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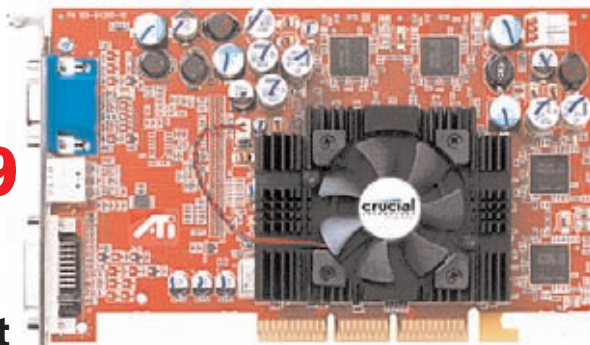
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Will the Tablet PC triumph where others have failed?

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FROM THE FRONT

Something new

The print version of *PC Magazine* is sadly no more. However, you can't keep a good thing down and the e-book you're now reading has risen from the ashes

tony_westbrook@vnu.co.uk

When *PC Magazine*'s final print edition hit the streets we didn't have a chance to say goodbye to all our loyal readers. At the time we were upset by this, but maybe it's just as well, as it has given us time to look at how we can continue to get some of the great information and wisdom contained within its pages out to our audience through multiple media outlets. *PC Magazine* in print was simply no longer a tenable product, great though we believe it always was. That's not to do with the quality of its content, but to do with the tough market we were (and are) facing. Even though the product you were familiar with has gone, we've worked hard to find new ways to deliver the same information to you in more effective and reliable ways.

With that in mind you'll see that PCW has already implemented some changes to address your information needs, specifically to incorporate the breadth of products and coverage that the *PC Magazine* audience valued—so you'll still always have a print product you can buy at the newsstand (or through subscription) that gives you the information you want.

But we wanted to offer something more, something that would retain the spirit of *PC Magazine* and its very labs-focused view of the world. And that's where this new e-book comes in. We've picked up where the October issue of *PC Magazine* left off with something complementary to the new and expanding PCW print product.

Kelvyn Taylor is now heading up the VNU Labs operation. Read about his plans to incorporating many of the techniques and methodologies of repeatable testing used in *PC Magazine* across PCW and all VNU's publications (see opposite).

We also wanted to complete some of the serialised 'Solutions' masterclasses that readers have expressed such interest in and concern at the loss of—so turn to page 26 to enjoy the next instalment of Alex Cruickshank's Web content management tutorial and find out what Geoff Einon is doing with Excel this month on page 22.

We've included a few other elements of *PC Magazine* in this first issue—a few reviews fresh from our new VNU Lab facility, an e-business feature looking at some key products in a key area and some news and comment from industry guru Guy Kewney.

This e-book isn't meant to be a continuation of the print *PC Magazine*, but a regular supplementary publication providing an outlet for our new VNU Labs team and covering the more specialist areas not addressed by PCW as it expands its coverage over the next few months. The December issue will be out before Christmas.

With this in mind I'd love to hear from you about what kind of information you'd like to see here, so that we can provide a tailored experience for you, our most loyal readers.■

> **We wanted to retain the spirit of PC Magazine and its very labs-focused view of the world. That's where the e-book comes in**

TECH TALES

The next chapter

Ex-*PC Magazine* staff are spearheading VNU's new testing facility—called VNU Labs— and will continue the tradition of supplying reliable and repeatable test results

kelvyn_taylor@vnu.co.uk

My career in publishing started 10 years ago as a tester in *PC Magazine* Labs (there were a couple of other careers before that, but that's another story), and now it's now come full circle. Losing the print version of *PC Magazine* was a sad experience for everyone involved, but I'm happy to announce that one of its fundamental components, *PC Magazine* Labs, is to not only continue but significantly expand its influence.

Renamed VNU Labs, the team consists almost entirely of ex-*PC Magazine* Labs staff, headed up by myself. Paul Monckton (Senior Project Manager), will be looking after our technical direction and test development; Simon Crisp and Alexander Arias (Project Managers) will be calling on their years of expertise to generate the reliable, repeatable labs information that *PC Magazine* Labs was always famous for. And not forgetting Alan Rider (Stores Supervisor), the indispensable man behind the scenes who keeps the whole process rolling along smoothly. But that's not all. In addition to supporting the new electronic version of *PC Magazine* that you're reading now, our tests and methodologies will also be used by Personal Computer World, Computeractiv and IT Week as well as the other IT print titles in the VNU stable. We've got a lot of other exciting plans for the future, but I'm afraid you'll have to wait to hear more details on those.

The American essayist Clarence Day once said: 'Information's pretty thin stuff unless mixed with experience.' It's only the extensive experience of VNU Labs' staff that adds value to the data we collect—the experience to understand what the test results are saying, the experience to spot spurious results, the experience to develop new test methodologies for new technology as it appears. We keep no secrets from our readers or manufacturers, we've no magic formulas or patents—we use industry-standard tools and methods that are available to anyone. The difference is our philosophy—if we can't reproduce a result or can't explain what it means, then we've failed and won't use the results. Anyone can obtain numbers from benchmarks, but not everyone can interpret them. That's the crucial difference that has always been—and will continue to be—our main strength. We're looking forward to building on the wealth of knowledge we've accumulated during our years at *PC Magazine* Labs—the name may have changed, but the song most definitely remains the same.

Double standards

DVD standards are a minefield, particularly when it comes to rewriteable formats. The problem has been caused by the existence of two rival factions: the DVD Forum, which promotes the DVD-RW specification; and the DVD+RW Alliance led by Dell, HP, Mitsubishi Chemicals, Philips, Ricoh, Sony, Thomson Multimedia and Yamaha. DVD+RW is in some respects technically superior, but the market will decide. However, a couple of recently announced drives look set to change the landscape significantly.

Sony is one of several companies with a foot in both camps and has decided that consumers aren't interested in waiting until the politics are sorted out. In September it announced the DRU-500A (internal ATAPI) and DR-500UL (external FireWire), multi-format drives that offer full compatibility with both DVD+R/RW and DVD-R/RW media. Costing around £280 (inc. VAT), the internal drive is available now, with the external model expected to cost about £40 more. If these drives live up to expectations, it could mark a significant turning point in the format wars.

Meanwhile in the DVD Forum camp, Panasonic is planning to launch (early 2003 is the best information I've managed to obtain) the DVD Burner II (SR-8588-C). This will be the first drive to support the new DVD-Multi specification, which covers DVD-RW, DVD-RAM, CD-RW, CD-R and DVD-R media in addition to all standard read-only CD and DVD formats such as Video CD and DVD-Video. The DVD+RW Alliance has no comparable multi-format specification (as it has no rights to DVD-RAM), although a DVD+RW drive will read and write to DVD+R, DVD+RW, CD-R and CD-RW media. It won't read or write to DVD-RAM, DVD-R or DVD-RW formats. My money's on Sony's approach, as simplicity is what everyone wants. The lack of DVD-RAM support is a bit of a nuisance—although it's not a particularly popular format despite its great suitability for backup and archiving purposes.

If I was building a new system and had the money, I'd go for one of the Sony multi-format drives plus a Panasonic DVD-RAM/DVD-R burner (the current LF-D311 costs around £330 inc. VAT). This would cover all bases, although it would cost you around £613. If Panasonic's new drive achieves the predicted sub-£300 price point, it would be slightly cheaper to go for this in combination with a £200 DVD+RW drive. At least the choices are becoming clearer, which is exactly the way the market should work.■

LETTERS

• **Email us at feedback@pcmag.co.uk including your name and address.**
You can also post a letter to us. Send it to: The Editor, *PC Magazine*,
VNU Business Publications, 32-34 Broadwick Street, London W1A 2HG.

LETTER OF THE MONTH

Killer switch...

I've recently been reading a number of disparate reviews of the new XDA palm device from O2. All seem to consider it a worthy device and worth seeing. This I did and received a remarkable warning from one of O2's own resellers.

As with most PDAs there is a pencil-push switch that resets the device should it lock up. No problem there. There's also a protected, or rather covered, switch which fully reboots the device and reverts it to an as-bought status. No problem there either, I thought.

It was then pointed out to me that if you open the SIM card access flap, there's a small metallic trip, nestling against the release clip. If you're unfortunate enough to depress this switch the machine is wiped. And I mean wiped—it can't be restarted or re-used afterwards. Not only that, O2 won't accept it back and can't repair it. It's just about the right thickness to hold open a door and according to the rueful O2 salesman, that was about all your device would be good for afterwards.

I have no idea what such a switch would be used for, or why it's in such a ridiculous location. The salesman said he felt morally bound to point it out as he expected an influx of returns as people went to remove or change a SIM card, went 'oops' and found themselves left with a worthless shiny doorstop.
CIARAN O'BRIEN, E-MAIL

didn't make any difference. However, I've discovered a possible way to recover confused SM cards.

If you use an SM card in a MP3 player, the player will automatically format the card and destroy the Card Information Structure (CIS). You may also be relieved to learn that there's a program out there called SMPREP.EXE, which can get the card working again. However that's not the end of the story, since the smprep utility needs to be configured with a compatible set of drivers. So if you have a particular camera, you need to go to those manufacturers and download their version of smprep. But I don't recall reading anything about this potential hardware-induced headache in the vendor literature.
ANDY FOOTE, EMAIL

Card tricks

In your recent article on creating your own PC (May 2002) I found it useful when you specify the actual graphics card manufacturer—something large companies advertising their computers neglect. Most of the manufacturers just print the chipset manufacturers' buzzwords, such as GeForce4 Ti or Radeon 8500 DLV. This is rather unfair on the likes of VisionTech and Asus. This could disadvantage potential buyers, as they could end up spending their cash on an MX instead of a Ti.
EUAN MORSE, EMAIL

Who's robbing who?

I loved your broadband feature in the October issue, which served as a good introduction to the wonderful world a fast broadband connection can open for you.

Your feature mentioned peer-to-peer file sharing. While a publication such as yours can't be seen to be condoning theft, I believe that the entertainment industry has had it too good for too long. Here in good old rip-off Britain, we're pretty much always the last market to be released into and at the highest price. How can the entertainment industry get away with releasing material in the states months before it's due for release here. So who is robbing who? The entertainment industry needs to sort itself out as otherwise, I can't see much to persuade folk to stop illegal file sharing.
MARK CLABON, EMAIL

SmartMedia RIP

I wonder how many of your readers have had the experience of Smart-Media (SM) card death?

It happened to me when I recently switched a 128MB SM card from my MP3 player to my digital camera. I got a 'card error!' message on my camera display and my camera refused to format the card. I tried formatting the SM card using my PC and a card reader, but that

TRENDS

Tablet PCs now shipping

Price and support concerns flaw the Tablet PC's arrival

A new wave of flat-panel mobile Tablet PCs has arrived, offering handwriting-recognition capabilities, but at high prices and lacking some important software support.

A flat-tablet format is favoured by Fujitsu Seimens, Research Machines and Viewsonic. Acer and Toshiba offer a clamshell design with a swivelling screen. HP is the only vendor to offer a model that can be attached to a notebook.

Following labs tests by *PC Magazine*'s sister title *IT Week*, potential buyers are advised to investigate a wide range of Tablet PCs before purchasing, due to significant differences in the hardware quality of the first-generation devices.

Acer, Compaq, Fujitsu Siemens, Research Machines and Toshiba have all begun selling Tablet PCs in the UK, based on an extended version of Windows XP. In the past, Tablet PCs were largely aimed at industry-specific applications in sectors, such as medical, for forms-based tasks.

Tablet PCs are intended to appeal to roaming users running a variety of applications. In particular, they're designed to support note taking through handwriting-recognition technology. However, some users may not wish to use the recognition engine, preferring to use the devices to store their notes as Microsoft Journal files or as image files that can then be emailed.

During testing, *IT Week* looked at three models—two notebooks with non-detachable screens and one without a keyboard. To gain greater accuracy from the handwriting recognition engine, users had to modify the way they wrote. Some devices provided a much more user-friendly experience than others, which greatly affected the efficiency of the handwriting recognition.

Though the machines are designed for mobile data-input, the casings seem to be easily damaged, as build quality is questionable on some of the units. A lack of application software may also dent enthusiasm for Tablet PCs in the near term. However, an Office XP pack for Tablets is already available and some independent software vendors have revised versions of their software to support pen input. But Office 2000 will have no support on Tablet PCs and a vast amount of software will be unable to take advantage of the new features.

High initial prices are also likely to deter many would-be users. The cheapest of these devices on the market are expected to cost around £1,500—roughly twice the price of budget notebook PCs from leading manufacturers.

The format of the first systems may also be a problem. Most are A4-sized and bulky, whereas A5 may be a more attractive format for everyday use and could become more common when the processing power of very small chips increases.
MARTIN VEITCH, IT WEEK

▲ Prospective Tablet PC buyers are being advised to try before they buy

O2 HAS DOUBLED THE MEMOry capacity of its XDA handheld and launched a cheaper connection package to sell as a Christmas present.

The XDA device is an integrated handheld computer and mobile phone with a colour screen and Internet access. From 15 November the device will come with 64MB of RAM as standard.

Customers will be able to buy the XDA at £299 if they commit to a 12-month voice-calling plan and add a 'data bundle'. This costs £12 per month, which includes 5MB of free data. Those who already have a mobile phone voice-calling plan with another UK network can purchase the XDA for £399 by committing to a standalone data bundle of £15 per month, which includes 5MB of free data.

The XDA has an Intel StrongARM 32-bit processor, an always-on GPRS connection and runs Windows Powered Pocket PC 2002 Phone Edition software. *NICK FARRELL*

Pentium 4 processor gathers speed

Intel's Pentium 4 hits 3GHz and gains Hyper-threading capabilities

Intel has recently launched the 3.06GHz version of its Pentium 4 chip, which brings the firm's Hyper-threading technology to its mainstream desktop processors. Hyper-threading makes each processor appear to software as two virtual processors, speeding up some applications. However, tests by *PC Magazine* Labs (*PC Magazine*, October 2002) showed that Hyper-threading can also slow down some workstation software.

The 3GHz operating speed of the latest P4 is a milestone for the industry and will reduce the advantage of Intel's 64-bit Itanium 2 processors compared with the 32-bit Pentiums.

In October, the Top500.org supercomputer benchmarking Web site (www.top500.org) published results showing that although the 2.53GHz

Pentium 4 was 20 per cent slower than the Itanium 2 in its optimised Linpack test, it was 7 per cent faster in the standard non-optimised Linpack benchmark. It's estimated the 3.06GHz Pentium 4 will close this gap.

Intel said Hyper-threading could boost performance by up to 30 per cent. But *PC Magazine*'s tests demonstrated that the performance of some applications drops significantly when Hyper-threading is enabled, partly because each virtual processor has access to only half the chip's resources, such as cache memory. Operating systems and applications must support Hyper-threading to benefit from it. Linux and Windows XP are explicitly compatible with the feature, but Windows 95, 98, 2000, NT 4.0 and ME aren't. *DANIEL ROBINSON AND ROGER HOWORTH, IT WEEK*

Smartphone chooses different direction

Handset-maker Sendo quits Smartphone programme in favour of open-source

Less than a month after Microsoft launched its Smartphone software, one of its major partners has withdrawn from the programme and defected to the open-source community.

UK-based mobile phone manufacturer Sendo has licensed Nokia's Series 60 Platform, which sits on top of the Symbian operating system.

Sendo had been developing the Z100 Stinger smartphone with Microsoft and missed several launch deadlines. All work on the device has now been abandoned. 'The Z100 will not be coming to market,' said Ron Schaeffer, head of product strategy and planning at Sendo. 'The main attraction of the Nokia product was being able to customise the product to suit others,' he explained.

The announcement leaves Microsoft with only one major mobile phone manufacturer, Samsung, developing for the Smartphone platform. However, Samsung has been hedging its bets by developing an open source smartphone with Symbian.

Jessica Figueras, a senior analyst at research company Ovum, said: 'In this market the big device vendors have seen what happened to the PC industry and have organised to stop the same thing happening again.'

The move by Sendo is a major win for the open source movement, which has been under sustained pressure from Microsoft.

'We're extremely pleased to welcome Sendo,' said Niklas Savander, vice president at Nokia Mobile Software. Microsoft is a part owner of Sendo, which was set up in 1999 by ex-Philips engineers. *IAIN THOMSON*
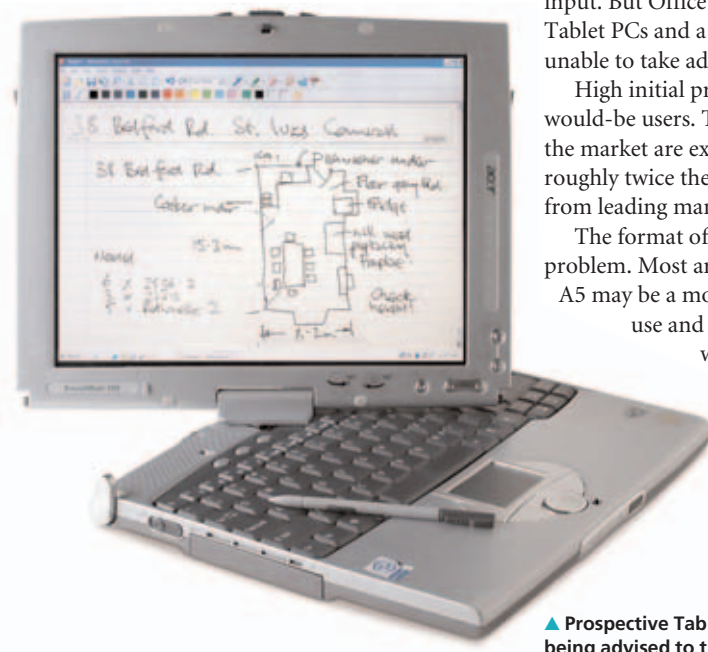

▶ Sendo defects from Microsoft

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Costa installs wireless-LAN hotspots

Coffee-shop chain puts technology into key outlets in the City of London

THE COSTA COFFEE-SHOP CHAIN has joined the growing ranks of companies rolling out wireless local area network (LAN) hotspots for use by customers, installing the BT technology in five shops in London.

The move marks a further step in BT's plans to install 70 Openzone hotspots by the end of the year. Costa joins Hilton Hotels, Welcome Break service stations and the Bluewater shopping centre in signing agreements with BT to host the wire-

less LANs. Starbucks signed a similar deal with T-Mobile in August.

Business subscriptions for the BT service start at £20 per month for 300 minutes and unlimited use is set at £85 per month. It will also offer a pay-as-you-go service costing £6 per hour. BT said that the service would be phased in gradually as shops receive pay-as-you-go cards.

European wireless Internet service provider Megabeam also released details of prices for its busi-

ness customers. A monthly subscription will cost 86.25 euros (£55) per month for unlimited access. Two hours will cost 7.50 euros (£4.79).

Megabeam has also come to an agreement with hotel chain Queens Moat House to install and operate wireless hotspots at 25 hotels in the UK, Germany and The Netherlands.

Ryan Jarvis, chief executive at Megabeam, said that business travellers are 'more likely to stay at a hotel with a high-speed wireless

communications service'. He added that tighter security is another important issue.

BT has assured customers that the Openzone hotspots are secure.

The company uses Nortel Networks' Contivity IP Services Platform to 'bolt, padlock and board-up the back door by ensuring that all communication devices are encrypted to the highest level using triple-DES and encapsulated within a secure tunnel using IPSec'. *RENE MILLMAN*

OPINION
GUY KEWNEY

KEEP TAKING THE TABLETS

HOW CONFIDENT WOULD you be, if you were launching the Tablet edition of Windows XP, that it was going to be a success? Or, to put it another way, if you had a choice between a Tablet and normal notebook PC, which would you buy?

Microsoft's chief developer for Tablet, Bodin Dresevic, said (just before the 7 November launch) that he 'could not see any reason why you'd want a standard notebook, rather than a Tablet version. Apart, of course, from the price'. He doesn't mean the price of the Tablet software—it's virtually invisible on top of the standard cost of XP to a PC maker, he means that the hardware costs more.

That's his opinion. If it were the opinion of his marketing bosses, then Windows

XP Service Pack 1 would have included Tablet Edition.

So why doesn't it then?

That's an easy one to answer. If it doesn't turn out to be a success, it would then have to be un-included from SP1 later and replaced with something different.

In addition, some sort of pen interface to notebooks is needed. We're accustomed, via PocketPC designs, to being able to draw on a touch screen and use the screen as a mouse. Handwriting is the missing data-input medium on the standard Windows setup, at the moment—so is voice. All of these issues are addressed by Tablet Edition.

Does this mean that Bodin's bosses don't think it will be a success? Hardly. It just means that Microsoft is going to go hard on this one,

but not to the extent of betting its survival on it.

Microsoft has one, simple answer. 'We will bet our reputation on it, when we know it's right.'

The fact is, Microsoft has tried pens before, lots of times. There was Pen Windows and there was even a stylus input for a special version of Microsoft Windows version 3.1, as shipped on the Compaq Concerto a decade ago. There was the Slate. There were other attempts, but all floundered on several points.

First, the handwriting recogniser is 14 years old. It required a 500 MHz Pentium III minimum and a huge, frequently refined database of handwriting styles and recognisers. That was never available before. The storage needed to hold it wasn't

available at a reasonable price before, either. And the display technology wasn't available. A touch screen is a nuisance and not just because of fingerprints, it also tends to pick up touches by things that aren't the official stylus. The current screen isn't pressure sensitive—the stylus is.

If this one doesn't work, Microsoft will just have to do another version, but it won't want to have a couple of hundred million obsolete versions of the failed one lying around on desktop machines and servers, just to enable 'ink' as a medium in information technology.

One day, all notebooks (at the least) will be like this, probably. But not until Microsoft is sure that this is the right—and a popular—design, will all desktops be like this.

30GB drive launches at Comdex Fall

Optical disk capacity set to leap again

A UK company, Plasmon, demonstrated a 30GB drive at Comdex in Las Vegas in late November. The capacity of the latest 30GB ultra density optical (UDO) disc is about 3.5 times that of current DVDs and Cambridge-based Plasmon said plans were already in place for 60 and 120GB drives.

The UDO drive is the first to use a 405 nanometer blue-violet laser and phase-change technology that allows greater storage density.

'We've taken a head and lens assembly, and other components, and built the electronics to put it together,' said Stewart Vane-Tempest, Plasmon's director of optical products.

Plasmon will demonstrate a write-once, read-many (Worm) drive at Comdex. But first customer shipments, planned for August 2003, will be of a multi-function drive supporting both Worm and rewritable media.

The company has stolen a march on the Blu-Ray consortium that includes Hitachi, Philips, Samsung and Sony. It's planning a single-sided 27GB drive that uses similar technology.

But Vane-Tempest said that the consortium is concentrating entirely on the MPEG video market

▲ **Ultra density optical discs to reach 120GB capacity**

and aiming to get three hours of high definition TV on a single Blu-Ray disc.

The relatively modest 8MB/s maximum transfer rate, equivalent to magneto-optical drives, is a little slow for raw video, but has plenty of capacity for MPEG-2, as used in most videos. So the company is already talking to some TV companies.

Vane-Tempest explained that although there are many possible markets the initial focus would be on document management and medical archiving where users liked the combination of Worm and rewritable media.

Drives will be shipped to software partners to test applications as early as next spring. Release pricing is expected to be around £1,300, similar to equivalent magneto-optical drives. *PETER WILLIAMS*

Half-price networking kit

Dell's long-awaited networking products include half-price offerings

Dell's PowerConnect range of layer-two local area network switches, which will connect PCs and servers at wire speed, has finally arrived in Europe and will be up to 50 per cent cheaper than rival products.

Dell is using third-party Taiwanese vendor Delta to build the products, but will design and develop them itself. They can be bought alongside servers, desktops, notebooks and storage products.

Keith Humphreys, from EuroLAN Research, described the products, of which two million network ports have been sold in the US, as 'meat and potatoes', adding that Dell will be going for the higher end of the SME market with customers that can support themselves.

Launched in the US 14 months ago, the range had four products aimed at the SME market. This has doubled and includes the enterprise sector.

'We are bringing the Dell Direct model into the networking market and this is what helps us deliver high-performance products at up to 50 per cent less cost,' said Kim Goodman, global vice president of the networking products division at Dell.

Humphreys explained that the Dell model isn't the same as for its PCs and servers as it's not a built-to-order system. However, Des Lekerman, MD at networking reseller Eurodata Systems, said that networking technology is about more than just price and suggested that the Dell offering won't appeal to larger companies. *KARL FLINDERS*

▲ **At up to 50 per cent cheaper than rival products, the Dell range should prove attractive**

NEWS IN BRIEF

● Companies should use Linux as a replacement for high-end Unix systems and move towards standards-based computing, according to Dell chief executive Michael Dell. In a keynote question-and-answer session at the Gartner Symposium in Cannes, Dell maintained that companies should think seriously about standards-based computing and investigate the opportunities offered by replacing Unix with Linux.

● Intel has ramped up its Xeon processor line in a move that analysts believe will put pressure on RISC vendors, such as IBM and Sun Microsystems. The three new processors, codenamed Gallatin, are for use in four- and eight-way servers and run at speeds of up to 2GHz. The two lower-speed chips run at 1.5GHz and 1.9GHz and feature 1MB of cache; the faster version features 2MB of cache. Intel says that when compared to previous Xeon chips the new processors deliver up to 38 per cent better performance for typical server workloads, such as databases and supply-chain management.

● IBM claims to have created the world's fastest silicon-based transistor, which operates at a speed of 350GHz. The transistor uses Big Blue's silicon germanium (SiGe) bipolar technology, which combines these two elements in order to speed the flow of electrons. The company said that the device runs nearly 300 per cent faster than existing production chips. IBM indicated that the new transistors could be used in commercial products at speeds of 150GHz within the next two years. The new transistor is also expected to cut costs for communications systems as well as other electronic products.

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PCI slots 6
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PENTIUM 4 MOTHERBOARD

Intel continues to launch and update chipsets at an increasing pace and one of the latest of these is an update of the i845E, the i845PE. The i845PE brings DDR333 (PC2700) support for the Pentium 4, supports both 533MHz and 400MHz front-side bus (FSB) CPUs and is optimised to support the latest generation Pentium 4s, which are Hyper-threading enabled.

The P4PE from Asus is the first motherboard we've seen that uses this new chipset and backs it up with an array of additional features. The P4PE board reviewed is the high-end model with even more features: Gigabit LAN, Serial ATA, single RAID connector and FireWire.

Some thought has clearly gone into the board's layout: there's plenty of space around the components and thankfully the board doesn't have the plethora of headers that have been seen on recent Asus boards. Those that it does have are all gathered around the bottom edge of the board. Unfortunately, this is another motherboard to suffer from the problem of memory latches being obscured by the AGP slot.

Three memory slots are provided but you should bear in mind that only two of these can be used with double-sided DDR-SDRAM modules, the third can only be used with single-sided modules, which can be rather difficult to find. Also DDR333 support is only available when a 533MHz FSB CPU is used—400MHz Pentium 4s are limited to memory speeds of up to 266MHz.

The Intel 82801DA Southbridge has connectivity for up to six USB 2.0 ports, four of which are on the I/O back panel, with headers on the board for the remaining two. These can either be implemented via the supplied expansion bracket or by suitable front ports in your PC's case, if present.

VNU Labs' tests
Asus P4PE/GL/F/SATA/GD

System performance (2.53GHz P4)
Content Creation Winstone 2002

▇	**38.2**
▇	37.5

▨ Reference—Soyo SY-P4S

The launch of Intel's latest chipset brings DDR333 (PC2700) support to the Pentium 4 processor—the first chipset to do so. Performance with a non-Hyper-threading Pentium 4 is comparable to that of the SiS645DX chipset in the Soyo SY-P4S.

The additional features of this top-end board are impressive. An integrated Gigabit LAN interface is controlled by a BroadCom BCM5702 single-chip solution, which supports 10/100/1000Base-T. There are two Serial ATA connectors and a Promise PDC20376 chip controls the additional Ultra ATA/133 RAID interface, which supports RAID levels 0 and 1.

The P4PE has enough BIOS features for those of you that like to tweak your system. You can adjust the FSB speed, memory timings, CPU core voltage, memory voltage and AGP voltage. And if any of these go wrong there's a feature called CPU Parameter Recall (CPR), which automatically re-sets to the default BIOS settings should the system hang, so there's no need to manually clear the CMOS as you would normally have to do.

Asus's P4PE is a well-specified motherboard, which—despite having many advanced features—is easy to set up and run. **SIMON CRISP**
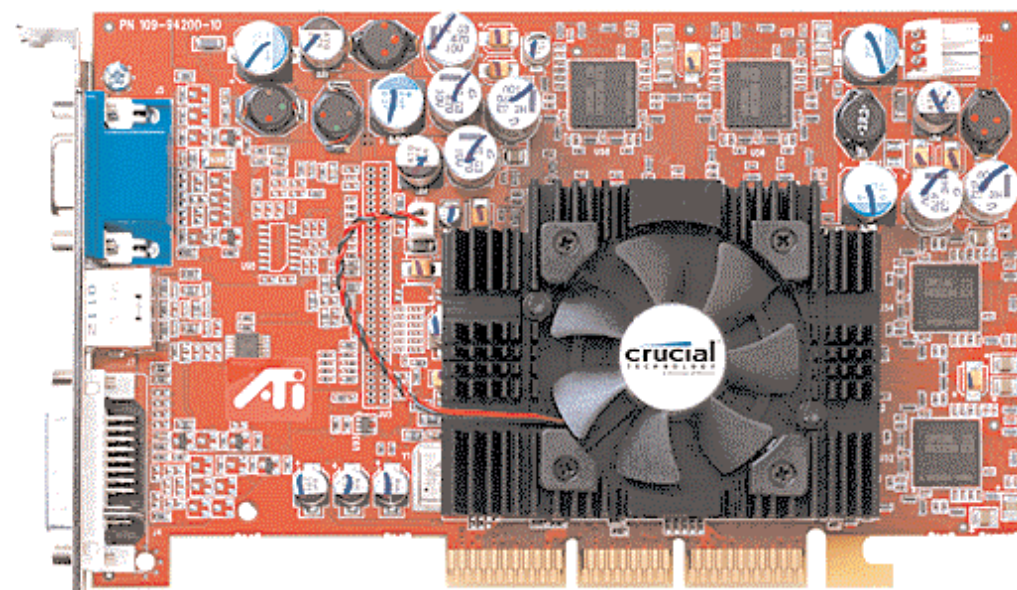
◀ The ATI Radeon 9700 Pro is an AGP 8X-capable board and is compatible with the upcoming DirectX 9 standard

Ultimate gamers' card

GRAPHICS CARD

Already well known for selling high-quality memory upgrades, Crucial Technology has recently moved into the graphics card market with two cards based on ATI chipsets. The entry-level model is based on the Radeon 8500LE and the second, reviewed here, features the much more powerful Radeon 9700 Pro. This is an AGP 8X-capable board, which is also the only one that's compatible with the upcoming DirectX 9 standard.

The Crucial Radeon 9700 Pro, built on a red printed circuit board, uses the same 0.15-micron ATI R300 core as the standard 9700 Pro and uses the same low-profile cooler to keep this power-hungry beast cool. This is no mean achievement when you consider the core clock runs at 325MHz and the DDR-SDRAM memory clock at 310MHz. The Radeon chip is covered by a large heatsink and fan assembly and there's also an EMI shield on the back of the card.

Memory bandwidth can be a real bottleneck when it comes to graphics performance and, in this regard, the 9700 Pro trounces the opposition. By using 128MB of 2.8ns DDR-SDRAM memory and a 256-bit memory bus, it offers an impressive 20GB/s memory bandwidth, nearly twice that of nVidia's GeForce4 Ti 4600.

The 9700 Pro also introduces some powerful 2D features to enhance the quality of video and DVD images by using ATI's VideoShader and Fullstream technologies. These serve to integrate pixel shaders to overcome the blocky artefacts usually associated with video and DVD images.

Twin 400MHz RAMDACS provide dual output capability, feeding single VGA and DVI-I ports along with a 7-pin S-Video output port.

If you don't have a spare floppy disk drive power connector (required to feed the card's

prodigious power requirements), Crucial Technology thoughtfully includes a Y-splitter in the card bundle. There's also an S-Video to composite video adapter, an S-Video cable and a DVI-I to DB-15 VGA converter.

While the Crucial Radeon 9700 doesn't offer any more in terms of features than ATI's reference boards you do, however, get Crucial's excellent service backed by free technical support and limited lifetime warranty (the latter isn't transferable). Crucial Technology is also currently offering an attractive 10 per cent discount as well as free UK shipping if you order this Radeon card online at www.crucial.com/uk/. **SIMON CRISP**

Verdict Hardcore gamers with deep pockets will love this card

➕ The fastest 3D graphics card we've seen to date
➖ Expensive; no games bundle

Fact file

Controller ATI Radeon 9700
Memory 128MB DDR SDRAM
Core clock 325MHz
Memory clock 310MHz
RAMDAC Dual 400MHz
Connectors VGA, DVI-I, S-Video
Contact Crucial Technology (0800) 013 0330 www.crucial.com/uk/
Price £263.99 (inc. VAT)

VNU Labs' tests
Crucial Radeon 9700 Pro

3D performance (4X anti-aliasing)
3D WinBench 20000

▇	**283**
▨	119

3D performance (no anti-aliasing)
3D WinBench 20000

▇	**359**
▨	314

▨ Reference—nVidia GeForce4 Ti 4600

Under 3D WinBench 2000, the Crucial Radeon 9700 Pro outperforms the nVidia GeForce4 Ti 4600 by almost 15 per cent with anti-aliasing disabled. The Radeon 9700 Pro also appears to cope with 4X anti-aliasing much better than our reference card, the Geforce4 Ti 4600, as performance drops by only 21 per cent compared to a 62 per cent drop for the nVidia chip.

CHOOSING PRODUCTS

E-BUSINESS

INTRO | REVIEWS | BENEFITS | CUSTOMER DATA | PAYMENT | TIPS

CHOOSING PRODUCTS

E-BUSINESS

INTRO | REVIEWS | BENEFITS | CUSTOMER DATA | PAYMENT | TIPS

Selling off the screen

If you already have a Web site, you could be selling your products direct to customers. We take a look at six packages that are designed to let you put your store online

The dotcom boom (and bust) may be behind us, but that doesn't mean that doing business online has gone away. There are plenty of examples of companies who've succeeded in changing or augmenting the way they work through effective use of the Web. Here we take a look at several e-business products and tactics to help smaller businesses make the most of online trading.

We've focused on three of the key tasks associated with running an e-business: setting up an online store, managing payments and making the most of customer data. We also address some of the major do's and don'ts for online business success.

Investing in tools appropriate to your size and type of business is essential to success. Much is made of enterprise e-commerce products from companies ike Oracle, but sizeable price tags and complex installations place them out of reach of smaller concerns. However, there also a risk in investing in low-end tools that offer no capacity for upgrading, should the online side of your business grow.

The technologies that support e-business could also undergo significant change over the next few years with the evolution of Web services. Demystifying the hype surrounding these services is difficult, with vendors encouraging businesses to buy heavily branded, but apparently open, sets of tools.

Web services should allow businesses to find and connect to each other more easily. However, it's unlikely that Web services will make a big difference for another three or four years. Vendors, such as Microsoft and IBM, are still building their frameworks, much of which is aimed at enterprise level businesses. But, the proposed simplicity of this technology should enable small businesses to fully participate in more collaborative forms of commerce.

More significantly, Web services should also help all sizes of business overcome problems with inter-operability between their own systems. As many of the products included in this feature demonstrate, there's little connectivity between e-commerce products and other business functions, such as accounting systems. This makes managing product, customer and financial data a significant challenge.

The enthusiasm with which UK companies of all sizes have embraced online trading depends on which set of statistics you read. Recent research from the British Chambers of Commerce suggests that there's still a long way to go. Its figures showed that although 57 per cent of UK companies believe that e-business has had some impact on their activities, most small firms have so far seen no increase in sales leads from their online investment. A third of UK companies haven't even updated their Web site since it was first created. Despite this, 94 per cent of companies involved in the survey felt that e-business would be essential to their future development.

The stories behind these figures tell some well-worn tales. Lack of broadband availability is still a problem, along with security concerns and a lack of skills. However, there are signs of better times ahead for those with good quality online offerings. Forrester Research estimates that online sales will account for 22 per cent of total UK purchases by 2006. And, in 2001, Jupiter MMXI found that 7.9 million UK residents had made an online purchase.

E-commerce offers challenges as well as future benefits. In this guide we show you what you need to make the most of the opportunities it presents.

HIGHLIGHTS

● **Key benefits of 'shop-in-a-box' products**

● **Six e-business packages reviewed, so you can choose the one that suits you best**

● **How to manage customer data effectively**

● **Get the best from your payment service provider**

● **Benefit from our experience and avoid making the most common mistakes**

Technical Editor Maggie Williams

Why buy a package?

Products for creating a small-business online store aren't in short supply. However, there's considerable diversity in the range of features offered by each package and their ability to cope with a growing business. In many cases it's also a difficult proposition to integrate an e-commerce site built with a store-creator product into a more general-purpose Web page. Help is at hand, however. Take a look at our reviews of various products to find out which ones offer the best mix of price and flexibility for you.

The main benefit of using a shop creator product over a general-purpose authoring tool, such as Dreamweaver, is convenience. Most of the products here include pre-defined templates for generating stores and provide ready-made components, such as shopping carts. Although the services they offer vary, store builder packages will also generally handle at least part of the process of connecting to a payment service provider. See our sidebar on page 16 for more information about the different payment services currently on offer.

However, it's by no means impossible to build your own store using an authoring tool, such as Dreamweaver. If you need help, a number of tutorials and e-commerce elements are available at Macromedia's site, including a PayPal eCommerce Toolkit for Dreamweaver MX (see www.macromedia.com/desdev/mx/ dreamweaver/articles/paypal_ext.html for more details). There are also third-party downloadable applications, such as shopping carts, either for free or for purchase from Macromedia's Web site (www.macromedia.co.uk). Adobe's GoLive (www.adobe.co.uk) package also includes links with e-commerce providers to simplify development.

4D BUSINESS KIT

Verdict Lots of potential, but poorly documented and too complex for some

⊕ Unlimited product listings

⊖ Obtuse front-end makes it difficult to get the most from it

Fact file

Minimum system requirements
—**OS** Windows NT 4.0, 2000, XP
—**CPU** 233MHz Pentium
—**Memory** 64MB
—**Hard disk** 40MB
Contact 4D UK ● (01625) 536178 www.4Duk.com
Price £375 (ex. VAT)

4D Business kit

Unlike most of its rivals, 4D Business Kit doesn't place any limit on the number of items you can display and sell on a single site. So it's a good choice if you're intending to sell multiple low-cost items, but not so good for less-experienced Web programmers.

The package offers 12 templates, which provide basic starting points for stores, but, more promisingly, it's also possible to build a site using a third-party HTML authoring package and import it into Business Kit. The product's custom tags are compatible with HTML, so integrating an e-commerce function with an existing site is much easier.

4D Business Kit enables you to display up to 20 pictures of each item in your catalogue, which is more generous than many other packages. Products can also be grouped in to as many as five custom categories for easier navigation. All data is stored in Business Kit's proprietary database format.

Stores created by the package support 128-bit SSL encryption and 4D has an agreement in place with Verisign PayFlow for handling online payments. Other security features include the ability to block access based on IP addresses or URLs as well as some anti-virus capabilities.

Business Kit also includes some basic tools for managing customers. You can classify customers into business sectors, or 'types'. Categorisations are stored with other data collected through the site, such as delivery address details. You can use this data to cross-sell products as the software records details of each customer's purchases and uses this information to suggest similar products on future visits.

However, Business Kit is let down by its usability. There are no Web site preview tools, so you can only check the appearance and functionality of your site after you've it's gone live. Limited online help and minimal manuals are further shortcomings.

Unlimited product listing and generous support for product images makes 4D Business Kit ideal for simple, small-value items. However, getting started is far from easy and the lack of help materials makes it difficult to get the most out of the product.

▲ 4D Business Kit supports a wide range of useful features

Actinic Catalog 6

The well-established Actinic Catalog is one of the best e-commerce products available. This new version has added features for basic content management and could be used for managing a complete Web site, including non-e-commerce pages.

Although you can develop a simple site using just Catalog, Actinic has also added tools for linking the product to Macromedia's Dreamweaver for general site creation. The Dreamweaver integration is available in the Developer Version 6 (see below).

A series of flowcharts provides an overview of the site creation process, which is a useful starting point for new users, but can also be hidden for more advanced developers. A selection of design templates and some 'clean designs', which provide a more basic starting point for a site, are included. You can also add custom templates.

Online catalogues are organised into sections, enabling you to group products with similar features together. Each product has associated attributes and components, providing tools for configuring orders.

In addition to the basic Catalog product, Actinic also produces Business Version 6 (£799, ex. VAT) and Developer Version 6 (£1,250, ex. VAT). Business includes a much broader range of customer support features, such as the ability to add 'wish lists' to a site, as well as tools for offering customers 'exclusive offers'. Parcel tracking through Consignia has also been added. Business's new stock control features will also benefit retailers. You can set Warn and Suspend details that generate alerts if stock falls below a certain level, so the item will be shown as out of stock on the Web site until new products arrive.

Business and Developer will also support links to an external data source in Microsoft Access 95 or above, Microsoft Excel 3 or above, or a SQL-based table with Level 2 ODBC support.

Actinic has strengthened its products with the addition of features like Dreamweaver integration. This makes it an excellent choice for creating an e-commerce element as part of a more general site.
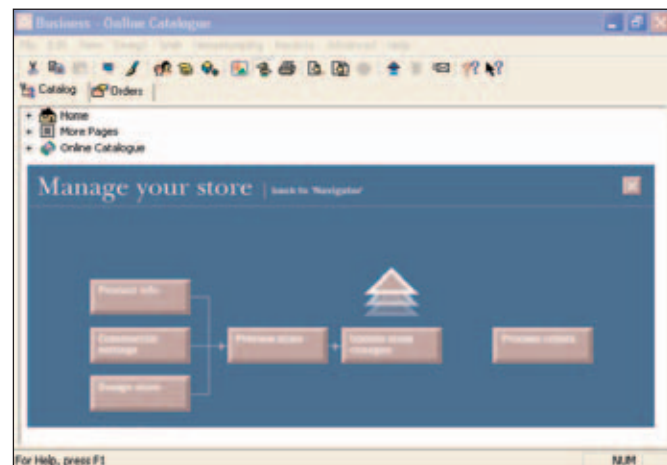
ACTINIC CATALOG 6

Verdict An excellent choice for more advanced developers who need to maintain an online store as part of a broader Web site
➕ Good integration with an existing Web site
➖ Costly

Fact file

Minimum system requirements
—**OS** Windows 9x, 2000, ME, XP, NT 4
—**CPU** Pentium
—**Memory** 64MB
—**Hard Disk** 60MB
Contact Actinic Software (0845) 129 4888 •
www.actinic.co.uk

Price £379 (ex. VAT)

ASTROSELL PROFESSIONAL

Verdict A good alternative for the advanced user
➕ Links with QuickBooks simplify accounting processes
➖ Lacks customer management features

Fact File

Minimum system requirements
—**OS** Windows 9x, ME, 2000, NT 4.0, XP
—**CPU** Pentium II 266 MHz
—**Memory** 32MB
—**Hard disk** 60 MB
Contact Astrosell • (0870) 746 1805
www.astrosell.com

Price £349.99 (ex. VAT)

Astrosell Professional

Although it's less established than Actinic's products, Astrosell Professional is targeted at the same audience. It has tools for importing a Web site from Catalog 3, 4 or 5, which will help you migrate between the different version of the product.

Most major elements of a Catalog Web site can be imported, but there's no support for volume discounts, so you'll need to rework some elements of your site after import. It also lacks tools like integration with shipping handlers, which is offered by other products, such as Actinic Business.

Astrosell comes with a small selection of templates, but there are few customisation options beyond modifying the layout of a page and no options for importing a template. It's also difficult to integrate an Astrosell shop into a more general site.

Links with the small-business accounting application, QuickBooks, for order handling is a significant benefit of Astrosell. You can export a file containing details of orders in IIF format from Astrosell, then import it into QuickBooks. Orders are then recorded as Accounts Receivable. Although there's no means of setting up an automatic update between the two products, the order export features do remove the need for re-keying between your online business and general accounts.

The product takes an order-focused approach, with all information linked solely to a sale, rather than a customer or product. As a result, it's difficult to detect customer buying patterns. A selection of pre-defined reports gives you a good overview of how sales are progressing, but, again, there are no features for understanding customer behaviour.

Payment options are also limited. Astrosell provides links to WorldPay and SECPay, but no other payment gateways, but tax handling is good.

Astrosell is a good alternative to Actinic Catalog and its export to QuickBooks feature is a very worthy addition. However, despite its comprehensive product-related features, it won't help you to understand who's buying what from your Web site.
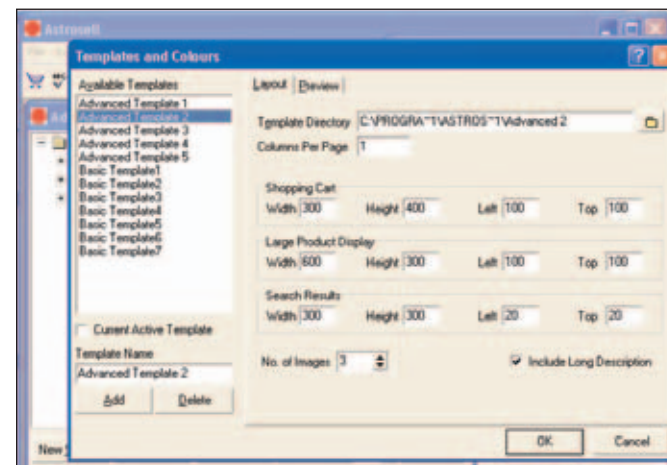
ECOMMERCE EDITION
Shopcreator Equology Extend

Shopcreator provides online commerce tools for different sizes of business. The company's recent acquisition of Equology Extend Ecommerce Edition has extended Shopcreator's range to more modest businesses. However, Extend is limited in comparison to some of the other products reviewed here. For example, it doesn't allow you to apply a custom template to your site and it only permits publication to a URL provided and hosted by Equology.

For very small e-commerce ventures that are unlikely to grow over time, Extend offers some useful features. There are over 140 templates, which you can use as a starting point for your Web site, many of which are tailored to suit the needs of particular types of store. Tools include a feature for grouping customers according to the types of products that they buy, although there's no means of automatically tracking customer purchases.

You're restricted to a single picture for each product on the site. The only customisable product option supported is colour, plus one other custom-defined attribute. These limitations make Extend better suited to selling products like books or CDs, rather than highly customisable items. However, a Downloadable Files feature will be particularly useful to anyone wanting to sell software online.

You can publish your site in German, French, Italian and Spanish, as well as English. Navigation controls and boilerplate text are translated as a part of the package, but you'll have to use a translation agency for anything else.

There's also a good range of support for payment service providers, including WorldPay and Barclay's ePDQ, but you can only trade in a single currency.

The product itself costs a minimal £34 (ex. VAT), but there's a monthly fee of £39.95 (ex. VAT), which is good value for a comprehensive set of tools. However, if you expect your business to expand in the future, the limited hosting options and poor product customisation features will be too limiting.
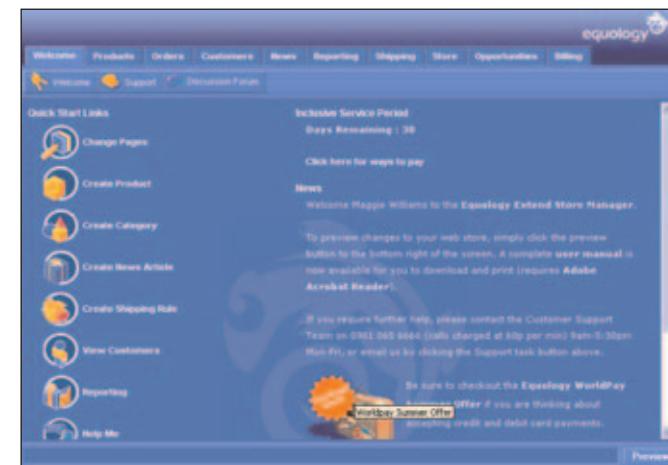
SHOPCREATOR EQUOLOGY EXTEND ECOMMERCE EDITION

Verdict Suitable for companies that are unlikely to expand
➕ Straightforward interface
➖ Limited to using a URL supplied as part of your account

Fact file

Minimum system requirements
—**OS** Windows 9x, ME, NT, 2000, XP. Also Internet Explorer 4.0 or above, Netscape 5 or above, Opera 7
—**CPU** 486MHz
—**Memory** 16MB
—**Hard disk** n/a (online service)
Contact Shopcreator Developments (0845) 1211 400
www.shopcreator.co.uk

Price £34, plus £39.95 per month hosting fee (ex. VAT)

SHOPCREATOR STALL AND SHOP CREATOR 100

Verdict Robust choice with a good expansion potential
➕ Upgrade as required
➖ Can become costly

Fact file

System requirements Internet Explorer 4.0 or above, Netscape 5 or above, Opera 7
Contact Shopcreator Developments (0845) 121 1400
www.shopcreator.co.uk

Price from £400 per year (ex.VAT)

Shopcreator Stall and Shopcreator 100

For those with more ambitious plans, Shopcreator's other products offer a more flexible and scaleable alternative. Price plans change depending on site traffic and the number of products on offer, but start at around £400 per year.
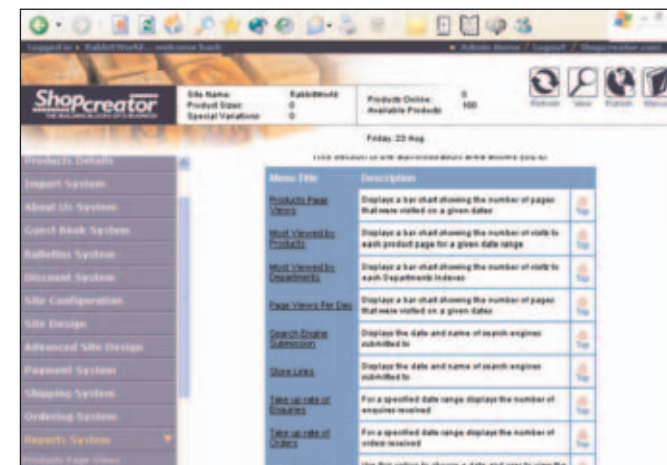
Shopcreator's entry-level product is Stall. This package allows you to sell up to 50 products online as well as including some extra features, such as basic reporting tools, multi-currency support and registration of a '.co.uk' domain.

As its name suggests, Shopcreator 100 handles up to 100 items online and also provides stock management features as a free optional extra. You can categorise products into departments, which is a useful extra benefit. Each product can be referenced by up to 25 keywords and other features include discounted 'sales', enabling you to lower the price of stock between specified dates. All of Shopcreator's services support a range of payment providers, including Barclays ePDQ, WorldPay and SECPay.

Shopcreator Stall and 100 don't require any installed software. All administration and site building services are hosted, which means you'll need a broadband connection to make the most of the service. Once you're logged in to your site, all administration features are listed on the side of the page. These include tools for creating email bulletins and managing payment options as well as site design. Underneath each feature is a list of sub-features, making most parts of the system easily accessible.

StoreFront Magic, Shopcreator's built-in online design tool, offers a selection of templates and configuration options for your site. However, most of these are quite basic and there's no means of importing your own templates to the site.

Shopcreator's services provide a good basis for a small business that's likely to grow rapidly. As charges depend on the number of products that you're hosting and likely use of your site, you can amend your arrangements as your needs change.

▲ The process of creating a site is represented as a flowchart in Business

▲ Astrosell Professional offers some features for customising templates

▲ Equology Extend's clear front-end makes general maintenance easy

▲ Shopcreator's administration tools are all hosted online

E-BUSINESS

E-BUSINESS

Making the most of your customer data

The information you have regarding your customers is pure gold in terms of tailoring your product to appeal to their specific requirements, encouraging them to spend more and come back time and time again. So why if this data is so valuable are so many companies failing to turn it into a clear business advantage?

Using data about your customers helps target marketing campaigns, plan future products or services and encourage return trade from previous visitors. However, despite the potential advantages, less than 20 per cent of small and medium-sized businesses have any form of customer management system in place.

One of the main problems is confusion over the products currently available in this market. In recent years the catch-all term Customer Relationship Management (CRM) has been used to lump together anything from basic Personal Information Managers (PIMs) to high-end enterprise systems.

Regardless of company size, true CRM tools should enable businesses to access and use customer data across all contact points, such as mail, phone, Web and mobile platforms. It should allow them to see a complete picture of interactions between customers and the company, and act on this data to provide better customer service. This is much more than just managing customer contact details, although some so-called CRM products amount to little more.

Achieving all of these requirements in a single product is no small undertaking and there are few products aimed at small businesses that effectively fulfil all of these goals. High-end vendors, such as Oracle, have made some attempts at introducing more modest versions of enterprise products. However, in many cases this has been at the

▶ **Sage's new Contact Manager product combines financial data with contact details**
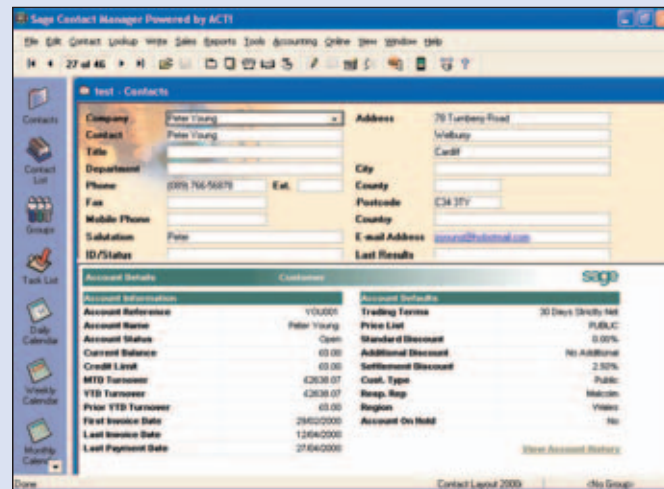
expense of functionality or integration features. Smaller businesses have the same needs as large corporates, simply with fewer staff and customers, so most of these cutdown products have quickly disappeared.

Interoperability is one of the biggest problems for lower-end customer management products. Most products don't provide tools for connecting to other sources of customer data. Therefore, the ability to share the same data across multiple applications is often limited, or non-existent. So it's worth investigating whether it's possible to connect your product to external databases.

A few of the shop creator products also include their own tools for managing customers. However, these are limited and don't provide tools for customer support offline. In contrast, although the products reviewed here provide good tools for off-line activities, such as sales force management and help desk support, none of them integrate easily with online sales products. Managing customers across all of your sales channels remains a substantial problem for many small businesses.

FrontRange Systems

FrontRange Systems is best known for Goldmine Business Manager (£165 ex. VAT) and Goldmine Sales and Marketing (£395 per seat for 5 to 9 users, plus £79 per seat maintenance). These started life as contact management tools but now include a much wider range of features. Goldmine Business Manager is intended for very small businesses, with Goldmine Sales and Marketing aimed at 10 to 100 employee companies.

FrontRange also produces HEAT PowerDesk (£395 ex. VAT per user), a lowend helpdesk product, which integrates with Goldmine Sales and Marketing. It can be run with any ODBC-compliant data source and also includes an integral Microsoft Access format database for clean installations.

The product contains a number of different modules, which match different types of business. In addition to the core HEAT product, there's also Knowlix, which includes tools for building and maintaining a search-

able knowledge store. Prices vary depending on implementation and number of users.

FrontRange is also planning a major rework of its products. Although few details were available at the time of writing, the tools will be built using Microsoft's .NET framework. This is intended to provide better interoperability with other systems—a traditional problem for CRM products.

Microsoft CRM (MSCRM)

Although FrontRange has been working closely with Microsoft to build its own CRM products around .NET, it will also face future challenges from Microsoft's own efforts. The software giant has announced plans to release its own midrange CRM tool, MSCRM. No dates have yet been confirmed and there's little in the way of concrete detail about the content of MSCRM. Predictably, close links with both Microsoft Outlook and SQL Server are expected to form a core part of the product. The company says MSCRM will be targeted at 'the mid-market ' of between 25 and 500 employees. Prices are expected to start at around $1,200 (£790).

Sage Contact Manager/ACT!

Sage bought Interact, a low-end CRM specialist in 2001 and has now begun to release its rebranded and reworked versions of Interact's products. ACT! 5.0 is one of the best-established contact managers for very small businesses, but doesn't offer much else in the way of tools for working with online data collection. It allows synchronisation with Palm OS PDAs, but not with Pocket PC 2002 devices, so it's also of limited use to more mobile sales forces.

Sage has announced plans for a new version of ACT!, which should be available by the time you read this. Enhancements to the new product include better integration with Microsoft Outlook and a new email tool. Despite these new amendments, ACT! remains a very low-end product, better suited to managing contacts within a sales team, rather than across an organisation. And it lacks the integration with call centre systems available through Goldmine/HEAT.

However, Sage has also worked to integrate ACT!'s features with its Line 50 accounting tool by introducing a new Contact Manager product (£250, ex. VAT, for a single user copy), which combines financial and contact data and so gives you a fuller picture of your customers.

▶ **Goldmine Business Manager contains customer management tools for very small businesses**

SmartStore.biz

If you're looking to experiment with a small store and don't want to spend too much money, then the freeware version of SmartStore.biz is a good starting point. But, if you are genuinely serious about selling online, this free version is limited both in terms of design and the number of products it supports.

The free product is a taster for the full entry-level product, StartUp (149 euros, £94 ex. VAT). Several functions are disabled in the freeware, including import of catalogues from outside the product. You're also restricted to the product's default template, which is acceptable, if unadventurous.

StartUp enables you to change the appearance of your site by configuring colours and fonts. However, even this full version doesn't provide sufficient flexibility to create a genuinely eye-catching site.
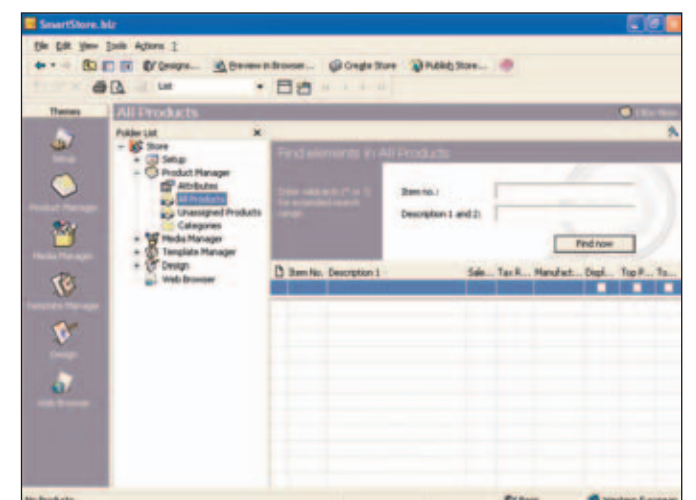
For growing businesses, SmartStore.biz also offers Advanced (499 euros, £318 ex. VAT) and Professional (999 euros, £638 ex. VAT). Only the Professional version compares to products like Actinic Catalog (page 16), making it a costly alternative.

The free version provides support for up to 20 products, divided into unlimited categories. StartUp allows you to add up to 100 products, Advanced supports 500 and Professional allows unlimited items to be added to a single store.

SmartStore.biz's products use a consistent frontend, which is divided into three panes. This offers a good hierarchical approach to managing templates and site layout, but it's not immediately obvious how to access and edit the content itself.

If your business is likely to grow with time, then SmartStore.biz incremental strategy may be worth considering. However, there are no big savings to be made when moving up from one package to another. For example, the price of upgrading from StartUp to Advanced is 449 euros (£286 ex. VAT), offering no real saving over buying Advanced outright. The free version is a good tool for experimenting with online commerce, but little more.
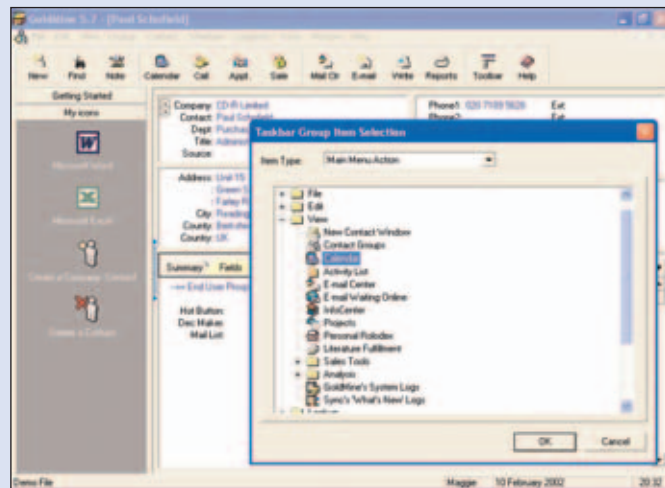
▲ **SmartStore.biz gives you a good overview of your Web site**

CHOOSING PRODUCTS

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Choosing a payment service provider

Creating an online catalogue is only one element of online commerce. Ensuring that customers' details
are handled securely and that you receive payments efficiently should also be at the top of your list. But
how do you get the most from your payment service provider (PSP) and keep your customers happy?

◀ Most payment gateways work in a similar way. You'll need to
establish a merchant account with your bank for it to accept pay-
ments. Customers are then discreetly transferred to the payment
gateway to verify their credit or debit card and purchase amount.

There's a variety of different
types of payment service
provider (PSP) available,
ranging from email payment
services, such as PayPal and
Nochex; through to more tradi-
tional credit card payment
providers like Barclay's ePDQ
system. Supporting several dif-
ferent types of payment method
gives your customers more
choice, although it may be pos-
sible to handle a variety of dif-
ferent payment types through a
single provider.

Online cash alternatives for
those who don't have a credit
card have struggled to find their
feet. An indication of the
malaise in this sector is that one
of the most established compa-
nies, UK Smart SmartCreds, has
recently ceased trading.

Credit/debit card payments
Choosing a credit and debit card
payment gateway will depend
as much on which bank you use
as the services on offer. To use
any gateway service you'll need

to have a suitable Merchant
Account with your bank. Most
products support a variety of
different banks, although your
bank may also want to recom-
mend a PSP. Costs also vary
depending on the structure of
the service. See the diagram
above for an illustration of how

credit/debit card payment
providers operate.

There's a wide variety of
credit/debit card PSPs around.
We've investigated two of the
most popular here, plus
Paystamp, an alternative for very
small businesses that doesn't
require a merchant account.

▲ Nochex is a simple means of moving money between email
addresses, offering a real alternative to using a credit card

WorldPay (www.worldpay.
com) offers card payment gate-
ways for any size of online
retailer. For smaller companies,
this includes a range of services,
including anti-fraud guarantees,
a click-and-build store creator
and FutureDirect for setting up
online direct debit mandates.

Although you can use
WorldPay if you already have a
trading account with another
bank, WorldPay can also set up
an account for you through the
WorldDirect scheme.

Costs Setup fee, £75; annual
fee (including three currency
handling), £150; transaction fee
of 4.5 per cent for credit card
payments or 50p for debit
card payments.

SecPay (www.secpay.com) cov-
ers other commerce channels,
such as call centres as well as
online payments, making it a
good all-in-one service. SecCard
is the credit card handling ele-
ment of the service, which
offers agreements with HSBC,

Barclays Merchant Services and
Royal Bank of Scotland.

SecPay is able to handle
the SmartCreds cash alternative
as well as credit cards. The
company has also introduced
paybox, a new service for
handling payments through
mobile phones.

Costs Setup, £50; monthly fee,
£10; transaction fee of 1.9
per cent per transaction, or
fixed at 39p.

Paystamp (www.paystamp.
co.uk) is a UK-based company
that handles credit and debit
card transaction, with an
emphasis on small-value pay-
ments. There's no yearly han-
dling fee and no need to have a
merchant account.

Costs 70p per transaction under
£5, rising to 35p per transaction
plus 6 per cent of gross sum for
orders over £20.

Email payment providers
Email payments allow you to
send and receive money through
an email account, rather than
via a cash, cheque or credit card
payment. They've gained in
popularity through auction sites
where they provided a means
for individuals to transfer money
online without the need for a
business merchant account. This
method of payment is better
suited to personal transactions
than online commerce. However,
it can be a useful extra
payment option for your site.

To use email payments, you
first create an account with the
service provider. This generally
only requires an email address.
Requests for payment can then

be emailed to your customers.
Customers load money from a
bank account into their own
email payment account.
Providing the funds are avail-
able, they can then pay you sim-
ply by sending a mail message
specifying the value of the trans-
action to your email payment
account. The payment provider
handles the process of transfer-
ring the money.

You'll have to register a debit
or credit card with the service to
transfer money between a regu-
lar bank account and the email
payment mechanism. There's no
need to apply for a merchant
account to use the service and
the service is generally free to
use, apart from transferring
money between a bank account
and the email service.

PayPal is one of the longest
running email payment
providers. It's a US-based com-
pany, so even if you visit
www.paypal.co.uk, you'll see
advertising literature and special
offers in US dollars.

Nochex is a purely UK-based
operation (www.nochex.co.uk).
It gained in popularity through
its early partnership with trading
sites like Ebay UK, although this
has now been replaced by
Ebay's own system. Like PayPal,
you need to create an email
account that will be used for
sending money to and from
your account. Retailers can set
up a free Nochex Checkout on
their site by adding a short piece
of HTML. By registering a debit
card from a UK bank with the
Web site, you can transfer
money between a Nochex
account and a bank account.

Do's and don'ts

We've had the experience of troubleshooting all
types of e-commerce problems, so read these top
tips and avoid the same mistakes we've made

⊕ **Do ensure you promote
your Web site as widely as
possible. Use search engine
listings, join online commu-
nities of merchants and
trade links with other rele-
vant sites. A extremely
useful starting point for
search engine listings is
www.searchenginewatch.
com. And, of course, keep
existing customers
informed, so that they'll
keep coming back.**

⊕ **Do make sure that all
browsers can access your
site properly. You wouldn't
arbitrarily deny customers
access to a real-life store,
so don't do it online. Make
sure that at the very least
your store works with ver-
sions of Internet Explorer,
Netscape Navigator and
Opera from the last two
years. Test on both PC and
Macintosh platforms. A
useful online listing of
available browsers is at
http://browsers.evolt.org.**

⊕ **Do take a realistic
approach to fraud. Online
fraud is a problem, both
for traders and for cus-
tomers. But, it's still only a
very small percentage of
all online transactions.
Investigate fraud protec-
tion schemes, such as the
Visa Authenticated
Payments Programme
(www.visaeu.com/for_
business/e-commerce_
security/main.html) for
extra security.**

⊖ **Don't let your content
age. Out-of-date content
undermines your site's
credibility. Regularly**

archive content and prod-
ucts that are no longer rel-
evant. Also, make sure
you continually check the
validity of any links or ban-
ners from your site.

⊕ **Do let everyone know
who you are. It's reassuring
for customers to have a
contact phone number
and address as well as
electronic means of com-
munication on your site.**

⊕ **Do design for slower
connections. Even if you're
using broadband, the
chances are that a lot of
your potential customers
aren't and won't be for
some long time. Use graph-
ics optimisation packages
to keep the size down.**

⊖ **Don't eliminate graphics
altogether. Your site can be
both visually attractive and
smooth to load, providing
it has been designed effi-
ciently. In particular,
remember that your site is
intended to sell goods, so
make sure customers can
see product information
and get to those all-impor-
tant buying pages as
quickly as possible.**

⊖ **Don't underestimate the
importance of backup
arrangements. All retailers,
no matter how small,
require some form of data
disaster recovery—at the
very least a mirrored
backup of your data.
Having backup ISP and
connectivity arrangements
is also essential if you're
really serious about
online trading.**

MASTERCLASS

GEOFF EINON

Tracking energy bills with Excel

Here we conclude the development of our application for tracking the costs of your fuel bills with Office VBA

KEYPOINTS
- Working out the calculations needed
- Conversion data
- CostIt() VBA listing
- A For....Next structure
- Two-tiered cost structure

In the previous instalments of this *PC Magazine* Masterclass series on Visual Basic for Applications (VBA) we've introduced a variety of VBA concepts and programming practices in the development of the TrackIt() procedure. Trackit() is designed to process the 'raw' data that you collect from both your gas and electricity meters. From successive records of meter readings and reading dates, TrackIt() calculates the average daily consumption between two readings and a breakdown of energy consumption per quarter—as shown in Figure 1 below.

The main task in this final instalment is to process the quarterly consumption figures produced by TrackIt() to calculate the cost per quarter. To do this we will create the CostIt() function that's called by TrackIt(). This article is structured to allow you to start from scratch this month or continue on from the developments from the last instalment. To get your hands dirty you'll need Excel 97, 2000, 2002 to host the TrackIt() and CostIt() code. The CostIt() function is designed to process gas consumption data—since this entails more complex processing than electricity data. To calculate gas costs we have to take into account various factors, such as the correction and calorific value factors and conversion from cubic metres to kilowatt hours that can be seen on your domestic gas statements. Despite this complexity it's a simple matter to use the application to calculate electricity costs by substituting the value '1' for the correction and conversion factors required by the gas costing calculations.

Calculating costs from energy consumption

The subtraction of a previous gas meter reading from the current reading gives a value in hundreds of cubic feet consumed. This value then is processed in four steps to convert to kilowatt hours consumed.

1 It is multiplied by a correction faction.
2 The result of step 1 is multiplied by 2.83 to convert to cubic metres.
3 The result of step 2 is multiplied by the calorific value to convert to milliJoules (mJ) per cubic metre.
4 The result of step 3 is divided by 3.6 to convert to kilowatt hours consumed.

To process the electrical readings where the meter reading units are in kilowatt hours, the value 1 should be substituted for each of the factors in steps 1 to 4 above.

To calculate quarterly costs, energy utility companies operate a tiered tariff, whereby a higher rate is charged for the first 'x' units than for subsequent units. Some may also impose a quarterly standing charge and all will charge VAT. So we have a few more calculations before we can work out the cost.

The first task for our CostIt() function is to apply steps 1 to 4 to convert quarterly energy consumption into units of kilowatt hours. The next step is to calculate the costs of energy consumed at the initial and subsequent rates and then to add in the standing charge (if applicable) and apply VAT to the total. The CostIt() function will be called by the TrackIt() procedure that we will explore first.

TrackIt() and the EOVBNOV02.XLS workbook

If you're continuing from the last article (*PC Magazine*, October 2002) you'll have developed TrackIt() in the EOVBOCT02.XLS workbook. Save a copy of this workbook as EOVBNOV02.XLS. If you're starting from
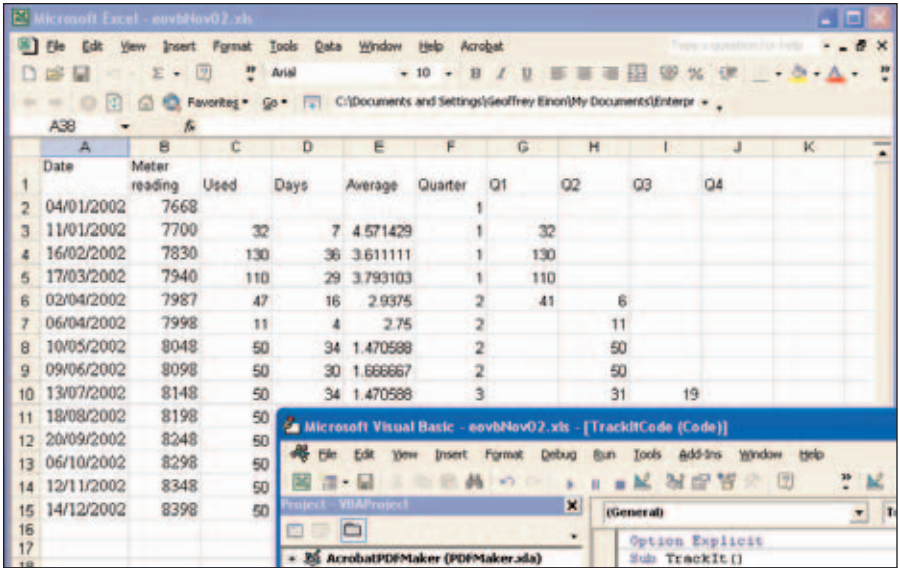
① The TrackIt() procedure calculates the amount of energy consumed each quarter from 'raw' meter reading data, as well as your average daily consumption between two readings

scratch, the EOVBNOV02.XLS workbook is in the EOVBOCT02.ZIP file, which is available from www.pcmag.co.uk/pcm/solutions. jsp Copy this Zip file onto your hard disk and extract its contents into a convenient subdirectory. Open the EOVBNOV02.XLS workbook. As a preliminary step before programming the CostIt() function we will explore the TrackIt() procedure. The detail of the TrackIt() VBA code was described in detail in the October Exploring Office VBA article and won't be described again here.

The TrackIt() VBA Procedure
In the EOVBNOV02.XLS worksheet, display the Data worksheet. If you're using the supplied worksheet, it consists of a column of dates, a column of meter readings and a sequence of labels in row 1—as shown in Figure 3. To process the raw date and meter reading data to get the consumption analysis shown in Figure 1 you should now run the TrackIt() procedure. To do this, first open Excel's Visual Basic Editor (VB Editor) using the Alt-F11 keystroke combination. In the VB Editor's Project Explorer, click on the entry for the TrackItCode module to open its Code window. We will step through the TrackIt() code using the VB Editor's Debug tool bar and follow its progress in the Locals window.

To display the Debug toolbar, select the Toolbars itemfrom the VB Editor's View pull-down menu and, from the resulting toolbar list, select the Debug item. If the Locals window isn't displayed in the VB Editor's workspace, select the Locals Window item from the pull-down View menu.

Before you run TrackIt() place a breakpoint in line 21—this is the start of the main For…Next loop. Click in the left frame of the TrackItCode Code window immediately adjacent to line 21 to set the breakpoint. The existence of the breakpoint will be indicated by a red dot in the frame.

Running TrackIt()
Locate the Run Sub/User Form control in the Debug toolbar and click it to execute the TrackIt(). The code will execute and then pause after executing the line preceding the breakpoint. Take a while to examine the contents of the Locals window—verify that the four user-defined variables lngQrtr1Total-lngQrtr4Total are intialised to zero as specified in lines 13 to 16 of the TrackIt() code. Now step down through the first iteration of the For…Next loop using the Debug toolbar's Step Into control. As you do this, follow the changes in Local variables and the results of the TrackIt()'s processing as they're written to the Data worksheet. Also, notice how TrackIt() calls the QuarterIt() function to return information about the quarter in which each reading falls. When you reach the

② The CostIt() function calculates the cost of the quarterly energy consumption
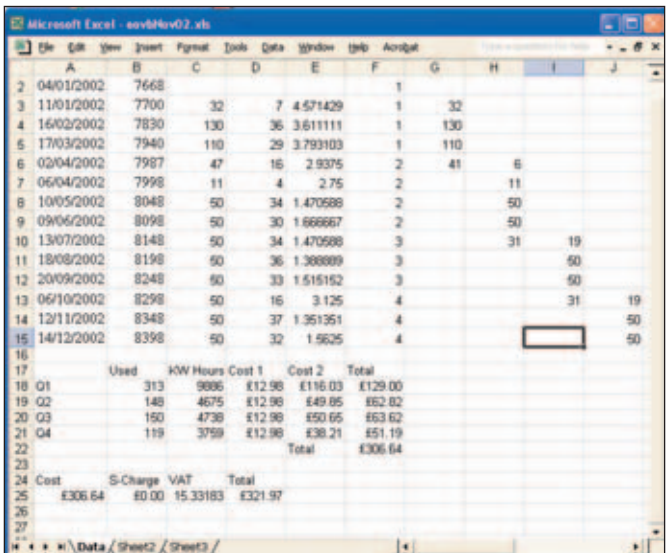
1 Data required to calculate quarterly costs

Cells	Label (row 1)	Value (row 2)
K1/2	Correction factor	1.025
L1/2	Conversion factor 1	2.83
M1/2	Calorific value	39.2
N1/2	Conversion factor 2	3.6
O1/2	Charge transition	125
P1/2	Charge 1 / unit	1.73
Q1/2	Charge 2 / unit	1.27
R1/2	Standing Charge	0
S1/2	VAT	0.05

Next lngCounter statement that marks the end of the For..Next loop, place a breakpoint in this line. Now you can use the Debug toolbar's Run Sub control to run complete iterations of the For..Next loop to view the results of the processing of each succeeding pair or meter readings. When the TrackIt() procedure has terminated the Data worksheet will look like Figure 1 (opposite).

Adding the Conversion Data
As described above, to calculate the actual quarterly energy costs, additional information is required (as listed in Table 1 above). Use this data to explore the CostIt() function's activities—you can substitute your energy utility company's figures later on.

Before you key the data from Table 1 into the Data worksheet, select the entire top row and change its cell alignment format to Wrap Text to accommodate Table 1's long labels. Each row in Table 1 represents a pair of cells: the upper located in the top row of the Data worksheet and the lower in row 2. Then type in the nine columns of data from Table 1 in columns K to Q. When you've done this, this area of the worksheet will look like Figure 4.

The CostIt() VBA function
The code that takes the information from Table 1 and uses it to calculate quarterly costs

based on the four quarterly consumption totals provided by TrackIt() is the CostIt() VBA function in Listing 1 on page 24. Later in this article we will add a couple of lines (listed in Table 3) to the Trackit() procedure to call the CostIt() function.

The main difference between a function, such as CostIt(), and a procedure, such as TrackIt(), is that a function is designed to be called from a procedure and requires information to be passed to it, whereas a procedure is designed to be run 'as is'. The function's dependence upon its 'host' can be seen from its parameter list. Look at the first five lines of Listing 1 (page 24), which are the declaration of the CostIt() function—these are a single line that has been split in to five chunks to help legibility. Note that lines 1 to 4 are terminated by the ' _' (space-underscore) character pair. This character pair tells that VBA compiler that the next line is to be appended before compilation.

The parameters required by the CostIt() function are specified within the pair of round brackets in its definition. Six parameters are specified to be passed from the host. Each of these is then available to be referenced by name for use within CostIt() without any further declaration. The first four parameters are the four quarterly consumption totals—that is the totals of the Q1, Q2, Q3 and Q4 columns in the Data worksheet shown in Figures 1 and 2. A reference to the objRange Range object is also passed. When TrackIt() calls the CostIt() function, this is Cell A1 in the Data worksheet. The last parameter passed to CostIt() is the number of rows of data in the Data worksheet. Using this information, CostIt() is specifically designed to take over from TrackIt() to calculate quarterly costs.

To carry out its calculations, CostIt() also needs the nine items of information from Table 1 that you transcribed to the Data work-

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1 The CostIt() VBA procedure

```
"Function CostIt(lngQrtr1Total As Long, _"
"lngQrtr2Total As Long, _"
"lngQrtr3Total As Long, _"
"lngQrtr4Total As Long, _"
"objRange As Range, lngNoRows As Long) As Variant"
Dim aryConsumed(3) As Integer
Dim intCounter As Integer
Dim lngCounter As Long
"Dim sglCorFactor As Single, sglConvFac1 As Single"
"Dim sglCalValue As Single, sglConvFac2 As Single"
Dim intTransition As Integer
"Dim curCost1 As Currency, curCost2 As Currency"
"Dim curStandCharge As Currency, curTotal As ↘
Currency"
"Dim sglCharge1 As Single, sglCharge2 As Single"
Dim sglVAT As Single
Dim lngKWH As Long
Dim curAllQrtrCost As Currency
"objRange.Offset(lngNoRows + 2, 0) = ""Q1"""
"objRange.Offset(lngNoRows + 3, 0) = ""Q2"""
"objRange.Offset(lngNoRows + 4, 0) = ""Q3"""
"objRange.Offset(lngNoRows + 5, 0) = ""Q4"""
"objRange.Offset(lngNoRows + 1, 1) = ""Used"""
"objRange.Offset(lngNoRows + 1, 2) = ""KW Hours"""
"objRange.Offset(lngNoRows + 1, 3) = ""Cost 1"""
"objRange.Offset(lngNoRows + 1, 4) = ""Cost 2"""
"objRange.Offset(lngNoRows + 1, 5) = ""Total"""
aryConsumed(0) = lngQrtr1Total
aryConsumed(1) = lngQrtr2Total
aryConsumed(2) = lngQrtr3Total
aryConsumed(3) = lngQrtr4Total
"sglCorFactor = objRange.Offset(1, 10)"
"sglConvFac1 = objRange.Offset(1, 11)"
"sglCalValue = objRange.Offset(1, 12)"
"sglConvFac2 = objRange.Offset(1, 13)"
"intTransition = objRange.Offset(1, 14)"
"sglCharge1 = objRange.Offset(1, 15)"
"sglCharge2 = objRange.Offset(1, 16)"
"curStandCharge = objRange.Offset(1, 17)"
"sglVAT = objRange.Offset(1, 18)"
curAllQrtrCost = 0
For intCounter = 0 To 3
"    objRange.Offset(lngNoRows + 2 + intCounter, ↘
1) = _"
aryConsumed(intCounter)
    lngKWH = (aryConsumed(intCounter) * ↘
sglCorFactor _
* sglConvFac1 * sglCalValue) / sglConvFac2
"    objRange.Offset(lngNoRows + 2 + intCounter, ↘
2) = lngKWH"
    If lngKWH > intTransition Then
        curCost1 = intTransition * sglCharge1 / 100
"        objRange.Offset(lngNoRows + 2 + ↘
```

```
intCounter, 3) = curCost1"
        curCost2 = sglCharge2 * (lngKWH - ↘
intTransition) / 100
"        objRange.Offset(lngNoRows + 2 + ↘
intCounter, 4) = curCost2"
"        objRange.Offset(lngNoRows + 2 + ↘
intCounter, 5) = _"
curCost1 + curCost2
        curAllQrtrCost = curAllQrtrCost + ↘
curCost1 + curCost2
    Else
        curCost1 = lngKWH * sglCharge1 / 100
"        objRange.Offset(lngNoRows + 2 + ↘
intCounter, 3) = curCost1"
"        objRange.Offset(lngNoRows + 2 + ↘
intCounter, 4) = 0"
"        objRange.Offset(lngNoRows + 2 + ↘
intCounter, 5) = curCost1"
        curAllQrtrCost = curAllQrtrCost + curCost1
    End If
Next
"objRange.Offset(lngNoRows + 2 + intCounter, 4) ↘
= ""Total"""
"objRange.Offset(lngNoRows + 2 + intCounter, 5) ↘
= curAllQrtrCost"
"objRange.Offset(lngNoRows + 4 + intCounter, 0) ↘
= ""Cost"""
"objRange.Offset(lngNoRows + 5 + intCounter, 0) ↘
= curAllQrtrCost"
"objRange.Offset(lngNoRows + 4 + intCounter, 1) ↘
= ""S-Charge"""
"objRange.Offset(lngNoRows + 5 + intCounter, 1) ↘
= curStandCharge"
"objRange.Offset(lngNoRows + 4 + intCounter, 2) ↘
= ""VAT"""
"objRange.Offset(lngNoRows + 5 + intCounter, 2) ↘
= _"
(curAllQrtrCost + curStandCharge) * sglVAT
"objRange.Offset(lngNoRows + 4 + intCounter, 3) ↘
= ""Total"""
curTotal = (curAllQrtrCost + curStandCharge) * ↘
(1 + sglVAT)
"objRange.Offset(lngNoRows + 5 + intCounter, 3) ↘
= curTotal"
CostIt = curTotal
End Function
```

2 Code to be added to the TrackIt() procedure

```
lngUsed1 = CostIt(lngQrtr1Total, lngQrtr2Total, ↘
lngQrtr3Total, _
lngQrtr4Total, objRange, lngNoRows)
MsgBox lngUsed1
```


3 As shown above, rRaw' meter reading data is processed by the TrackIt() procedure to produce the analysis shown in Figure 1 on the oposite page

4 The layout of the additional information required to calculate quarterly costs

culations. These are written into cells B17 to F17 (see Figure 1 on the opposite page).

All the VBA objects, methods and properties used in the CostIt() function that you've encountered so far have been introduced and described in previous articles in this development. However, lines 27 to 30 take us into new territory. In these lines a array called aryConsumed is populated with the quarterly consumption values. The aryConsumed array is defined and dimensioned in line 4 of Listing 1. The statement: Dim aryConsumed(3) As Integer creates an array in memory that is used to hold four items of data. The first item is addressed as aryConsumed(0) and the fourth as aryConsumed(3). Lines 27 to 30 load the array with the energy consumed in Q1 to Q4 by TrackIt() and passed as CostIt()'s first four parameters.

Setting up a For….Next structure
You may have guessed the reason for using this array structure in this way. It allows us to set up a For….Next structure (lines 41 to 62 in Listing 1) that iterates four times using loop counter values of 0 to 3 specified in line 41. The loop counter's value is used to access each of the four items in the array using the aryConsumed(intCounter) structure (lines 42/3 in Listing 1). On the first iteration of the loop the Q1 consumption value is returned, on the second the Q2 value is returned… and so on. This implementation then lets us avoid writing a separate chunk of code to process each of the four values in sequence and considerably reduces the amount of code required by CostIt().

The operations that have to be carried out on each quarterly consumption value were listed in the four steps described at the beginning of this article. The result of these four steps is that the units of energy consumption are converted from cubic feet to kilowatt hours. This calculation is carried out in line 44/45 in Listing 1 using the values that you typed in to the data worksheet from Table 1 ('Data required to calculate quarterly costs). As described previously, on the first iteration of the For…Next loop the Q1 energy consumption value is processed. On iteration 2 the quarter 2 value is processed … and so on.

Two-tiered cost structure
With the conversion from cubic feet to kilowatt hours complete, the next task is to calculate the cost using the two-tiered cost structure specified in the rows 6 to 8 of Table 1. If the number of kilowatt hours consumed is greater than the specified threshold (125), two values need to be calculated. The first is the cost of the 125 units at the higher rate and the second the cost of the remaining units at the lower rate. These calculations are carried out in the IF clause in lines 48 and 50. The two resulting values are written into the Data worksheet by lines 49 and 51. In addition, the total cost for the quarter is calculated and written to the worksheet by line 52. Finally, the quarterly cost is added to the curAllQrtrCost variable by line 54 to create a running total of the quarterly costs.

If the number of kilowatt hours consumed doesn't exceed the threshold, then a single cost calculation is needed. This is carried out

and written to the Data worksheet by the Else clause in lines 56 to 60.

With the quarterly costs written to the worksheet, the final step is to add the standing charge value and VAT to calculate the total charge. Some utilities levy a quarterly standing charge; others do not. If a charge is made, the value in the penultimate row in Table 1 should be changed from zero to reflect this amount. Lines 63 to 74 in Listing 1 apply these calculations and write them beneath the quarterly cost information as shown in Figure 2. Finally, in line 75, the CostIt variable is set to the total cost—this is the value that is returned to the TrackIt() function when the CostIt() function terminates.

Entering and running the CostIt() function
You could type the CostIt() function code manually from Listing 1 into the VB Editor's TrackItCode Code window, but, to avoid typing errors, it's easier to copy and paste it. The EOVBNOV02.ZIP file on this month's cover CD-ROM contains the EOVBNOV02.BAS file that provides the CostIt() function code. Copy the code from this file and paste it into the TrackItCode Code window immediately above the TrackIt() procedure.

This CostIt() function is designed to be called from the TrackIt() procedure and requires the few lines of code from Listing 2 to be added to TrackIt(). These three lines should be added immediately above the End Sub statement. Note that the top two lines are a single line of code with the first line terminated with the ' _' (space-underscore) character pair. This line calls the CostIt() function and passes the six items of data described above. The value returned by the CostIt() function is stored in the lngUsed variable and displayed in a message box to indicate the completion of the application.

With the Listing 2 code in place, before running the TrackIt() procedure to call the CostIt() function, in the CostIt() code place a breakpoint in line 18. Run the TrackIt() procedure and when execution pauses at CostIt() line 18, use the Debug toolbar Step Into control to run through the code line by line to see from the Locals window the progress of the calculations and the way that it structures the Data worksheet to display the results of its calculations.

We have now completed a journey in which we progressively developed a knowledge of and competence in VBA programming. The series started with a straightforward introduction to the VBA programming environment. And now with the development of the TrackIt() and CostIt() code we've programmed a very sophisticated application, both in terms of its coding and the processing that it implements. ∎
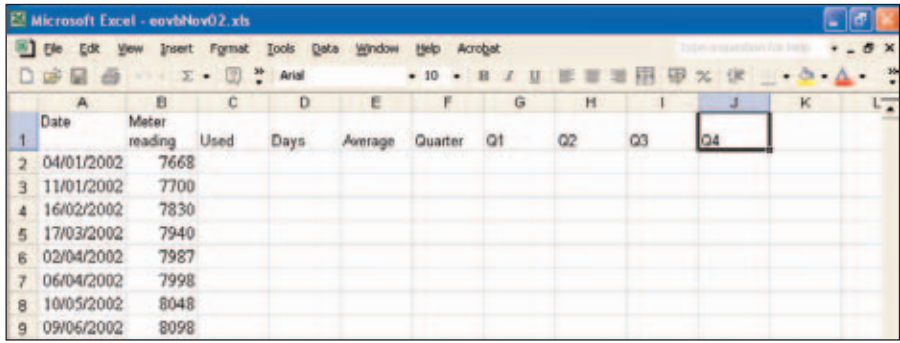
sheet. This information is read into and saved in the CostIt() function by lines 31 to 40. Before these lines are read, CostIt() structures the Data Worksheet to signpost the results of its calculations. Lines 18 to 21 write the Q1 to Q4 labels in cells A18 to A21. Note the use of the Offset property of the Range object to

specify the location of the cell to receive the label. To see the details of the Offset property, place the mouse cursor inside the Offset word, click to select it and then press the F1 key to display the corresponding VBA Help page. From line 18 you can see that the Q1 label is written two rows beneath the existing data

region, in the first cell in that row. Remember that the lngNoRows variable passed from the TrackIt() procedure specified the row number of the last cell in the data region as specified by the CurrentRegion property of the Range object. Lines 22 to 26 in Listing 1 write the column headings that identify CostIt()'s cal-
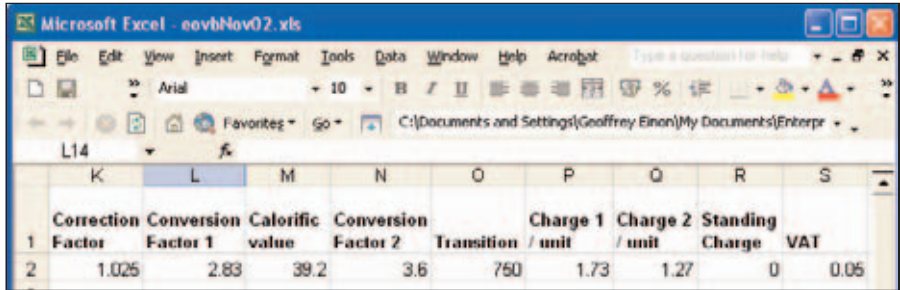
MASTERCLASS

ALEX CRUIKSHANK

Content management systems

Part five of our series delves inside the code of the content serving modules to get your Web site online

KEYPOINTS
- Reading source contents
- Proprietary tags
- Converting high ASCII
- Sending your page to a browser
- Files you'll need

In previous issues we've built the basic structure of a content management system (CMS) using Perl. Once finished, this could be used to generate and serve HTML pages for a Web site, separating content from design so that little or no HTML knowledge is required in order to update the site.

So far, the content-generation section of the CMS has been built, so that source text files can be created and edited. We've also incorporated a script that will handle the uploading of images from within a browser, eliminating the need for FTP transfer and so improving site security. Last time we looked at the part of the CMS that handles page delivery, taking the source text files and wrapping them in HTML. Here we'll investigate this in more detail, explaining how the content-serving sub-routines actually work.

The file concerned is CONTENT.CGI, which can be opened in any text editor. Having ensured that the request for a page is valid, as discussed last month, the next step is to open the chosen source text file and extract its contents, placing them into the relevant variables. The code in Listing 1 does this.

Advanced programmers will note that some code overhead could be saved by using 'eval' statements here but, as with the rest of the CMS, clarity and ease of modification are more important for now. Script optimisation can be carried out at a later date if necessary.

At this point, the variables contain code that includes proprietary formatting commands, such as '(!paragraph)' and '(!fontsize=7)'. As discussed in previous issues, the reason for doing this is so that the CMS can be used to serve data to a variety of clients (WAP, XML and so on) and not just in HTML. However, it means we need an extra processing stage here to convert these proprietary tags back to HTML. This is achieved by the

1 Reading in the contents of the source text file

```
open (READIN, "$targetfile") || &trap_error("$!");
@rlines = <READIN>;
close(READIN);

# read in the variables
foreach $readline (@rlines) {

    if ($readline =~ m/\heading\=(.*)/i) {
        chomp($html_title=$1);
        $maintitle=uc($html_title);
    }
    elsif ($readline =~ m/^pagename\=(.*)/i) {chomp($filepagename=$1);}
    elsif ($readline =~ m/^description\=(.*)/i) {chomp($description=$1);}
    elsif ($readline =~ m/^keywords\=(.*)/i) {chomp($keywords=$1);}
    elsif ($readline =~ m/^publication_date\=(.*)/i)
{chomp($publication_date=$1);}
    elsif ($readline =~ m/^body\=(.*)/i) {chomp($body=$1);}
    elsif ($readline =~ m/^note\=(.*)/i) {chomp($note=$1);}
    else {next;}
}
```

2 Converting proprietary tags back to HTML

```
# handle the body image bit
$body =~ s/\(\!bodyimagestart\)(.*?),(.*?)\(\!bodyimageend\)/<IMG
SRC=\"$1\"$2\>/gis;

# general formatting and tweaking
s/\(\!bulletlistline\)/\<LI\>/gis;
s/\(\!indentliststart\)(.*?)\(\!indentlistend\)/\<UL\>$1\<\/UL\>/gis;
s/\<UL\>\<LI\>/\<UL\>\n\<LI\>/gis;
s/\(\!underlinestart\)(.*?)\(\!underlineend\)/\<U\>$1\<\/U\>/gis;
s/\(\!italicstart\)(.*?)\(\!italicend\)/\<I\>$1\<\/I\>/gis;
s/\(\!boldstart\)(.*?)\(\!boldend\)/\<B\>$1\<\/B\>/gis;
s/\(\!fontcolour=(.*?)\)(.*?)\(\!fontcolourend\)/\<FONT
COLOR=\"$1\"\>$2\<\/FONT\>/gis;
s/\(\!fontsize=(.*?)\)(.*?)\(\!fontsizeend\)/\<FONT
SIZE=\"$1\"\>$2\<\/FONT\>/gis;

...
```

unprocess_html_tags sub-routine, which is the exact opposite of the process_html_tags sub-routine in the EDITOR.CGI script. Part of this sub-routine is shown in Listing 2 (the rest has been omitted for reasons of space).

More processing has to be done to ensure that there are no high ASCII characters in the text, since these shouldn't be present in content served to browsers. For most UK users there wouldn't necessarily be a problem, but you can't assume that a client browser is using the same character code page as you. Instead, any high ASCII characters (such as the '£' sign and any accented characters) must be converted to true HTML. For example, the '&' and '£' signs should be converted to '&' and '£' respectively. There are many other similar conversions that need to be carried out in order to ensure full compliance with HTML standards and the section of code shown in Listing 3 handles these (note that only part of the sub-routine is shown here, for reasons of space).

This sub-routine will accept any string, convert all instances of the 'illegal' characters to valid HTML and then return the updated string value—this makes it easy to use, as it can simply be called by the statement.

```
$body = 
&fix_special_chars($body);
```

This will place the new, fixed contents of the original $body variable back into $body. In our script, this is also done for the $heading, $description and $note variables in exactly the same way. Now that we know our page content is relatively 'legal', we can send it to the browser. That's handled by the serve_page sub-routine, as shown in Listing 4.

First, the HTML template file is opened, as defined in the variables section at the top of the script. This document is then parsed on a line-by-line basis, with the script looking for particular trigger entries. If it finds a </TITLE> tag, it will append the $html_title variable to the existing page title. It will then add two extra meta-tag lines, for search engine keywords and general page descriptions. These are optional, but they do tend to help sites achieve better search engine rankings, as well as making their entries in those rankings easier to read. You can also add more meta-tags and other header code here.

The second trigger is the <!--body--> comment, which should be embedded in the HTML template at the point where you want the body text to appear. When this is found, the title heading is displayed along with the publication date (in brackets and in a smaller font). Then the actual body text is displayed, followed by a note if one exists. You can change the formatting, order and layout of these page components to suit your design

3 Converting high ASCII characters to valid HTML

```
sub fix_special_chars {
    # replace 'illegal' characters with HTML code

    $_ = shift;

    s/\s\&\s/ \&amp; /g;
    s/°/\&iexcl;/g;
    s/¶/\&brvbar;/g;
    s/®/\&uml;/g;
    s/Ø/\&macr;/g;
    s/¥/\&acute;/g;
    s/│/\&cedil;/g;
    s/ø/\&iquest;/g;
    s/±/\&plusmn;/g;
    s/´/\&laquo;/g;
    s/ª/\&raquo;/g;

    ...

        return $_;
}
```

4 Sending the page to the browser

```
sub serve_page {
    # handle the page generation

    open (TEMPLATE, $html_template);
    @template = <TEMPLATE>;
    close (TEMPLATE);

    foreach $template_line (@template) {

        if ($template_line =~ m/<\/TITLE>/i){# insert the title and 
relevant meta tags
            $template_line =~ s/<\/TITLE>/ - $html_title<\/TITLE>/i;
            $template_line .= "<META NAME=\"keywords\" CONTENT=\ 
"$keywords\">\n";
            $template_line .= "<META NAME=\"description\" CONTENT=\ 
"$description\">\n";
        }

        elsif ($template_line =~ m/<!--body-->/i){# insert body and 
associated components
            $template_line = "<H2>$maintitle</H2>\n";
            $template_line .= "<SMALL><I>$description
($publication_date)</I></SMALL><BR>\n";
            $template_line .= "$body\n";
            $template_line .= "<P><SMALL><I>$note</I></SMALL></P>\n";
        }

        print "$template_line";
    }
}
```

5 Adding a 'preview' link to the output screen in editor.cgi

```
&header;
print "<P>Finished. The content has been written to $full_ 
textfilename</P>\n";
print "<P>To preview the page, click <a target=\"_blank\" href=\ 
"$content_script?page=/$pagename\">here</a></P>\n";
&footer;
```

What you'll need

ALL THE SCRIPTS, DATA FILES AND other components of the CMS cab be downloaded from www.pcmag.co.uk/ pcm/solutions.jsp (They are all contained in a single compressed file called CMS5.ZIP). Make sure you maintain the existing directory format when copying it to your server.

In order to use this content management system you'll need a Perl interpreter running on your Web server. If your server's running on a Unix box (including Linux) then you'll find it's almost impossible to install Apache or Zeus without also installing Perl.

The same is not true of Windows servers running IIS, but a free port of Perl for 32-bit Windows machines is available from www.activestate.com. This comes with all documentation and

is simple to install. The only caveat is that file paths may be slightly different compared with a Unix box. If in doubt, you should use absolute rather than relative paths (for example, . /site/ www/data rather than ../data)

Perl scripts need to be set to 'executable' in order to run. Using your FTP client, you should be able to right-click on a script once you've uploaded it to your server and select File properties, File attributes or 'chmod'. Then you'll be asked to define the file's attributes. The shortcut for this is to type in '755' to the 'chmod/manual' box if your FTP client allows it. If not, you need to set the permissions as follows:

```
owner: read, write and execute
group: read and execute
public: read and execute
```

Generally this is only necessary with Unix servers. With Windows servers you probably won't need to change any permissions (or indeed be able to). But you may have to tweak IIS to ensure that .pl and .cgi files in the cgi-bin or cgi-local folder are executable.

We will be using some additional Perl modules that may or may not be included as part of your standard configuration. We'll make a note of these as we progress through the CMS development, but you'll definitely need the Time::Local and Image::Size modules. If these aren't already included in your server, you can download them from www.cpan.org. See your Perl documentation for notes on installing new modules—it usually requires a single 'install' command. *ALEX CRUICKSHANK*

preferences. You can also add extra fields (perhaps an author field or a product code field), but you should note that you will have to make changes to both the content.cgi script and the editor.cgi script at the same time for any new fields to be properly processed.

Now that the content-serving part of the CMS is working, it would be nice to add a Preview button to the editorial script, so that users can see what the page will look like as soon as they've finished editing it. This is a straighforward thing to do. Add a link to the output page that includes the current $pagename variable, as shown in Listing 5 (note that this particular listing applies to the EDITOR.CGI file, not the CONTENT.CGI file).

Clicking on the link will open the new page in a separate window, so that the user can see what it will look like when it goes live.

The core components of the CMS (editor. cgi and content.cgi) are now just about finished. You can make them more appealing by adding more aesthetically pleasing headers and footers, but the core functionality is complete. We've included a basic HTML template on the supporting files, which are downloadable from www.pcmag.co.uk/pcm/solutions. jsp, but you should use this merely as a guide to creating your own, more attractive design. For the most part you'll only need one template, although if you do need to run separate parts of your site with a different design, the easiest way is to set up duplicate installations of the two main scripts along with different HTML templates for each.
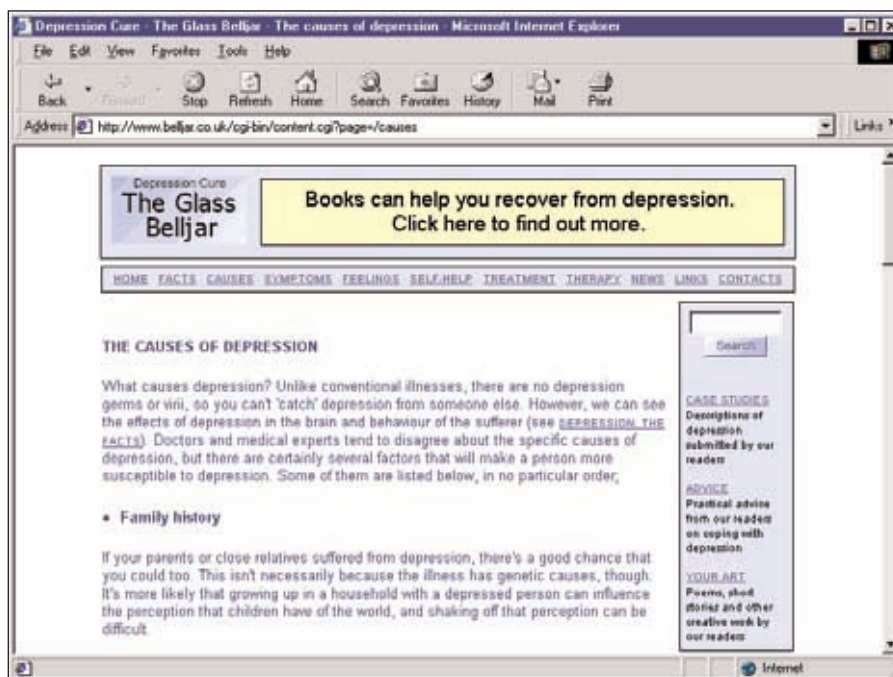
1 Here's an example of a Web site generated using the content serving system described here

The next step

There are still some things to bear in mind, though. As discussed last time (*PC Magazine*, October 2002), error-trapping code has been included at every stage of the page-creation routine. This is important with any user-facing script, because it's so easy for things to go wrong, either due to a mistyped URL or through malice. In the next issue of the

PC Magazine e-book, we move on to Part 6 where we'll take things a step further, putting in sub-routines that are specifically designed to minimise the risk of hacking. We'll also look at ways in which you can remap the existing URLs on your site to match the new ones, so that you don't lose traffic or generate a rash of '404 page not found' errors when you convert your site to the CMS model. ■