



Series 3

# .NET live

Taking business to the next level

Microsoft

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# Mobile Enterprise Development

**Why focus on the enterprise? Ivo Salmre, UK Manager, .NET and Developer Technologies, explains.**

To date most of the attention in mobile application development has been around consumer applications, focusing on such things as small games, SMS messaging and, more recently, multi-media messaging.

This is interesting but, excepting SMS, may be putting the cart before the horse. Among these items, SMS is unique – due to its pricing and inherent simplicity it has been wildly successful in providing businesses and consumers with affordable two-way paging.

It is instructive to look at the history of the private line telephone and mobile phone to gain some perspective. The first groups to adopt these technologies were businesses that saw great opportunity to save money, increase productivity or do more business. The business usage of these led to a large-scale roll out of infrastructure creating economies of scale that enabled broad consumer use.

Mobile computing is likely to follow a similar path in its maturation. For this reason, this article will focus on the current business

aspects of mobile computing and leaves a discussion of consumer applications for some time in the (hopefully near) future. There is real business value to be realised today!

## **PREVIOUS CHALLENGES**

In the past, developers targeting mobile devices have had to choose between powerful but very low-level tools or tools that promised rapid development but at the expense of richness and flexibility.

Very few situations justified the expense and skills required to build rich applications with low-level tools, leaving this market to very specialised vertical applications or a few broad based platforms.

The very ingredient that made the personal computer a successful and general-purpose device was missing: the ability for a large mass of developers to easily innovate on the platform. It is only with the release of Visual Studio® .NET 2003 that this power/flexibility barrier has been transcended with the

Windows® .NET Compact Framework supporting VB .NET and C# development targeting devices.

By utilising the same productivity tools and languages that are used for rapid desktop application development a whole new world of possibilities opened up on devices. Additionally, the .NET Compact Framework offers a common and familiar set of libraries with which to build rich and robust applications to run on devices.

### **BUSINESS APPLICATIONS ARE FUNDAMENTALLY ABOUT DATA**

Business applications are fundamentally about enabling people to connect and interact with information. Businesses run on information and this information is typically stored in databases. This information is then updated or transacted with on a continual basis.

As the past 20 years have shown, productivity is greatly enhanced when people have efficient access to this information in a just-in-time manner. This means the ability to see, analyse, update and interact with information whenever needed.

Increasingly mobile devices will play an important part in building enterprise solutions. Mobile devices that can interact with business information enable increased efficiency for existing tasks and enable entirely new processes to be designed around a pervasive computing model. The ability to get to

information 'anywhere, any time and on any device' is a huge advantage for enterprises.

### **USAGE MODEL OF DEVICES VERSUS DESKTOP APPLICATION USAGE**

While devices and desktops share many similarities there are also important differences; these very differences make mobile devices a valuable addition to an organisation's information environment. It is instructive to look at how mobile devices present different usage models compared to their desktop brethren.

Much desktop computing tends to be longer session-oriented. Typically people spend long periods of time web browsing, working for hours on a document in a word processor (as I am doing now) or with a spreadsheet asking detailed what-if questions. Some line-of-business applications are used throughout the day or around the clock.

In contrast, device usage tends to be short session oriented: an individual quickly peeks and pokes at a PDA to see what appointments they have to add new appointments, a mobile delivery person looks up the address and map for their next delivery or pick-up, a sales person quickly looks up product information and registers sales during a customer visit.

Devices tend to be used often, but in short spurts. People use devices to quickly get to the information they need to make decisions or record events and then move on.

Despite the difference in usage models, the back-end data interacted with tends to be the same for devices and desktops; this data and the rules associated with it make up the core information and processes of any organisation.

Desktops tend to be used to explore and modify this information and devices tend to be used to act on or add to that information. This is a product of both the form-factor (no large keyboard or mouse are featured on most mobile devices) as well as the inherent nature of mobility; people on the go need information just-in-time and benefit from a focused user interface. The same people working at desktops want an interface that allows them explore the data.

## **APPLICATION MODELS – THIN AND THICK**

Devices should be seen as incremental additions to an enterprise's information infrastructure. To interact with an enterprise's data and processes mobile applications offer two primary application models: mobile browser, and rich client.

The mobile browser applications are analogous to HTML browser applications viewed over the Internet on desktop computers, but with more limited and focused purposes. In addition to familiar HTML, many mobile devices utilise device-optimised formats (cHTML and WML/WAP) to convey information from server to a device's screen.

Mobile browser applications have the same advantage of being fully server hosted and using common denominator user interfaces to

allow broad reach to a range of devices. As with desktop browser applications, the primary drawbacks are the necessity to be online to use the applications and the lower interactivity that round-trips to the server inherently imply. If your application is only going to be used when online and page latency is not a primary concern, the browser/device model is a good way to go.

Microsoft offers the 'ASP .NET Mobile Web Application' model for these kinds of applications. Developers presently building desktop browser applications with Visual Studio .NET will be immediately familiar with this model of development and can easily extend their solutions to embrace devices using the browser model.

The rich client experience addresses the shortcomings of the browser model, offering the ability to work online and offline as well as offering the high interactivity that only a rich client application can offer. It does so by having an on-device presence and narrowing the list of target devices.

Devices having the capability of running rich on-device applications are commonly referred to as 'smart devices'. For smart devices such as the PocketPC or PocketPC Phone Microsoft offers the .NET Compact Framework. Desktop developers using Visual Studio .NET to build rich client applications can immediately use the same model to build rich device applications.

Presently the .NET Compact Framework targets PocketPC 2000/2002/and beyond,

Windows CE 4.1/and beyond. Future versions of the Microsoft SmartPhone will also support the .NET Compact Framework. As with mobile browser development, Visual Studio .NET 2003 serves as the development environment for building rich on device applications.

Of additional interest to enterprise developers building rich mobile extensions to their information infrastructure will be SQL Server CE 2.0. SQL Server CE 2.0 is an on device database tailored for mobile use that can synchronise with SQL Server running on desktops and servers.

Once again the same technologies and skills used for desktop and server development carry over to devices.

## **PRINCIPAL WAYS TO INTERACT WITH YOUR ENTERPRISE DATA**

There are three principal ways to interact with your enterprise data when building rich on-device applications.

The first is using Web Services. Data can be moved between device and server as XML, allowing for rich standards based interoperability between heterogeneous environments (e.g. Windows, UNIX, etc) and devices running the .NET Compact Framework.

The second is to utilise an on device data-store such as SQL Server CE and have the mobile data-store synchronise with a server.

The third is to have your mobile application connect directly with the server based data store; SQL Server can be accessed in this way from .NET Compact Framework applications.

All are valid solutions and which one you choose will depend on your specific applications needs.

## **WI-FI VS. CELLULAR NETWORKS VS. CRADLE**

There is a great deal of discussion going on as to whether Wi-Fi (wireless Ethernet) or cellular networks will dominate in the future for mobile device communication. Both are valid connectivity models with their own strengths and shortcomings.

Wi-Fi excels in intranet environments, providing high bandwidth network access in specific locations at low cost.

Cellular networks promise broad geographical coverage and increasing bandwidth over time with metered pricing.

The simplest form of device/server communication should also not be ignored, the cable tethering a device to a desktop PC. While 'low tech', the physical cable offers a quick and easy way for a device to synchronise with desktop and server data.

Many devices can also tunnel-through a desktop connection and access the intranet/Internet, allowing web service calls and synchronisation to occur at that time.

The .NET Compact Framework is capable of operating in all of these environments and provides the same programming model for all, allowing for ease in portability between each of these models. The choice of connectivity model will depend on the bandwidth, location and cost structure of the application you are

building. Common programming models make it easy to start simple and expand as needs dictate or infrastructure evolves.

## **EMULATION IS AN IMPORTANT PART OF APPLICATION DEVELOPMENT**

Both browser and rich client solutions gain greatly from rich emulator support during development. Visual Studio .NET 2003 ships with emulator support for both of these,

allowing developers to design and test against physical devices as well as rich emulated devices. Emulators also allow you experiment with a variety of different device configurations without needing to purchase or configure large amounts of hardware.

## **SUMMARY**

This is an exciting time for mobility. The current economic environment is forcing

# Microsoft technologies explained

The Microsoft .NET Framework is a component of the Windows operating system that provides the programming model for building, deploying, and running Web-based applications, smart client applications, and eXtensible Mark-up Language (XML) Web Services. It provides a highly productive, standards-based, multi-language environment for integrating existing investments with next-generation applications and services, as well as the agility to solve the challenges of deployment and operation of Internet-scale applications. The .NET Framework consists of two main parts: the Common Language Runtime and a hierarchical set of unified class libraries that includes a componentised version of ASP .NET, a loosely coupled data access subsystem (ADO .NET), and an environment for building rich Windows-based applications (Windows Forms).

The Microsoft® .NET Compact Framework, a subset of the .NET Framework, extends the benefits of developer productivity and XML Web Services integration to resource-constrained devices, such as Pocket PC and other Windows CE-based systems. It provides a highly productive environment for development and integration with virtually any data source, ranging from local SQL Server CE databases

to enterprise back ends. The Compact Framework's unified, hierarchical class library enables software developers to rapidly construct rich user interfaces, access native operating system methods, and inter-operate with assets on the device, such as the infrared data port and other hardware extensions.

*For more information, go to:*

*<http://msdn.microsoft.com/netframework>*

Microsoft Visual Studio .NET is the rapid application development (RAD) tool for building next-generation Web applications and XML Web services. Visual Studio .NET empowers developers to rapidly design broad-reach Web applications for any device and any platform. In addition, Visual Studio .NET is fully integrated with the .NET Framework, providing support for multiple programming languages and automatically handling many common programming tasks, freeing developers to rapidly create Web applications using their language of choice. Visual Studio .NET includes a single IDE with RAD features for building Web applications and middle-tier business logic, and RAD XML designers for working with data.

*For information, go to: <http://www.visualstudio.net>*



technical decision-makers to carefully evaluate technology investment decisions based on their ability to benefit organisations by increasing efficiency. The ability to use existing server and desktop infrastructure and development skills to enable enterprises to mobilise their processes offers even greater opportunities to drive efficiency and empower people to be effective in mobile environments.

As with previous communications

technologies, businesses are embracing mobile infrastructure as a way of increasing agility and productiveness. At the same time, hardware has advanced significantly and brought significant computing power to affordable mobile devices and created interesting software development possibilities.

I look forward to seeing what kinds of remarkable applications this upcoming year will bring. ■

Microsoft Exchange 2000 Server provides rock-solid messaging and collaboration 24 hours a day, seven days a week-with low total cost of ownership. Designed with mission-critical performance in mind, Exchange enables access to the people and information you want, anytime and from anywhere. Combining industry-leading reliability and scalability with unmatched ease of management, Exchange 2000 seamlessly integrates with the Microsoft Windows 2000 operating system and takes advantage of the full power of the Windows 2000 Microsoft Active Directory® service and security features. With Exchange 2000, businesses can further leverage their messaging infrastructure with value-added collaborative solutions. Exchange 2000 is part of Microsoft's .NET Enterprise Server family for building, deploying, and managing next-generation integrated web experiences.

*For more information, go to:*

*<http://microsoft.com/exchange>*

Microsoft Visual Studio is at the heart of MSDN® Subscriptions, a premier software service that provides developers with the latest development tools

and technologies. To learn more about MSDN Subscriptions, go to:

*<http://msdn.microsoft.com/subscriptions/productinfo/overview.asp>*

Microsoft BizTalk® Server 2000 is for orchestrating business processes within and between organisations. It enables an organisation to build dynamic business processes, easily integrate applications and business partners, and ensure interoperability using public standards.

*For more information, go to:*

*<http://www.microsoft.com/uk/servers/biztalk>*

Microsoft Windows 2000 Server is the server operating system for line-of-business applications and e-commerce. It provides you with the opportunity to Internet-enable your business, gain advanced manageability and take advantage of the best new devices.

*For more information, go to:*

*<http://www.microsoft.com/uk/servers>*

.NET live

# Telecommunications



## Customer Management and Billing Solution Using .NET Framework is 'Revelation' for NTL

*NTL offers a wide range of communications services to residential and business customers throughout the UK and Ireland and is the UK's leading broadband company with 40 per cent market share. NTL recognised that its existing in-house solution for customer billing, one of the main tools for providing customer service, lacked agility and was inadequate for its growing business. Faced with a need to cut administrative costs as well as to improve customer service, NTL agreed a strategy to integrate its various billing systems and customer databases. By choosing Microsoft .NET Framework over other technologies such as Unix, NTL has improved the productivity and performance of its provisioning and billing solution, initially for its one million NTL World Internet customers.*

### BACKGROUND

NTL, the UK's leading broadband company, offers a wide range of communications services to residential and business customers throughout the UK and Ireland. NTL's fibre-optic broadband network passes 8.8 million homes in the UK and Ireland including London, Manchester, Nottingham, Oxford, Cambridge, Cardiff, Glasgow, and Belfast. NTL Incorporated is listed on NASDAQ.

Last year NTL recognised that its existing technology platform was unable to accommodate the growing needs of the business for registering and billing its one million NTL World Internet customers. The company was experiencing high costs in its call centres, lack of flexibility, and lengthy training periods for customer representatives. The company also wanted its in-house developed Subscriber Administration and Billing System (SABS) to expand and handle the company's TV and telecoms service users.

### Overview

#### Customer Profile

NTL, the UK's leading broadband company, offers a wide range of communications services to residential and business customers throughout the UK and Ireland. NTL's fibre-optic broadband network passes 8.8 million homes in the UK and Ireland including London, Manchester, Nottingham, Oxford, Cambridge, Cardiff, Glasgow, and Belfast.

#### Business Challenge

NTL was unable to accommodate the growing needs of the business for registering and billing 1 million Internet customers. It wanted its in-house developed system to expand and handle TV and telecoms customers.

#### Solution

NTL chose a Microsoft package involving .NET Framework and Microsoft Visual Studio .NET, with Microsoft BizTalk Server 2002, Microsoft Operation Manager 2002 and Microsoft SQL Server 2000.



***“Instead of migrating 500 accounts an hour, NTL is now achieving throughput of 110,000 an hour. NTL World customers are 50 per cent of our entire customer base, so moving them onto the new platform has lifted a load of the old Classic SABS system.”***

**JUSTIN LEESE  
TECHNICAL DIRECTOR  
NTL**

When NTL started offering Internet services in 1995 there were no off-the-shelf products so the SABS solution was developed to perform multiple functions. From 1995-2001 a number of large wholesale customers were added such as Virgin.net, Which?Online and Tesco.net. Only NTL's Internet customers were on SABS, both wholesale and home users.

“NTL's architecture is very complicated as different systems are used to support customers on different products,” says Phil Pavitt, Director Group Projects and IT, NTL. “SABS was used for Internet customers. TV clients are on other systems and in some cases telecoms subscribers on further systems. There is a complex range of legacy systems as NTL had grown through acquisition and so different systems are still managing various customer databases. NTL is currently in the process of integrating these various customer management and billing systems so we could service all our customers together.”

For its Internet customers NTL was using single threaded Microsoft Visual Basic 6.0, no Microsoft Visual Basic .NET and no middleware. NTL realised that any future middleware it chose would be required to integrate with an increasing number of third-party systems.

## **SOLUTION**

When NTL was choosing its new technology, the company considered Unix-based products, Microsoft Visual C++, and Oracle. The choice of Microsoft .NET Framework, an integral Microsoft Windows component that supports building and running the next generation of applications and XML Web Services, and Visual Studio .NET, was based initially on concern for business continuity as well as cost. “One of the reasons we decided to remain with Microsoft was continuation,” says Justin Leese, Technical Director. “Classic SABS had been written in Microsoft technology so it was relatively simple to do a technology refresh rather than re-write in new technology.”

The solution now handles customer management, provisioning, billing, payments, collections, and fault management and runs over 200 servers and more than 5,000 client systems. Leese says that the three primary technical reasons for choosing the .NET Framework were: its scalability; resilience, by using a clustered database technology; and compatibility with the Classic SABS solution. NTL is using Microsoft products for web, application and database servers.

The middleware product chosen by NTL was Microsoft BizTalk Server

2002. "We chose BizTalk because it integrated extremely well," says Leese. "It meant that NTL would have an end-to-end Microsoft system. Software licensing for BizTalk proved to be cost effective for NTL. In terms of functionality BizTalk did everything it needed and was more cost effective compared to other solutions."

## BENEFITS

The productivity and performance gains from using Microsoft .NET Framework, and the lower development costs compared to other offerings, were a revelation to NTL. Although the development work was done in house, the team worked closely with Microsoft Consulting Services. "They were on site all the time, sitting with the development team and working among them," says Leese. "It was sometimes hard to tell who were Microsoft employees and who were NTL. We received lots of advice and assistance from Microsoft."

## PERFORMANCE IMPROVEMENT

The fast running code, due in part to multi-threading, has dramatically improved the speed NTL is able to migrate customers to the new systems. "Instead of migrating 500 accounts an hour, NTL is now achieving throughput of 110,000 an hour. NTL World customers are 50 per cent of our entire customer base, so moving them onto the new platform has lifted a load off the old Classic SABS system," says Leese.

Not only has performance improved, but also NTL has found that there are fewer bugs and fewer security or firewall issues with the new solution. "Very basically SABS sits on top of BizTalk and then all our other systems sit below BizTalk and plug into it," says Leese. "NTL's IT department sees it like a child's Lego building system. You can pull out one brick easily and stick another one in as all the interfaces can connect. It saves developers having to re-programme everything anytime a new system needs to be added in. This is a fantastic simplification of structure."

## REDUCED DEVELOPMENT COSTS

Any re-development of the code for Classic SABS was updated using Visual Studio .NET. It was refreshed and made compatible with Microsoft SQL Server(tm) 2000.

Moving from Visual Basic 6 to Visual Studio .NET enabled NTL's in-house team to multi-thread so that eight processors could be used

## Benefits

- Increased migration of accounts to new system from 500 to 110,000 per hour.
- Scalable, supported, and leading edge systems
- Increased productivity matched with reduced costs and fewer servers
- Development costs were lower thanks to the latest tools from Microsoft
- Expandable to encompass billing for other services e.g. telecoms and cable TV

## Products and Services

- Microsoft® .NET Framework
- Microsoft Visual Studio® .NET 2002
- Microsoft BizTalk® Server 2002
- Microsoft Operation Manager 2002
- Microsoft SQL Server™ 2000
- Microsoft Consulting Services



simultaneously to help with the migration of customers. "Considering the number of accounts that need to be moved this is a vital improvement," says Leese.

Microsoft tools won out when competing against Java/Unix in a developer contest organised by NTL during assessment of the various offers. Once the project began NTL found that its developers enjoyed using the .NET Framework. "Although most of the development team moved over from other languages to .NET, they really like the new version of Visual Studio .NET," says Leese. "They have seen the benefits of it from, for example, the data loader pumps, and are now completely sold on it."

#### **SCALABILITY DELIVERED**

NTL has a scalable, supported, and leading-edge system using .NET Framework. The applications centre is the SQL Server 2000 database cluster-a small number of larger servers. This sits above a database layer using Microsoft Com+ to scale application power out horizontally to lots of smaller servers.

The next layer is web servers-again scaled out with smaller servers. "These layers are economic to scale out as you are just adding low-cost small servers," says Leese. "There are many servers to upgrade and manage, but when you need to put an upgrade into these the applications centre helps to distribute it and ensure that the right version is on each server. Microsoft Operations Manager is used to monitor the whole environment.

NTL knew that the new system would have to talk to many more third-party systems and that in particular they would need to integrate with voice switch and cable TV provisioning systems.

#### **TECHNOLOGY 'REVELATION'**

NTL found that the .NET Framework with Microsoft Windows 2000, SQL Server 2000 and BizTalk were a 'revelation,' according to Leese. "They enabled NTL to build out a clustered database, multi-server and multi-process environment and offered us the most efficient use of hardware resource. BizTalk in particular was a revelation as the old platform was built on point-to-point interfaces." ■

For more information about NTL products and services, visit the web site at: <http://www.ntl.co.uk>

***"It [BizTalk] saves developers having to re-programme everything anytime a new system needs to be added in. This is a fantastic simplification of structure."***

**JUSTIN LEESE  
TECHNICAL DIRECTOR  
NTL**

## T-Mobile International Uses Microsoft .NET to Accelerate Time-to-Market and Minimise Costs

*Using Microsoft .NET, T-Mobile International launched a new service that enables customers to extend their existing applications to a mobile workforce with low start-up costs and predictable service fees. The company's new mobile service platform uses standards-based technologies such as XML and XML Web Services to integrate with business solutions running on any platform and in any location, enabling customers to easily extend their messaging, ERP or CRM systems for access through a broad range of mobile devices. These capabilities make T-Mobile's business customers more productive and agile by providing remote access to the applications and data that employees need to do their jobs. Selecting Microsoft and .NET enabled T-Mobile to launch its new service in less than a year, minimising development and deployment costs while accelerating time to market for an important new source of revenue.*

### BACKGROUND

T-Mobile International, the mobile phone subsidiary of Deutsche Telekom, has approximately 60 million customers worldwide and is one of the few global players for mobile data services. T-Mobile Deutschland, part of T-Mobile International, is the industry leader in Germany with more than 23.3 million customers and €7.1 billion in revenues for 2001.

Like all mobile service providers, T-Mobile faces a significant challenge: The wireless voice service industry is beginning to mature, which is commoditising prices and forcing the company to find new sources of revenue. One area with significant growth potential – and where T-Mobile already has network capabilities – is mobile data services. However, the effort required to mobile-enable business applications is preventing many



### Overview

#### Customer Profile

T-Mobile International is the mobile phone subsidiary of Deutsche Telekom.

#### Business Challenge

To drive new revenue streams, T-Mobile decided to build a service platform capable of connecting mobile users with their business applications.

#### Solution

To build its mobile service platform, T-Mobile selected the Microsoft platform and .NET technologies.

#### Benefits

- Minimised time-to-market
- Launch new services in less than a year
- Provided scalable and reliable service platform



***“Selecting the Microsoft platform significantly reduced our time-to-market by providing everything we needed to build a world-class solution.”***

**WERNER KARBACH  
PROGRAM MANAGER  
T-MOBILE  
INTERNATIONAL**

companies from purchasing and using these services. “The benefits of a mobile workforce are obvious, but up-front costs can be prohibitive for even our largest customers,” says Martin Witt, chief operating officer for the Mobile Business Solutions group of T-Mobile International. “To realise new revenues through the adoption of mobile data services, we need to help our customers mobile-enable their business applications.”

To help its customers overcome this challenge, T-Mobile decided to offer mobile access to business applications as a service. Addressing all market segments would require multiple service offerings: Smaller customers would want a hosted service with built-in business tools, whereas larger customers would need to mobile-enable existing applications such as email, enterprise resource planning, or customer relationship management.

Delivering on this vision required building a solution capable of connecting with any back-end application and extending its functionality to a broad range of mobile devices. In selecting the best platform, T-Mobile evaluated its options against the following key requirements:

- Time-to-market. To win early marketplace acceptance and begin driving new mobile data revenues, the solution had to be built as soon as possible. Once deployed, the solution had to be easily extensible.
- Reliability. Customers would derive the greatest value from mobile-enabling their mission-critical applications first, so the solution had to deliver the level of availability that users have come to expect from voice-based communications.
- Security. Businesses using the service would demand end-to-end security – from mobile devices through T-Mobile’s service platform and into their internal networks. To avoid the high costs of dedicated leased lines, the solution had to support commercially available, Internet-ready security technologies such as virtual private networks and Internet protocol security.
- Integration. To be widely accepted, the solution had to integrate a wide range of systems and technologies: mobile devices, PCs, applications hosted by T-Mobile, customer-hosted solutions, third-party applications and external billing and provisioning systems.
- Scalability and performance. Scalability requirements included a carrier-grade solution that could deliver superior responsiveness.

## **SOLUTION**

To best meet these requirements, T-Mobile decided to build its new solution on Microsoft software. Extensive built-in functionality minimised time-to-



market, while Microsoft .NET technologies, such as native support for XML and XML Web Services and ASP.NET, ensured an open and extensible solution capable of connecting with any system or device.

Less than one year after beginning development, T-Mobile had a solution capable of providing mobile-optimised access to business applications running in any location. The company's new mobile services were launched in Germany on October 14, 2002 – to be followed by expansion of the service offering to the rest of Europe and eventually worldwide. “Selecting the Microsoft platform significantly reduced time-to-market by providing everything we needed to build a world-class solution,” says Werner Karbach, T-Mobile Program Manager.

T-Mobile is taking advantage of the flexible nature of its new solution to deliver two initial service offerings. The first service, targeted at smaller companies, provides mobile access to a set of T-Mobile hosted business tools such as email and calendaring. The second service, targeted at larger companies, enables businesses with existing enterprise solutions such as messaging, enterprise resource planning (ERP), or customer relationship management (CRM) to rapidly and cost-effectively extend these systems for access by mobile devices. For example, a sales representative visiting a customer could use a Pocket PC or web-enabled cell phone to send and retrieve email, access a corporate address book, change a meeting time, review a customer's order history, submit a sales order, or check inventory.

## COMPREHENSIVE FEATURE SET ACCELERATES TIME-TO-MARKET

Karch attributes T-Mobile's rapid time-to-market to the extensive prebuilt functionality provided in Microsoft software. “The Microsoft platform enabled us to build an end-to-end solution very quickly and efficiently,” he says. “It provided a reliable, scalable and extensible foundation, highly-integrated security, a built-in application server, instant support for mobile devices, comprehensive integration capabilities, and an integrated development environment.” Some of the key Microsoft products and technologies that T-Mobile used in building its solution include:

- The Microsoft Windows Server family, which provides a firm foundation for the entire solution. Built-in clustering and load-balancing capabilities ensure a scalable and reliable solution.
- The Active Directory service, a built-in feature of the Windows Server family, which gives T-Mobile an integrated and secure mechanism for storing user data and authenticating users.

## Products and Services

- Microsoft Windows® 2000 Advanced Server with Internet Information Services version 5.0 and Active Directory
- Microsoft SQL Server
- 2000 Enterprise Edition
- Microsoft Visual Studio .NET
- Microsoft Exchange 2000 Enterprise Server
- Microsoft Internet Security and Acceleration Server 2000 Enterprise Edition
- Microsoft BizTalk Server 2002 Enterprise Edition
- Microsoft Application Center 2000
- Microsoft Mobile Information Server 2001 Carrier Edition and Mobile Information Server 2002
- Microsoft Operations • Manager 2000
- Microsoft .NET Framework
- ASP.NET
- ASP.NET mobile controls Compaq DL380 and DL580 servers



- Microsoft Internet Security and Acceleration (ISA) Server 2000, which provides several strong security technologies for the service platform: integrating with Active Directory to authenticate users, securing the communication channel into customer networks, and helping to protect the service platform from unauthorised access.
- The Microsoft .NET Framework, including ASP.NET and the ASP.NET mobile controls, which helped to minimise time-to-market by enabling T-Mobile to create a single user interface compatible with a broad range of devices.
- Microsoft Exchange 2000 Server and Mobile Information Server (MIS), which are used to provide a set of hosted mobile business tools that include email, mail notification via SMS, address books, fax capabilities, calendaring and instant messaging.
- Microsoft BizTalk Server 2002, which maximises the service platform's extensibility by providing a flexible means of integrating with legacy billing applications and business support systems (BSSs). BizTalk Server also automates the complex process of provisioning new users and services.
- Microsoft SQL Server 2000, which provides storage for system data and user profiles.
- Microsoft Operations Manager 2000, which enables T-Mobile to deliver superior levels of availability by providing an integrated monitoring environment with the ability to implement automated corrective actions.
- Microsoft Visual Studio .NET, which provided the solution's 30 developers with an integrated development environment and highly productive tool set.

***“With the native support for XML Web services in Microsoft .NET, we can integrate with and mobile-enable applications running on any platform.”***

**WERNER KARBACH  
PROGRAM MANAGER  
T-MOBILE  
INTERNATIONAL**

#### **XML WEB SERVICES ENSURE EASY INTEGRATION**

Over time, an extensive range of customer-hosted solutions, third-party applications and new functionality hosted by T-Mobile will be delivered through the service platform. To accommodate each new application without custom integration, the service platform makes extensive use of XML and XML Web Services – a method of integrating disparate systems over the Internet using standard web protocols. This approach ensures that existing solutions running in any infrastructure and location can be mobile-enabled with little effort and can be easily provisioned for use. “With the native support for XML Web Services in Microsoft .NET, we can integrate with and mobile-enable applications running on any platform,” says Karbach.

#### **BUSINESS SUPPORT SYSTEM EXTENDS LIFE OF LEGACY SYSTEMS**

T-Mobile also built a new business support system on Microsoft software to

handle the associated accounting, billing, monitoring, provisioning, and customer-care functionality for its new service. Integrated with the service platform using BizTalk Server 2002, the BSS captures usage data and performs extensive pre-billing calculations before forwarding final results to the company's existing mainframe-based billing systems. "Building the BSS on the Microsoft platform offers several key benefits," says Karbach. "We were able to leverage and extend our existing legacy billing systems while avoiding a major mainframe development project." *(See the Appendix for more information about the architecture of T-Mobile's new solution.)*

## **BENEFITS**

T-Mobile's new solution enables the company to offer customers a unique and compelling value proposition: the benefits of a mobile workforce with low acquisition costs and predictable service costs. By selecting Microsoft and .NET, T-Mobile was able to rapidly bring this valuable service to market and begin realising new revenues. "Solutions in our industry have traditionally been closed systems taking years to develop," says Witt. "Microsoft and .NET enabled us to do more with less, delivering an open and extensible service platform in a short period of time." "The Microsoft platform provided a wealth of prebuilt functionality, which minimised the time to build our solution and begin realising new revenues," says Karbach. "Most of the low-level plumbing we needed – such as mobile device support and flexible integration tools – was already built and ready to use."

## **MULTIPLE REVENUE STREAMS WITH ONE INVESTMENT**

The open and extensible nature of the company's solution facilitates an 'ecosystem' of third-party application providers, with each new solution leading to an additional revenue stream for T-Mobile. "XML Web Services make it very easy for systems integrators and third parties to integrate with our service," says Karbach. "Our solution does most of the 'heavy lifting' with respect to the mobile interface, billing, provisioning, and so on, making it very attractive for other companies to extend their existing applications to the mobile workforce through our service."

## **ENHANCED MARKET POSITION**

Using XML Web Services as the integration mechanism between T-Mobile's service platform and the applications running on a company's internal network makes the process of mobile-enabling core business applications



fast and painless. This will help to win over more new customers and accelerate the adoption of T-Mobile's mobile data services. "With its low barrier to entry, our new service delivers a compelling value proposition for customers and will further enhance our market position," said Karbach. "Combined with Deutsche Telekom's other products and services, our new service enables us to remain positioned as one of the few telecommunications companies in the world capable of offering truly integrated, end-to-end solutions from a single source."

### SCALABLE AND RELIABLE SERVICE PLATFORM

By selecting Microsoft and .NET, T-Mobile can focus on growing revenues and winning early market share without having to worry if its technology is up to the task. "The scale-out approach supported by the Microsoft platform enabled us to build our service platform using cost-effective, industry-standard servers, clustering them together to ensure high availability," says Karbach. "We can easily add new servers to support growth, paying for them when needed instead of having to purchase a large amount of spare capacity up front."

### MINIMAL UP-FRONT AND LONG-TERM COSTS

Using Microsoft software enabled T-Mobile to build its new solution using cost-effective, industry-standard servers. Moreover, the common set of management tools provided across Microsoft software simplifies day-to-day system management and administration now that the solution is in production. "There are more qualified professionals available for the Microsoft platform than any other," said Karbach. "The comprehensive management tools provided in the platform help us to administer and support our new solution with minimal effort and costs."

### APPENDIX: SOLUTION ARCHITECTURE

Requirements for T-Mobile's new service platform included extensibility, scalability, availability, and ease of integration with other systems. The company met these objectives by following the recommendations provided in the Microsoft Systems Architecture Internet Data Centre Reference Architecture Guide, which provides design guidelines and best practices based on Microsoft's experience helping thousands of customers build, deploy, and manage enterprise-class solutions. T-Mobile's service platform is based on a highly scalable multi-tier architecture. Servers in each tier are

***"Solutions in our industry have traditionally been closed systems taking years to develop. Microsoft and .NET enabled us to do more with less, delivering an open and extensible platform in a short period of time."***

**MARTIN WITT  
COO, MOBILE BUSINESS  
SOLUTIONS  
T-MOBILE  
INTERNATIONAL**

clustered to maximise availability using Microsoft Windows Load Balancing or Cluster Services, preventing any single point of failure from compromising service availability. The solution resides on Compaq ProLiant DL380 and DL580 servers, each configured with a minimum of two processors and 1 gigabyte (GB) of RAM. External storage is provided by an EMC storage array.

## **INTEGRATED DEVELOPMENT ENVIRONMENT: VISUAL STUDIO .NET**

Developers built the entire solution using Microsoft Visual Studio .NET, realising the productivity benefits of an integrated development environment and common tool-set across all tiers of the application. During the development process, T-Mobile took advantage of several features in Visual Studio .NET to accelerate time-to-market. Enterprise templates were used to jump-start the design process, partitioning the work to be done across several small teams working in parallel while ensuring that best practices were easily shared across the entire development team. Dynamic Help, IntelliSense technology, data tools, and an XML designer also enhanced individual developer productivity, while the cross-language debugging capabilities in Visual Studio .NET enabled software components written in three programming languages (primarily C# with some C++ and Visual Basic) to be tested, refined, and integrated with minimal time and effort.

## **INSTANT MOBILE ACCESS: ASP.NET AND THE ASP.NET MOBILE CONTROLS**

T-Mobile had to support a wide array of mobile devices with its new service platform, but wanted to avoid creating and maintaining a separate UI for disparate web browsers. The company overcame this challenge using the ASP.NET mobile controls, which are a set of controls that the .NET Framework knows how to render for most mobile web browsers. T-Mobile enhanced these controls using object-oriented programming techniques to add functionality for wireless optimisation (e.g., image size reduction), role-based authorisation, and per-user, per-department, and per-company UI customisation.

"ASP.NET and the ASP.NET mobile controls enabled us to create a logical UI design once and have it used for all mobile devices, saving us an enormous amount of time," says Karbach. "This feature alone was reason enough to select the Microsoft platform. As new devices become available, we'll be able to support them by simply updating configuration files."

## **SECURITY: INTERNET SECURITY AND ACCELERATION SERVER 2000**

Customers would demand end-to-end security before entrusting their



***“Web Forms and the Microsoft Mobile Internet Toolkit enabled us to create a logical UI design once and have it used for all mobile devices, saving us an enormous amount of time. This feature alone was reason enough to select the Microsoft platform.”***

**WERNER KARBACH  
PROGRAM MANAGER  
T-MOBILE  
INTERNATIONAL**

critical business information to T-Mobile's service platform. T-Mobile used Microsoft Internet Security and Acceleration Server 2000 to address this challenge, using ISA Server to help secure both the service platform and its communication channels into customers' internal networks. The extensible nature of ISA Server enabled T-Mobile to meet the unique needs of a mobile solution by adding features such as bearer detection – information that is used to further optimise system responsiveness. “ISA Server provided end-to-end security capabilities for our new service platform,” says Karbach. “Its level of integration with the rest of the Microsoft platform helps to ensure seamless security, and it was quite easy to extend to meet the unique needs of the mobile environment.”

Some features of ISA Server that T-Mobile used include:

- State-of-the-art firewall. T-Mobile used the multi-layer firewall capabilities of ISA Server to help secure the perimeter of its service platform. All traffic attempting to access the platform from either the Internet or the mobile data network is subject to inspection at the packet, session, and application levels.
- Server publishing. The server publishing capabilities of ISA Server enhance security by terminating all external requests to the system at the firewall.
- Integration with Active Directory. ISA Server performs user authentication through integration with the Active Directory service, which is used to store user data. In addition, it publishes the device-level Remote Authentication Dial-In User Service (RADIUS) service provided by the Windows .NET Server Internet Authentication Service.
- Support for third-party tools. The Trend Micro InterScan WebProtect Plug-in for ISA Server is used to scan all Hypertext Transfer Protocol (HTTP) traffic passing through the firewall for viruses and malicious code.
- High-performance Web cache. System responsiveness was improved using the caching capabilities of ISA Server. Requests for items such as a graphic are forwarded through the service portal only when the item is not already present in the ISA Server cache.
- Scalability. The servers running ISA Server are configured in array mode, which enables them to be managed as a single server while delivering a scalable, load-balanced security solution.

#### **BACK-END INTEGRATION AND SERVICE PROVISIONING: BIZTALK SERVER 2002**

To charge for its new service, T-Mobile had to connect the new service platform and BSS with its existing mainframe-based billing system. The company used Microsoft BizTalk Server 2002 to integrate all three systems

in a loosely coupled manner – an approach that provides maximum flexibility in connecting with the billing, provisioning, and business support systems of third-party application providers and other national service providers. “BizTalk Server was the perfect tool to couple our new service platform with its supporting systems,” says Karbach. “With the integration features provided by BizTalk Server, we can easily mix and match the capabilities of our internal systems with the billing, provisioning, and customer-care systems of our business partners.”

T-Mobile used BizTalk Orchestration to automate the provisioning of new users, user groups, companies, and services, exposing these complex processes through a standardised interface. Companies using the service enjoy a web-based interface into this functionality, enabling designated administrators to adjust services or manage users.

#### **EMPOWERING SYSTEM INTEGRATORS AND THIRD-PARTY SERVICE PROVIDERS**

Making it easy for companies and systems integrators to mobile-enable existing business applications is a key component of T-Mobile's go-to-market strategy. To this end, T-Mobile will offer a partner program comprising a developer network and a software development kit (SDK) that enables others to create mobile user interfaces and connect these interfaces to existing business applications while ensuring compatibility with T-Mobile's service platform.

The SDK includes a Visual Studio .NET enterprise template that accelerates the integration of existing applications with the T-Mobile platform. It also includes a self-contained “service-portal-in-a-box” run-time environment that lets developers emulate running their applications against T-Mobile's service platform. Through this capability, developers can verify their implementations are correct and see how their applications will look and feel once mobile-enabled.

Although the SDK is designed to accelerate the delivery of business applications through the mobile portal, use of the SDK does not require companies to run Microsoft software. “Use of the SDK leverages the power of Visual Studio .NET at design time, but the output of this process is a set of XML-based templates that can be hosted on any platform,” says Karbach. “Similarly, the XML Web Services exposing the back-end application – as well as the application itself – can be running on any platform.” ■

For more information on T-Mobile International, go to: <http://www.t-mobile.net>

.NET live

## Retail Services



## Shirt Retailer Charles Tyrwhitt Sews Up Web Sales with Powerful New Online Store

*Multi-channel shirt retailer Charles Tyrwhitt was one of the earliest players in the ecommerce arena. So when it was redesigning its online store the company knew it wanted a site that offers a truly intuitive customer experience coupled with seamless back-end integration and straightforward management procedures. Using Microsoft Commerce Server 2002 and the Microsoft .NET Framework, technology supplier Snow Valley built a new, integrated site that is both powerful enough to support Charles Tyrwhitt's customer service and promotional strategies, and simple enough for its content managers to keep pace with demand.*

### BACKGROUND

Established in 1986, Charles Tyrwhitt is an award-winning multi-channel retailer of quality shirts and accessories. The company, which has a mail order service and a number of shops around the world, launched its first transactional web site in April 1997 and has seen online revenues increase continually, contributing to total sales of over £30 million for 2002.

Recently the retailer became dissatisfied with its existing online store. It wanted to increase international sales by providing customers with a new site that was helpful, fast and easy to use. As Charles Tyrwhitt runs between 30 and 40 promotional campaigns at any one time, the new site needed to be flexible, enabling employees to self manage their promotions, online content and product catalogues.

The other major requirement was full integration between the company's online store and its back-end order fulfilment system. This would eliminate unnecessary costs and logistical procedures, and maximise efficiency as order volumes increased.



### Overview

#### Customer Profile

Charles Tyrwhitt is a successful global multi-channel retailer of shirts and accessories.

#### Business Challenge

Charles Tyrwhitt wanted to improve its online sales with a new web site that was more customer-friendly, more tightly integrated with existing back-end processes and more efficient in terms of operation and management.

#### Solution

The new online store benefits from the advanced e-commerce functionality of Microsoft Commerce Server 2002 and the Microsoft .NET Framework. Using these technologies, Charles Tyrwhitt has streamlined its operations and has greatly improved customer satisfaction and sales.



Nick Wheeler, Managing Director at Charles Tyrwhitt, says: "We had a good idea of what functionality we wanted and how it would fit into the business. We are a multi-channel retailer and wanted all our channels to integrate seamlessly."

## SOLUTION

In early 2002, Charles Tyrwhitt began discussions with Snow Valley, a Microsoft Certified Partner, about building the new online store. Snow Valley has extensive experience of developing transactional web sites for multi-channel and catalogue retailers – including Rohan, The White Company and Manchester United Football Club.

The new online store was built using Microsoft Commerce Server 2002 and the .NET Framework. The site, which went live on time and within budget in September 2002, also utilises SS2.NET, Snow Valley's commerce platform for multi-channel retailers. This enables stores to be built rapidly with advanced commerce functionality and high levels of integration, security and scalability.

Charles Tyrwhitt's complex promotional strategies are easily supported by the site, which allows employees to amend prices, offers and discounts as and when they need to – without the intervention of IT staff.

The online catalogue has also been fully integrated with the company's existing catalogue and mail order systems. This ensures that Charles Tyrwhitt can grow its business without major increases in administration costs. This enables secure integration over the Internet. Now :

- Online orders are automatically placed into the back-end ERP system;
- Real-time stock details, such as when out of stock items will be available again, can be viewed over the Internet;
- Customers can securely amend their profiles and view full information about all orders – even those not placed online.

Ben Taylor, Head of Development at Snow Valley, says: "Charles Tyrwhitt was told by previous suppliers that integration with its existing enterprise resource planning system would be difficult if not impossible. We have been able to achieve tight and reliable integration with this system using XML, Web Services and our own ERP connectors which are written in C#. In addition Commerce Server 2002 provides support for developing our stores in ASP.NET, and this brings new levels of security, reliability and connectivity."

***"The fantastic thing about the Internet is spontaneity. You can put products up and take them down quickly, and you can change prices. With mail order that takes us two months. The ability to react to supply and demand is much better online."***

**NICK WHEELER  
MANAGING DIRECTOR  
CHARLES TYRWHITT**

Snow Valley also provided comprehensive training for Charles Tyrwhitt employees on all aspects of managing the online solution.

## BENEFITS

### CUSTOMER SATISFACTION

The site includes multi-currency (GBP, EUR, USD) and multi-language (English, French, German) capabilities to help Charles Tyrwhitt provide a more localised service to its international customer base and increase sales revenues across Europe. QAS integration also helps to make the checkout process easier and faster, and ensures that orders for both home and abroad are correctly addressed before they are despatched.

Charles Tyrwhitt's online store offers customers an unusual degree of personalisation – a resource-intensive feature that could have resulted in a very slow, frustrating user experience. But with the .NET framework, Snow Valley was able to utilise ASP.NET caching technologies for presentation and data content on the site. It then wrote additional code to manage and flush the cache, ensuring that it always contains up-to-the-minute site information. In this way, customers of the online store are guaranteed an accurate, fast and highly satisfying shopping experience.

### INCREASED REVENUE

Since implementation, Charles Tyrwhitt has more than doubled its previous best in online sales. They now account for 28 per cent of total revenue.

Ben Taylor, Head of Development, Snow Valley, says: "We use Commerce Server 2002 as our core commerce toolbox. We then extend existing functionality and build new features and applications such as our Call Centre console. Commerce Server is a great base for building on, and as we always work in conjunction with the object model, we can easily upgrade our stores as new editions come out. This means our customers can quickly take advantage of new functionality provided by the Microsoft Commerce Server Team."

### STREAMLINED MANAGEMENT

Even the most non-technical employees can now easily manage the online catalogue, content and promotions. Taylor explains that the site constantly needs new targeted home pages to tie in with the latest promotional campaigns. Now, management personnel can create this

## Benefits

- Back-end integration enables better business and service without increased administration costs.
- Business flexibility is improved as non-technical staff can manage their own content.
- Customised reports have improved analysis and decision making.
- Many additional features, including multi-language and multi-currency capabilities, have boosted international sales.

## Products and Services

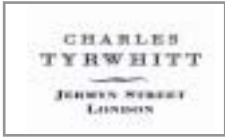
- Microsoft SQL Server™
- Microsoft Visual Studio®
- Microsoft Commerce Server®2002
- Microsoft Windows 2000 Server
- Microsoft SQL Server® Analysis Services
- Microsoft .NET Framework
- ASP.NET
- C#

## Partner

Snow Valley

For more information on Snow Valley visit their website at:  
[www.snowvalley.com](http://www.snowvalley.com)





***"A brochure costs £250,000 and can take two months to produce, which means by the time it lands we might have sold out of a particular line. Emails cost next to nothing, can be sent within minutes and can be targeted."***

**NICK WHEELER  
MANAGING DIRECTOR  
CHARLES TYRWHITT**

content themselves and run a trigger to get it swiftly and securely uploaded onto the site. This means promotions can be followed through effectively and customers are more likely to find what they are looking for. Wheeler says: "The fantastic thing about the Internet is spontaneity. You can put products up and take them down quickly, and you can change prices. With mail order that takes us two months. The ability to react to supply and demand is much better online."

Commerce Server 2002 also offers a comprehensive reporting engine, which has been customised by Snow Valley to present valuable performance data in a format relevant to the user, allowing staff to track sales and make informed business decisions.

#### **COST SAVINGS**

Excess stock can be costly to store and difficult to get rid of. The new site's Clearance section is useful for reducing excess, and currently accounts for 38 per cent of Charles Tyrwhitt's US web sales.

Email is another important tool. Wheeler says: "A brochure costs £250,000 and can take two months to produce, which means that by the time it lands we might have sold out of a particular line. Emails cost next to nothing, can be sent within minutes and can be targeted. For example, if we find ourselves with an excess of 17 inch collar shirts, we can send a promotional email to customers with that particular measurement." Those customers will be able to find the shirts online and purchase them within seconds – without delay, interference or hassle. ■



## Supermarket Improves Truck Routing and Delivery with .NET Compact Framework

*When Tesco.com and the Tesco supermarkets wanted to extend their automation structure to their delivery vans, they turned to the Microsoft .NET Compact Framework. They targeted Symbol industrialised Pocket PC devices with wireless links, connected to GPS receivers mounted in their vans. Using Visual Studio .NET, they were able to quickly code a C# application to download customer order lists for a truck, route the truck to its destinations, capture any customer rejections of product substitutions, capture a customer signature along with its time and location, and log the truck's entire actual route.*

### BACKGROUND

Tesco.com is the ecommerce arm of Tesco PLC, the United Kingdom's largest food retail/supermarket company. With 270 stores and a web site, it was eager to improve the efficiency of its home delivery process. Nick Lansley is IT New Technologies Manager at Tesco.

"We already had experience with Windows 95-based tablet-style PCs in our stores, but we felt that the PCs would be too expensive and too fragile for use in a delivery van. We considered using Windows CE-based devices, but we didn't have any in-house experience with embedded Visual C++, and we didn't have the budget to hire this project out.

"We did have expertise in C# and Visual Basic .NET, however. Our company had already brought the .NET Framework on board, and we'd used it to implement XML Web Services that let us interoperate with some of our partners. Using Web Services had allowed us to communicate with our 'Tesco Pocket Shopper' grocery shopping application for Pocket PCs, for instance," says Lansley.



### Overview

#### Customer Profile

Tesco.com is the ecommerce arm of the UK's largest (in terms of turnover and profits) food retail/supermarket company, Tesco PLC.

#### Business Challenge

While Tesco already had experience with wireless-connected tablet-style PCs in its stores, it wanted to place more rugged, less expensive devices in its delivery vehicles.

#### Solution

Using Symbol industrialised Pocket PC 2002 devices, C#, and the .NET Compact Framework, Tesco built a prototype solution in-house that downloads the order list for a vehicle in the store, and assists the driver on the road.



“ We discovered the .NET Compact Framework during its alpha test period, got a copy for evaluation, and realised that programming a Pocket PC application with Visual Studio .NET is almost the same as programming a desktop application. Of course, we put up with the same alpha problems as everyone else – we built desktop Windows Forms and modified the generated code to work on the device. When we got the beta of the .NET Compact Framework, all those problems were fixed, and we could design device forms graphically and test them in the emulator,” he continues.

**SOLUTION**

Lansley says: “ Our prototype solution was built by a single developer in eight weeks. The application replaces all of the delivery driver’s paperwork – and with the size of our stores and the amount of paper we have, paperwork was always getting lost.

FAST FACTS	
Number of developers to build application	1
Number of months to build application	2

“ In addition, our solution ‘listens’ to a Global Positioning System (GPS)



receiver, which records the exact latitude and longitude of the delivery van. The application uses this information to plot a path to the customer's home using an on-screen map.

"In the store, the application pulls across the orders for a delivery van to the Pocket PC over a wireless 802.11b network connection. The order list includes the customer locations and a list of potential product substitutions – we substitute for ordered products that are out of stock, but the customer has the option to reject the substituted product if he or she wishes.

"We use an industrialised Pocket PC manufactured by Symbol. We expect that it's rugged enough for our purposes, and is affordable enough to use in our vans. Each device has 802.11b wireless connectivity, which works with the wireless access points in our stores. In the van, the device docks in a cradle, and we have a GPS device connected to the cradle. The GPS provides the van's latitude and longitude as well as the current time and date.

"When the order list has been downloaded to the Pocket PC and the van has been loaded, the driver docks the Pocket PC in its cradle and it

### Benefits

- Rugged, inexpensive devices
- Able to integrate with special device capabilities such as GPS, wireless networking
- High developer productivity-built by one developer in eight weeks
- Easy transfer of skills from desktop to mobile device development
- Able to develop in-house

### Products and Services

- Microsoft Pocket PC 2002 Software
- Microsoft SQL Server™
- Microsoft Visual Studio® .NET
- Symbol PPT 2800 with barcode scanner and 802.11b wireless network card





***"The remote debugging facility where the application on the Pocket PC could be remote-controlled from the desktop (development) machine was extremely useful and very time saving, particularly as the Pocket PC runs on a wireless (802.11b) LAN connection and could be installed in a Tesco.com delivery van parked nearby for testing."***

ANGELA WALKER  
IT DEVELOPER  
TESCO.COM

displays a map giving the route to the first customer. When the driver arrives and parks, he takes the Pocket PC device to the customer along with the order. The customer can accept or reject any product substitutions, and the device captures the customer's signature along with the van's current position and the time of day."

#### **BUSINESS BENEFITS**

Says Lansley: "Once we've made a delivery to a customer, we have the exact latitude and longitude of a successful parking spot on file, so that it doesn't matter whether the same driver delivers to the customer on the next trip. That parking spot will show up on the map presented the next time round.

"We also log the entire trip as it progresses: the latitude, longitude, and time every few seconds. That information provides feedback to the mapping and routing vendor, and allows us to improve our routes and the accuracy of delivery times promised to customers.

"Once the delivery van completes its route and gets within the range of the store's wireless access points, the Pocket PC automatically uploads its logs to the store's central computer. The central database gets the lists of successful and unsuccessful deliveries, the delivered and rejected products, the customer signatures (as signed straight onto the Pocket PC's screen) with their time and location stamps, and the truck's route log."

#### **.NET COMPACT FRAMEWORK SURPRISES**

Angela Walker is the project's IT developer at Tesco.com. "As a Visual Studio .NET and C# developer, I found I could get to grips with programming for .NET Compact Framework with very little extra learning. The Pocket PC emulator and remote debug tools were particularly useful and enabled me to discover and remove bugs and any unexpected behaviours very quickly.

"We were surprised to discover that in the Pocket PC, like many other handheld platforms, but unlike Windows desktop platforms, only the foreground application runs – any other application in the background actually goes to sleep!

"The only way to make an application do several things at once is to use several threads running simultaneously. Fortunately the .NET Compact Framework has good support for handling multiple threads, which makes this easier than on most handheld platforms, some of which don't



support threads at all.

"However, threads have no 'thread abort' method in the .NET Compact Framework, unlike the full .NET Framework. So we had to use a work-around to signal threads to abort.

"On the plus side, virtually no change to the way a standard application is developed was needed for .NET Compact Framework development. Leveraging existing knowledge of development in Visual Basic .NET or C# (or any other .NET language) was all that was required. Very little extra thinking 'out of the box' was needed. Existing familiarity with the IDE was not compromised to develop in the .NET Compact Framework.

"Leveraging existing knowledge of C# was just fantastic. The emulator screen helped a great deal; and the remote debugging facility where the application on the Pocket PC could be remote-controlled from the desktop (development) machine was extremely useful and very time saving, particularly as the Pocket PC runs on a wireless (802.11b) LAN connection and could be installed in a Tesco.com delivery van parked nearby for testing."

## ONGOING DEVELOPMENT

Says Lansley: "Our trial has just begun at our Basingstoke store, with four delivery vans. Basingstoke is a nearly ideal test area: it's a small city surrounded by countryside villages. There are forests in the area, so we've been able to test the application in places where the GPS receiver can't acquire satellites easily.

"We're revising our application on a three-week cycle with feedback from the trial. We listen to the issues that the drivers find from using the application and design solutions to them very fast thanks to the rapid application changes that can be made using Visual Studio .NET and the .NET Compact Framework.

"We have not yet planned roll-out to other stores until we have perfected the application, and we have a clearer view of the costs of rollout. However with .NET Compact Framework development we will be able to reach these answers much more quickly because of its accelerated development nature. ■

For more information about Tesco.com's products and services, visit the web site at: <http://www.tesco.com/>

.NET live

# Financial Services

## Deutsche Bank Manages Global Graduate Recruitment Online with the Help of .NET

*Deutsche Bank is using an online recruitment and management system to recruit more than 1,000 full time and intern graduates and MBAs every year. Recruiters in the UK, Europe, USA and Asia are sifting through applications from more than 80,000 students worldwide, booking interviews and recording feedback and results 24x7. This is of strategic importance as more than 50 per cent of employees working for Deutsche Bank are not based in Germany and work across several time zones. The system – Konetic™ – was designed by Kprime, a leading UK IT provider, and is based on the Microsoft .NET Framework, Microsoft Visual Studio.NET and XML Web Services. The system connects businesses, customers, systems and services.*

### BACKGROUND

With assets of almost 1tn euros and over 97,000 employees, Deutsche Bank offers financial services in over 70 countries. It ranks among the leaders in asset management, capital markets, corporate finance, custody, cash management and private banking.

The bank is organised in two customer-oriented groups – Corporate and Investment Bank (CIB) plus Private Clients and Asset Management (PCAM). Key to the bank's success is its commitment to customer service, products, innovation and technology.

As a knowledge-based business, finding and recruiting the best talent from universities and business schools is of strategic importance. Approximately 100 company recruiters worldwide manage this process, supported by line managers actively involved in the selection process. Applicants can apply for a large number of vacancies across different



### Overview

#### Customer Profile

Deutsche Bank is a global investment bank and ranks among the leaders in asset management, capital markets, corporate finance, custody, cash management and private banking.

#### Business Challenge

In today's marketplace, organisations may be recruiting fewer graduates but receiving more applications. They need a tool to attract and identify key candidates effectively and cost-efficiently.

#### Solution

Deutsche Bank is using an online recruitment and management system to recruit more than 1,000 full time and intern graduates and MBAs every year. The solution is based on the Microsoft .NET Framework, Microsoft Visual Studio.NET and XML Web services. This enables developers to create applications from new and existing code, regardless of platform, programming language or object model.



business units and multiple regional offices, so recruiters need to share information on candidates globally and track over 80,000 different applications. Dr Paul Worthy, CEO of Kprime Ltd, says: "In today's marketplace, organisations may be recruiting fewer graduates but receiving more applications. They need a tool to attract and identify key candidates effectively and cost-efficiently."

### SOLUTION

Kprime is a forward-thinking, UK-based software company that demonstrates leadership through its engineers and managers, many of whom have MScs and PhDs. The company designed, built and delivered Konetic, a Human Capital Management (HCM) system using the Microsoft .NET Framework, Microsoft Visual Studio, Microsoft Windows 2000, Microsoft SQL Server, XML and Web Services.

Worthy says: "IT managers are free to allocate human resources as they think fit because developers can use the languages they are most familiar with. The Microsoft .NET environment allows developers to use different languages at different places in the platform. We used C# in the middle layer and ASP.NET in the front layer, for example, but there are 25 languages supported."

The Microsoft .NET Framework helps developers to build web-based applications, smart client applications and XML Web Services applications over a network using standard protocols such as SOAP and HTTP. It offers standards-based interoperability, modular and reusable code and multi-language connections. All recruitment information is stored in the Microsoft SQL Server database. The Konetic™ system enables recruiters to access, view and analyse over 100,000 applications in a familiar In-box view from a web browser.

Kprime used the Microsoft .NET Framework, Microsoft Visual Studio.NET and XML Web Services to develop its own tool, Konetic, which enables recruiters to sift through applications from more than 80,000 students worldwide, book interviews and record feedback and outcome.

Adam Wright, Account & Project Manager for Deutsche Bank at Kprime, says: "Prior to Microsoft .NET, we would have created the application using standard web forms which would have had to query the server before returning an answer. It would have been very slow and cumbersome. But the Web Services-based application dynamically updates pages in real time, which is vital to recruiters searching for the candidates' interview results."

***"Microsoft Visual Studio and .NET give us a fast but robust development environment and real commercial advantage. We can deliver solutions tailored to our customers' exact requirements at a fraction of the cost of previous technologies."***

**DR PAUL WORTHY**  
CEO,  
KPRIME LTD

Recruiters can search more than 100,000 concurrent applications to find key candidates and arrange interview dates. During the campus recruitment project, they scheduled more than 1,300 candidate interviews in multiple locations. This was of strategic importance to Deutsche Bank as 50 per cent of its employees work in subsidiaries outside Germany.

The system offers rich, interactive user interfaces with a familiar look-and-feel. Worthy says: "The Microsoft Framework enabled us to develop a system that looks like a desktop application. This is vital for people using it for eight or nine hours a day. The solution took just nine weeks from signing the deal to launching the system in five regions. This speed of development offers a huge commercial advantage to companies wanting to get to market fast."

Jeremy Holland, Head of Development, led Kprime's implementation for Deutsche Bank. The Microsoft .NET Framework and Microsoft Visual Studio.NET development environment impressed him.

He says: "The .NET Framework was invaluable in helping us to complete a significant implementation on time and to budget. The robustness of the platform, complemented by the rich depth of available functions, meant that the timeframe between design and release was reduced enormously. Visual Studio .NET enabled us to rapidly develop bespoke toolsets for speeding up the development process."

Worthy agrees: "Visual Studio and .NET gives us a fast but robust development environment and real commercial advantage. We can deliver solutions tailored to our customers' exact requirements at a fraction of the cost of previous technologies."

The solution has the openness and flexibility to develop multi-language versions. Worthy says: "We already offered candidates the opportunity to ask questions and receive answers in Japanese, although the system does not have full Japanese language functionality yet."

Since developing the solution for Deutsche Bank, Kprime has been invited to customise and implement it at a large international law firm. The system can be deployed in-house or as a remotely managed solution in any market sector.

## **BENEFITS – SCALABLE ARCHITECTURE**

Recruiters in nine countries routinely handle more than 80,000 applications from candidates all over the world, 24x7, but the system has the flexibility to cope with surges in demand during recruitment campaigns.

## **Benefits**

- Web pages with interview results are updated in real time
- Rapid design, test and build of code through reusable objects
- Handles more than 80,000 applications from candidates in nine countries, 24x7
- Scaleable, open architecture with the flexibility to cope in surges of 100,000 applications and more during recruitment campaigns
- Concurrent access by over 250 line managers, recruiters and potential hires

## **Products and Services**

- Microsoft Windows® 2000 Server
- Microsoft SQL Server™ 2000
- Microsoft .NET Framework
- Microsoft®
- Visual Studio.NET
- XML Web Services
- SOAP
- HTTP

## **Partner**

Kprime

For more information about Kprime Ltd products and services, visit the web site at: <http://www.kprime.com>



Deutsche Bank



Wright says: "Konetic has demonstrated that it has the flexibility to cope with large volumes of applications from diverse sets of candidates. But each individual applicant has a tailored and personalised application console to provide them with a very rich experience during the recruitment process."

#### **OPTIMISED AND AUTO-GENERATED CODE**

Worthy says: "We worked rapidly because of the pre-built libraries of code available within the Microsoft .NET Framework. The code covers 80 per cent of commonly used coding requests and code can be reused in an application or new service."

#### **EASE OF DEVELOPMENT, DEPLOYMENT AND MAINTENANCE**

Wright says: "Visual Studio.NET is a true development environment. The server environment (Microsoft Windows 2000 and Microsoft SQL Server) were linked by the common language runtime. This allows us to use different languages at different places in the platform."

Worthy agrees: "The key strength of Microsoft Visual .NET is that developers can use any of the 25 languages supported. This means they can use the tools they are most comfortable with rather than being shoe-horned into having to learn new languages at speed." ■



## London Stock Exchange selects .NET Framework for New Data Delivery System

*The London Stock Exchange plc (the 'Exchange') is Europe's largest exchange and operates the world's biggest market for listing and trading international securities. It wanted to invest in a new market information and data access services system to deliver better and richer real-time price and value-added information to the market. The Exchange is a leader in financial technology but adopts a considered approach to investment projects because it needs total reliability in its data distribution. In seeking a partnership with world class companies, the Exchange turned to Accenture for delivery capability and chose technology based on the Microsoft .NET Framework 1.1 and Windows Server 2003. This enabled the solution to be implemented in between one-fifth and one-third of the time expected for other development environments.*

### BACKGROUND

The Exchange was established 220 years ago and is the largest equity exchange in Europe by market capitalisation of the companies listed on its markets. It is also the most international exchange in the world, with more than 450 companies admitted from over 60 countries. The Exchange has an unrivalled reputation for its highly liquid markets, and as a pioneer in using financial technology.

Now a publicly quoted company, the Exchange provides a place to trade and supplies information to market data consumers on nearly 100,000 screens worldwide. It promotes the globalisation of capital markets through technology links and partnerships, thus creating value for its shareholders. A key objective in implementing this strategy is to extend the Exchange's service offering by broadening and deepening its



### Overview

#### Customer Profile

The London Stock Exchange is the largest in Europe and a technology leader throughout the world.

#### Business Challenge

The distribution and sale of real-time price and value-added information is a major source of revenue for the Exchange. It needed a flexible platform for data distribution that was scalable for new products and services.

#### Solution

The Exchange chose to work with Accenture and Microsoft to implement a new solution for data distribution based around the Microsoft .NET Framework on Microsoft Windows Server 2003.



product range. The Exchange has an enviable record for reliability – its trading systems are at least as resilient as any other system used by major equities exchanges around the world. To deliver new real-time price and value-added information to market systems and consumers, the Exchange decided to enter a partnership with a best-of-breed technology provider and a global management and technology consulting firm.

## SOLUTION

The Exchange created a partnership with Accenture and Microsoft for its new market information and data access system. This is based on an application developed with the Microsoft .NET Framework 1.1 and hosted on Microsoft Windows Server 2003. It is designed to deliver value-added products from existing trading services within the internal infrastructure of the Exchange. The solution also draws on a newly created corporate data warehouse. This is a central data repository that gives customers access to a wide range of current and historical data going back 30 years. The system consumes raw trading data and publishes it in real-time.

This application has the following characteristics:

- Built on the Microsoft .NET Framework 1.1 using Microsoft Visual C# programming language and Microsoft Visual Studio .NET 2003
- Uses XML Web Services for data distribution
- Windows Server 2003 operating system integrated with ASP.NET
- Intel Itanium 2 and Xeon powered servers
- Fully resilient hardware platform

The core of the solution is two four-node Windows Server 2003 clusters. Should a node fail, Microsoft Cluster Services will automatically failover the resource group to a different node. There is a Microsoft SQL Server 2000 operational data store configured as an Active-Passive cluster connected to a storage array and other Windows Servers acting as domain controllers and web servers.

The Exchange wanted not only a scalable solution, but also a high performance application with messages delivered in order, with consistency and with sub-second timing to its many customers. It also needed a development environment that simplified application development and enabled developers to leverage their existing skill sets. To ensure present and future scalability, the system uses parallel scaling over multiple CPUs per server, and multiple servers with Microsoft Clustering between servers.

***“Working with industry leaders such as Accenture and Microsoft cut the learning curve for us to a bare minimum.”***

**IAN HOMAN  
HEAD OF TECHNOLOGY  
LONDON STOCK  
EXCHANGE**



"We really believe in pushing the boundaries of technology but we were not prepared to take chances with resilience," says Ian Homan the Exchange's Head of Technology. "Working with industry leaders such as Accenture and Microsoft cut the learning curve for us to a bare minimum. Our applications are mission critical and Microsoft provides very good development tools. Reliability is everything and so far it's been first class. The new system will keep on running year after year."

Homan says that Microsoft provided the right tools for this particular application. "By using C# and the Microsoft .NET Framework 1.1 we were able to focus on writing the business application and constructing the business logic. These Microsoft tools are first class and extremely productive," he explains.

## **BENEFIT – THE VALUE OF PARTNERSHIP**

Distributing real-time, value-added market information already provides a significant proportion of the Exchange's £220 million annual revenue. The new system implemented by Accenture and Microsoft will give the Exchange a platform to achieve its objective of "increasing substantially that annual revenue within five years," says David Lester, the Exchange's CIO. "The whole ecosystem of partnership around this project worked very well and we are extremely proud of the relationship between us. We are pioneers in the use of technology and always have to be at the leading edge of development."

His view is shared by John Erik Ellingsen, Engagement Partner for the Exchange at Accenture. "The Exchange is being bold in harnessing the potential of technology – they are pushing the envelope" he says. "This innovative project, which involved a close working relationship between the Exchange, Accenture and Microsoft, enables the Exchange to deliver business value more rapidly."

## **REDUCED DEVELOPMENT COSTS**

The lower total cost of ownership of the system and the reduced development costs were key factors driving the Exchange to the solution. "A major benefit of this solution is that it's based on a Microsoft platform," says Ellingsen. "We have seen a significant increase in development productivity through the use of Visual Studio .NET 2003, with an impressive reduction of time to market."

Homan estimates that the solution has been implemented in between

## **Benefits**

- The platform is predicted to increase substantially the Exchange's annual revenue from sale of price and value-added information within five years.
- The implementation meets the Exchange's high standards for reliability, with optimum resilience for applications, operating systems and hardware.
- Performance has reached 2,000 transactions a second, at a far lower cost than other applications.
- Development costs were lower due to the latest developer tools from Microsoft.
- The solution has given the Exchange scope for future product growth.

## **Products and Services**

- Microsoft Windows Server® 2003
- Microsoft SQL Server™ 2000
- Microsoft Visual Studio® .NET 2003
- Microsoft .NET Framework 1.1

## **Partner**

Accenture

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one-fifth and one-third of the time that otherwise would have been expected. "Our team greatly enjoyed working with leading-edge software project development tools from Microsoft," says Callum Licence, Project Leader at Accenture. "They like to have the latest equipment, especially when, as in this project, failure is absolutely not an option."

#### PERFORMANCE GUARANTEED

The value of the information distributed by the Exchange is at its highest if it reaches subscribers within the first second. Revenues grow as historical data and analysis come into play. "We were looking for 3,000 transactions per second on SQL Server 2000," says Homan. "Other applications could go that far, but the cost was much greater."

#### SCALABILITY DELIVERED

The Microsoft solution has given the Exchange scope for future growth. "We want to be able to extend it and make it richer," says Lester. "Investment decisions of this kind aren't made carelessly and the ability to scale to our future needs was a critical factor. All our projects are subject to very stringent tests, but the value added by the Microsoft platform was compelling and very clear in this case."

#### RELIABILITY REQUIRED

Traders rely on more than simple price information to trade on the Exchange. When vital information stops flowing markets become ineffective. This issue of reliability is just one reason why Microsoft technology was used in this case.

David Lester says: "The support we have had from Microsoft has been absolutely first class. Traders are now operating 24 hours a day, seven days a week and banks are deploying more technology. We will match this development by always using best-of-breed systems."

The Exchange is renowned for high standards in the dealing, regulation and supervision of its markets. It only works with world-class partners to preserve its reputation and fulfil its mission. The success of its new market information and data access services system has been ensured through its partnership with Accenture and Microsoft. ■

For more information about London Stock Exchange products and services, visit the Web site at: <http://www.londonstockexchange.com/>

*"The support we have had from Microsoft has been absolutely first class."*

DAVID LESTER  
CIO  
LONDON STOCK  
EXCHANGE

## Riskclick Helps Insurers Build New Bridges and Improve Collaboration with the .NET Framework

*The commercial insurance industry depends on complex business processes-shared among many different partners. While standards bodies, hub-based transaction platforms and other solutions have driven some efficiency in the industry, complexity and the need to stay in control of corporate data have delayed meaningful progress. To improve the efficiency of collaboration between business partners, Riskclick has developed a new, Web Services-based solution built on Microsoft Windows Server 2003 and the Microsoft .NET Framework.*

### BACKGROUND

In recent years, insurance and risk management companies have made substantial investments in collaboration solutions. From messaging technologies to workflow, document, data and team management, these have largely failed to deliver meaningful collaboration with business partners. This is because the insurance industry is characterised by complexity. Not only do transactions between partners involve complex, unique negotiations. They are also conducted in a market that is not controlled by a few dominant players. Whereas the automotive giants can dominate the supply chain and impose their own working practices in their vertical, collaboration in the insurance industry requires greater compromise on all sides.

In addition, the number of participants in commercial insurance business processes often makes collaboration problematic. From clients and brokers to numerous insurers, re-insurers and valuation companies, even simple claims and settlements can involve dozens of organisations. These complexities have prevented any coherent approach to collaboration in the industry. Instead, bespoke document management and electronic data interchange (EDI) solutions have created islands of incompatible technology.

**riskCLICK**

### Overview

#### Customer Profile

Riskclick enables firms in commercial insurance to achieve the efficiency and connectivity benefits of Web Services. The company is able to customise its software platform rapidly to integrate the specific business processes of any customer or community.

#### Business Situation

Riskclick wanted to develop a solution to promote cross-enterprise collaboration in the insurance and reinsurance industry, streamlining shared business processes such as placements, claims and settlements.

#### Solution

Riskclick extended its ASP services to a federated infrastructure facilitated by Web Services interfaces.



***"We conducted a return on investment (ROI) analysis of our work for Dutch Insurance Bourse. The results show that the time taken to conduct transactions has been reduced by between 35 and 65 per cent. In addition, settlements that were taking as long as three months are now being completed in just four weeks."***

**ANTHONY SIGGERS  
CHIEF TECHNOLOGY  
OFFICER RISKCLICK**

Some quarters of the insurance industry have engaged in projects to further the cause of effective collaboration. The Worldwide Insurance Network was created by the (then) six largest global insurance brokers that held 70 per cent of the total market. But even this initiative failed because EDI, its chosen technology, was not flexible enough to deal with convoluted business processes and the transfer of unstructured insurance documents.

Since the Worldwide Insurance Network was created, organisations such as ACORD have championed the cause of collaborative standards in the insurance industry. To date, their successes have been significant in defining XML standards but limited in promoting commercial adoption.

Understanding the particular challenges of the commercial insurance business, Riskclick wanted to develop a solution to promote cross-enterprise collaboration. In doing so, it wanted to streamline shared business processes such as placements, claims and settlements, making brokers, insurers and reinsurers much more productive and efficient, thereby improving service levels received by risk managers. The company also wanted to help the insurance community track and search electronic documents effectively, making it fast and simple to reference disputed claims files, placement transactions and other critical legal documents.

To achieve this, Riskclick originally implemented an online collaborative platform based on an ASP model focused on meeting the needs of middle market retail brokers. Here, brokers, their insurers, TPAs and clients could come together online to exchange structured and unstructured documents and negotiate placements and claims settlements.

While many middle tier players were happy to outsource their IT infrastructure in this way, Riskclick realised that larger organisations had already invested heavily in IT systems and wanted to maximise the value of their investments.

Anthony Siggers, Chief Technology Officer at Riskclick, says: "We wanted to build a solution to improve connectivity between the disparate systems of business partners without asking them to outsource their IT functions. By opting for this 'federated' architecture approach, we could help organisations retain control over their data and get the best from their technology investments."

Riskclick also wanted a solution to enable the integration of email systems, databases and document management solutions with no need for large scale upgrades to existing systems. This needed to be flexible enough to handle the most complicated and unstructured business processes.

## SOLUTION

Riskclick extended its ASP-based collaborative solution towards enterprise systems with collaborative connections based on Web Services. One of the primary advantages of the XML Web Services architecture is that it allows programs written in different languages, and on different platforms, to communicate with each other in a standards-based way. This technology means Riskclick clients can exchange documents, emails and data in a cross-enterprise collaborative manner – while creating an audit trail to track the progress of processes such as claims and negotiations.

Riskclick created its first collaborative solution using the .NET Framework on Windows 2000, giving it extensive experience of working with Microsoft technologies. This enabled the company to create its new, Web Services-based solution rapidly using Microsoft Windows Server 2003, which includes the Microsoft .NET Framework development environment as a native component. The company also used the Global XML Web Services Architecture (GXA) developed jointly by Microsoft, IBM and VeriSign. This is a protocol framework designed to provide a consistent model for building enterprise-quality Web Services and applications. GXA provides critical services such as security, reliability and a common, tried and tested approach to integrating business processes in the most effective way possible.

Using Windows Server 2003, the .NET Framework and GXA, Riskclick rolled out its new Web Services-based architecture. Immediately, the company began a pilot project for the Dutch Insurance Bourse, traditionally a physical marketplace split over two trading floors in Amsterdam and Rotterdam. The pilot was a success and the Dutch industry is now moving every participant in this coinsurance market to a more effective way of working together using a .NET solution configured by Riskclick.

Siggers explains: "The first step of the pilot for this project was to map the typical business interactions between different types of insurance players. Then, we could integrate the working practices of 117 major insurance companies and brokers." The primary result of this pilot was to increase the efficiency of cross-company communications, such as: claims notifications; negotiations between brokers, lead insurers and followers; interventions and filing of reports by loss adjusters and surveyors; issuing of settlement notices.

In addition to streamlining these processes, the new solution also creates a shared, cross-enterprise audit trail, improving the certainty of coinsurance transactions in the market. This ensures not only that there can be no doubt for all parties as to the status of a given transaction, but also that all

## Benefits

- Greater collaboration between business partners
- Enterprise-class Web Services deployed rapidly
- Legal compliance for insurers
- Unprecedented operational efficiency
- Significant transaction time savings
- Lower total cost of ownership (TCO)

## Technology

- Microsoft® Windows® Server 2003
- Microsoft .NET Framework
- Microsoft Active Directory

## Partner

Accenture



***"We conducted a return on investment (ROI) analysis of our work for Dutch Insurance Bourse. The results show that the time taken to conduct transactions has been reduced by between 35 and 65 per cent. In addition, settlements that were taking as long as three months are now being completed in just four weeks."***

**ANTHONY SIGGERS  
CHIEF TECHNOLOGY  
OFFICER RISKCLICK**

documentation can be traced and recovered quickly and easily in line with industry legislation.

Furthermore, the Riskclick solution improves data flow, providing all organisations associated with the market access to the same structured and unstructured data which is streamed seamlessly to each market participants using Web Services. The .NET Framework and its native support for Web Services lies behind the successful integration and increased efficiency provided by the Riskclick solution. Previously, for example, claims information was input by each participant into their own systems, causing immense duplication of effort. Now, information can be entered into one system and uploaded to any business partner's database using a Riskclick Web Service.

#### **BENEFITS – RAPID DEPLOYMENT OF ENTERPRISE-READY WEB SERVICES**

The .NET Framework is a highly efficient environment for the creation and deployment of Web Services. The development team at Riskclick found that commercial grade Web Services could be implemented with very little original coding. Web Services are described using the Web Services description language (WSDL), which identifies the functions of services and enables businesses to access them electronically. The language descriptions are automatically generated using the built-in features of the .NET Framework.

Once a Web Service has been identified by the .NET Framework, a simple object access protocol (SOAP) envelope is created automatically to make data or application functionality available across company boundaries.

Siggers says: "When developing Web Services, the Microsoft Windows 2003 Server platform and the .NET framework is the best. Using it, we have been able to establish guaranteed transactions over the Web and across company boundaries with just one line of code. The result is rapid, secure deployment of Web Services that makes collaboration between business partners simple."

#### **MEETING CHALLENGING LEGAL REQUIREMENTS**

The advent of email has compromised insurers' ability to keep accurate records. As a result, clients can have no certainty that brokers or insurers can reconstruct an audit trail relating to any given transaction. Meanwhile, the London Insurance Market and Financial Services Authority is implementing new legislation to ensure the accurate keeping of insurance records. Under the new rules, authentication, accountability, permissions, approval and compliance must all be tightly controlled and monitored by audit trails.

"These disciplines have to be applied to the communications tools that people are already using, notably email," says Siggers. "The .NET Framework enables us to use Web Services that collect data from disparate systems to enforce a non-repudiable cross-enterprise audit trail and manage complex multi-party interaction. Because they are modular, additional functionality can be added quickly and easily when the scope of legislation for record keeping in the commercial insurance industry is extended."

## **BUILDING BRIDGES**

The use of Web Services has major benefits for collaborating partners. Previous solutions based on the hub model required modifications to companies' IT infrastructures or even full outsourcing. By contrast, Web Services enable connectivity between disparate systems with no need for upgrades or modifications. Siggers says: "Web Services translate information into a universal standard that can be received by any other Web Service-enabled system. For large companies that have invested millions in their internal IT resources, this is a critical benefit."

With collaborative platforms, key company data often has to be held in a third-party environment. Now, the new Web Services-based solution enables companies to maintain control over their own data. Riskclick has also used the globally recognised GXA standards for security, routing and transaction management, giving participating organisations peace of mind that their corporate information will remain secure.

In addition, the performance and reliability of the solution ensures the best possible service to collaborating organisations. "Since the deployment of Windows Server 2003, there has been a threefold improvement in the performance of our solution on the same hardware infrastructure," says Siggers. "We have also experienced 100 per cent uptime."

## **UNPRECEDENTED EFFICIENCY**

Siggers says: "We conducted a return on investment (ROI) analysis of our work for Dutch Insurance Bourse. The results show that the time taken to conduct transactions has been reduced by between 35 and 65 per cent depending on the process and the actor. In addition, settlements that were taking as long as three months are now being completed in just four weeks.

"This kind of efficiency positions us to revolutionise collaborative working in this challenging industry. And Web Services deployed using the .NET Framework are at the heart of this success." ■

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The Accenture logo, featuring the word "accenture" in a lowercase, sans-serif font, with a stylized "a" that incorporates a small upward-pointing arrow.

.NET live

Industry



## Web Entrepreneurs Boost Customer Satisfaction, Cut TCO 50 Per Cent by Migrating to Windows 2000 Server

*AtomIC Systems IP Ltd hosts a rapidly growing number of subscription-based web sites. But its servers, previously based on Java and Linux, offered sluggish performance and frequent crashes – a potential death sentence for an Internet-based business. Though the company founders were long-time Java and Linux fans, they looked into Microsoft Windows 2000 Server and the Microsoft .NET Framework and liked what they saw. With its migration to Windows 2000 Server well underway, AtomIC anticipates availability of 99.9 per cent, and customers report that downloads are now so fast that they leave their modems “smoking”. AtomIC also praises the richer functionality, manageability and easy upgrade path that the company gets with Windows – which add up to a 50 per cent cut in total cost of ownership.*

### BACKGROUND

When Steve M. Brown and Matthew J. Peddlesden became computer programmers and administrators 15 years ago, they never imagined that they would end up as principals of a burgeoning British empire of web sites called AtomIC Systems IP Ltd.

AtomIC hosts a variety of special-interest sites for Webloggers, fiction writers, Microsoft Train Simulator fans and motorcycle enthusiasts. The company also provides online forums, mail hosting, and web hosting for special-interest sites created by its users. While many online-based businesses went belly up after advertising revenues dropped off in 2000, AtomIC went on to develop a successful revenue model based on premium user subscriptions. AtomIC now sees millions of page requests and tens of millions of hits each month.



### Overview

#### Customer Profile

AtomIC Systems IP Ltd runs special-interest sites for Webloggers, fiction writers, Microsoft(r) Train Simulator fans, and motorcycle enthusiasts. The company also provides online forums, mail hosting, and Web hosting for special-interest sites created by its users.

#### Business Challenge

AtomIC's servers, previously based on Java and Linux, offered sluggish performance and frequent crashes – a potential death sentence for an Internet-based business.

#### Solution

The company is migrating to a platform based on Microsoft Windows(r) 2000 Server and the Microsoft .NET Framework. With Microsoft Terminal Services, part of Windows 2000 Server, the company can administer servers thousands of miles away as though they were next door.



***“We had been hard-core Java and Linux advocates for a long time, but we weren’t going to pass up a good opportunity if it had the potential to solve our problems.”***

**STEVE M. BROWN  
DIRECTOR  
ATOMIC SYSTEMS IP LTD**

“Our principles are to promote creativity online and to make the tools for that creativity as accessible as possible to as many people as possible with the minimum outlay on their part,” says Peddlesden, Managing Director of AtomlC.

After entering the computer field, Brown and Peddlesden worked in a variety of positions (including tenures with a leading UK Internet service provider and with British Telecommunications) in which they developed expertise in the Java development language and Linux operating system. So, when the two formed AtomlC Systems IP Ltd in 1999, it was natural that they would take advantage of their strengths and build AtomlC’s web sites on those technologies.

Over the next few years, Brown and Peddlesden found the Java/Linux combination did not provide satisfactory performance. When subscription-based web sites are the basis of one’s business, those web sites had better offer flawless performance and reliability, or customers will go elsewhere. AtomlC was getting availability as low as 96 per cent from its web servers – a number that didn’t please Brown, Peddlesden, or their customers.

“Over the course of a year, we’d have incidents where our Java/Linux servers would go down and take hours to reconfigure and bring back up,” says Brown, Director of AtomlC. “We’re not a large company – we have two production servers and two backup/development servers – so we couldn’t just switch over to other machines. We needed full-time reliability from our software. And we weren’t getting it.”



AtomlC also found unexpected pain – and failure – in attempting to upgrade their Linux servers from Red Hat Linux version 6.2 to Red Hat Linux version 7.2.

“In Linux there are no upgrade wizards as there are in Windows, so the entire process is manual,” says Brown. “After spending a day working on the migration, I discovered that the sendmail function for version 7.2 is radically different than the one for 6.2, which came out less than a year earlier. My carefully crafted configuration wouldn’t work on the new box.

“I looked online for documentation or a solution from a user group, but couldn’t find anything helpful. I downgraded to the earlier sendmail version, but that broke other parts of the upgrade. We reverted back to version 6.2, and I swore we’d never try to upgrade a Linux machine again. We’d been bubbling with discontent over Linux for a long time, and this was the last straw.”

## SOLUTION

Sometime in 2002, Brown acquired the Microsoft Visual Studio .NET development system and, late in the year, began to explore it and the C# development language. He quickly discovered what he calls “a better world” in the Microsoft .NET Framework and the Visual Studio .NET development tools. The Framework is an integral component of Windows that provides a programming model and runtime for Web Services, web applications and smart client applications.

“We had been hard-core Java and Linux advocates for a long time, but we weren’t going to pass up a good opportunity if it had the potential to solve our problems,” says Brown.

Today, AtomlC Systems has migrated one of its two production servers to the Microsoft Windows 2000 Server operating system, has adopted the Windows 2000 Active Directory service and Microsoft Exchange 2000 Server, and is planning to migrate its web applications – currently based on Apache – to Windows 2000 Internet Information Services and ASP.NET.

“Microsoft’s end-to-end solution and superb development tools convinced me we should migrate to Windows and .NET,” says Brown. “Matthew and I have been in the Java and Linux camps for years, but C# is the ultimate language for me. Microsoft had added so much that I like and nothing that I don’t like. The performance, functionality, and cost savings we’re getting from .NET have just blown us away.”

For the migration, AtomlC’s goals were to move the web sites as

## Benefits

- Faster time-to-market enables AtomlC to bring more Web sites to market more quickly, boosting agility.
- Higher performance and reliability boost customer satisfaction.
- Total cost of ownership declines by 50 per cent.

## Products and Services

- Microsoft Windows 2000 Server with Internet Information Services
- Microsoft .NET Framework
- Microsoft Visual Studio .NET
- Microsoft Exchange 2000 Server



quickly as possible to Windows 2000 Server to gain the immediate benefits of Windows-based performance and manageability, and then to take the time they needed to migrate their application code from Perl and PHP to the Microsoft .NET Framework. To implement the migration, Brown and Peddlesden brought in an additional Windows 2000-based server, moved the Apache Web sites to it, and eliminated a Linux production server.

The mixed environment interoperates through the use of third-party software, and Atomik plans to use Microsoft Services for UNIX until it is ready to migrate its remaining server to Windows. In the second stage of the migration, the team is using Visual Studio .NET and C# to create new versions of the web sites.

Atomik's two production servers aren't based in the United Kingdom with the company's principals but instead are located at a US-based Internet service provider where the company gets more bandwidth at less cost than it could find closer to home. In the past, Brown and Peddlesden had regarded Linux as faster and easier to administer remotely than the virtual private network (VPN) and remote administration solutions available for Windows. Then they discovered Terminal Services in Windows 2000 Server.

"We found that Terminal Services gives us all the speed and convenience we need to administer our production servers remotely," says Peddlesden. "We administer the servers as though they were next door. And in Administrator Mode, both of us can use Terminal Services and log into the servers without having to buy any extra licenses – they're included in Windows 2000 Server."

***"Bottom line:  
Windows and .NET  
provide us with  
greater agility,  
making them  
better choices for  
our business."***

**MATTHEW J.  
PEDDLESDEN  
MANAGING DIRECTOR  
ATOMIC SYSTEMS IP LTD**

#### **BENEFITS – INCREASED AGILITY AND CUSTOMER SATISFACTION**

"We're in the business of creating and maintaining web sites that will attract and keep premium users as subscribers," says Peddlesden. "We can do that faster, easier, and more cost effectively with Windows 2000 Server and .NET than we can with Linux. Bottom line: Windows and .NET provide us with greater agility, making them better choices for our business."

For example, Brown points to the ability to use style sheets and have advanced features optimised for the particular browser that the subscriber is using to view web pages – something that Atomik didn't provide on Linux because it would have required extensive manual testing that the company did not have time to do.

"We can create web sites for the 21st century because Microsoft has done the testing for us to ensure that functionality is optimised for each browser," says Brown. "We're freed up to add our value to the Web site – not worry about the plumbing, as we did with Linux. Also, the resulting .NET code will be of higher quality when it leaves the compiler. Problems with PHP code crashing because of insufficient error checking will be a thing of the past. That will boost customer satisfaction – and our satisfaction. And because our applications will require fewer lines of code, we'll be able to create new web sites and applications more quickly, making us more agile in responding to our customers."

#### **RICHER FUNCTIONALITY, GREATER RELIABILITY, FASTER PERFORMANCE**

Brown points to new features and capabilities that AtomIC now can use thanks to its move to Windows 2000 Server, such as the Internet Connection Firewall to help improve security. Windows 2000 Server also ensures scalability to support growth. "Windows scalability just works; we know the software will continue to support us as we add sites and users," says Brown. "Linux scalability requires you to write everything yourself and hope for the best."

In addition, he praises the jumps in both availability and performance that have come with the move to Windows. "We expect our availability to be 99.9 per cent, ensuring that our subscribers have unimpeded access to our web sites," says Brown. "And even before we've rewritten our applications to take advantage of .NET, just moving from Linux to Windows has boosted responsiveness of our servers so much that customers are telling us their modems are 'smoking.' One customer told us he's getting the fastest download performance he sees from any web site. Our Windows 2000-based servers are delivering this faster performance while handling a heavier load than we had on the Linux servers."

#### **TCO CUT BY 50 PER CENT**

In addition to the richer and more comprehensive infrastructure and better performance, Brown and Peddlesden praise Windows 2000 Server and the Microsoft .NET Framework for doubling their productivity and reducing total cost of ownership (TCO) by an estimated 50 per cent – an especially important benefit given AtomIC's modestly sized staff of four.

"Moving from Linux to Windows, I sometimes feel as though we have another 10 employees in the company," says Peddlesden. "That's how much



***“Moving from Linux to Windows, I sometimes feel as though we have another 10 employees in the company. That’s how much extra time and productivity we have, thanks to the functions that Windows handles automatically that we had to manage manually with Linux.”***

**MATTHEW J.  
PEDDLESSEN  
MANAGING DIRECTOR  
ATOMIC SYSTEMS IP LTD**

extra time and productivity we have, thanks to the functions that Windows handles automatically that we had to manage manually with Linux.”

Some of that savings comes from the superior functionality – such as error checking – in Visual Studio .NET. Some comes from the broad and immediate availability of documentation and resources for Windows 2000 Server and the Framework, including the MSDN developer program, Knowledge Base, and user groups staffed by Microsoft experts. In contrast, Brown and Peddlesden complain about their frequent inability to find needed Linux documentation on the web. Performance on the Linux servers was so bad that at one point AtomIc gave two-week rebates to subscribers, a cost it doesn’t expect to repeat under Windows. Other savings come from the predictable product upgrade path for Windows, which enables AtomIc to upgrade its Windows platform without the incompatibility issues that plagued its Linux servers.

“Microsoft has put great effort and thought into the entire life cycle of the server,” says Brown. “We know we can make changes to the Windows-based servers without risk. There are wizards and graphical interfaces to guide us through upgrades, and we can easily roll back if we wish. Even if we make a mistake, it doesn’t affect anything else on the machine. Life-cycle costs on Linux are much higher because upgrades require considerable manual labour, often don’t work, or break other parts of the system.”

Brown’s key advice for others weighing the costs of Windows 2000 Server versus Linux is to look at TCO, not at initial price. “Look at the long term, and Windows 2000 Server is much less expensive than Linux,” he says. “A Linux server has a lower initial price because of the Open Source software, but that differential is equal to about 10 to 15 hours of the average IT administrator’s salary. I guarantee that anyone running Linux will eat up those 15 hours very quickly, given the extra administrative burden of Linux. And then the prices of Linux and Windows are the same – except that Linux will continue to cost more to administer than Windows, while delivering less.”

There’s yet another pair of reasons for moving from Linux to Windows, according to Peddlesden. “Since we made the switch from Linux to Windows, we sleep much better at night and we have a lot more fun during the day,” he says. ■

For more information about AtomIc services, visit the Web site at:

<http://www.atomic-systems.com/>

## Construction Contractors Improve Efficiency With .NET-Based Mobile Solution

*M J Gleeson needed an on-site work-efficiency assessment tool to help the company gain real-time awareness of the productivity of its contractors and other resources. The construction contractor has successfully completed a preliminary field trial of COMPASS-IP. This solution, based on the Microsoft .NET Compact Framework, was built especially for the construction industry and is helping Gleeson measure work activity against industry norms to identify sources of waste and respond swiftly to inefficiencies.*

### BACKGROUND

M J Gleeson is one of the UK's major general building and engineering contractors and the leading contractor in the UK water industry. It has long-term partnering contracts with most of the country's water authorities. The contractor is always at the forefront of new initiatives in the construction and property industries, such as those relating to partnering and quality. It was recently included in the FTSE's socially responsible investment index series, FTSE4Good, for its commitment to corporate responsibility. In *The Sunday Times* 100 Best Companies to Work For list, Gleeson was ranked number one employer in the construction industry.

Gleeson's work for water authorities includes designing, constructing and commissioning multi-million pound water and waste water treatment works, pumping stations and service reservoirs. In late 2002, Gleeson was contracted by the Caldervale Waste Water Treatment Works (WWTW) – a division of Yorkshire Water Authority – to carry out essential refurbishment work on one of the Works' digesters.

As a leader in its field, Gleeson is always looking for new ways to increase productivity and improve the efficiency of its workforce and



### Overview

#### Customer Profile

M J Gleeson is one of the UK's leading building contractors. It has worked for most of the UK's water companies, having been awarded some 65 contracts with values in excess of £300 million.

#### Business Situation

Gleeson needed a mobile work efficiency assessment tool to deliver greater resource visibility, leading to efficiency enhancements.

#### Solution

Gleeson trialled Information Systems' flagship construction solution, COMPASS-IP. This handheld solution, based on the Microsoft .NET Compact Framework, enabled rapid corrective action wherever under-performance was recorded.

#### Benefits

- Time savings
- Cost savings
- Streamlined supply chain
- Construction site productivity gains of up to 80 per cent
- Improved management



processes. The Caldervale WWTW project was an ideal opportunity for the company's managers to trial a new, on-site work activity assessment tool.

Gleeson wanted to demonstrate to Yorkshire Water Authority that, despite their long-term relationship, it was constantly looking for new ways to become more efficient. The company knew that construction sites can be up to 40 per cent inefficient, and needed a solution that would help managers locate these inefficiencies and reduce them.

### **SOLUTION**

Over a four-month period, Gleeson trialled COMPASS-IP, a handheld solution that has been built specifically for the construction, utility and maintenance sectors by longtime Microsoft Partner, Information Systems Associates. COMPASS-IP is an end-to-end Microsoft .NET solution, built using a beta version of Microsoft's Compact Framework for the .NET environment. It measures and records work activity levels on site on a handheld computer or Pocket PC.

Data, including the number of workers on site, which workers are idle and which are adding value, is inputted easily into standard reports on the device. And since data is captured in real time, errors are kept to a minimum. The site data is then gathered through a Microsoft Visual C# client application and exported securely back to a central Microsoft SQL Server 2000 database, via Microsoft SQL CE2 and Microsoft Active Sync.

COMPASS-IP comes with seven standard reports that can be viewed via the Navigator-based COMPASS-IP Web site. Alternatively, users can easily create customised reports to extract the exact information they need from the database. Reports are exported from the database to the web site using Microsoft ASP.NET. Thus the information stored in the SQL database can be viewed by all relevant parties, and assessed according to industry standards and project key performance indicators (KPIs).

### **BENEFITS – TIME/COST SAVINGS AND PRODUCTIVITY GAINS**

COMPASS-IP gave Gleeson insight into the productivity of its Caldervale labour force, both direct and subcontracted.

The company was able to observe three different work teams on an hourly basis across the trial. It found that the majority of the inefficiencies that emerged were due to employee absence from the workplace – for instance, subcontractors being pulled off site to do other jobs, or simply not turning up to work at all. The company was able to address these issues

***"COMPASS-IP highlighted the inefficiency of specialist subcontractors travelling long distances to the workplace – and it easily quantified the inefficiency."***

**DONNA RADY  
CONSTRUCTION  
MANAGER  
GLEESON**



swiftly, before too much time and money was wasted. At the same time it was able to elicit better productivity levels, without the requirement of any additional outlay. Gleeson has managed to reduce the inefficiencies of its construction sites by up to 80 per cent. The main saving has been labour time, and was possible because managers were able to access accurate reports and swiftly analyse where procedures could be improved.

## SUPPLY CHAIN EFFICIENCY AND IMPROVED VISIBILITY

COMPASS-IP enabled Gleeson's management staff to focus on production times for the whole life cycle of the project in terms of man hours, outputs and production plans. In particular, Donna Rady, Construction Manager, Gleeson, says: "COMPASS-IP highlighted the inefficiency of specialist contractors travelling long distances to the workplace – and it easily quantified the inefficiency." The solution also enabled Gleeson to view cumulative resource graphs, which were monitored throughout the trial. Gleeson found that it was far easier to get to this level of data using COMPASS-IP than by using more complicated planning packages. The degree of visibility afforded by COMPASS-IP meant the construction company could make important changes to its integrated supply chain, delivering a more streamlined, efficient workflow.

## IMPROVED MANAGEMENT REPORTING

The COMPASS-IP site enabled trained Gleeson managers to assess their data against KPIs for the project, and against industry norms. Managers could then swiftly establish work efficiency patterns and identify causes of waste. Crucially, where under-performance was recorded, rapid corrective action could be taken. Due to the extreme reliability of the .NET Framework development environment, the COMPASS-IP application has no uptime issues. It is always available for Gleeson to use on site, in real time.

## SPEED TO MARKET

For Information Systems, the benefit of developing COMPASS-IP on the Microsoft .NET Framework was clear. No other technology would have enabled it to create the new application and get it to market so quickly. Development of COMPASS-IP for the Pocket PC took only four weeks, and one man year, of effort. This was made possible by the use of shared code in the integrated environment of the application's backend database and its web site – previous tools would have doubled or tripled development time. ■

## Products and Services

- Microsoft® SQL Server™
- Microsoft SQL CE 2.0
- Microsoft .NET Compact Framework
- Microsoft ASP.NET
- Microsoft Active Sync

## Partner

Information Systems  
Associates

For more information on  
Information Systems Associates,  
visit the website at:  
[www.isa.co.uk](http://www.isa.co.uk)





## RebusHR Takes the Flexible Approach to Employee Remuneration with Microsoft .NET

*RebusHR knows that for most businesses, finding and retaining high quality staff can be the difference between market leadership or business failure. It wanted to offer a flexible benefits package, without the restrictions of heavy administration. RebusHR used the Microsoft .NET Framework to develop a flexible benefits application, which opens up numerous possibilities for customers wanting to offer their employees more than just a paycheck.*

***“We expect the flexible benefits application to be particularly popular among dynamic and ‘culture conscious’ companies who pride themselves on providing a flexible and rewarding working environment.”***

KEVIN SHEPHERD  
PRODUCT PLANNING  
MANAGER  
REBUSHR

### BACKGROUND

Established in 1963, RebusHR is a world-class human resource (HR) and payroll solutions provider. It delivers strategic HR, payroll, and employee information services and is dedicated to helping professionals deliver bottom line business benefits to employees.

One way for companies to attract and retain high quality employees is to provide them with a flexible remuneration package, giving them some scope to make their own decisions about its composition. But this flexibility relies heavily on administration.

So while many companies would like to offer their employees more choice in the benefits they receive, they are generally discouraged by the high costs involved.

A satisfied workforce leads to higher morale, greater productivity, and attracts the right employees. RebusHR saw the demand for a software solution that would reduce the administrative burden involved in providing employees with a flexible benefits package.

If the administrative hurdles could be overcome, such flexibility is attractive to RebusHR's clients. Flexible benefits schemes cover a broad range of benefits from traditional items such as company cars, healthcare,

and pension contributions, to items such as leisure club membership, retail vouchers, and even free fruit. An organisation may also wish to provide flexible holiday entitlement, enabling employees to exchange some holiday for other items within the scheme.

Kevin Shepherd, Product Planning Manager, RebusHR, says: "Younger employees may be more inclined to trade in holidays for a higher salary, whereas older employees may consider the level of their pension contributions."

## SOLUTION

Comprehensive research confirmed that there was interest in flexible benefits among RebusHR's core clients and prospects. While searching for a solution RebusHR considered the use of Java and J2EE. David Woodward, Development Director, RebusHR, says: "We recognised that a big learning curve would be required to adopt J2EE and it was not as compatible as we expected."

As a Microsoft Certified Solutions Provider Partner, RebusHR decided that the Microsoft .NET Framework would be ideally suited for development of the solution.

"The broad availability of support and training in Microsoft technologies was important to us," says Woodward. RebusHR also recognised that its customer base already used Microsoft-based technologies, and a move to another technology would have been disruptive. In January 2002, RebusHR began working on the flexible benefits application. By May 2002 a beta version was complete.

The RebusHR flexible benefits application was developed using Microsoft Visual Studio .NET, and programmed in Microsoft Visual C#. It can be configured as a Microsoft Windows or web-based solution, depending on the customer's preference. The application is browser-based and fully customisable from business rules to the user interface, enabling customers to easily configure the solution to meet their unique needs. RebusHR believes the system can cope with the needs of hundreds of thousands of employees.

The application enables employees to run 'what-if' scenarios so that they can experiment with various combinations of benefits choices. This functionality will also be available via mobile devices such as Microsoft Windows Powered Pocket PCs, enabling employees to use the application from home.

## Overview

### Customer Profile

RebusHR is a world-class human resource (HR) and payroll solutions provider. It delivers strategic HR, payroll and employee information services.

### Business Challenge

RebusHR saw the demand for a software solution that would reduce the administrative burden involved in providing employees with a flexible benefits package.

### Solution

Flexible benefits application supported by the Microsoft .NET Framework

### Benefits

- Fast development from the ground up
- Easily tailored to customer needs
- Easy integration with internal and external applications
- Automates processes, reducing costly and time-consuming manual processes
- Increases employee morale and productivity
- Provides a technical foundation for future developments



The solution enables RebusHR customers, their management, staff, and benefit providers to interact. It automates the data flows that occur between the application and participants, reducing the administrative burden that is the primary obstacle for most organisations. Employees can access benefit supplier details, benefit plans, options and coverage, eligibility rules, premiums, and benefit contributions.

#### **BENEFITS – RAPID IMPLEMENTATION**

Building the flexible benefits application on the Microsoft .NET Framework ensured that the vision soon became reality. David Phillimore, Principal Technical Analyst at RebusHR, says: "The depth of knowledge of Microsoft products within the company, and the intuitive design of Visual Studio .NET and other Microsoft Windows .NET tools and technologies meant that development moved very quickly even though we started from scratch."

Microsoft has also implemented the flexible benefits application in-house. Stephen Harvey, Group Director, People, Profit & Culture, Microsoft, says: "We developed the system on technologies that enabled us at Microsoft to determine our own flexible business rules."

*"Comprehensive integration throughout the application means that we do not have to duplicate work."*

**PETER CHAMPION  
PRINCIPAL SOFTWARE  
ENGINEER  
REBUSHR**

#### **FLEXIBLE, EFFICIENT AND EASY TO USE**

RebusHR's customers can easily customise the solution to suit their needs. The entire application is Web browser based, providing full web functionality and a familiar user interface. For employees wanting more information on a particular benefit, the application links directly to benefit providers' web sites, and documents are easy to access online, helping to speed up the selection claims process.

For administrators, the data entry and deployment processes are simplified. XML Web Services provide a consistent foundation for



communication across both internal and external applications. Peter Champion, Principal Software Engineer, RebusHR, says: "Comprehensive integration throughout the application means that we do not have to duplicate work."

## COST SAVINGS

The RebusHR flexible benefits application automates the processes involved in the flexible benefits calendar, reducing costly and time-consuming manual administration.

Harvey says: "Our overall business model is to create systems and tools that are flexible, low maintenance and of added value to our employees. With this .NET solution we will save money on administration and increase the benefits available to our employees."

## INCREASED EMPLOYEE SATISFACTION

The solution enables organisations to offer their employees greater choice in the composition of their salary package. Rather than getting a specified salary and benefits, employees are given a package value and can select their benefits within pre-defined limits. This flexibility leads to higher staff morale and greater productivity. Organisations with a progressive approach towards employment have a greater ability to attract the type of employees they need to run their businesses effectively.

"Employees have total control over the management of their benefits, via a web-based system that they are accustomed to using every day," says Harvey.

RebusHR also has plans to introduce flexible benefits for its own employees using the new application. Shepherd says: "We expect the application to be particularly popular among dynamic and 'culture conscious' companies who pride themselves on delivering a flexible and rewarding working environment."

## FUTURE PROOF

The flexible benefits application was built from the ground up on the Microsoft .NET Framework, which leaves RebusHR well placed to take full advantage of further technological advances with Microsoft .NET technology. "The Windows .NET architecture now in place will provide the technical foundation for other projects that will add value to RebusHR's new and existing customers," says Woodward. ■

## Products and Services

- Microsoft® Windows® 2000
- Microsoft Internet • Information Server 5.0
- Microsoft SQL Server™ 2000
- Microsoft BizTalk® Server 2000
- Microsoft Application Center 2000
- Microsoft Visual Studio® .NET
- Microsoft Visual C#™
- Microsoft Visual Studio® for Applications
- XML Web serviced
- Microsoft .NET Framework

.NET live

**Public Sector**

## Guy's and St Thomas' Web-based Medicines Information Portal is Just What the Doctor Ordered

*London & South East Medicines Information Service, based at Guy's and St Thomas' Hospital NHS Trust, has a new portal making information about drugs, drug reviews and R&D papers available in real time to healthcare professionals in the NHS. The solution enables the Trust to reduce support and maintenance costs and improve efficiency. It complies with the UK Government's e-GIF initiative to ensure interoperability with other NHS sites.*

### BACKGROUND

Guy's and St Thomas' Hospital NHS Trust is one of the largest hospital trusts in the UK with 7,000 staff caring for more than 750,000 patients a year. Geographically, it serves three London boroughs directly and also works with neighbouring NHS trusts, health authorities, local pharmacists, GPs and local primary care groups.

The London & South East Medicines Information Service (MIS) is provided by the Trust to meet the medicines information needs of healthcare professionals in the region, including pharmacists, GPs, doctors, nurses and advisors, in both hospitals and the community.

Dr Shapour Hariri, Director of e-Communications, says: "This centre is one of 12 Medicines Information Centres around the UK. We produce and share information about medicines with healthcare staff in the NHS. Most of this information is published on our web portal."

In 1999, the MIS initiated a project to improve its medicines information service and meet its vision of using technology to promote the safe and effective use of medicines in the NHS. It wanted to provide healthcare professionals with up-to-date and evidence-based information. In phase one, the MIS developed a web site where users could access this



### Overview

#### Customer Profile

Guy's and St Thomas' Hospital NHS Trust is a major acute trust and teaching organisation that is closely involved in disseminating information as well as training tomorrow's doctors, nurses and other healthcare professionals.

#### Business Challenge

The Trust wanted to update the Medicines Information Service's flat HTML information site to use technology to promote the safe and effective use of medicines. It needed more accurate, up-to-date information for healthcare workers, faster, more conveniently, at a lower cost, and within the e-GIF standards.

#### Solution

DrugInfoZone (<http://www.druginfozone.nhs.uk>) is a portal with a dynamic datafeed from other reference sources for drugs and drug alerts. It also allows non-IT staff, such as pharmacists and researchers, to send information to the site. It has a controlled and fast publishing process. And it has the scope to be rolled out to mobile devices.



***“If there are any queries about stories or articles, we can rapidly identify who submitted the information and get back to the original author. The site enables us to share best prescribing practice with doctors, nurses and pharmacists.”***

**DR SHAPOUR HARIRI  
DIRECTOR OF E-  
COMMUNICATIONS  
GUY'S AND ST THOMAS'  
HOSPITAL TRUST**

information, but it was made up of more than 6,000 pages of flat HTML files. This became difficult to manage and maintain, placing a limit on how much content could be uploaded.

The MIS then planned phase two of the project. As a public sector body, it needed to comply with the e-government interoperability framework (e-GIF). The framework, approved by the UK Government, sets the standards for achieving the interoperability of IT systems across the public sector, with a view to achieving joined-up and web-enabled government. This is seen as essential in enabling the NHS to provide better, more reliable services to patients and healthcare workers alike, while making cost savings at the same time.

## **SOLUTION**

The planning for phase two pointed towards Web Services. The MIS already had a web site delivering information. Now it was looking for an improved solution that could provide more accurate information, faster, more conveniently, at a lower cost, and within the e-GIF standards.

The MIS looked to Microsoft Certified Partner Phoenix Database Technologies (Phoenix) to design and implement this solution alongside the MIS's own program management team. Phoenix is one of the UK's leading software development and consulting services companies. With a strong focus on the business issues faced by healthcare clients, and the healthcare sector in general, and a commitment to using the latest Microsoft technologies to address those issues, Phoenix offers leading edge solutions that provide real business benefit.

John Stanford, Business Solutions Director at Phoenix, says: “Our brief was to replace the existing web site to enable non-IT staff, such as pharmacists, doctors and healthcare providers, to submit articles and stories to the site for review by the editorial board. We had to ensure that the system was scalable enough to meet the MIS's vision of a system that could act as a model for a national system in the future.”

In August 2002, Phoenix used the Microsoft .NET Framework to build a bespoke solution to connect information, people, systems and devices. The company chose to use the .NET Framework as it offers built-in functionality, meaning less coding, which ultimately allowed the project team to deliver the solution more quickly and cost effectively. The .NET Framework also offers far greater integration capabilities to enable the MIS to extend the service to other applications and organisations in the future.



Stanford says: "We believe the .NET Framework is the way forward for these types of solutions. It allows our clients to safeguard their investment in existing IT systems as well as developing scalable solutions through new technology. The .NET Framework, XML and Web Services enabled us to comply with e-GIF standards."

In October 2002 the team delivered DrugInfoZone (<http://www.druginfozone.nhs.uk>), a user-friendly portal through which healthcare professionals can access the latest information about medicines and make editorial contributions to the site. Feedback from healthcare professionals has been overwhelmingly positive. DrugInfoZone is seen as a proactive medium communicating all the latest, reliable information at the touch of a button.

#### **BENEFITS – ACCESSING RELIABLE INFORMATION FROM DISPARATE SOURCES**

DrugInfoZone provides an instant and reliable one-stop reference guide for healthcare professionals in the NHS. Hariri says: "We scan about 50 news sources from around the globe every day, and report on stories about medicines. Our aim is to reference all information about medicines and prescribing that will support our users."

#### **SAVES TIME AND MONEY**

Healthcare professionals can be confident in accessing information from a reliable and up-to-date single source. They no longer need to search endlessly on the web for more recent articles, so they save time and money by being empowered to find the right information quickly and safely.

#### **EASY FOR NON-TECHNICAL HEALTHCARE WORKERS TO USE**

The user-friendly interface has been designed specifically with a non-technical user in mind. Staff can submit stories, articles and white papers to the editorial team for review without the help of the IT department. This has resulted in a greater voluntary involvement in information gathering and submission by healthcare workers. It has also reduced the investment the Trust's IT department needs to spend on support and maintenance, and it has streamlined the publishing process so that it is faster to make updates.

Hariri says: "If there are any queries about stories or articles, we can rapidly identify who submitted the information and get back to the original author. The site enables us to share best prescribing practice with doctors, nurses and pharmacists."

#### **Benefits**

- Healthcare workers can access reliable information from disparate sources
- Saves time and money
- User friendly for a non-technical audience and contributors
- Being web-based, there is no limit to the number of users
- Lays the groundwork for the future of e-healthcare

#### **Products and Services**

- Microsoft® Windows® 2000 Server
- Microsoft® SQL Server™ 2000
- Microsoft® .NET Framework
- XML Web Services

#### **Partners**

Phoenix Database Technologies

For more information on Phoenix Database Technologies services, go to:  
<http://www.phoenixdb.co.uk>





### SCALABLE KNOWLEDGE NETWORK

Through the successful implementation of the portal, Guy's and St Thomas' Hospital NHS Trust MIS has raised its profile and improved the efficiency and service standards in the NHS. It is the vision of the MIS that it can play a positive role in promoting the safe and effective use of medicines nationwide through the DrugInfoZone initiative. In future, it is hoped to expand the service to provide content from all Medicine Information Centres across the UK. And as it is a web-based system, there is no limit to the number of users who can access the site.

### INCREASED PROFILE THROUGH AWARD-WINNING WEB SITE

The site has already been placed in the top three in the 'Best Use of IT in Any Healthcare Sector,' in the 2003 Healthcare IT Effectiveness Awards. The awards are held annually by a consortium that includes the British Journal of Healthcare Computing and Information Management, the Department of Health and the British Computer Society Health Informatics Committee and British Telecom.

### THE FUTURE OF WEB SERVICES AND JOINED-UP HEALTHCARE

The scope for the development of this initiative challenges the boundaries of healthcare as they stand today. The use of .NET Web Services means that the DrugInfoZone information has the capability to be delivered on a variety of devices, connecting a variety of systems. A scenario to consider would be that a doctor on the wards could use their mobile device, such as a PDA, to access a patient's electronic records. Using the records they could select a medicine to prescribe, their electronic prescribing system would seamlessly query the DrugInfoZone portal and display the latest information on that medicine, including news articles, evidence and NHS prescribing guidelines. Once the patient is discharged, the local GP could access the patient's electronic health record. All of the relevant information from DrugInfoZone that the hospital doctor used would be available and date stamped.

Through NHS Direct online, the patient could also access their health records and further query DrugInfoZone for information. This vision is what the government is striving towards – joined-up healthcare to deliver better services to citizens, professionals and suppliers through integrated and interoperable solutions. ■

For more information on Guy's and St Thomas' Hospital and NHS Trust, go to:  
<http://www.guysandstthomas.nhs.uk/>

***"We believe the .NET Framework is the way forward for these types of solutions. It allows our clients to safeguard their investment in existing IT systems as well as developing scalable solutions through new technology."***

**JOHN STANFORD  
BUSINESS SOLUTIONS  
DIRECTOR  
PHOENIX DATABASE  
TECHNOLOGIES**

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**To access information about Web Services go to:**

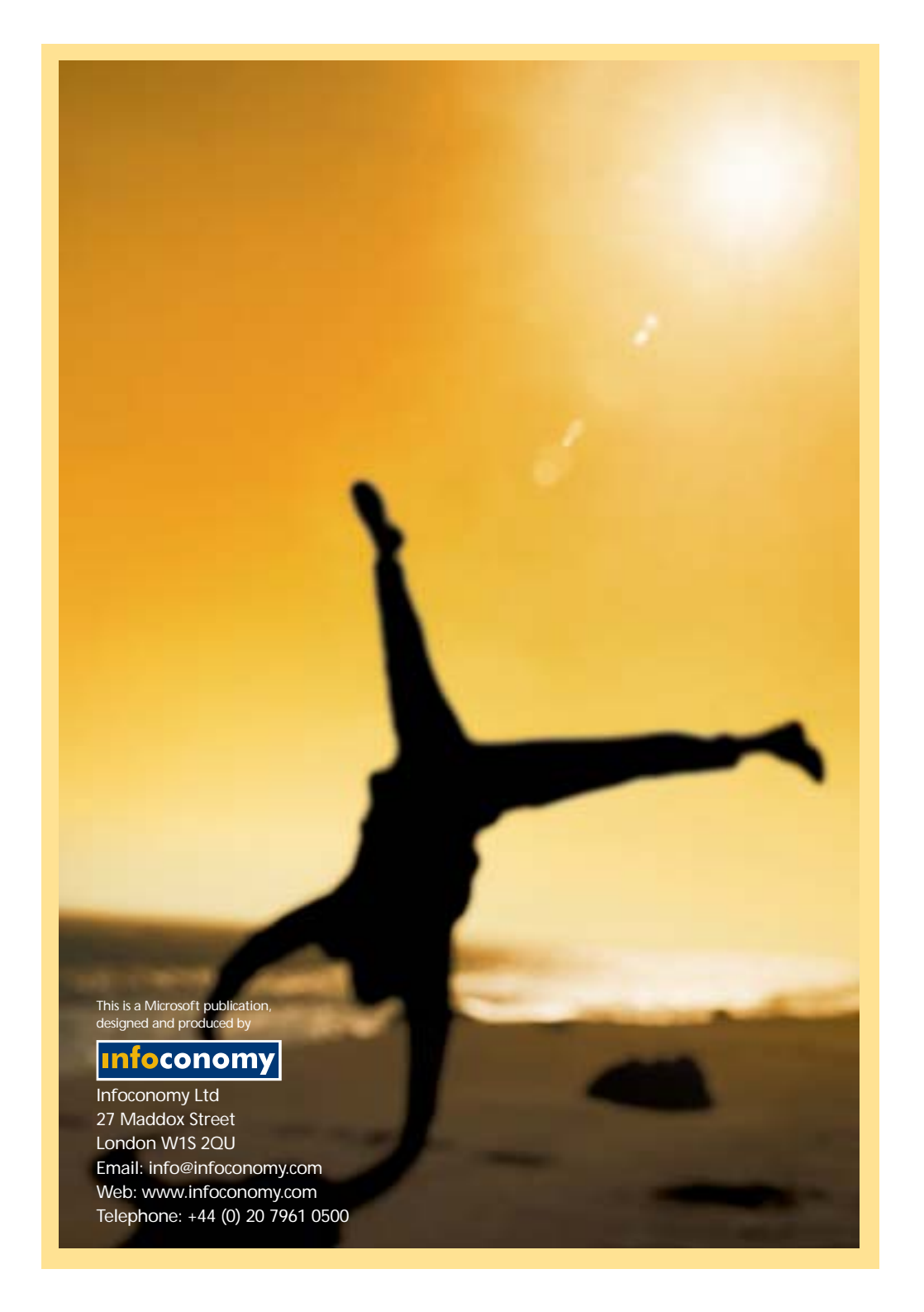
[www.microsoft.com/webservices](http://www.microsoft.com/webservices)

**To access information about companies that have used Microsoft technology go to:**

[www.microsoft.com/uk/casestudies](http://www.microsoft.com/uk/casestudies)

**To access information about the Microsoft .NET Framework go to:**

[www.microsoft.com/.net](http://www.microsoft.com/.net)

A full-page background image showing a silhouette of a person performing a handstand on a sandy beach. The person is in a dynamic pose with one leg raised high and the other extended horizontally. The background is a bright, hazy sunset or sunrise over the ocean, with the sun low on the horizon creating a strong lens flare and illuminating the sky in shades of orange and yellow. The beach is visible in the foreground with some dark rocks or debris.

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