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# Welcome

Microsoft delivers on this promise with software like Windows 2000 Advanced Server and Datacenter Server; Microsoft BizTalk Server 2000; Microsoft Application Center 2000, Microsoft Mobile Information Server and much more.

As for the future the arrival of 64-bit computing will bring even more innovation. Such advances can be seen in the Windows XP operating system and Office XP suite of applications. A new desktop platform that brings many technologies to market, including ubiquitous access to the likes of XML.

At the server Microsoft will continue to innovate, delivering best of breed applications to meet the challenge of the new millennium. In this publication writer and journalist Neil Fawcett will look at the future of Microsoft software, pulling innovative products that will impact the industry.

Just what is innovation? The simplest answer is the action of never standing still. It is about the provision of technologies on an ongoing basis, technologies that meet the demands of companies and deliver on the promise of enabling better business through reliability, scalability and flexibility.

## Neil Fawcett **A biography**



With 22 years experience in the IT sector, Neil Fawcett currently writes for a number of leading IT publications in the UK and is regularly asked to speak at events around the country.

Neil has held senior positions within publishing houses including Technical Editor of Computer Weekly, Director of Technology for CMP Publications, where he re-launched Information Week, and most recently Group Consulting Editor at VNU Business Publications.

He has published several books on IT-related subjects and worked with both Sky Television and the BBC. Prior to writing, Neil worked in Silicon Valley as a software developer and hardware engineer.



# Just what is Innovation? Neil Fawcett

**T**he computer industry does not stand still. As we all know it moves in cycles of development and with each peak and trough of these cycles we are left figuring out what comes next, but more importantly, does the stuff I did last week, last month fit into the brave new world?

If you look at where we are now – peak or trough – then it has to be accepted that things have never been so complex. The Internet, wireless communications, web hosted software environments, multi-faceted standards, XML being just one of a raft, and much more impact our daily lives.

The industry keeps getting harder, the pressures on companies to deliver more, whatever that 'more' may be, deliver it faster, deliver it to more people etc is an interesting problem. As a result the purveyors of technology must move faster than they ever have before.

This brave new world demands great things. The company that sits around waiting for it to happen dies out. Develop, redevelop, keep ahead of the curve is what drives new business solutions. In a nutshell: innovation.

So where is all this innovation happening? The digital economy demands scalability and stability, and it doesn't just want a bit of each, it demands copious amounts of each. The world of data interchange is getting more complex which is where XML is currying favour – so if you're not XML enabled, well you are just so 90s.



The arrival of 64-bit mainstream computing from Intel with its Itanium processor is a major milestone, so you can expect to support the speed and capacity of this chip from the key platform suppliers. The arrival of Itanium does in no way indicate the demise of 32-bit computing as we know it, but the existence of a split personality world where both 32-bit and 64-bit based systems will meet the demands of IT departments embracing the brave new world.

Wireless too is another area that is demanding close attention, what with the move to 2.5G and 3G wireless communication networks upon us. Within this sits the telephonic device of the future with a computer embedded within it, or the Smart Phone as they are now being dubbed.

In the past people talked about convergence in fairly loose terms, presumably because they had no real idea about what convergence was all about. Now the consumer worlds and

business worlds have collided, the Internet has ripped down business barriers, and erected a few of its own, and the wireless world of the mobile phone has now reached a technological stability whereby it is meaningful to a business user.

We are living in a world where convergence is now commonplace. Not just a neat concept, but a business reality. To meet the demands of this complex world takes a lot of hard work, not only from the implementers, but the technology creators who have been asked to innovate like never before.

## Top to Bottom Innovation

Just what is innovation? The easy answer is to look in a dictionary to find a meaning for the word, but that is the easy way out. The hard way is to look at what innovation in the computer industry is all about. Here we are talking about never standing still, always being one step ahead of the complex needs of customers.

Within IT, innovation comes from many levels. We have programming languages that either make creating applications much simpler or allow applications that could have never before been written to be created. At the operating system level you have to innovate downwards to the hardware, supporting the latest chip architectures, and upwards as you define standards for the new applications you have just created.

But the one thing that defines innovation, links it all together if you will, is usefulness. Just 'doing it' is no use. Innovation has to have a place within the real world. It needs to fulfil a business requirement otherwise it becomes nothing more than the latest solution looking for a problem.

## The Internet

As everyone knows the Internet is far from a new concept. With over 25 years of fine-tuning having taken place the world's giant network of networks has now become accepted as a medium for business delivery, both to consumers and within supply chains.

As a result the innovation taking place within the Internet arena is amazing, with the leading computer companies rolling out new products and technologies on a daily basis.

For its part Microsoft has defined its role in the Internet around a strategy called .NET. Last year the company took the lid off this strategy that has been five years in the making. Formerly known as Next Generation Windows Services, or NGWS, the .NET strategy is one that touches all aspects of the company, and will see a multitude of new technologies and products rolled out this year and beyond.

The net result is that you will see Microsoft innovate its offerings like never before, with Bill Gates himself stating that he's not only "betting the company on .NET" but that there





“ ... the arrival of Application Center 2000 has been much anticipated, with the need to load balance COM objects high on many people’s wish list. ”



is “not a product the company develops that won’t be affected by this Internet revolution.”

At the heart of this announcement is the eXtended Markup Language (XML) technology as advocated by the W3C, and now embraced by Microsoft as the way for handling all data in an online Internet world. Indeed, XML has become pervasive across Microsoft software and as time moves on will take on the role of data translation and modelling tool.

Steve Ballmer, president of Microsoft, refers to XML as the lingua franca of the Internet, the

way that data is handled across connected machines, allowing the “ultimate in enterprise application integration.” See conclusion for research firm Gartner’s views on exploiting XML.

### Product Innovation

One product that will be impacted significantly by Microsoft’s .NET strategy is the Office productivity suite that has been re-launched as Microsoft Office XP. This is the XML upgraded edition of Office that lays down the bedrock for creating documents that are XML-enabled.

As to the future of Office we will see Microsoft take a somewhat radical decision to eventually offer the Office applications [Word, Excel and so on] as a paid for online service, in the form of Office.NET. The innovative work taking place within Microsoft on software like Office XP and in the future with Office.NET is a simple recognition that the world of computing is changing and companies need access to rich tools, flexible applications and robust baseline computing platforms.

If you look forward to a time when the Application Service Provider (ASP) model is somewhat more prevalent then the role of Office.Net becomes somewhat clearer. Software ‘rental’ via an online provision model is not a substitute for buying packaged applications, but in the future the idea of accessing and paying for software as and when you need it is certainly an innovative concept.

If you extrapolate this further then business software creation becomes an interesting exercise when you can look to the Internet for companies that make application objects available [say billing, calendar, or e-mail] that can be assembled by other companies into a bespoke business application.

Such a future is rich with opportunity and fraught with complexity, but such a combination can only drive forward innovation.

If we look at the base platform end of things then Microsoft offers the Windows 2000 family of operating systems. Connected by a multitude of common technologies this family ranges from the desktop/notebook environment right the way up to the data centre.

The most complex operating system ever created by Microsoft is Windows 2000 Datacenter Server. This is the software that takes Microsoft into the domain of the mainframe, offering the highest level of computing possible on the Intel platform.

The arrival of Windows 2000 Datacenter Server last year ended much speculation as to the ability of a Windows operating system to scale. In the past the Intel platform and Windows was overshadowed by the power of Unix-based servers.

This is clearly not the case anymore, and the scalability of a single SMP server based around an Intel chip can no longer be questioned. The first operating system from Microsoft not to appear in a shrink-wrapped box, Datacenter Server supports massive leaps in hardware.

For starters, up to 16 or 32 processors can be managed as a single, giant SMP image, or segmented into multiple servers within a server design. Add to this the 64 Gbytes of memory that can be supported, and you really do have the beginnings of a Windows mainframe marketplace.

Better yet, up to four of these Windows mainframes can be clustered to provide both scalability and resilience. An example of a high performance SMP server running this software is the Unisys ES7000, which is based around the Cellular Modular Processing (CMP architecture).

The way that CMP works, and therefore takes advantage of the Windows 2000 Datacenter Server operating system is as follows: up to eight processing units (what Unisys calls sub-pods)





“ XML’s role here is to provide the mechanism for creating powerful business schemes without too much pain. ”

can be connected. Each sub-pod can take up to four processors, currently 32-bit Pentium III Xeon but 64-bit Itanium support will follow.

These sub-pods are in turn connected to a large third level cache which keeps them ‘fed’ with data, maximising processor efficiency, and improving processor utilisation. Even better than this is the fact that CMP will allow for a mix of 32 and 64-bit sub-pods can coexist in different partitions.

Using Datacenter Server this machine can be used to look like one big SMP server [mainframe] or several smaller ones. Even better is the ability to assign ‘jobs’ to the sub-pods, allowing a batch-processing environment to be simulated within the Windows arena.

Looking at the partitions more closely shows that several operating systems are supported, and can therefore be run concurrently. This is a great strength when designing new IT systems, allowing production and live systems to co-exist. Software supported includes Windows NT Server Enterprise Edition, Windows 2000 Datacenter Server, Windows 2000 Advanced Server, Novell Netware and SCO Unixware.

At an application level Microsoft offers many enterprise ready products that make it hard to pinpoint one singularly innovative product, although BizTalk Server 2000, steps forward as an early frontrunner for this mantle.

What you have with BizTalk Server 2000 is a great engine for data exchange, and a tool with which you can develop a set of system software and development tools that use XML to solve two of the most difficult IT problems out in the wild.

The first of these is the integration of disparate internal applications by tying together their data streams and process logic (what some refer to as Enterprise Application Integration), and the second is the integration of these internal applications with supply chain partners to support what some call e-business, or indeed B2B.

Where the software fits in is to truly showcase XML. It is not unusual for people to think of current schemes, such as EDI, as expensive, proprietary, and challenging to implement. XML’s role here is to provide the mechanism for creating powerful business schemes without too much pain.

What BizTalk does is take this promise and roll it into a server application that promises to attack these two problems, problems that are high up the executive radar. It then marries this promise with the premise that companies won’t need many programmers to roll out enterprise-critical applications if they use this set of tools.

Software like BizTalk Server 2000 – with XML at its core – will act as the hub through which data will pass, something like a hub within a hub, as the computer industry truly turns to XML to perform its role as the lingua franca of data.

At a different level of complexity and innovation Microsoft has developed Application Center 2000, which when embedded into a Windows 2000 server infrastructure delivers many benefits.

This software which provides the economic benefits of software scaling with the operational simplicity of hardware scaling is a key component of the Windows 2000 operating system strategy. For the first time it delivers the ability to load balance COM objects across multiple servers. There are two main benefits to this: firstly, to safeguard against software failure as a result of a server failing and secondly, to allow scaling to take place by monitoring the performance of COM objects, a health check if you will, and re-distributing workload as and when a critical COM object becomes taxed.

The software does this via a performance-weighted round-robin algorithm. The ability to balance key COM objects is something that should appeal to any IT professional looking to roll out key applications across a cluster of servers. The idea being that Network Load Balancing can manage IP traffic efficiently, so in an n-tier architecture performance bottlenecks go away, and in the mid-tier, the application tier, the use of Application Center 2000 can safeguard against performance hiccups here. At the backend tier a fail-over cluster of 8-way servers could be used to deliver high levels of performance, or indeed a simple SMP server running Windows 2000 Datacenter Server could be implemented.

It could be said that the arrival of Application Center 2000 has been much anticipated, with the need to load balance COM objects high on many people’s wish list. Combined with the performance and availability improvements of Windows 2000 itself as an operating system, this software solution to scalability makes clustering a very favourable solution for today’s computer intensive environments.





“We are talking about a world of data bouncing not just between people, but from people to machine and from machine to machine.”

### XML – innovation at a new level

The continued usage of computer technology within business means that by the simple process of relationship we are moving into a digital age. We are talking about a world of data bouncing not just between people, but from people to machine and from machine to machine. What we need is a machine independent language for data that takes the pain out of communicating.

This digital content is an exciting promise of enriched connectivity and communication, but with this communication comes a range

of problems. The first of which is the fact that the IT industry has created “islands of data” that are accepted as the norm, even if they are not wanted. Hence the arrival of the idea of EAI – a way of linking data that should never have been separated.

But in order to create this global pot of data the industry needs a data champion, and XML has been offered as the most innovative way that we can amalgamate all this information.

What is key to understand though, is that whilst XML is the way forward for data

consolidation, and you will see companies like Microsoft continue to make XML pervasive throughout their product offerings, it is not a product, nor is it a single standard. XML may be the master-meta language for data, but it does this by being an entire family of specifications and applications.

Using these specifications the next generation of applications will be built upon XML and will serve as the infrastructure for the next-generation Internet that is now emerging to support web enabled e-business and e-commerce.

### Conclusion

There is no doubt that the Internet has had and will continue to have a dramatic impact on business around the globe. The traditional bricks and mortar world is under attack from dynamic, fast paced companies that break the mould as we move to a digital economy.

As a consequence XML is poised to have as radical an impact on the IT market as the

Internet is having on traditional business. The truth of XML is that it will impact all aspects of the IT environment, ranging from application deployment, relational databases, middleware and operating systems.

As time moves on you will soon find it impossible to find an aspect of IT that is not impacted by XML. As a result of this, embracing

innovative applications like BizTalk Server and Office XP which provide the foundations for using XML will become more important, but this must be tempered with embracing development tools that allow for XML to become part of the fabric of any application.

Research firm Gartner has looked long and hard at XML. Here are some of its recommendations for exploiting XML.

- Understand the concept of how XML can enable a content-based infrastructure in a business. This equates to identifying which content is reusable by different applications, and how it can be represented so that all relevant applications can share in its use.
- Identify the shared content opportunities within an enterprise and in exchanges with extra-enterprise organisations. Where is data re-entered or translated to be used by multiple applications? Where can common information structures be used to improve process automation?

- Identify if and when business applications within a domain are becoming XML-enabled. Try to discover if there are industry initiatives (such as XML/EDI, HL7 CBL, ACORD and so on) that cover a portion of your business processes or applications? Do your IT people know their status? Are your IT staff even tracking their evolution?
- It is VERY important to avoid the simplistic XML “quick fixes” that treat XML as an isolated, Web document technology.
- Do not underestimate the breadth of impact or power that XML will have. As the various standards reach maturity, the infrastructure will undergo radical transformation and the market will be flooded with a host of new products. It is critical to be prepared to exploit them.



# Gateway opens the door to an electronic future

The heat is on. By 2005 the UK government expects all government departments to be able to provide their services electronically. Now a new project, called Government Gateway, promises to help central and local government and devolved administrations get services online faster than ever before. With a target of only three months for delivery of the first phase, there was a serious risk that this deadline would not be met. Microsoft was appointed to the role of senior project partner and in the space of 75 days delivered the system on time and to budget.

Most suppliers expect some kind of praise once a solution has been successfully implemented. But when the customer is the UK government it is worth taking note. It is even more remarkable when the government’s e-envoy, Andrew Pinder states that the Microsoft team which worked on the project, ‘comprised some of the best people I have seen working on a government system in the past 20 years.’

Praise indeed, but to fully understand the reason for it, it is worth taking a look at the history of the Government Gateway project and the urgent delivery deadlines which were driving the project team.

### A time critical project

Simple, consistent electronic interaction with citizens and businesses has long been the dream of the UK government. In particular, it is keen to implement the infrastructure which will eventually enable individuals to log on and exchange information with any government department, agency or local authority.

In the past, there were major technical obstacles to this vision. Indeed the concept of a single hub which links a variety of interfaces including web sites, kiosks and digital TV with public sector organisations, from the largest departments, to local authorities and healthcare trusts, is now only achievable thanks to the arrival of the Internet and associated open data exchange technologies such as XML.





**Matthew Bishop**  
Industry Practice  
Manager, Microsoft  
Consulting Services

## Fast Facts

Customer Profile	Challenge	Solution	Benefits	Technology
<ul style="list-style-type: none"> <li>The Cabinet Office is responsible for delivering the Government Gateway solution – a hub which will enable UK citizens and businesses to transact and exchange electronic forms with a virtually unlimited number of public sector organisations</li> </ul>	<ul style="list-style-type: none"> <li>Build an innovative, XML-based solution which sets the benchmark for public sector IT initiatives</li> <li>Deliver the solution both to budget and with extremely demanding deadlines</li> <li>Create a highly scalable platform which enables true e-government</li> <li>Provide a single authentication point for citizens and businesses</li> </ul>	<ul style="list-style-type: none"> <li>A truly open hub which connects government, citizens and businesses</li> </ul>	<ul style="list-style-type: none"> <li>Economy of scale: build once use many times</li> <li>Immense scalability</li> <li>Outstanding ROI</li> <li>Enormous boost to e-government credibility</li> <li>Single authentication point of all tiers of government</li> </ul>	<ul style="list-style-type: none"> <li>Windows 2000 Advanced Server</li> <li>BizTalk Server 2000</li> <li>Commerce Server 2000</li> <li>ISA Server</li> <li>SQL Server 2000</li> </ul>

At the start of 2000, the Cabinet Office took the decision to build such a hub, called the Government Gateway, which would go some way to meeting Whitehall's ambition to electronically link all areas of government with the general public by 2005.

The first stage involved connecting businesses with three departments: the Inland Revenue, Customs and Excise, and the Ministry of Agriculture, Fisheries and Food. The government's aim was simple. Let's say that you want to send a VAT form to the Government. You simply use an Internet based VAT application, fill in the forms and hit the

send button. The information is electronically signed and relayed to the Government Gateway which authenticates it and redirects it to the appropriate HM Customs and Excise system. Farmers and businesses are also able to carry out farm subsidy transactions and send end-of-year PAYE information.

Bob Evans, programme director, UK Online, says that it is impossible to overestimate the importance of the deadlines to the Gateway project. "This wasn't something that could be simply pushed back by a month or two. Both MAFF and the Inland Revenue were depending on us to deliver their solutions in

time for the financial end of year. If we missed that deadline we would effectively fall one year behind schedule. At the same time, the credibility of this project would have plummeted in the eyes of the departments and local authorities watching to see whether they can take advantage of this system."

The Cabinet Office needed a supplier who could commit to meet this deadline and had the vision, strategies and technology to achieve this goal. "Microsoft pledged to deliver an industrial strength solution and provide the resources and skills to make it happen on time," says Evans.

**"We now have a solution of which we can be truly proud, and which demonstrates real technology innovation. Whichever way you look at it, Microsoft deserves enormous praise, for delivering a benchmark system both to time and to budget."**

**Bob Evans**  
Programme Director,  
UK Online

In October 2000, Microsoft was selected as the principal partner for the Gateway project. "The team was faced with a pretty daunting timeline," says Jenny Duff, industry manager, public sector, Microsoft UK. "They effectively had only 75 days to deliver the first phase of the project."

**"Microsoft was only able to commit to delivering the Government Gateway within 15 weeks, as so much of the functionality required to deliver a project of this complexity was inbuilt into its .NET Enterprise Server products. This is a major differentiator over competitive offerings."**

Aware of the importance of the project to the UK government, Microsoft set up the resources to ensure successful delivery. A team of 70 Microsoft staff and partners established a round-the-clock operation at Microsoft's UK headquarters in Reading. An entire floor was cleared to start work on the project. Everyone was focused on delivery of the first stage of the project – a registration website where organisations can enrol for transactions. Thanks to unswerving commitment from Microsoft and its partners, this went live successfully in January 2000. Users of the Government Gateway are able to authenticate themselves using User ID and

Passwords or using a digital certificate. The Chambersign digital certificate from the British Chambers of Commerce and Viacode is the first certificate to work with the Government Gateway, with plans to add additional certificate providers over the course of the year. Authentication ensures total security when exchanging information with these departments.

This first phase of the project also delivered outstanding return on investment. Says Evans: "This stage had a budget of £18.3m, quite modest by the standard of central government IT projects. It also delivers excellent ROI – we

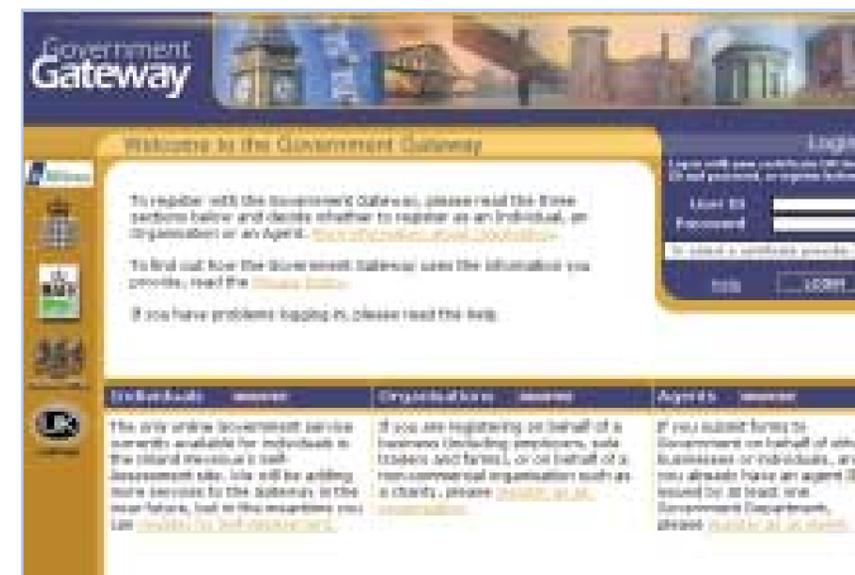
have a build once, use many times solution which will reap further dividends as more and more departments buy in to the technology."

The technology infrastructure now in place forms the foundation of a comprehensive network which will eventually connect citizens and government via many interfaces including web portals, kiosks and digital TV. Importantly, it will also connect the Government's UK Online web portal with departments.

### A flexible hub

The Government Gateway takes full advantage of Microsoft's .NET Enterprise Servers software, which has the scalability and the reliability required for the system to accommodate all UK citizens and businesses and be available 24x7x365. The server hardware is provided by Dell, while Cable and Wireless is the hosting partner. SEMA is the long-term application service partner.

The .NET platform also delivers the flexibility and agility essential for such an ambitious project, while the .NET Enterprise Servers' in-built XML functionality enables many interfaces to connect with an almost unlimited number of organisations. Matthew Bishop, industry practice manager, Microsoft Consulting Services, explains: "Thanks to BizTalk Server 2000 and the XML standard, government organisations can build dynamic





business processes that span application boundaries.”

Says Evans: “We’ve been very disciplined about what Gateway actually does. Of course it’s an ambitious project with wide-reaching goals. But at heart it is very simple - a piece of middleware which supports XML-enabled electronic forms to be submitted via a variety of channels to different organisations.”

In other words, all the interfaces – web site, portal, digital TV, kiosk – will send information

to the Government Gateway in the XML language. The business rules in the Gateway then dictate where and how that information should be directed. The information is then routed to the relevant department and where necessary, Gateway has the capability to transform that information into a format which can be understood by the destination system.

### Take the next steps

As well as MAFF, the Inland Revenue and Customs and Excise, the Cabinet Office has a list of public sector organisations ready to take advantage of the Government Gateway roadmap of new services. Other interested parties are advised to identify which of their services should go online first, and find out all they need to know about XML.

A good way of doing this is via the UK GovTalk initiative which supports public sector organisations who want to take full advantage of The Government Gateway. Led by the Cabinet Office, UK GovTalk membership is open to public and private sector organisations working on UK government projects. The web site, [www.govtalk.gov.uk](http://www.govtalk.gov.uk), holds draft and agreed schemas, best practice guidance, online support and toolkits to help convert legacy data to XML. It will also contain requests for proposals to attract innovation and cost-effective solutions from around the

world, and requests for comments in which anyone is invited to remark on draft schemas.

With all the pieces now in place, the Cabinet Office can look to the future with a solution which forms the cornerstone of the UK’s e-government ambitions. “We now have a solution of which we can be truly proud, and which demonstrates real technology innovation,” says Evans. “Whichever way you look at it, Microsoft deserves enormous praise, for delivering a benchmark system both to time and to budget.”



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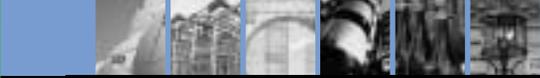
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