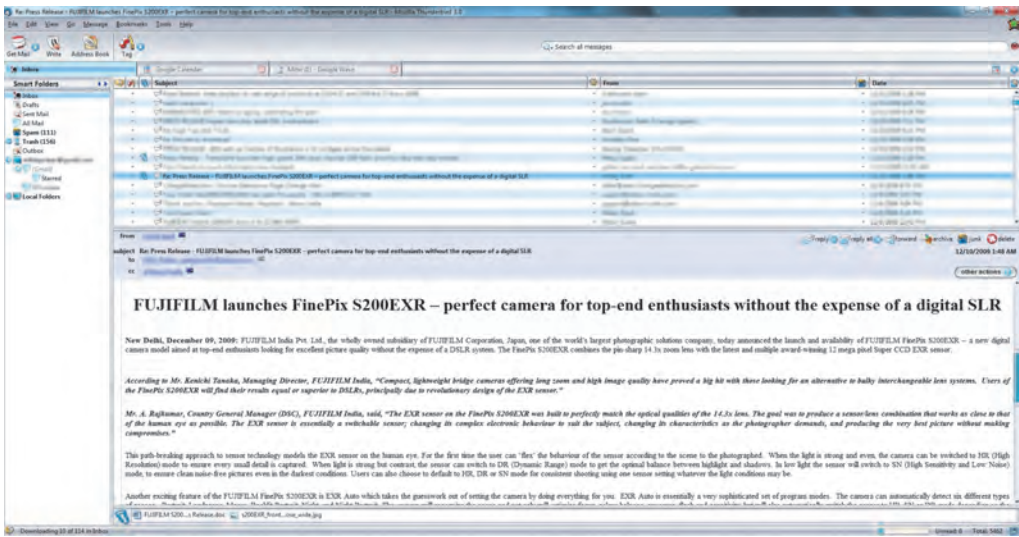
By default, most email services export your contact list in the CSV format, which both Outlook Express and Thunderbird can read. Some email providers give multiple format options; in that case, choose CSV or anything that is Outlook compliant.

Once you download and save the file to your hard drive, go to your Mozilla Thunderbird and select `Tools > Import`. In the first pane, choose Address Book. Next, choose text file (LDIF, TAB, CSV, TXT). Browse to the file on your hard drive when prompted. Put a check mark against the fields that you want imported and click `OK`. You're done!

This same method can also be applied to Gmail, of course, but with an extensions as awesome as gContactSync, the need would never come up.

Enable spell check

To avoid making spelling mistakes, Thunderbird 3 comes with a built-in spell check. However, you will first have to enable this. Go to `Tools > Options > Composition > Spelling`. Here, check `Check spelling before sending`. Currently, Thunderbird 3 supports only the American-spelling dictionary for English words, but this should soon be rectified, in all likelihood.

Noia 2.0 is an interesting theme for Thunderbird

Exciting themes

Just like Firefox, Mozilla has made Thunderbird completely skinnable. This has led to many independent fans come up with themes for the email client over the years. While Thunderbird 3 does not support older themes yet, there are quite a few of the old favourites that would still catch anyone's fancy. The one that stands out, in our opinion, is Noia 2.0 eXtreme. A must-have!

Ubuntu 9.10

The release of Canonical's Ubuntu 9.10 coincided with the release of the latest Windows OS and prompted comparisons between the two. In fact, some even suggested trying out Ubuntu as a replacement for those who are not satisfied with Microsoft's operating system.

Boot options

If you're satisfied with the Live CD experience, and choose to install the OS to the disk along with any existing OS, you will feel miffed. During installation, Ubuntu succeeds in annoying the user by displaying what is hallmark Windows behaviour - messing up the bootloader. The boot loader installation cannot be tweaked, so one cannot change the default boot option - which is Ubuntu. Dedicated tools to modify the boot menu are available in some distros like PCLinux and Opensuse, but in Ubuntu one needs to do the modification maually using the text editor and command line. Additionally, those who are familiar with editing the /boot/grub/menu.cfg file will be clueless here. The reason : Ubuntu uses GRUB2 which works differently and doesn't use a menu.lst file.

In Ubuntu to get the default OS entry right, you need to edit the /etc/default/grub file. This file is not quite helpful because it does not list the boot entries. So either recall the entries in the boot menu displayed when your booted, or open the /boot/grub/grub.cfg file to figure out the exact entries and their sequence. In the grub.cfg file, the "menu entry" prefix denotes the entries in the boot menu. The first entry is numbered 0, and the second 1 and so on. Once the required default entry number is arrived at, this figure can be added to the line GRUB_DEFAULT=1 replacing the 1. This line is in the /etc/default/grub file, not the grub.cfg file. The default interval of 10 secs can be adjusted by tweaking the GRUB_TIMEOUT=10 line, in the /etc/default/grub file.

Of course, there is a possibility that the GRUB routine gets the boot parameters wrong. In the case of the writer's system already containing a PCLinux installation, GRUB did not properly detect the boot parameters leaving the PCLinux installation inaccessible. In such cases the menu can be modified by editing the /etc/grub.d/40_custom file to include the corrected menu entry. This is a bit advanced, but for minor editions, like in the writer's case, the relevant entries from the grub.cfg can be copied over to the 40_custom file and necessary changes made.

Once all modifications are completed, the command grub-update needs to be run to ensure that the changes are incorporated in the /boot/grub/grub.cfg file which is the basis of the boot menu.

Root password?

In the Linux world the root account is held in high esteem. In 9.10 the all powerful root account is practically insignificant - the first user becomes the defacto root. Unfortunately, if one doesn't know this fact, it can be quite frustrating trying to figure out what the default root password is (a online search reveals root-mein), since the installation routine doesn't seek one and trying the user password is the last thing on a Linux user's mind. Also try logging in as root or su, and you won't get much far. The solution is to use the "sudo su" command to stay on with higher privileges for a longer period.

The right Resolution

Getting the video right can be considered as a top most priority for a distro, and when two year old distros manage to get it right, one would expect the latest distros to atleast do as much, especially since the hardware is not cutting edge. But, Ubuntu 9.10 (or 9.04 for that matter), fails to detect the max resolution on two of the systems this writer tried installing the OS on. Now had this been PCLinux or Opensuse, the tools to modify the graphics properties would be available within the GUI, but this is Ubuntu. So one needs to be prepared for some command line action. There are a few surprises in store here as well. For one, the familiar xorg.conf file is missing. So to create a xorg.conf file, one needs to run the X -configure command after logging in as superuser. As in the writer's case, even this doesn't always work, in which case the best option is to download the relevant
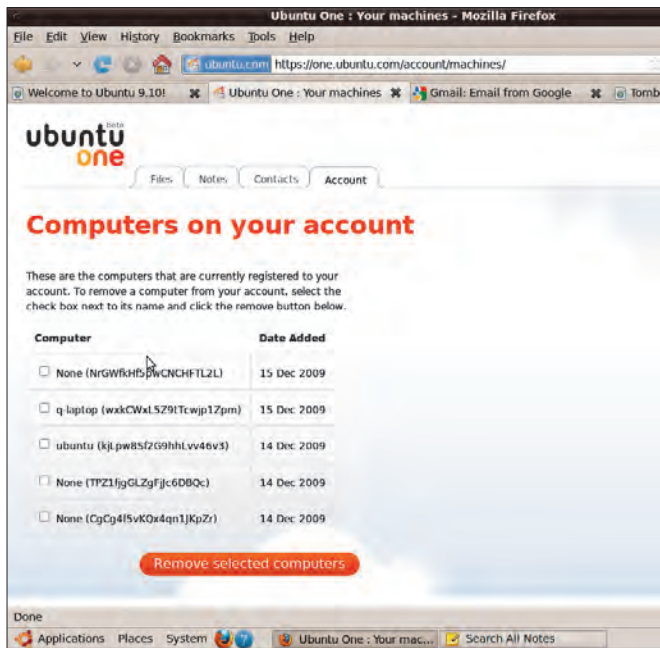
The Ubuntu One account page

On the cloud

Ubuntu One is the name of Ubuntu's cloud service. The Link to Ubuntu One is under the Appications, Internet Menu. A user needs to sign up for the service first, and on first launch a browser window takes you to the sign up page. Subsequently launching Ubuntu One link opens the preferences window, where one can set the behaviour of the service. An icon in the system tray will display the status of the Cloud and allow easy synchronisation. Unfortunately, despite 9.10 being the first Ubuntu to offer this feature, the synchronisation operation is not smooth and the reason for this is that the client software is incompatible with the server.

Nonetheless, one can add data in the form of files, contacts and notes to the Ubunto One account and these can be synchronised within applications like Nautilus, Tomboy and Evolution respectively on systems running the service.

graphics drivers and follow the instructions.

Migrating settings

Theoretically, it involves merely copying the files from one installation site to the other. Ubuntu has incorpor-

The Ubuntu Software Center

tated a tool to do this during the installation, but in the three installations that this writer did, the tool failed to detect the Windows installation on the same disk, and in one case the PCLinux installation as well. Even when the other OS is detected, the end result of the migration is not obvious. There doesn't seem to be any documents imported to the user's home folder, and neither are any settings changed in the Ubuntu environment as a result.

Wubi

This is an interesting utility. Briefly, it allows one to install Ubuntu in any Windows partition. Wubi creates a folder in the Windows partition where all OS files are stored, and requires atleast 3 GB free space to start.

After providing a password, space and location to store the files at the start of the process, there is no user interaction required. So, potential minefields like creating partitions are avoided. Once launched, Wubi goes through the same motions as the normal installation process. On rebooting, post installation, the modified boot menu presents both OS options with the default option being the Windows installation. The Ubuntu installation performs quite smoothly with no apparent lag inspite of using a non native file system. The application can be uninstalled like any Windows program and the disk space freed, but the boot menu is not restored (atleast in Windows XP). If no entry to the uninstall link figures in any menu, the uninstall file is present in the Ubuntu folder Wubi is highly recommended for people using Windows and should be the only way to try Ubuntu to avoid most troubles of a normal installation. Sadly, Linux users are not similarly treated.
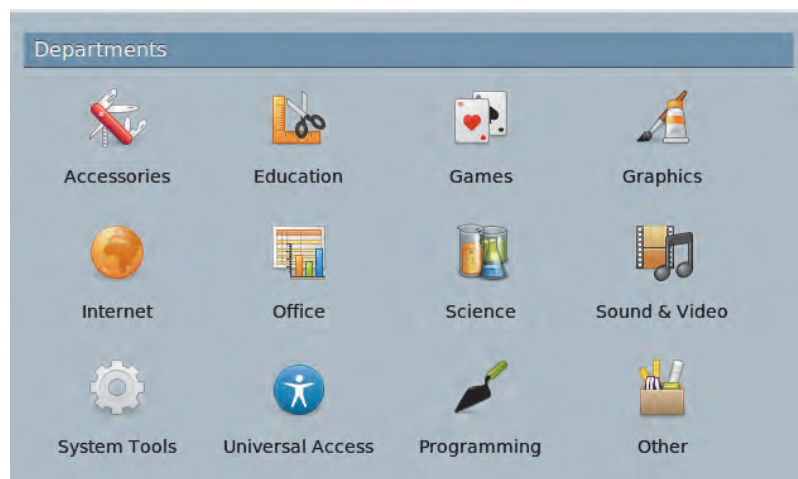
Mobile broadband

One feature that thoroughly impressed this writer was the automatic configuration of the GPRS enabled mobile phone. Just plugging in the mobile presented a wizard, which already had the settings to access various GPRS service providers from India, like BSNL, Airtel, Idea etc. A few clicks and one was online. Impressive. In contrast with the earlier PPP or wvdial routine in older versions of Linux, and the Nokia PC Suite in Windows, 9.10 truely is in a different league.

Conclusion

9.10 is for the inveterate distro hopper who already has gotten into the Ubuntu groove. For Windows users, Wubi is the recommended route - probably the best way to sample a distro, something for the other distros to emulate. For the rest of us, 9.10 is worth a dekko to drool over the visual effects, and return to our more familiar distros.

Setting the tab

With rising power costs, it's time to take a look at ways we can reduce our electricity consumption. To reduce your PC's power consumption, it's important to get the right hardware in place and tweak your settings according to your needs. Before you know it, your laptop battery will be going longer than usual and your electricity bill will see a substantial cut.
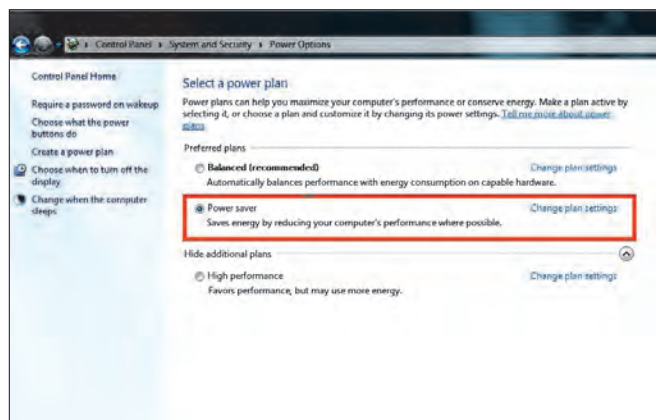
Hardware

First make sure your power socket and wiring is good. You can ask an electrician to verify this. If either of these is faulty, your computer can try to sap more electricity than it needs.

Solid state drives and ultra-low voltage processors are becoming increasingly affordable and offer significant boosts in power usage. When choosing a monitor, go for an LED monitor over an LCD, and an LCD monitor over a CRT. LED is the most power-effi-cient technology for screens, while LCD comes second. An LCD monitor can reduce your power consumption by 70 per cent when compared with a CRT monitor.

Reducing the brightness of the screen also reduces power consumption. Change your monitor's settings and reduce the brightness to a point where it's still comfortable to read text easily. A simple way is to open a Word document, set the font to Arial, size 8. Change the colour to a grey that is mid way between white and black on the font colour palette. Now reduce your screen brightness or contrast to the point where this text is legible. With this setting, all other text you come across should be easily readable for you.

Unplug any external devices you won't be using, such as portable hard drives, additional wireless keyboards and digital cameras. If you are not using your optical drive, keep it empty and don't forget any disc in it. Each disc periodically asks the computer to seek it, thus taking up more power.

Software

If you're running Windows 7, there's good news for you as Microsoft has come up with a special `Power Saver` mode which will ensure your computer does not take up any more electricity than needed. To activate this, go to `Control Panel > System and Security > Power Options` and select the `Power Saver` power plan.

You can further customise your power plan by clicking on `Change plan settings`. The two main options here are the amount of time in which the computer will automatically switch off the monitor and the amount of time it will put the computer to sleep. Tweak it to your heart's content – we recommend keeping the display turn-off at 5 minutes and the computer sleep time at 10 minutes.

Not many people know that the screensaver actually guzzles up a lot of power. You can program your PC to automatically turn off the display through Power Options. Install MonitorOff (www.monitor-off.com) that lets you configure hotkeys and different timers and other schedules for your monitor to be automatically switched off when not in use.

If the above settings are already enabled, and you wish to have more control over your computer's power usage, a nifty free application called Set-Power (http://www.setpowersoftware.com/Free.aspx) might just be the answer. Immensely customisable and robust, SetPower lets you create power profiles and schedules for your computer based on hourly, daily and monthly requirements.

Power saver mode in Windows is your first step in cutting down

LCD or CRT?

Electronics DIYs
If you're an electronics hobbyist and find such projects interesting, send us exciting ideas so we could feature them in our future issues

Etching
This is a process of dissolving copper on a PCB, so that components can be soldered on a printed circuit board without using connecting wires

DIY

Build your own amplifier

Nash David
nash.david@thinkdigit.com

DIYs are fun. Electronics is fun too, but the thought of putting your circuitry together and soldering them seems like a daunting task. If done right, you should be able to get your circuitry up and running in the first go. But as an amateur, mistakes are bound to happen. You might need to take a closer look to ensure all the connections are right. We'll attempt building an amplifier around the TDA 2030A audio power amplifier IC. We referred to the data sheet of this IC and opted for the bridge amplifier configuration for its simplicity and price.

Although the circuit looks small, building it can be a tough nut to crack for an amateur. Taking care of a few things, however, could take you a long way. This way you'll find it really easy.

Your components

Resistors are thin components with coloured bands. These coloured bands are standard convention used in reading the values of resistors.

Among the various types of capacitors, you'll use ceramic as well as electrolytic capacitors while building this circuit. The difference between the two is that electrolytic capacitors have polarised terminals while ceramic capacitors don't.

You can connect ceramic capacitors irrespective of polarity, but when soldering electrolytic capacitors, ensure the terminals are oriented across appropriate voltage potentials. Also, electrolytic capacitors have a voltage rating. As a rule, opt for a voltage rating of double the power supply.

Effectively, for this circuit, with a power supply of 15 V, use electrolytic capacitors with a voltage rating exceeding 30 V. We opted for 62 V.

Integrated circuits have a pin-out diagram and you should refer to the appropriate data sheet for information on pin-outs to avoid damage to the component as a result of wrong connections.

Circuit diagram

Understanding circuit schematics and following connections is vital in getting your amplifier to work. The circuit diagram in Figure 1, A line indicates a connection path. Similarly, two intersecting lines mean the connections don't intersect each other. If the two lines intersect each other and have a dot at the point of intersection then the two paths are connected. Accordingly, positive supply voltage is connected across pin 5 of the two ICs and pins 1 and 5 of IC1 are not connected to each other. These are some common errors while building a circuit.

As you can see in the circuit diagram, there are two amplifier ICs with an identical circuitry for each stage. This supporting circuitry is wired such that both the ICs handle the signal identically. However, one generates a positive signal while the second stage generates a negative signal, thereby increasing the resultant potential difference of the output signal. This way, you have double the output with the same amplification factor. This way of wiring an amplifier is known as bridging. A sample of the input signal is fed to the inverting input of the amplifier to get an inverted output. The output of each stage is then connected to the speaker terminals.

This circuit needs a symmetrical power supply built around a centre-tapped transformer (18-0-18V/1A). We got one for around Rs. 90. The two wires on one end of the transformer (known as the primary winding) should be connected to the AC 230 V supply. Similarly, in the case of the centre-tapped transformer, you'll find three wires at the other end (secondary winding). The wire at the centre should be considered as ground.

If you take a multimeter, set it to AC voltage measurement (indicated by the V~ symbol) and measure the voltage across the terminals (the centre terminal should be reference), you will get a reading around 18-20V. However, the two AC

What you need

Resistors
R1, R2, R3, R5, R7 – 22k
R4, R6 – 680E
R8, R9 – 1E

Capacitors
C1 – 2.2uF
C2, C6 – 100uF
C3, C7 – 100nF
C4, C5 – 22uF
C8, C9 – 0.22uF

ICs
7815, 7915 – Positive and negative voltage regulators (15V)
TDA2030A x 2.

18-0-18V step-down transformer
3.5-mm audio jack (male)
Connecting wire
Multimeter
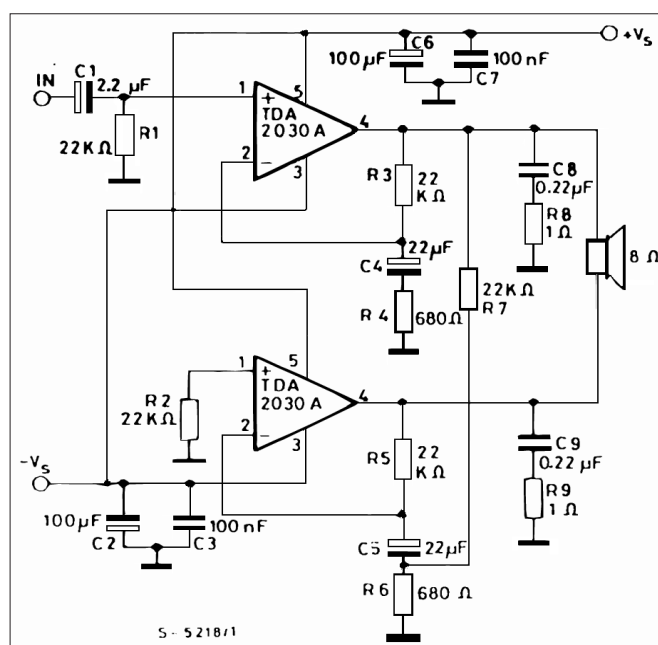Soldering iron and alloy
General purpose PCB
Speaker connector

Figure 1: TDA 2030A wired in a bridge configuration can give you a higher audio output with fewer components or amplification stages

Make your cabinet
You can use a variety of materials such as plywood and sheet metal to house your amplifier. You can also use ready-made cabinets available in electronic stores

Shielding
When using cables for audio signals, always use coaxial cables with a braided outer layer. This braided layer is grounded and prevents external noise interference

Resistor colour code

The sentence – **BB R**oy (from) **G**reat **B**ritain (had a) **V**ery **G**ood **W**ife – is commonly used as a mnemonic for the colour code. The first letter of each word corresponds to the colour band.

Colour code		Value
Black		0
Brown		1
Red		2
Orange		3
Yellow		4
Green		5
Blue		6
Violet		7
Gray		8
White		9

Accordingly, if the resistor is colour coded Red-Red-Orange, then its value is 22 x 10^3 = 22 x 1000 = 22 k.

signals are out-of-phase. Electronic circuitry need a DC supply to work. Effectively, this is where our first circuit stage is needed. A rectifier circuit converts the lower voltage alternating current to a more stabilised direct current (DC) supply. There are two kinds of rectifiers – half wave and full wave rectifiers. The most common type of rectifier circuit is the bridge circuit which is nothing but four diodes (1N4007) connected as a bridge. Input AC voltage is applied across two ends of the bridge, while unregulated rectified DC voltage from the other ends are fed to the voltage regulator stage. The voltage regulator is built around positive and negative voltage regulators ICs 7815 and 7915, respectively. The one tricky thing about these voltage regulators is their pin outs. Depending on how you look at them, pin numbers 1 to 3 are arranged differently. Test your connections

separately before attempting to power your amplifier off it. With all going right, the output voltage should be stable at +15 V and -15 V, respectively.

With your power supply done, the most important part is the amplifier itself. For this, a closer look at the circuit diagram will tell you how to go about building the circuit. The two ICs as explained earlier are two stages used to process the same audio signal. In fact, both the stages are wired identically. The only difference is the output audio signal that is fed back to the inverting input of IC2 via the RC stage comprising R7 and C5. And yes, the +15V and -15V that you got from the regulator stage will be connected to the points marked +Vs and -Vs. Similarly, the point marked with the black line (GND) is connected to the centre tap of the transformer (also the common point of ICs 7815 and 7915).

Stages

The circuit is made up of several stages. A look at Figure 1 will give you a fair idea of how your amplifier will work.

Input stage

Audio signal is input via a 3.5-mm audio jack. Connect

Reading capacitor values

Ceramic capacitors have a numbering scheme instead of colours. The first number represents the first digit, the second number, the second digit, the third number is the number of zeros to give the capacitance in pF. For example, 102 indicates 10 x 10^2 in pF = 10 x 100 = 1000 pF = 1 nF

the wire soldered to the outer connector to the ground terminal, and the inner wire carries the audio signal. Capacitor C1 couples the audio to the input of the amplifier and reduces the DC level at the input of the amplifier.

Biasing/Feedback

Resistors R1 and R2 (22k) are connected to pin 1 of TDA2030, respectively. Also, R3, R4 and C4; and R5, C5 and R6 together form the biasing network for ICs 1 and 2. R7 couples the audio between IC1 and IC2.

Output stage

Capacitors C8, R8, C9 and R9 form the output stage before interfacing the speaker. A series RC-circuit (resistor and capacitor connected one after the other) helps boost the audio signal. Use a speaker connector to connect your speakers here.

Power supply stage

Pin 5 of IC TDA 2030A is connected to +15V and pin 3 to -15V. Capacitors C6, C7, C2 and C3 form the basic by-pass circuitry to remove AC components from the regulated power supply. This minimises AC hum due to 50 Hz mains AC supply voltage.

Soldering

File the component leads to get rid of oxide deposits. This will aid a good solder joint. Insert the component into the PCB and on the other end, place the hot soldering iron tip across the component lead near the copper base of the board, while applying the solder alloy. 2-3 seconds should be ideal.

Powering on

Before switching on your amplifier, check all the connections with the continuity checker on a multimeter, ensuring they're all connected. If all seems fine, your amplifier should work, unless a particular component is faulty; in which case, you'd have to isolate and replace the faulty component. If you've followed the circuit diagram, your amplifier should function properly; and yeah, as far as the price goes, you should be done within Rs. 250. **d**
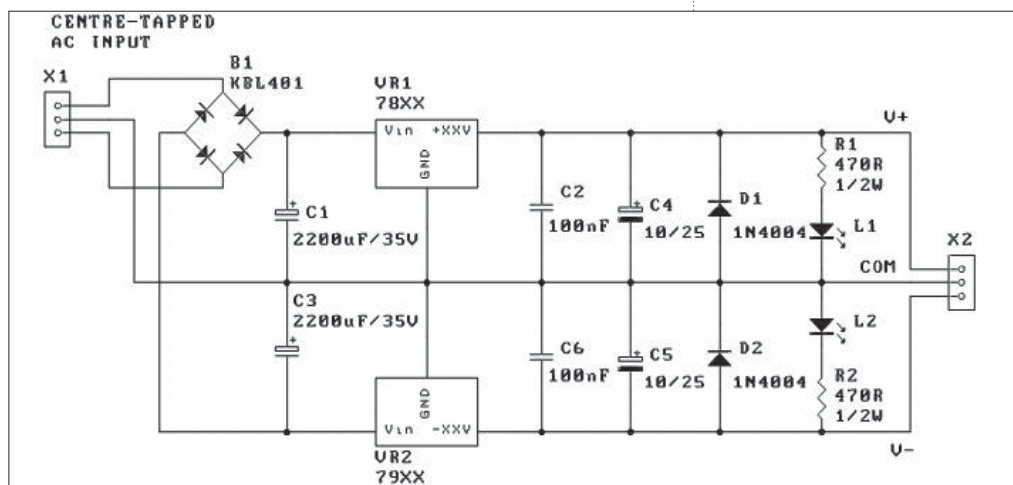

Figure 2: You need to convert AC to DC to power the amplifier circuit in Figure 1. Use 78XX series voltage regulator ICs for this

Street smart

In touch with ergonomics **96**
After hearing his friend out, Agent decides to take
a look at ergonomic devices available. Enough of
aches and pains. Time to ease out

Price watch **98**
Looking for accessories or buying a
new gadget? Get the latest prices

Photographs: Jiten Gandhi

Must have Streetware

It's no secret that we're Lamington Road regulars, and each one of us has our favourite dealers, but what about all those little guys peddling their wares in makeshift shops? The story's the same wherever in India you are, and you've probably been wondering if any of those interesting looking gadgets are actually worth buying. From lights and fans to USB attachments and more, it's all so tempting isn't it? We decided to do an under Rs. 300 roundup of some of the best and worst stuff out there. Obviously, no one, including the shopkeepers you buy this stuff from will guarantee anything, so make sure you use and test everything before you pay.

Here's our round up of 12 products that you **MUST HAVE**, some that you just **WANT** and other that you should **AVOID**.

Siddharth Parwatay
siddharth.parwatay@thinkdigit.com

Anti-glare scratch guard (Rs. 40)

Well, LCD screens don't really produce all that much of a glare anyway right? Besides, the glue used on this scratch guard is not at all adhesive. It'll keep flapping and won't last a day. Definitely avoid.

Triple fan notebook cooler (Rs. 110)

This product is basically an acrylic sheet with four rubber knobs and three fans. It promises to keep your laptop cool, and we found that it actually doesn't do as bad a job as we thought it would. The fans are powerful enough to cool down your precious hardware. Just plug it into a USB port, and place your notebook on top of it — carefully, because it's not as steady as it looks. The blue LEDs will make your notebook look like an invading alien spaceship, and that's something some of you will love and others will hate, so figure out which, and either run out and get it, or skip to the next product. Since the fans are not shielded, be careful where you put your fingers, and don't even think of putting it on your lap!

Killer rigs
98 Plan your dream configuration depending on your needs. Whether budget, gaming or high-end rigs, you'll get a headstart on it all

MIDI guitar
The innovative folks at released a funky looking MIDI controller in the shape of a guitar. It's got 32 LED push-button switches and 6 touch sensitive copper plate switches

Feature

USB Light (Rs. 65)

It's late and night, and everyone's asleep. You're trying real hard to not wake up the house, while you surf for... err... whitepapers. Your laptop screen brightness is all the way down, and since hardly any notebooks come with key backlighting, even typing thinkdigit.com can be as hard as playing F.E.A.R. without ever using your flashlight — impossible. That's where this little gadget can be a lifesaver. It connects to USB, and has three LEDs that are pretty powerful over short distances. You're never going to have to squint to find the right keys again, and best of all, no one is going to be disturbed by bright lights. The bendy-wire-neck-thingie lets you adjust the light just so, and it's only Rs. 65. Get it now!
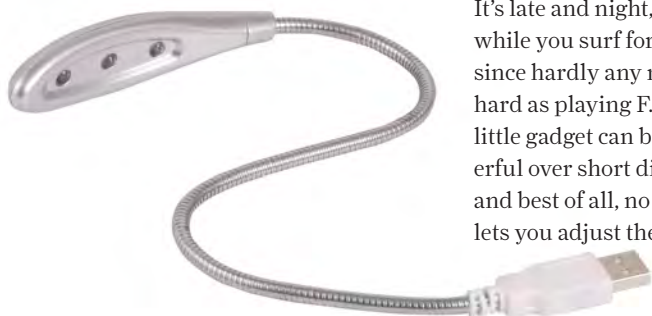
USB Hub (Rs. 100)

Who wouldn't want this funky looking USB Hub? Unlike those boring HUBs that have all their ports an a single line, this one is more functional. Something definitely worth having plugged into your PC at all times.

FM car transmitter (Rs. 200)

Some people have music systems in their cars that are worth as much as the car itself. With CD-changers, satellite radio, funky displays, and other features that most can't afford... For the rest of us, there's the FM car transmitter. What this gadget does is let you turn a regular USB flash drive or memory card into an MP3 player. Connect your pen drive to this gadget, hook it up to the cigarette lighter port, tune your radio to the specified frequency, and you're good to go. There's a remote and a display to show you the track details, but make sure you're not bending over trying to read the small font while driving. What's more, you can now play DJ for some of the other poor car radio owners stuck in traffic around you...

USB fan (Rs. 65)

For those times when you want to experience the wind in your hair, even if you're working in an AC environment. We're kidding. This powerful little fan provides life saving comfort for those times when you're working in a stuffy room and sweating right down to your unmentionables. But wait a minute... what if you put your finger in it? We were curious too, and got the new intern to do it. Turns out the blades are soft membrane – not mightier than your finger.

Chargeable Speakers (Rs. 275)

Linux fans rejoice ! This cute little penguin speaker works on a rechargeable lithium ion battery and draws power from a USB so it can be an improvement over your laptop speakers as well. The device weighs just 80 grams and is about the size of a tennis ball so don't expect to blow your ear drums with its 3 W output. Still the sound quality is definitely not bad. It can connect to any MP3 player or phone with a 3.5 mm jack making it perfect for weekend trips, picnics or even to annoy fellow commuters in the train. In case you're wondering the sound comes from the penguin's back side.

Feature

Happy Geek Christmas!
Some folks all over the world are busy making LED Christmas trees. Quite a fun idea worth trying

Flying high
Boeing's 787 Dreamliner is in the air. The behemoth is an 80 per cent composite material aircraft, with 35 tonnes of carbon-fibre reinforced plastic

Gaming Mat (Rs. 170)

Long cylindrical packaging and a name a name like PlayMat, arouses a strange suspicion. Turns out it's a gaming mat. And a very good one at that. Not that it's a testament to the quality but the company that make this, UltraPRO has website too and seems to have a rather large range of products. The mat offers a huge playing surface and has a very nice print of a dragon. The mouse glides smoothly over its traction happy surface. We'd say it offers about 70 per cent of the performance of products offered by the likes of Razer and EverGlide, at about 15 per cent of the price. Sweet deal isn't it?

LCD cleaning kit (Rs. 40)

People often poke their friends about the possibility of getting questionable stains on their LCDs from watching questionable content. If it does ever happen, you can always use this box set which comes with a soft cloth which is a 80:20 mix of polyester and polymide – whatever that means. There's a liquid spray, that works quite well, and a soft brush that has a miniature hand at one end for some reason.

CD and lens cleaner (Rs. 50)

Many users write in about how they can clean their CDs and DVDs. Well here's something you can try. Along with badly translated Chinese instructions, this kit comes with a CD VCD cleaning fluid, soft cotton brush, a separate DVD cleaning fluid to be used with the lens cleaner CD. The lens cleaning CD has two brushes with soft bristles on the reading surface. The fluids are odourless, colourless, non-viscus, and non-soapy. We wouldn't be surprised if the bottles are just filled with water. The lens cleaning disk just about saved this one from the avoid list.

Bluetooth (Rs. 100)

If your laptop doesn't have Bluetooth, then a dongle is a must. This one is the smallest one we've seen so far. Let it occupy a spot on your laptop and you have Bluetooth connectivity. Even for your desktop PC it's always nice to have another means of connectivity right? Connect to headsets, mobile phones cameras just about anything. On Windows 7, the device installed automatically and there was no trouble to have it up and running in no time.

Multi USB kit (Rs. 90)

The central device has a auto retracting cable that basically acts as an extension to your USB port. The six other thingies let you connect to all sorts of devices. The connectors include Micro-B, Mini B, Type B and many other standards. A must have for any self respecting geek. [Psst – here's a tip - Combine this with the USB adapter to make your own universal charger.]

Notebook lock (Rs. 75)

It's not just wallets that get pinched these days. With notebooks getting smaller and lighter, and netbooks protruding out of large pockets, any help we can get to safeguard our gizmos is appreciated. This little device fits into the Kensington lock slot on your notebook/netbook, and can prevent someone with sleight of hand walking away with your precious baby. Especially recommended for those who go to LAN parties, or waste time at coffee shops, pretending to work. Just remember to hook the other end to something that's immovable — and not your briefcase, or you'll end up losing more than you bargained for.
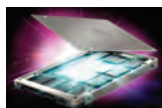
Pulsar
We're not talking about the bike. It seems Seagate has entered the SSD space with Pulsar their first SSD offering in the enterprise space

Xylophone Table
Xylophones can be made from almost anything. Check out this unique one that is the size of a coffee table. In fact, it's a coffee table!

Feature

Mobile battery charger (Rs. 100)

This is one of the most useful devices that we got our hands on. With this baby hanging on your bag or in your pocket, you will never ever run out of battery on your cell phone. All you need to do is put in a standard AA battery (pencil cell) and it'll charge up your phone. It has connects for Nokia (both thin pin and fat pin), Sony Ericsson, and miniUSB. If you run out of battery on that crucial call simply head over to the nearest store and pop in a pencil cell. If you're going on a long expedition to the Himalayas carry a few pencil cells and use as per your convenience. Definitely a must have.

USB adapter (Rs. 50)

This little gadget is a great utility while travelling. Often we have devices that draw power from USB ports, and there's no PC in sight. This adapter solves that problem by converting essentially any power point into a USB charger.

Foldable keyboard (Rs. 250)

A mat like keyboard that rolls up into a compact package? "I want one" would be anybody's reaction. It instantly transports you back to hacker movies where they show geeky yet strangely well built men roll open foldable keyboards to hook up to a target system. This is a full keyboard with a num pad so it makes for a great addition to a notebook. However the quality isn't so great. You'll get more exercise than you bargained for - the keys need to be pressed really hard.

USB Vacuum (Rs. 75)

This product sucks. Yes that's what its supposed to do, we know. But it even sucks at sucking! A total disaster. Avoid at all costs. The gadget only makes a hell of a ruckus. It comes with a brush attachment that can at best be used to sweep dust. It does pull in a little bit of dust, but since there are vents at the back it's essentially it's just displacing whatever little dust that it pulls in.

Membrane Keyboard guard (Rs. 40)

Ever tried to clean a notebook keyboard after you spill something on it? You have three choices. Stop using notebooks, stop eating or drinking, or just spend Rs. 40 and get yourself one of these. Surprisingly, this doesn't hinder typing at all, and apart from protecting you against your own clumsiness, also helps keep the dust away.

Dual fan foldable notebook cooler (Rs. 75)

The idea of a folding notebook cooler is nice. Not when it comes to this one though. The fans are not as powerful as the other notebook cooler and the balance is off. Buy it only if you're going to go giddy at the prospect of folding it into a neat little package.
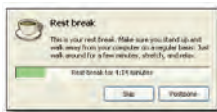
Software enforcers
AntiRSI, Timeout, and Workrave force you
in not-so-subtle ways to take a break and
engage in stress relief exercises

Kinesis advantage
A completely split keyboard that is
ergonomically designed and features a
Dvorak optional layout instead of the regular
QWERTY layout

In touch with Ergonomics

Agent 001 scours the streets for the best ergonomic devices money can buy. Here's the dope on ergonomics and whether the so called ergonomic devices out there are really worth it

Illustration: Binesh PS

Agent 001
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Recently a friend of mine, who's used to cribbing, was complaining a lot about wrist pain and all sorts of other "stress" related afflictions while we were chatting. Initially, I dismissed it as him being his usual whiny self until I realised the magnitude of his problem. Could this be Carpal tunnel syndrome or repetitive stress disorder caused by working in a non ergonomic or human friendly environment? There could be many more people out there who could use some guidance when it comes to ergonomic devices reducing the chances of injury when using a computer for long hours. Confused? Let me explain.

By and large, ergonomics tries to improve human interactions with products, equipment, environments and systems. It takes into account human biology, stress analysis and material engineering to make products more usable and less stressful to the human body during repetitive use. Simply put, that's making products keeping the end user and usage in mind. Ideally, all devices should be ergonomic. But in reality, only a small percentage are.

So, keeping the risks of RSI in mind, I went out on a quest to find out what ergonomic input devices and aids are available out there. Lamington road – the hardware capital of our country – turned out to be somewhat of a disappointment. My hardship began with explaining the product category to the guys behind the counter. They were better versed with gaming mice and keyboards – Salmosa and Steel Series being the most sought – than ergonomic devices. But after a bit of shop to shop hunting, model number quoting and describing such devices, two boxes were

specially unearthed and called for. One was the Logitech MK 700 wireless keyboard. Though not strictly an ergonomic keyboard it did have scalloped keys, which according to the Logitech "position your fingers properly, and their softly rounded edges invite your fingertips to glide from key to key". This one was available for around Rs. 4,500 and I'm certain will improve typing accuracy if not give you ergonomic comfort. The

other keyboard + mouse set that was shown to me, was the Microsoft Natural Series 7000. This one was an ergonomic keyboard in the true sense of the word. It featured a 12 degree split down the middle (roughly between the T and Y set of keys) and a 14 degree gable. A gable can be thought of as a sloping bump on the keyboard with its peak roughly at the centre. The mouse had a thumb rest contour which takes away weight from the side of the palm and other carpel tunnel stress points. It feels like you are holding a blob that is adjusted to the space naturally formed when you close your palm. I found the mouse to be way more comfortable than standard mice. But with a price tag as much as its model number, it remains a significant decision, which could prove useful in the long run. Also of interest, though not strictly ergonomic was my old favourite – the TV Gold mechanical keyboard available for around Rs. 1,100.

Other than keyboards and mice there are other ergonomic aids on offer in the form of gel-filled keyboard rests and mouse pads. These are available for around Rs. 200 and offer support when using devices that are not ergonomic. However my personal experience with them has not been up to the mark. The gel does give tactile support but it's almost always a little higher than you'd normally want.

To conclude, I would urge everyone to seriously consider doing whatever little they can from improving posture to exercises and keep your body stress free. **d**

ERGONOMIC FURNITURE

Apart from ergonomic input devices, the furniture you sit on and house your computer, goes a long way to avoid repetitive stress injuries. Ergonomic furniture is designed in such a way that your posture automatically improves. You sit and work in a way that is most natural. There should be no forward flexion of the next, twisting of the torso. While adequate lumbar (back) support should be provided. There are furniture attachment modules that are separately available too, such as a negative tilt keyboard tray that lets you tilt the keyboard away from you, leaving your wrist drop to its most natural or neutral position. So the next time you custom make a computer table or go out to buy one, be sure to consider these principles.

Remote access
Teamviewer (www.teamviewer.com) is a free remote access desktop sharing alternative to VNC or Logmein

Firefox RC in sight
Firefox 3.6 Beta 5 was released late December. Release Candidate build isn't far away

Agent 001

Q. My budget is Rs. 43,000 and I'm not a hardcore gamer. I have set up the following configuration, please comment.
AOC 2216 SW 22-inch LCD monitor, iBall Benz with 400W SMPS, 1.5 TB Seagate (SATA2), 2 GB (800 MHz) Kingston DDR2 RAM, ASUS P5Q-E 1600 FSB, Quad Core Q9505 2.83 GHz
V. Srikanth

A Since you're not into gaming, I suggest focusing on a good CPU. The Core i7 is much better than the ageing Core 2 Duo. The Core i7 860 is available for Rs. 14,600 and makes a good buy. Invest in an MSI P55 GD65 board for around Rs. 10,500 and 4 GB of DDR3 RAM costing around Rs. 5,000.

I recommend Acer's 2236Vw priced at Rs. 8,700. For the power supply look at a VIP 450 W. This should cost Rs. 2,000. The Seagate 1.5 TB hard drive is available for around Rs. 6,000. You will also need a graphics card. I recommend a GeForce 8400 GS-based card, that should cost Rs. 1,500 or so. Although this would increase your budget by Rs. 3,000, it would be worth it.

Q. I'm reviving an old AMD Athlon system and would like to replace / upgrade the following:
1) Motherboard
2) Processor
3) Graphic card (something like a 9400GT/8600GT/equivalent ATI card)
4) RAM
5) Hard drive
My budget is Rs. 10,000, although I am flexible with it. I require it to play full HD video, play the latest games. Please give a satisfactory configuration, best possible within the budget.
Vishnuram Rajagopalan

A I recommend a combination of AMD Athlon II X2 240 CPU and ASUS M2N68-AM board. The CPU is available for approximately Rs. 3,000, while the motherboard retails for close to Rs. 2,200. Pick up 2 GB DDR2 (667 MHz) RAM which should cost another Rs. 2,000.

For the HDD, I recommend a 7200.11 Seagate 250 GB. Expect to pay another Rs. 2,000 for this. You could also pick up a GeForce 9400 GT from a brand like ZOTAC, Galaxy, MSI or Palit for another Rs. 2,800 or so.

If you want to use this for casual gaming, I recommend a GeForce 9600 GT from ZOTAC, priced at just around the Rs. 5,000 mark.

Q. I'm planning to buy a touch-screen mobile phone within Rs. 10,000. I have short-listed Samsung Corby s3653 and Samsung Star. Which one is better? Please suggest a better option.
Prateek

A It all depends on what you want. If you want a QWERTY keypad, you could consider the iMate Kjam. This phone will give you a 2.8-inch touch screen with a full QWERTY keypad. Otherwise, the Corby s3653 should be decent, though you can also look for the LG KP500 (Cookie) for around the same price, which has a touch screen but no QWERTY.

Q. I'm planning to buy a gaming rig for around Rs. 40,000. Does it need to be DX 11 capable?
Ron Thomas

A A budget of Rs. 40,000 is not really enough to buy a "gaming rig", but you can get a decent configuration based on a Core 2 Duo E8400 (Rs. 7,800), BioStar I45 motherboard (Rs. 5,500), 2x2 GB DDR2 RAM (4,500) and an ATi Radeon HD 5770 which supports DX11 and should be priced at Rs. 11,000 or so. Look for brands like Sapphire, Palit, XFX or MSI. For the hard drive, I recommend a 1 TB 7200.12 HDD from Seagate that should be priced at the Rs. 5,000 mark. AOC's 2236Vw should be priced at the Rs. 8,700 mark and will suffice as a good gaming monitor.

It should also compliment the card well. For the power supply, you should consider a Corsair VX 450 priced at the Rs. 3,000 mark. The rest of the peripherals and cabinet are totally your choice, but I would go with a CoolerMaster 690 chassis (Rs. 4,200) and a Logitech keyboard and mouse combo (Rs. 500).

Q. I want to buy a 512-MB graphics card. I play only GTA: San Andreas-like games. I also want good performance for HD content and viewing photos. My budget is between Rs. 1,800 and Rs. 2,600.

A I recommend the Galaxy or ZOTAC GeForce 9400 GT graphics card with 256 MB of video RAM. However, this would set you back by around Rs. 2,800.

Q. I want to buy a external hard disk of size 500 GB. I want portability with decent speed to store movies, videos, music and photos. Please suggest me some good hard disk models. My relatives suggested either Seagate Free Agent Go or Western Digital.

A For true portability go with a 2.5-inch solution. Seagate's solutions are cheaper, but WD has a slightly better reputation in the market and arguably better drives, so they charge a premium. I recommend WD's 500 GB Passport available for around Rs. 6,500. **d**

Secure Bluetooth
The latest version of Bluetooth has been announced
with 128-bit encryption and 32-bit addressing
among other goodies

Stories this Christmas?
Amazon's Kindle has its highest selling
month in December, but sales figures are
hard to come by

Spend smart

Processors

Model	Market Price	Tested In	Socket	Speed	FSB	L2 Cache
AMD Sempron 140	Rs. 1,950	September 2009	AM2+	2.7 GHz	2000 MHz HyperTransport	1 MB
AMD Athlon X2 5200+	Rs. 3,200	November 2008	AM2+	2.7 GHz	2000 MHz HyperTransport	1 MB
AMD Athlon X2 7850 BE	Rs. 3,350	September 2009	AM2	2.8 GHz	2000 MHz HyperTransport	2 MB
AMD Athlon II X2 250	Rs. 4,100	September 2009	AM2+	3 GHz	2000 MHz HyperTransport	2 MB
AMD Athlon II X2 550	Rs. 5,450	September 2009	AM2+	3.1 GHz	2000 MHz HyperTransport	1 MB
AMD Phenom X4 9650	Rs. 6,025	November 2008	AM2+	2.3 GHz	3600 MHz HyperTransport	2 MB
AMD Phenom II X3 720 BE	Rs. 7,500	September 2009	AM3	2.8 GHz	2000 MHz HyperTransport	1.5 MB
AMD Phenom II X4 810	Rs. 8,350	September 2009	AM2+	2.6 GHz	2000 MHz HyperTransport	2 MB
AMD Phenom II X4 920 BE	Rs. 9,650		AM3	2.8 GHz	3600 MHz HyperTransport	2 MB
AMD Phenom II X4 945	Rs. 12,075	September 2009	AM2+	3 GHz	2000 MHz HyperTransport	2 MB
AMD Phenom II X4 955BE	Rs. 13,100	September 2009	AM3	3.2 GHz	2000 MHz HyperTransport	2 MB
Intel Dual Core E2200	Rs. 3,000	September 2009	LGA775	2.2 GHz	800 MHz	1 MB
Intel Dual Core E5200	Rs. 3,375	September 2009	LGA775	2.5 GHz	800 MHz	2 MB
Intel Core 2 Duo E7400	Rs. 5,900	September 2009	LGA775	2.8 GHz	1066 MHz	3 MB
Intel Core 2 Duo E8400	Rs. 8,850	September 2009	LGA775	3 GHz	1333 MHz	6 MB
Intel Core 2 Quad Q8200	Rs. 8,650	September 2009	LGA775	2.33 GHz	1333 MHz	4 MB
Intel Core 2 Quad Q8400	Rs. 8,750	September 2009	LGA775	2.4 GHz	1066 MHz	8 MB
Intel Core 2 Quad Q9400	Rs. 12,100		LGA775	2.66 GHz	1333 MHz	6 MB
Intel Core 2 Quad Q9550	Rs. 12,601		LGA775	2.83 GHz	1333 MHz	12 MB
Intel Core i7 920	Rs. 14,900	September 2009	LGA1366	2.66 GHz	4.8 GT/s QPI	NA

Monitors

Model	Market Price	Tested in	Size	Resolution	Contrast Ratio	Response time
Acer V203H	Rs. 7,250		20-inch	1600 x 900	10000:1	5 ms
ASUS VM193D	Rs. 6,850		19-inch	1440 x 900	800 : 1	5 ms
BenQ E2200HD	Rs. 9,950		21.5-inch	1920 x 1080	1000 : 1	5 ms
Dell 1909W	Rs. 6,800		19-inch	1440 x 900	1000 : 1	5 ms
Dell S1709W	Rs. 7,200		17-inch	1440 x 900	600 : 1	8 ms
Dell S2409W	Rs. 14,750		24-inch	1920 x 1080	1000 : 1	5 ms
LG 177WSB	Rs. 6,300	May 2008	17-inch	1440 x 900	700 : 1	8 ms
LG W1942T	Rs. 6,900		19-inch	1440 x 900	700 : 1	5 ms
Samsung 2033	Rs. 7,250		20-inch	1600 x 900	15000 : 1	5 ms
Samsung 733NW	Rs. 6,550		17-inch	1440 x 900	1000 : 1	8 ms
Samsung 943NWX	Rs. 7,500		19-inch	1280 x 1024	1000 : 1	5 ms
ViewSonic VA1918WM	Rs. 6,600		19-inch	1440 x 900	1000 : 1	5 ms
VIEWSONIC VX2255WMB	Rs. 12,500	May 2008	22-inch	1680 x 1050	1000 : 1	5 ms
ViewSonic VX2240W	Rs. 9,900		22-inch	1680 x 1050	1000 : 1	2 ms

Graphic Cards

Model	Market Price	Tested in	Core Speed	Type of memory	Memory
EVGA 9600GT Knock-out	Rs. 6,650	November 2008	700 MHz	GDDR3	512 MB
Power Color HD4850	Rs. 6,600	August 2009	625 MHz	GDDR3	512 MB
Power Color HD4670	Rs. 4,650	August 2009	750 MHz	DDR3	1024 MB
Palit GeForce 9400 GT Super	Rs. 2,525	August 2009	550 MHz	GDDR2	1024 MB
Palit Radeon HD 4870 SONIC	Rs. 13,500	October 2008	750 MHz	GDDR5	512 MB
Palit GeForce GTX 260	Rs. 1,0750		650 MHz	GDDR3	896 MB
Palit GeForce GTX 275	Rs. 1,3900		633 MHz	GDDR3	896 MB
XFX GeForce 8600 GT	Rs. 3,150		540 MHz	GDDR3	256 MB
ZOTAC GeForce GTS 250	Rs. 9,250		738 MHz	GDDR3	1024 MB
ZOTAC GeForce GTX 285	Rs. 26,000	Feb 2009	648 MHz	GDDR3	1024 MB

8,00,000 not enough
NVIDIA says the early lead rival AMD has with DX 11 chips, to the tune of 8,00,000 pieces of DX 11 GPUs is not significant

Phenom II mobility?
AMD promises their flagship Phenom II processors for notebooks by May 2010

Price watch

The latest peripheral prices updated every month. Go ahead, plan your configuration today

Motherboards

Model	Market Price	Tested In	Socket	PCIe x8/x16 slots	SATA ports	USB ports
ASUS M3N78-EM	Rs. 4,300	November 2008	AM2+	1	6	4
ASUS P5Q Deluxe	Rs. 14,900	June 2008	LGA775	2	6	6
ASUS P5Q-PRO	Rs. 9,650		LGA775	2	6	6
ASUS P5Q-E	Rs. 11,350		LGA775	2	6	8
ASUS P6T Deluxe	Rs. 20,975	October 2009	LGA1366	3	6	8
ASUS Rampage II Extreme (BEST PERFORMER)	Rs. 26,000	October 2009	LGA1366	3	6	6
ASUS Rampage II GENE	Rs. 16,450	October 2009	LGA1366	2	6	6
ASUS M4A79T Deluxe	Rs. 13,050	October 2009	AM3	4	5	6
GIGABYTE EX58-UD5	Rs. 16,950	October 2009	LGA1366	3	6	8
Gigabyte GA-EP45-UD3R	Rs. 8,900		LGA775	1	6	8
GIGABYTE MA790GP-UD4H	Rs. 9,100	October 2009	AM2+	2	6	4
Gigabyte GA-EX58-UD3R	Rs. 14,250		LGA1366	2	6	8
MSI X58 PRO	Rs. 11,300	October 2009	LGA1366	3	7	6
MSI P7N Diamond	Rs. 15,200		LGA775	4	6	6
MSI X58 Eclipse	Rs. 20,250		LGA1366	3	10	8
XFX nForce 790i Ultra	Rs. 21,050	October 2009	LGA775	3	6	6
Zotac 780i Supreme	Rs. 14,500		LGA775	3	6	6
Zotac nForce 750a	Rs. 6,500		AM2+	2	6	4

Digital Cameras

Model	Market Price	Tested in	Sensor	Optical Zoom	LCD Screen Size
Canon Powershot SX120	Rs. 14,995	October 2009	10 MP	10x	3.0 inches
Canon IXUS 100IS	Rs. 12,999	October 2009	12 MP	3x	2.5 inches
Canon Powershot A480	Rs. 7,499	October 2009	10 MP	3.3x	2.5 inches
Canon A1100IS	Rs. 9,499	October 2009	12 MP	4x	2.5 inches
Canon IXUS 95IS	Rs. 10,500	October 2009	10 MP	3x	2.5 inches
Canon SX200IS (BEST PERFORMER)	Rs. 21,500	October 2009	12 MP	12x	3.0 inches
FujiFilm FinePix F200	Rs. 17,999	October 2009	12 MP	5x	3.0 inches
FujiFilm FinePix S1500	Rs. 12,500	October 2009	10 MP	12x	2.7 inches
Kodak C140	Rs. 4,999		8 MP	3x	2.4 inches
Nikon P90	Rs. 23,995	October 2009	12 MP	24x	3.0 inches
Nikon Coolpix L20	Rs. 7,750	October 2009	10 MP	3.6x	3.0 inches
Nikon S220	Rs. 8,500	October 2009	10 MP	3x	2.5 inches
Olympus FE25	Rs. 5,995		10 MP	3x	2.4 inches
Panasonic FS4	Rs. 6,750		8 MP	4x	2.5 inches
Samsung ES55 (BEST BUY)	Rs. 6,990	October 2009	10 MP	3x	2.5 inches
Sony HX1	Rs. 29,800	October 2009	9 MP	20x	3.0 inches
Sony S930	Rs. 7,800		10 MP	3x	2.4 inches
Sony H20	Rs. 17,500		10 MP	10x	3.0 inches

External HDDs

Model	Market Price	Capacity	Interface	Warranty (Years)
Seagate Freeagent GO	Rs. 5,150	500 GB	USB	5 years
Seagate Freeagent GO	Rs. 3,250	250 GB	USB	5 years
Maxtor One Touch 4 Mini	Rs. 3,200	250 GB	USB	5 years
Transcend StoreJet	Rs. 2,725	160 GB	USB	2 years
Western Digital MyPassport	Rs. 2,850	160 GB	USB	3 years
Western Digital MyPassport Essential	Rs. 4,100	640 GB	USB	3 years
Western Digital MyPassport Studio Edition	Rs. 7,800	1 TB	USB, FireWire, eSATA	3 years

digit
KILLER RIGS
everything you will ever need to build your own PC. whatever your budget.

- Basic rig = Rs. 21,350
- Multimedia cum gaming rig = Rs. 81,100
- Ultra high-end PC / Gaming rig = Rs. 1,51,700

PRIMARY COMPONENTS
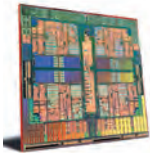
PROCESSOR
- AMD AthlonII X2 240 / Rs. 3,000
- Intel Core 2 Duo E8400 / Rs. 8,200
- Intel Core i7 920 / Rs. 14,400

MOTHERBOARD
- ASUS NVIDIA 7025 M2N68-AM / Rs. 2,250
- ASUS P5Q / Rs. 8,500
- MSI X58 Pro / Rs. 13,500

RAM
- 2 x 1 GB DDR2 800 MHz (Kingston) / Rs. 2,000
- 2 x 2GB DDR2 800 MHz (Corsair) / Rs. 4,000
- 2 x 3 GB Corsair Dominator 1600 MHz DDR3 / Rs. 9,000

GRAPHICS CARD
- None
- ZOTAC GeForce GTX 260² / Rs. 14,000
- ZOTAC GeForce GTX 295 / Rs. 29,000

HARD DRIVE
- Seagate 500 GB 7200.11 / Rs. 3,300
- Seagate 1 TB 7200.12 / Rs. 4,600
- Western Digital Velociraptor 150 GB / Rs. 9,900 / Western Digital 1 TB Black Edition / Rs. 6,800

MONITOR
- ViewSonic VA1928wm / Rs. 8,200
- AOC 2230fm / Rs. 14,000
- Dell 2408WFP / Rs. 38,000

SECONDARY COMPONENTS

CABINET
- Zebronics Antibiotic / Rs. 2,100
- CoolerMaster 690 / Rs. 4,400
- CoolerMaster ATCS 840 / Rs. 12,000

SOUND CARD
- None
- ASUS Xonar DX / Rs. 3,700
- ASUS Xonar DX / Rs. 3,700

POWER SUPPLY
- VIP 350 Watts / Rs. 850
- Corsair TX 650 / Rs. 6,500
- Corsair HX 850 / Rs. 10,300

SPEAKER
- None
- Altec Lansing MX 5021 / Rs. 6,500
- Logitech Z5500 / Rs. 14,000

MOUSE
- Logitech 3 button scroll / Rs. 300
- Logitech MX518 / Rs. 1,300
- Logitech MX518 / Rs. 1,300

OPTICAL DRIVE
- LG H55N / Rs. 1,100
- LG H55N / Rs. 1,100
- ASUS BC-1205PT / Rs. 11,010

KEYBOARD
- Logitech Multimedia / Rs. 400
- Logitech G15 / Rs. 4,400
- Logitech G15 / Rs. 4,400

MISCELLANEOUS

TABLET
- None
- iBall Design Tablet PF1209 / Rs. 8,900
- Wacom Intuos4 Medium (PTK-640) Rs. 21,280

MOUSEPAD
- None
- Razer Goliathus Speed (Oversized) / Rs. 1,400
- Steel Series Qck Heavy / Rs. 2,000

HEADPHONES
- None
- Sennheiser HD 201 / Rs. 1,500
- Sennheiser HD 280 Pro / Rs. 5,500

GAMING CONTROLLERS
- Xbox 360 controller / Rs. 1,350
- Logitech Momo / Rs. 5,500
- Logitech G25 / Rs. 17,500

PRINTING SOLUTIONS
- Canon PIXMA iP1980 / Rs. 2,695
- Canon iP3680 / Rs. 5,595
- Epson B-500DN / Rs. 22,999

POWER PROTECTION
- None
- APC 550W / Rs. 2,400
- Numeric 1 KVA / Rs. 4,200

Go, as in Google
Named from the first two letters of Google itself,
Go is aimed to be a programming language of
tomorrow's concurrent, networked computing world

Go on Go?
The Google Go web site golang.org runs
on the godoc documentation server which
is written in Go itself

Google GO

A new language for geeks to play with

Kshitij Sobti
kshitij.sobti@thinkdigit.com

{T}here is a reason Google appeals to geeks; they give us so much fun stuff to play with, and often for free. Google Go is one of their latest new projects, born during the famous 20 per cent time that all Google employees use to develop innovative products on their own.

What is Go?

Go is a new open-source programming language created by Google which it claims to be simple, fast, safe, concurrent, fun. For someone who is familiar with programming languages such as Java and C++, it does not significantly depart from the syntax. The same familiar curly braces are there along with semicolons as line terminators. Yet there are enough idiosyncrasies to make the language new.

The language draws heavily from the basic C syntax, while bringing in some of the best features of other programming languages. It supports concurrency in its basic syntax, and has built-in garbage collection.

Why another language?

Google created Go since they believe that current programming languages are not very suitable for creating the kind of applications that are needed nowadays.

Their issues with the state of affairs with developing in current programming languages is that despite computers being enormously faster now, software development has not speeded up much. Languages such as C and C++ use headers which make dependency analysis and fast compilation difficult.

Many of current programming languages also have a very "cumbersome" type system which pushes more people towards languages like Python and Java-Script which have dynamic typing. Most of them also have very limited features when it comes to parallelism and support

Google Go: Google's take on what a modern programming language should be like

a complicated syntax for the same.

Programming languages have kept on adding features via newer and newer libraries which bring new features, however the languages themselves have not evolved to take on the features which are required at their very core. Current languages have become very verbose requiring much "clerical work" in adding any functionality.

The shape of computing has changed significantly over the last couple of years,

and it is time for a change. With the introduction of a new programming language which is developed keeping the requirements of today in mind, developer and users alike have a lot to benefit for code which runs faster and is easier to develop.

Some important aspects

C++ is definitely one of the most popular languages for system development. Let us look at some of the ways in which Go differs from C++, since many of the points have already been mentioned before, they will be given in brief:
- No pointer arithmetic
- No type hierarchy
- No overloading methods or operators
- No implicit type conversions
- No header files, Go uses the concept of packages instead
- Strings, arrays and maps (hashes) are a native type in Go
- Threading and concurrent programming features are natively provided by the language
- Variables are initiated on declaration, there are never any uninitiated variables.
- Internal garbage collection

The syntax for declaring variables is reversed, as:

```
var variable_name int;
var another_variable_name
string;
```

Instead of C++'s:

```
int variable_name;
char *another_variable_name;
```

- Functions are declared using the func keyword with the following syntax:

```
func some_function(a int, b
int, c string);
```

- If a variable is being assigned at the same time as it is being declared, the type may be omitted as follows:

```
var some_variable = some_
other_variable;
```

- There is no distinction in syntax for accessing properties of pointers to structure and structure, both are accessed via the . notation. This is unlike C++ where pointers to structures require a -> notation.

- Go supports multiple parallel assignments, as such swapping two variables can be written quite simply as follows:

```
i, j = j, i;
```

Nomenclature
The Google Go compiler and linkers are named as per Plan 9 with one letter for architecture (6 for amd64, 8 for x86, 5 for ARM) and the second is g for Go or l for linker

Mishmash
Go's syntax is inspired by C, and some its features by Pascal, Modula, Oberon, Newsqueak and Limbo

Open source

Functions in Go can return multiple values. A function which returns multiple values can be declared with a list of variables in parenthesis after the function as follows:

```
func f() (i int, j int);
v1, v2 = f();
```

• The `FOR` statements must be used without parenthesis, and the if statement can be used without them too. Any code which follows a for or if statement, should be wrapped in curly braces as follows:

```
if a < b
{
  //SOME CODE
}
for i = 0; i < 10; i++
{
  //SOME CODE
```

• Arrays are copied when passed to functions as they are first class values. To pass by reference, you use slices which are portions of an array complete with their own length and capacity.

Exploring OOP in Go

For someone who is quite used to classes derived from other classes derived from yet other classes, Interfaces might be a slightly jarring experience. Classes and inheritance allow for the creation of complicated hierarchies of relations between different elements. Inferfaces, on the other hand, encapsulate multiple types based on common properties. Interfaces are supported in many languages such as Java, ActionScript and C#. However in Go a type needn't declare what interfaces it implements.

An image button is a type of button which is a type of UI widget and so on, we start with the common base functionality and derive new elements from that.

In the above example we would code functionality which is common for any UI widget in a say the UIWidget class, and then derive that and add functionality for creating a Button. The Button class can then act as the base while we add functionality for an ImageButton.

Comparing to real life scenarios, this is the equivalent to creating a vehicle first, and then adding something to it to classify it as a car, and further add something to make it a specific model of a car. Although

since you wouldn't be coding a car on your computer such analogies are useless for establishing the utility of the concept.

Interfaces work the other way around. Giving a real world example, as you go around the world looking you notice similarities in many of the things that you encounter, at which point you tend to group them in a collection. An observer who looks only at the night sky might call all twinkling lights stars, on further reflection he may call all twinkling lights in the sky stars, and after observing an aeroplane or two one might redefine them as stationary twinkling lights in the night sky.

You would call all portable computers laptops, and might then find it useful to classify some of them as netbooks based on certain properties that a subset exhibits. Such relationships are clear even with classes. However we now have many high-end mobiles / smartphones which could easily fall under the category of portable computers, as such smartphones and portable computers will have some shared items.

In the kind of interfaces provided in Go, you can aggregate multiple types into one interface based on their common properties. Looking at the example of mobiles: An interface for mobiles would require that the device be portable, that it allow voice communication and have a unique identifying phone number.

In programming languages such as Java, and C#, a type has to explicitly declare what all interfaces it implements. An interface then becomes, in a way, a promise that it will deliver at least the functionality defined in the interface declaration. In Go however we can define an interface with the functionality we'd want from it, and any type which provides the same will automatically implement it.

If we create an interface in Go for all types which are sortable, it would be something like the following:

```
type Sortable interface
{
    Len() int;
    Less(i, j int) bool;
    Swap(i, j int);
}
```

Now we create a function which

does the actual sorting. In the function instead of specifying a particular type as a parameter, we use the interface instead, as follows:

```
func Sort(data Sortable)
{
    for i := 1; i < data.
Len(); i++
    {
        for j := i; j > 0 &&
data.Less(j, j-1); j--
        {
            data.Swap(j, j-1);
        }
    }
}
```

Now this function will work on any type which we define now or in the future with the three functions (Len, Less, and Swap) in it. While in other languages we would have had to manually specify which types implemented the interface Sortable; in Go any type we define now or in the future which implements these three functions (Len, Less, and Swap) will instantly be Sortable, and can be used by this function!

Conclusion

Google Go is still pretty much a language in incubation, as is many of their recent products and services, Google hopes that the community will help mold the direction of the product in the future. Google has unveiled the programming language and its source code early so that people can begin experimenting and playing with it already.

Google is already offering a choice of two compilers for the language, once which is a standalone compiler and linker, and another implementation which is built on GCC (GNU Compiler Collection).

Bad news for all the geeks out there using Windows though, the Go compiler is currently exclusively for Linux and Google has no plans to release a Windows version any time soon.

How far this language can go is something which will only start to become clear when the language reaches maturity, for now its only use remains in priding yourself in being one of the first few to know it. **d**

Developer corner

Chrome Gallery
Visit http://chrome.google.com/
extensions to download extensions

Chrome extensions
Google Chrome extensions can contain DLL files that can make
them more powerful than normal HTML+JavaScript extensions,
however such extension will be manually reviewed Google

Polishing your Chrome

Google Chrome finally gets support for extensions; grab a piece of the action!

Kshitij Sobti
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Add-ons, Firefox's most touted feature, have finally come to Google Chrome, and you'll be surprised to know how easy it is to get started making one. While Chrome extension support is certainly not as powerful as that of Firefox, it's much simpler and easier to use.

Chrome's simple extension support comes with many advantages. One of the prominent ones being that Chrome Extensions can install without restarting the browser. The extension starts working immediately.

Much of Chrome's functionality is not exposed to Extensions yet, making extensions such as FlashGot difficult to create due to the lack on an API to monitor downloads. Although with Chrome 4.0 already in beta, and around the corner, we might see extensions take their next step with Chrome 5.0.

An extension from scratch

If you're familiar with web development, you'll be glad to know that a Chrome extension is essentially just JavaScript, HTML and CSS. It's pretty much the same thing as developing web applications, except that you have access to some of the internal functions of Chrome.

Using JavaScript you can manipulate parts of Chrome's functionality, or appearance. Depending on what you want your extension to do, you can listen to events within Chrome such as changing the current tab, or adding a bookmark, or you can add a button to the toolbar that presents people additional tools.

Since Chrome development is essentially the same as writing functionality for any web page, you can use JavaScript libraries such as jQuery to make your job much easier. In fact, you can even use Google Analytics with your extension to get statistics about its usage!

We're assuming basic level of knowledge about web development using JavaScript, HTML and CSS. A little knowledge of AJAX will also help since you will often need to load external resources.

Getting started

Since Chrome extensions are just text, JavaScript and HTML (and CSS) files, all you really need is a decent text editorsuch as Notepad++.

A Chrome extension will also need to contain an icon for the extension, and any other resources you might use, such as images, or even videos. You'll also need to install at least the latest beta if not the dev version.

Anatomy

A Chrome extension is a signed ZIP file that contains all the files you need. You needn't worry about packing and signing the file, as Chrome will manage this for you. Since Chrome doesn't need to be restarted after adding an extension, you will immediately be able to see your extension, and in fact you can make changes to your extension while Chrome is running, and reload just your extension to see the latest changes instantly!

A `manifest.json` file in the extension is used to provide Chrome basic information about your extension, such as a name, description, version, permissions, and information about the kind of extension it is, and where the resources Chrome needs to know about are located. As you can tell by the extension, this is a JSON (JavaScript Object Notation) file that uses a JavaScript-like format for storing information.

Other than that, the extension will contain at least one HTML file to contain the code for the extension, and it may contain other resources such as icons, images and JavaScript files.

To begin with, you should create a folder to contain all your extensions files.

manifest

Since the manifest files is just JSON, which is a plain text format, simply create a new text file in your favourite text editor, and save it as `manifest.json` in the directory you created to contain all your extension files.

After creating the file, add the following code to it:

```
{
    "name": "My first Chrome
extension",
    "version": "1.0",
    "description": "Here is a
little something about what my
extension does.",    "options_
page": "options.html",
    "browser_action": {
        "default_icon": "icon.png",
        "popup": "popup.html"
    },
    "permissions": [
        "http://www.thinkdigit.com/"
    ]
}
```

Besides the obvious name, description, and version entries, we can see the `browser_action` and its sub-fields `default_icon` and `popup` `options_page` and permissions.

The `options_page` entry tells Chrome which file should be used for displaying the configuration page for the extensions.

Extensions and themes
Themes for Google Chrome are quite similar to extensions, and in fact come in the same CRX format

Chrome addon development
Chrome extensions page on Google Code is a good place to start if you want to develop extensions http://code.google.com/chrome/extensions/

Developer corner

This HTML file will contain the code for changing and saving the settings used in the extension.

The `browser_action` field defines that this is a browser action plug-in, i.e. one which will appear on the toolbar and will be visible in the browser at all times. If you want the icon to only appear in certain situations you can use a page action instead.

You can only use one of page action

and browser action in an extension. Under browser_action, we have `default_icon`, and `popup`. The default icon, as you might be able to guess, is set to the location of the icon image which will be shown on the toolbar on the browser. The popup field is set to the location to the file which will be used as a popup when someone clicks on the icon.

The permissions field is used to declare the web sites from where you

extension will load data. For security sake, Chrome ensures that you only get access to these web sites. Here we are going to be accessing the RSS feed of the thinkdigit web site, and as such we tell Chrome to permit the extension to load resources from there. However, you can also set this field to `http://*/` to gain access to any web site!

The `default_icon` can be any image (JPG, PNG, GIF) which should optimally

EXTENDING THE EXAMPLE TO USE ANY RSS FEED

We can quite easily make this extensions work for any RSS feed instead of just one, and can in fact leave the option up to the user. Let us see how we can go about doing that.

We can use `localStorage` to store the URL of the feed, and load this URL instead of loading a preset one. Just to make sure that there is always a feed to load, we can have a preset value pointing to a feed. Or you can add logic which prompts the user to configure the extension if the URL hasn't been set. Since asking the user is better, let us do that.

First we check if the URL has been stored in the localStorage, and if it hasn't, display a link to the options page instead of the links from the feed. To do that we need to make a few changes though. Since you cannot add anything to the popup till it loads, we will shift all our code to a new `main` function, and call it when the popup is done loading as follows:

```
var req = new
XMLHttpRequest();
function main()
{
  if(window.
localStorage["feedURL"])
  {
    req.open("GET",window.
localStorage["feedURL"], true);
    req.onload = showTDRssFeed;
    req.send(null);
  } else {
```

Your very own Chrome extension at work

```
    var optionsLink = document.
createElement("a");
    optionsLink.href = chrome.
extension.getURL("options.html");
    optionsLink.innerText =
"Options page";
    document.body.innerHTML =
"Before you begin using the
extension, you need to configure
it from its ";
    document.body.
appendChild(optionsLink);
  }
}
```

Since earlier all additions to the document were being done after the feed loaded (which is bound to be after the popup loads, there was no problem.

Now we are checking if a `localStorage` property called `feedURL` has been defined, and if it doesn't, we are adding a message telling the user to visit the options page before proceeding. We can get a link to the options page using `chrome api chrome.extension. getURL("options. html")`.

Now if we don't have a `feedURL` set, it will prompt you to open the extension options page. You could set the extension to automatically open that page if no URL is found if you want. We will also need to add the body tag to the same popup.html file with the main function set to run once it is done loading:

```
<body onload="main()">
</body>
```

We will also need to add the option parameter in the "options.html" page. You can simply add the following after the first option block:

```
<label for="feedURL" >What RSS
feed do you wish to load stories
from?</label>
<input id="feedURL" type="text"
/>
<input type="button"
onclick="storeURL()" value="Set"
/>
```
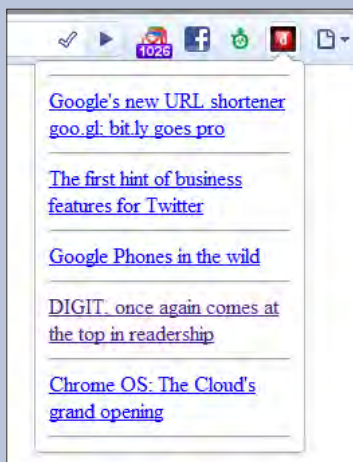
And the storeURL function is simply:

```
function storeURL()
{
    window.
localStorage["feedURL"] = docu-
ment.getElementById("feedURL").
}
```

Finally, to make sure that your extension has permission to load any feed it wants, the permissions block should become:

```
"permissions": [
    "http://*/"
]
```

Instead of:

```
"permissions": [
    "http://www.thinkdigit.
com/"
  ]
```

There you have it! A simple Chrome extension which can display items from any feed in a dropdown! Go ahead, start building on this, and make an extension which can load from multiple feeds, or one which allows paging. There are many possibilities even in this small example.

Developer corner

Largest image
The world's largest giga-pixel image is made of 1,655 21-MP images

ASUS 1201N
ASUS's new Atom netbook is powered by the NVIDIA Ion platform

MySQL 5.5
New beta of MySQL 5.5 codenamed "Betony" released

be of 19x19 pixels. Since this will be used as an icon on the toolbar, it is best if it's a PNG file with a transparent backdrop, ensuring that it will blend with any theme that is applied to Chrome.

popup

In this file, we will actually add the code which will load and display the RSS feed contents. To load the RSS feed, we use the `XMLHttpRequest` object which is commonly used in all AJAX applications for loading data onto a page asynchronously.

```
var req = new XMLHttpRequest();
req.open("GET","http://www.thinkdigit.com/rss/tech-news", true);
req.onload = showRssFeed;
req.send(null);
```

First, we create a new `XMLHttpRequest` object which will then be used to load the feed contents. This object is stored in the req variable.

The second line actually instructs the `XMLHttpRequest` object that it is supposed to retrieve the feed located at `http://www.thinkdigit.com/rss/tech-news`, which is the thinkdigit.com feed location.

In the third line, we specify the function that needs to be called when the feed is done loading. Here, we create a function called `showRssFeed` to use the downloaded feed content to generate a list of links.

The fourth line simply sends the `GET` request to the specified URL and begins the loading process.

Now we look at the `showRssFeed` function that will do the actual work of rendering the feed contents. However, before we do that, let us briefly go over the structure of RSS.

An RSS feed is simply an XML file with it's own syntax of tags. Details of each story in an RSS feed are encapsulated in an `<item>` tag. The `<item>` tag contains further tags which give details of each story. The `<item>` tag contains (listing only the important ones used in the example):

• `<title>` tag that contains the title of the story.

• `<link>` tag that contains a link to the original article.

• `<description>` tag that contains an extract (or the entirety) of the article (not used in this example).

```
function showTDRssFeed() {
    var posts = req.responseXML.
getElementsByTagName("item");
    document.body.
appendChild(document.
createElement("hr"));
    for (var i = 0; i<5; i++) {
        var story = document.
createElement("div");
        story.class = "storylink";
        var storyLink = document.
createElement("a");
        storyLink.href = posts[i].
getElementsByTagName("link")[0].
childNodes[0].nodeValue;
        storyLink.inner-
HTML = posts[i].
getElementsByTagName("title")
[0].childNodes[0].nodeValue;
        story.
appendChild(storyLink);
        document.body.
appendChild(story);
        document.body.
appendChild(document.
createElement("hr"));
    }
}
    var posts = req.resp
    onseXML.getElementsBy
    TagName("item");
```

In the first line in the function, we use the `responseXML` property of req, the `XMLHttpRequest` object (that contains the XML content loaded from the RSS feed). The `responseXML` property contains the XML structure of the RSS feed.

You can reload the extension after making even a small change, and see how it affects your extension

Now by running the `getElementsByTagName` function we get an array of all the items in the feed into the array named posts.

```
for (var i = 0; i<5; i++) {
```
Let us leave the second line for now

and go to the for loop. The for loop is just repeating the operating in it 5 times, to display the first 5 stories in the RSS feed. We will here iterate over each item in the posts array.

```
var story = document.
createElement("div");
    story.class = "storylink";
```

In these lines, we are creating a new `<div>` element which will be containing our story link. The `<div>` element is being given a class of `storylink` so that we can later style it using CSS.

```
var storyLink = document.
createElement("a");
```

Now we create the actual link to the story using the `<a>` element.

```
storyLink.href =
        posts[i].
getElementsByTagName("link")[0].
childNodes[0].nodeValue;
        storyLink.innerHTML =
        posts[i].
getElementsByTagName("title")
[0].childNodes[0].nodeValue;
```

This are two rather long lines of code which do the simple task of extracting the link and title from the feed story item and injecting them into the `<a>` element. Lets break it down to get a better idea.

The posts[i] is the i-th element of the posts array, from this feed item, we need to extract the link and the title. We extract these by using the `getElementsByTagName` function with the required tag name as parameter. Since this will return an array of link and title elements (even though it will contain only one object), we use the first element of the array using `[0]`. This will return us something like (for the first `<link>` tag):

```
<link>http://www.thinkdigit.com/General/Soccer-Dance-Kung-Fu-AcYut-does-_3822.html</link>
```

Since we only need the link itself from this XML element, we use the childNodes property (which will again be an array of child nodes although only with one text element containing the link) and access the first child by appending `[0]`. This will now finally give us a string with the link. We now use the value of that string using the nodeValue property and get

Gboard
Google launches Gboard - an USB Gmail shortcuts keyboard

48-core CPU
Intel recently demonstrated its 48-core processor

Etherpad open source
After being bought by Google, Etherpad, an online collaboration service goes open source

Developer corner

the link which we need to inject into the storyLink's `href` attribute. Similarly we get the story title and put that inside the link using the `innerHTML` property. Now we have a link to the feed story.

```
    story.appendChild(storyLink);
        document.body.
appendChild(story);
```

This newly created link is now appended inside the story `<div>` we created earlier. This complete link within a `<div>` is now appended to the document body. We skipped the `docu-ment.body.appendChild(document.createElement("hr"));` earlier because all it does is create a `<hr>` or a horizontal rule element which just serves to improve the looks of the extension by adding a line around every story.

All this is contained inside a `<script>` tag in the `popup.html` file. We will also add a few CSS instructions to improve the appearance of the popup.

```
    body {
      min-width:180px;
    overflow-x:hidden;
}
```

This ensures that the popup gets a width of at least 180 pixels, and any over-flowing width is hidden.

options

Since we are just looking at the basic configuration scenario, here's the options.html file in its entirety:

```
    <html>
      <head>
        <title>Options for my
extension</title>
        <script>
        function main()
        {
          if(!window.
localStorage["numStories"]){
            window.
localStorage["numStories"] = 5;
          }
            document.
getElementById('numStories').
value = window.
localStorage["numStories"];
        }
        function store()
        {
            window.
```

```
localStorage["numStories"]
= document.
getElementById('numStories').
value;
        }
      </script>
    </head>
    <body onload="main()">
      <div>
        <h2>
          Options for my exten-
sion
        </h2>
        <label for="numStories"
>How many story links should be
displayed?</label>
        <input id="numStories"
type="text" />
        <input type="button"
onclick="store()" value="Set" />
      </div>
    </body>
  </html>
```

This is what you'd expect from pretty much any HTML file. Now let's delve in.

First inside our page `<body>` we have a text input element with an id of `num-Stories` which is asking the user how many stories need to be displayed from the feed. We also have an input button that will call the `store()` function when clicked to save the setting. Also, the `<body>` tag itself runs the `main()` function on loading.

Here the main function is checking if the `localStorage` value for `numStories` is set. In case the extension is being run for the first time, it might not be, in which case it is set to 5. Its value is then read and put in the `numStories` textbox.

The `store()` function reads the value from the text box and saves it in `localStorage`. The options page is done. However, it's useless if we don't use the option in our main popup page itself! So now we go about modifying that to use this configuration parameter. This can be very simply be achieved by modifying the for loop to look as follows:

```
    for (var i = 0; i<window.
localStorage["numStories"]; i++)
```

Although, before the `window.localStorage["numStories"]` value is used, you should also check if it exists, and set it to a constant value (such as 5) in

case it doesn't.

Testing the extension

As said before, in Chrome you needn't restart the browser after each change. You can in fact load the directory containing the extension files as is, without packing into a CRX file. To go about testing your extension, open the Extensions page using the wrench menu. On the page that appears, you'll see a link titled `Devel-oper mode` near the top-right corner of the page. This will reveal extended options among which will be the option to load an unpacked extension. Click on the button to `Load unpacked exten-sion...` and point the folder browse dialog which results to the directory with the extension files.

You extension will now appear in the list, with the option to reload, disable and uninstall. The options button should also be enabled. You can reload the extension after making even a small change, and see how it affects your extension.

Conclusion

You can see how easy it is to get started with creating extensions for Chrome. However, we have only just scratched the surface. There's a lot more you can do with Chrome than just display a popup from a toolbar button. You can respond to event in the browser to trigger your own code. You can add content scripts which can change the very looks of a page. You can even pass messages between exten-sions to make them work together.

Remember that to make full use of this tutorial you should actually code the extension yourself while adding your own changes to the mix, instead of just reading it. Hopefully after you are done with this tutorial, you will explore further the intricacies of creating Chrome extensions.

With extensions, Chrome has made a significant step in gaining parity with Firefox, which still remains the favourite of those who wish to customize their browsing experience to the fullest. Hope-fully we have added a few extension developer to the mix, who will push the envelope further. d

Esc

Unwind
110 Twistori, Tech Art, Twitter gets hacked, Biotech and this month's Digit Diary

Community
Keep track of the latest events at Digit. Interesting forum posts, offers and webinars
112

A rough guide to backyard astronomy

You don't need telescopes, or 20/20 vision to figure out the night sky. All you need is a PC or a smart phone loaded with interactive star maps

High-resolution images of space are available on www.gigagalaxyzoom.org

Sriram Sharma
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In the year 1600, Galileo was able to look into Jupiter, see its moons, and declare that the earth revolved around the sun instead of the other way around. Today, you can do the same, with a toy telescope that costs 2,000 rupees from a mall.

There are only 6,000 to 9,000 stars visible from Earth to the naked eye even at the best viewing conditions. Even then, by using just a pair of binoculars and software you can see planets, constellations and star clusters, and at least one spiral galaxy on a clear night.

As part of ESA's International Year of Astronomy, three pictures were released last year, the trilogy of pictures zooms further and further in, demonstrating the capabilities of modern astronomy, and is downloadable from their web site at gigagalaxyzoom.org.

The first picture, an 800-million pixel 360-degree panoramic image reveals the stars and the milky way as seen by the naked eye (from the darkest and best viewing locations in the world.). It is also available as an interactive 3D map where you can rotate, zoom in and out of it in a browser (www.sergebrunier.com/gallerie/pleinciel/360.swf).

The night sky was for mediaeval civilisations, like TV before TV, a galactic PowerPoint presentation that signalled the passing of time and change of season.

"I wanted to show a sky that everyone can relate to — with its constellations, its thousands of stars, with names familiar since childhood, its myths shared by all civilisations," said Serge Brunier, who spent many months compiling this composite picture made out of 1200 photos from both the hemispheres of the Earth.

Stargasing is free, and so is most of the software that supports it. Google may be more renowned for making

maps that look down on Earth from space, but the Sky Map, a free app for Android phones that can construct a map of stars and constellations. It uses a combination of GPS, network signals, in built compass, and other sensors to determine which direction in the sky the phone is facing, pinpointing the position using GPS to work out exactly which direction you are pointing at, in the known universe. You can also search for stars and planets by name, and chase an arrow to pinpoint it in the sky.

No smart phone? In that case, the best software to accompany your laptop or netbook on an outdoor excursion would be Stellarium. This open source planetarium software is the best way for you to discern the stars and planets visible in the night out of your window. It takes in your latitude and longitude coordinates, and then gives you a real-time simulation of every visible object in space. Using this software, you can safely estimate the time, position, and trajectory of planets and stars visible to the naked eye.

Easily viewable planets in city skies include Jupiter, Venus and Mercury. You will also be able to estimate exactly where and when the moon will rise and set.

Since Stellarium works offline, you can load it on a laptop (hopefully with a battery on full charge,) and be fully equipped for a night of star gazing. It comes loaded with illustrations of constellations, a whole bunch of keyword shortcuts for navigation, and is highly customisable. It

Stellarium is a free astronomy software just like Celestia

114 SKOAR!
Exciting game reviews this month, presented by SKOAR!

NASA POTD
NASA has an updated space "Picture of the Day" site (http://apod.nasa.gov)
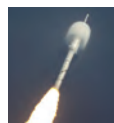
Feature

is available on all PC platforms.

We particularly like Stellarium's rewind and forward feature, which helps you visualise the steady movement of the planets, the Milky Way galaxy, and everything related to it. Stellarium supports real-time movement of celestial objects, a catalogue of over 6,00,000 stars.

Using zoom, you can track and locate a galaxy like the M31, also known as the Andromeda Galaxy, which can be seen with a pair of binoculars. Many other spiral galaxies can be seen with a basic telescope.

If you are into living out Star Trek fantasies, albeit for free, then Celestia, a real-time 3-D space simulation software

Celestia, an astronomy software is almost like a game

is a good bet. This software is good enough to give a conventional game a run for its money. You can use it to watch the solar eclipse as it cuts through Earth, travel light years into the deepest parts of the universe, or travel back or forward in time to see the Halley's Comet.

The controls for Celestia are quite intuitive, similar to the space simulator game Homeworld from Relic. It lets switch the scale and viewing angle to zoom in and out of any part of the universe in a flash.

Buying a telescope

The Bangalore Astronomical Society recommends that one buy a telescope not just on the basis of its magnification (often emphasised in packages), and that a good pair of binoculars with good optics would be better than a cheap telescope. Reflector telescopes are cheaper than refractor telescopes. Newtonian

Types of space objects

Star Clusters	Globular clusters M2, M3, M4	Open clusters M45, M11, M18,	Supernova Remnant M1: Crab Nebula
Nebula	M1: Crab Nebula	M8: Lagoon Nebula	M16: Eagle Nebula
	M17: Horshoe Nebula	M20 Trifid Nebula	M27: Dumbbell Nebula
Galaxies	Spiral galaxies M51, M31, M33, M104	Lenticular galaxies M84, M85, M86	Elliptical galaxies M87, M89

reflecting telescopes, aka table top telescopes are made in India by a company called Startracker systems. The complete kit, which includes eye pieces, lenses, and a tripod, starts from Rs. 4,800 and goes up to Rs. 14,700. While the low-end 75-mm telescope can let you see a 10.5 magnitude star, the high-end 125-mm version can see a 12.5 magnitude star.

An astronomer's getaway guide to India

Finding low-light areas is quite difficult in a country like India. Avoid the big cities, villages, and mapped out in bright dots in this light map picture courtesy NASA.

Forest reserves, hill stations, deserts, coasts, islands, and long treks generally lead you to a place where you can see a lot of stars.

NASA images

In 1966, Stuart Brand, best known as the editor of the Whole Earth Catalog, campaign to have pictures of Earth as seen from space available in the public domain. Since 1968, NASA has been a leading supplier of high-definition astronomy pictures available through a network of web sites. You can download poster size pictures of the universe, solar system, satellite photos and visualisations of Earth.

NASA images is a partnership between NASA and the Internet archive, a non-profit digital library based out of the US. The content is without copyright and can then be reproduced, as long as image credits are given.

You can download the iconic image known as the Blue Narble, a light map of the world that is 27 MB in size, and contain photographs from space probes like the Voyager and photos from the outer edge of civilisation from the International space Station. Spiral galaxies and nebulae courtesy Hubble are also available. The thousands of pictures that show up in a search "moon", for example, can be narrowed down quickly, by year, the space laboratory and subject matter.

Messier objects

Seventeenth century French astronomer, Charles Messier was notable for publishing a catalogue of deep space objects such as nebula star clusters that came to be known as the 103 Messier objects, which includes nebula, galaxies, clusters, and supernova remnants. It was published to help other astronomers distinguish between permanent and transient objects in the sky. For amateur astronomers, the Messier collection encompasses some of the grandest objects in the night sky. Many of which, are a delight to see through a telescope the first time.

According to Wikipedia, the human eye can pick up faint stars up to +6.5 magnitude under a modern dark sky.

These Messier objects all have an apparent magnitude equal to or below that. The following should be easy to spot and watch out for: The Butterfly Cluster (M6) and Ptolemy Cluster(M7), Eagle Nebula (M16) , The Horseshoe Nebula (M17), Trifid Nebula (M20) Sagittarius Cluster (M22), the Andromeda Galaxy (M31), Triangulum Galaxy (M33), Orion Nebula (M42), and the Pleiades cluster (M45). **d**

THE JARGON FILE

Ascension: the rising of a star above the horizon
Inclination: the angle between the plane of the orbit and the plane of the ecliptic stated in degrees
Azimuth: The azimuth of a celestial body is the angle between the vertical plane containing it and the plane of the meridian

Robot dino stolen
A 1.5m tall walking remote controlled robot dinosaur that was a part of a BBC exhibit was stolen in Mexico

iPhone cyborg app
MIT professor Hugh Herr is famous for creating outrageous lower body prosthetics, His latest experiment involves cybernetic legs that are controlled using an iPhone app

Geek culture: *Biotechnology*

Biotechnology involves modifying living creatures for human use. Now this is undertaken on a cellular level. There are some scary implications though, and a lot of debate is going on in laws for research, and the products available in the market.

Books
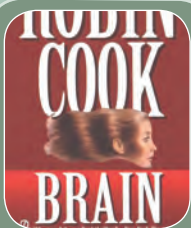
BRAIN
Robin Cook's best selling neurohacking conspiracy, where human brains interface directly with computers.

NEXT
Michael Chrichton's thriller explores the legal and social angles of the advent of biotechnology.
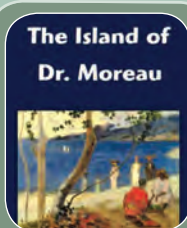
THE ISLAND OF DR. MOREAU
This HG Wells classic uncovers the extreme horrors of grafting, but the technology is old-fashioned.

Movies

JURASSIC PARK
This 90s classic shows the danger of cloning and bringing back to life organisms that don't belong to the current era.

EXISTENZ
Features some of the most amusing biotech weapons, including using teeth for the bullets in a gun made of flesh.

DISTRICT 9
A government official discovers the dangers of playing with alien biotechnology, when a part of his body acquires alien DNA.

Games

BIOSHOCK
A rich RPG with loads of mutants and drones, this is THE biopunk game. A sequel is expected this year.

DEUS EX
A cult classic, this game involves upgrading the body with various implants. This is an FPS that has still not aged.

RETURN TO CASTLE WOLFENSTEIN
Battle an army of hideous monsters spawned by the Nazis at X-labs.

digit DIARY

This month, the Digit team was plagued by bugs - the real world bloodsucking variety. Mosquitoes were getting so fat that they were just falling off the air drunk. The team went lo-tech in trying to solve the problem. Vijay had an elaborate setup, involving three fans, two aimed at his feet at ground level, and one at his shoulders. Raaabo went all Tintin over them, rolling up his socks over his pants. Rossi and Nash were battling the menace with those electricity raquets, and the steady *phat* of mosquitoes being fried reminded everyone of Diwali. Michael got out a big tube of repellent cream, but he was mostly left alone because of some other mysterious defences he happened to posess on his person. Aditya tried to repel them with high frequency noises from his computer, but just put the team on edge, without really achieving anything. Siddharth just got frustrated and was attacking them with anything he had, including sticks, which got a little too violent, especially when a mosquito landed on Rossi's head.

Flash Games: Cursor *10

You have 10 possible runs using a cursor, to make it to the 16th level of a building. Each run is tracked by the game, so the ghosts of your previous clicks are essential for you to unlock certain paths that let you navigate to the top. It may be necessary to sacrifice one run just to ensure that the other cursors can make it up faster. It's a game where you co-operate with yourself.

FLOOR 10   HIGH-SCORE 8
SCORE 2

CURSOR LIFE
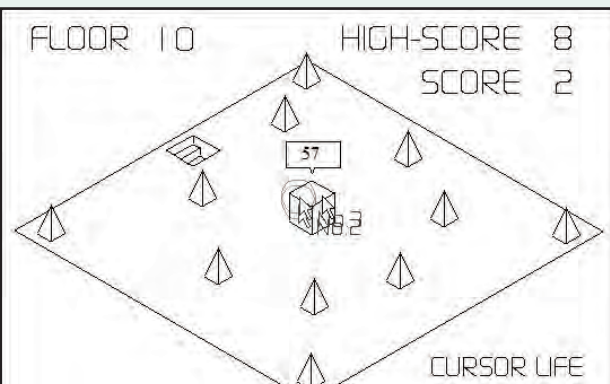
1337sp33k
Stay up to date with internet lingo, so you don't wt? the next time you are chatting with someone

borked: used to describe something that is broken

tweepish: Being embarrassed by something you have fed into your twitter stream

How we unwind

Movies
Avatar: The Swiss must envy the Cheese in the story, but we loved what was done in the CGI department.

Music
This month, the team revisited classics, with RATM's Evil Empire. We suggest snakecharmer.

Game
LEFT 4 DEAD 2:
Valve's second iteration in the series, and despite what Rossi says, we really liked it.

Baby Mafia
Shi Jinsong has just the thing for the underworld family, a baby carriage mounted with machine guns

Giant spiral in Norway sky
While cheesy forums went crazy, calling it proof that the Pastmaster really exists, the more serious sources revealed a mere Russian missile failure as the cause

Unwind

Bookmarks

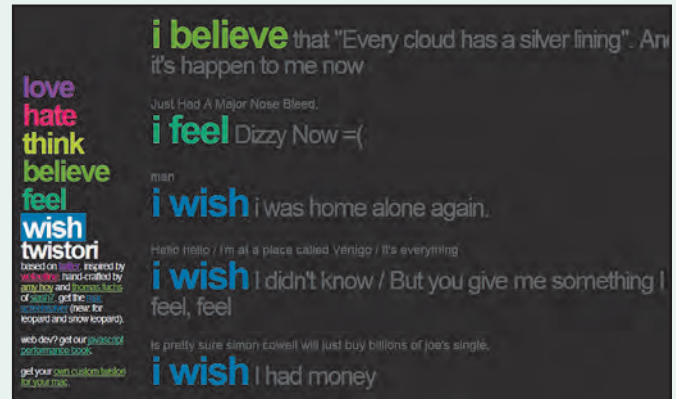A monthly update of great sites to browse through.

Whatport80: A toned down, safe for work site that chronicles all the drama on the internet, and explains the logic (or lack thereof) in some of the more extreme forms of madness prevailing on the tubes.

Artpad: Artpad is a quick and dirty online painting tool, with a few brushes, frames, effects and the very useful history tracking tool.

Aviary Myna: Cloud based audio-editing, just upload the files you want to work on, edit them, and download them again or share them on the Aviary network. We just wish the edited versions could be messaged to our mobile phones.

Thewhalehunt: A strange story about a real whale hunt told through images and hearbeats.

Image Credit: **Ramiro Perez Clare Nash**

tech art: 3D Fractals

A sub-form of generative art, 3D fractals involve creating artwork by feeding in mathematical formulae into renderers or programmes made for that purpose. There are many fractal enthusiasts, and this particular piece, known as "Furnace" is from the hobbyist web site www.rfractals.net, made using a software known as Incendia.

www.twistori.com

Inspired by wefeelfine.org (featured in DigitTV), Tiwstori applies the same concept exclusively to Twitter, but a few extra words thrown in to watch. Click on any of the coloured words on the bar on the left, and the tweets start pouring in in real time, as in the murmurs menu on wefeelfine.org. No stats or history at this point of time though, but the "believe" segment is often outrageous and funny. This site is NSFW, as we discovered to our expense. There is a desktop client available exclusively for Mac users.

NEWS

Twitter compromised by DNS attack

Users of Twitter were greeting with something far more threatening than the Fail Whale on 18th December. There was a message that proclaimed that "This site has been hacked by the Iranian Cyber Army". At first it looked like this was a rather belated response to the six week long #IranElections trend on Twitter, where tweeple from around the world rallied for the support of Democracy in Iran using a combination of tweets, proxy servers, information and in some cases, disinformation. A sustained six weeks effort is in itself a terribly long time on Twitter timescales, but a retaliation after six months is even longer. It later emerged that this was an attack on the DNS vulnerability, something that internet gurus have been trying to fix for two decades now. Fortunately, this means that accounts on Twitter had not been compromised. As a large share of tweeters used third party tools and applications, the steady stream of tweets was not really interrupted despite the defacement.
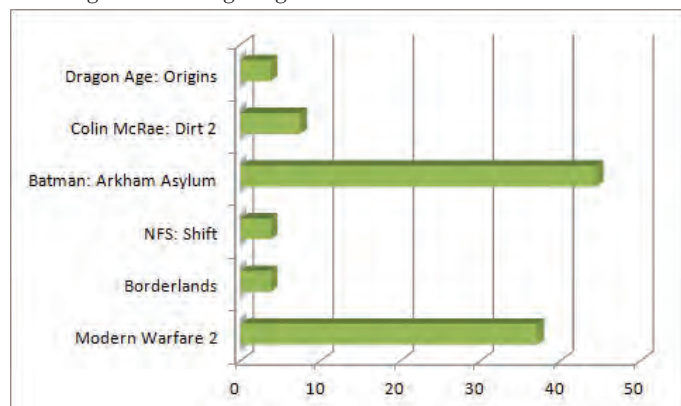
[Poll] Game of the Year 2009

NVIDIAGeek: Yo! Just like Ethan's yesteryear post, vote for the best game of this year & it's strictly PC. If there are any games - that you think is great – other than the 10 ('cause only 10 polls are allowed), please post in this thread. So, let the votin' begin!

Krow: Good to see no Ezio, Nomad or any other similarly sad reference in your post OP. Please keep this up. Voted for Arkham. I know Vamsi will give it to Dragon Age.

NVIDIAGeek: Thank ye. I'll do that only for "Game You are Currently Addicted to" thread. Outside that thread, I'm a serious guy.

vamsi_krishna: absolutely not. I didn't even beat the game yet.. how can i rate it??? Even if I would have completed the game, My vote definitely goes to Batman. Sure Dragon Age origins is rocking but I might be cheating the gamer inside me if I vote for it.

[Poll] Indie Game of the Year 2009

Anorion: Thought I'd get this going as well, just wanted to know. I hope I haven't left out anything.

kanjar: World of Goo

NVIDIAGeek: Machinarium for me. It's too great.

Ei8t: Trine for me.... even Braid was good... but multiple characters of Trine made me vote it....

Davidboon: It's World of Goo for me , simply addictive .

chavo: Braid is amazing. After that Trine

confused: Yes u left out: "And Yet It Moves"

Thread Tools ▼ Search this Thread ▼ Rate Thread ▼ Display Modes ▼ ▼

10-10-2008, 07:01 PM   #1

IronManForever
IronMan; Ready to Roll...
0 tweets
tweet
Join Date: Jun 2008
Location: Metal City
Posts: 1,221

Just bought HTC P3400i... Attemtping a Review

Looks
The first thing one notices are the looks; and let me tell you I hated this handset when I looked at its pictures on the web. But I was surprised that it looks pretty good when you have it in front of your eyes.

Touchscreen
The Touchscreen is responsive in most cases. But the stylus is not comfortable enough for my tastes. I am currently using an ink-finished-pen with a big tip; this is much better for navigation as well as writing on-screen.

UI
The overall speed is not anything to talk home about. It is somewhat slow.
RAM usage is high at default setup with no programs running. Very less free RAM left at startup, just 33%. (Is windows sluggish in every patform?)

The Today screen is awesome and adds a lot of functionality to the phone. (Is it the same is all new WM phones or just HTC? I think its only HTC?)

Camera
Camera is just okay. For viewing pics on phone or posting to blogs. Just for emergency uses. Despite the 2MP sensor, quality is not much better than my age old Nokia 6600's VGA camera. And its painfully slow. Video capture is handicapped at QCIF resolution.

Music
Music quality through the single speaker on the phone is fair for soft numbers, it just isnt the thing for heavy metal stuff. But loudness, my my, I didnt expect a PDA to be so loud. Not that its very loud, but its much more than what I expected. The Treble is more emphasesed through the external speaker as is the case with many mobiles.

But I seriously hate the propietary jack. A 2.5 mm jack would have been tolerated. I am an earphone-buster and this one would last only 2-3 months. A replacement would therfore be expensive due to the propietary jack.

Productivity
The phone allows creating, viewing and editing Word and Excel files. Viewing Powerpoint files is supported but it is sluggish. I was surprised to see support for Office 2007 File formats. The Adobe PDF reader makes an appearance here as well. But for all practical purposes, it ain't that usable because of the slow processor.

Conclusion
Well well, I definitely am in love with this device. Perhaps because its my first experience with Windows Mobile. I was able to adapt to the new OS in a period of one day.

ADD SOME FORZE

Sameer Desai
readersletters@thinkdigit.com

Forza Motorsport is the Xbox's answer to one of PlayStation's most famous brands – *Gran Turismo*. 2007's *Forza Motorsport 2* on the Xbox 360, in fact, must have got quite a few alarm bells ringing in Japan, as it delivered the most complete sim racing experience on current-gen consoles. And while we're yet to see a full *Gran Turismo* release on the PS3, Forza's next instalment – *Forza Motorsport 3* – is already in stores. But does it do enough to steal the top step of

the sim racing podium that *Gran Turismo* has so long occupied?

The daunting physics and spirit-crushing realism that have turned so many away in the past, can now be dialled down using an array of driving assists, such as rewind, which lets you go back in time and retry a segment of the race where you may have erred.

Then there's the one-button driving assist that makes driving so easy that all you really need to do is hold down the accelerator and steer, without having to use the brakes or worry about spinning out of control. By this, Turn 10 aims to appeal to anyone who loves cars, but doesn't want to spend time learning a sim.

Forza 3 has a completely revamped career mode that is broken up into seasons. Here too, accessibility is the mantra with voice-overs guiding you through its many features, be it races, car tuning, or upgrades. The career mode is long, and will take you well over 50 hours to complete. Graphically, *Forza 3* isn't a massive jump up from its predecessor, with performance getting priority.

FORZA MOTORSPORT
8/10
Developer: Turn 10
Publisher: Microsoft Game Studios
Genre: Racing
Platforms: Xbox 360 (Rs. 2,290)

Make Ezio bucks

Sameer Desai
readersletters@thinkdigit.com

Assassin's Creed was built up as the hottest new IP when it released in 2007. It promised to revolutionise the open world action-adventure genre with Parkour-like platforming, stealth, and a unique game world set in the 12th century. The game however, failed to live up to the hype and although it received praise for its originality, it was universally criticised for its repetitive structure. Fortunately, the game sold very well, paving the way for a sequel and a second chance for Ubisoft to deliver on its promises.

If *Assassin's Creed* was a statement of intent, then *Assassin's Creed 2* is a realisation of those intentions, and for anyone who loved the idea behind the first game, but lamented its lacklustre implementation, the sequel will not disappoint. *AC2* has all the qualities of a great sequel; it irons out all the faults from the original, while building upon everything that made it great. While you played Altair in the first game, this time you play the more flamboyant Ezio, and the setting moves from 12th century Middle East to a more beautiful Renaissance Italy.

THE SKOAR
9

Assassin's Creed

Reviewer: Ubisoft
Genre: Action-adventure
Platforms: Xbox 360, PS3 (Rs 2,599). PC version delayed till March 2010

The characters from both games do share similarities. They're both assassins, after all; they dress similarly and share similar physical abilities. Ezio, however, has a wider range of weapons to choose from. He now has smoke bombs, throwing knives, and various other means to take on enemies. Money also plays a role and revenue earned from renovating and upgrading businesses in his hometown can be used to buy better weapons and armour, and even to hire courtesans, thieves, and mercenaries to help you in your missions.

While some missions are similar, there are enough variations in them to not feel monotonous. From thrilling chase sequences through narrow streets and rooftops to the challenging assassins' tombs puzzles to the main assassination missions, there is plenty of variety to make each mission feel fresh.

Then there are the side missions and collectibles; a standard inclusion in all open-world games. It really is an achievement when a game makes you want to complete optional tasks. Side missions are a mix of delivery missions, assassination contracts, rooftop races, and roughing up unfaithful husbands, and these missions yield cash rewards. But it's the collectibles that will keep you playing long after you've completed the main story. Codex pages are pieces of a puzzle that you must collect throughout the game, however collecting these is compulsory to progress the story. Viewpoints are tall building strewn around the various cities and climbing them will add more objectives to your map. Then there are glyphs hidden on various landmarks. On finding them you're required to solve some very challenging puzzles. Each puzzle unlocks a few seconds of a video clip, and finding all glyphs unlocks a rather interesting video.

So the missions are fun and the side quests and collectibles are engaging as well, but the icing on the cake in Assassin's Creed 2 is the locations. As you play in Renaissance Italy, you will travel through a few Italian cities, but none more stunning than Venice. The city is painstakingly detailed, teeming with a busy population, and it's a joy to navigate around with its network of canals and rich architecture. The inclusion of a day and night cycle further adds to the beauty.

You could argue that some of the missions feel like filler material, but on the whole, Assassin's Creed 2 is a game with few faults. It delivers on every promise that the first game made but failed to uphold, and like any good sequel should, it raises the bar in just about every area. **d**

THE SABOTEUR

TIME TO SABOTAGE

Sameer Desai
readersletters@thinkdigit.com

The Saboteur is a World War II game. But before you dismiss this as another generic Nazi-killing first-person shooter, let me tell you that it isn't. Yes, you do kill Nazis in The Saboteur, but this isn't a war game. It's a story of personal vengeance that just happens to take place during World War II in Nazi-controlled Paris. The Saboteur is a free-roaming action adventure game with a mission structure similar to that of Grand Theft Auto. In fact, it borrows ideas from many popular games. But does it manage to create an identity of its own?

You play as foul-mouthed Irish race car driver Sean Devlin, who is forced to flee to Paris after the war breaks out. There he finds himself on a personal quest to avenge the death of his best friend at the hands of a top Gustapo agent. Somewhere along the way, he gets caught up in the Parisian resistance movement and simultaneously chain-smokes his way towards ridding Paris of the Nazis.

The Saboteur is an open world game and the missions are mostly of the infiltrate, kill and destroy variety. There is also a fair amount of Assassin's Creed-style platforming and Sean is able to climb pretty much any building in the city. Missions can be dealt with in multiple ways. You can either go all guns blazing or throw on a Nazi uniform and see how far the stealthy approach takes you. Gun play is satisfactorily exciting without being perfect, while the Hitman-inspired stealth works well enough without being as clinical as specialist stealth titles.

The most unique aspect of The Saboteur is its art style. Nazi-controlled areas are ominously dark, gloomy and devoid of all colour, with only the yellow tinge of window panes at night and red representing Nazi flags, arm bands and control points breaking the monotony of black and white. When it's pouring down, it is reminiscent of Frank Miller's Sin City, and along with a fantastic '60s soundtrack, it creates a brilliant atmosphere. But liberate these areas by completing missions and the look is drastically different. It's vivid and colourful like a Disney animated film and it's almost jarring to a point where you'll start to miss the noir film charm of the Nazi areas.

Besides the story missions, which vary from chase sequences in giant zeppelins and car races to assassinations and destroying Nazi control points, you also have side missions. These consist of destroying smaller Nazi installments such as sniper towers, radars, AA guns and propaganda speakers. Completing missions earns you contraband, which you can use at various dealers to buy weapons and ammo. There is also an interesting perk system that rewards you for excelling in various areas such as gunplay, sniping, stealth kills and driving.

As we said, missions are presented in the standard GTA-esque 'go there and talk to him' structure, platforming is strikingly similar to Assassin's Creed, stealth is inspired by Hitman, and the area liberation system is similar to, most recently, inFamous. So clearly, The Saboteur is a game built on borrowed ideas, and while that may sound bad on paper, the implementation of these elements, while not perfect, is pretty good and they come together cohesively to provide a fair amount of gameplay variety.

The Saboteur isn't historically accurate, the voice acting is so bad that it almost feels intentional. What it lacks in polish and production values, it makes up by delivering heaps of simple, unadulterated fun. And that's worth something.◘

THE SABOTEUR
7/10
Developer: Pandemic Studios
Publisher: EA
Genre: Action-adventure
Platforms: PS3 (Rs 2,499), Xbox 360 (Rs 1,899), PC (Rs 999)

PC MINIMUM REQUIREMENTS
Operating system:
Win XP SP3, Vista SP1, Win 7
CPU:
Intel Core2Duo 2.4 Ghz or AMD equivalent
RAM: 2 GB
HDD: 7 GB
Video: NVIDIA GeForce 7800GTX w/ 256MB video ram or ATI Radeon HD2600 Pro
Sound: DirectX 9c compliant sound

Where is my mysterious missing Hard Disk space?

The rest of the world considers Kilo and Mega to be multipliers of a thousand and a hundred thousand respectively. Unfortunately, the nerds who designed computers don't seem to count in anything but binary. The obscure number of 1024 became the multiplier, and they went right ahead and called it "Kilo" anyway. So in reality, **1 megabyte = 1048576 bytes**. Manufacturers caught on, thinking it would be simpler to advertise a 1 Terrabyte drive, but give a few GBs less. That explains the difference between the memory space you expect, and the memory space you get. A new standard proposes to use *kibibytes* instead.

The Jargon File

● **Cloud:** A description for data online that can be accessed from many locations and platforms. A Word document saved on Google docs, for example, can be accessed from mobile phones, desktops and cybercafes. The document is said to be in the *cloud*.

● **Distro hopper:** A Distro hopper is someone who compulsively installs different flavors of Linux.

● **PictBridge:** PictBridge is an interface that allows cameras to be directly connected to printers, without a computer or any other device in between

● **MFD:** MFD stands for multi-function device. For example, a combination of a scanner, photo copying machine and printer.

● **Live CD:** A Live CD is typically a Linux distribution that runs directly off a CD, without any installation.

● **Ubuntu:** Canonical's attempt at making a widely publicised idiot-friendly Linux distribution on the lines of Windows.

How to get rid of the irritating mobile alerts

Does your mobile service provider send you updates you don't really appreciate? Here is how to unsubscribe:

Reliance Infocom
Call 51234 863 for Cricket
Call 51234 863 for Astrology
SMS U to 51234 for Astropack

Loop Mobile just press *112#
and follow the instructions

Vodafone Live!
SMS CAN VL to 111 (postpaid)
SMS CAN VL to 144 (prepaid)

Airtel
SMS UNSUB <service> 54321
Examples of the <service> include Comic, Mobile, News, Business, Film

Idea
SMS DND to 1909

When Will The World End?

500002010 AD   428897 AD   2012 AD

No, really, 5 Billion years from now, the planet *will* go kaput

Some people were actually surprised when the world didn't end back in 2000, and now a group is rallying around the year 2012, just because Mayans got bored of calculating the days of the year. The more patient cultists are pin-pointing the date at 2020. They will just have to bear the disappointment. Current science dates the Sun at 5 billion years old, and at middle-age. When the sun goes nova, 5 billion years from now, is when the planet will be swallowed up in a big ball of hot gas.

Near disasters of 2012
• Microsoft will release Windows 8
• The second largest near earth space rock (Eros) will *just* miss us
• The Kyoto protocol will be void
• The sun will become hyperactive
• A Dalek will break loose