

Windows Azure:
How Four Groups at Microsoft
Developed Scalable, Efficient
Applications That Unleashed
Competitive Differentiators and
Delivered High Value to
Customers

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Introduction

In recent years, Web-based applications and services have complemented traditional software applications to provide businesses with a myriad of competitive benefits. Within an organization, Web-based applications deliver critical business tools to employees and provide simpler deployment and management scenarios compared to applications that are installed on local client computers. In addition to line-of-business applications, companies often use standalone Web services to deliver timely, relevant Web applications to customers.

Despite their evolution—and increasing popularity—Web-based applications also present significant challenges. Though many organizations want to deliver applications and services over the Internet, the ability to scale up quickly to meet demand can be difficult without investing significant financial and personnel resources. Scaling down during nonpeak times can also be problematic, so organizations are often faced with underutilized server hardware.

In addition to the overriding issue of scalability, organizations need agile, cost-effective solutions that enable them to focus on competitive differentiators, deliver services and value to customers, and respond faster to ever-changing business needs. IT teams and developers should be able to use existing skills to build innovative applications, rather than spend valuable time learning and managing complex technologies.

The Windows Azure platform helps organizations address these needs by providing a foundation for building applications that span from consumer Web to enterprise scenarios. Windows Azure offers on-demand compute and storage for hosting, scaling, and managing Web applications over the Internet. Instead of procuring new hardware or deploying resources to manage servers through traditional hosting, organizations can rely on virtually unlimited compute and storage capabilities offered by the Windows Azure platform. As demand for an application or service fluctuates, organizations can quickly scale the solution to either meet increased demand or avoid paying for underutilized resources.

Windows Azure is a flexible, familiar platform that supports and integrates with existing on-premises environments. It supports popular standards and protocols, such as SOAP, REST, and XML, and developers can rely on their existing expertise with .NET, Java, and PHP to build compelling applications and services on it. By utilizing their existing skills and expertise, developers can focus on innovative solutions that bring high value to customers, and quickly bring these solutions to market. At the same time, Windows Azure also provides a cost-efficient model for adding and using IT resources. By building on Windows Azure, organizations can deploy their applications and services quickly without requiring significant capital expenditures up front.

In addition, the Windows Azure platform addresses the driving need that people have to discover information. The Microsoft service code-named “Dallas” is an information marketplace that brings data, imagery, and real-time Web services from leading commercial data providers and authoritative public data sources together in a single location. Developers and information workers can easily discover, purchase, and manage premium data subscriptions using Dallas in the Windows Azure platform.

Microsoft Benefits from Windows Azure

Four groups at Microsoft—from consumer and business product groups to groups that drive internal initiatives—are taking advantage of the Windows Azure platform for their own applications and services. What they found was a solution that not only provides the ability to scale up and down as demand dictates, but also a platform that enables them to use their existing skills, focus on competitive differentiators, and respond faster to customer business needs.

Learn how:

- [Online services for Microsoft Dynamics](#) helps customers streamline business management processes.
- [Microsoft Hohm](#) provides personalized energy-usage recommendations to consumers.
- [The 2009 Giving Campaign Auction Tool team](#) hosts a charity auction site, supporting 15,838 unique visitors.
- [The H1N1 response team](#) delivers critical health information through an interactive Web site.

Microsoft Dynamics: Focus on Solving Customers' Business Problems

Online services for Microsoft Dynamics extends the familiar line of Microsoft Dynamics business management solutions to a service that customers can access over the Internet. Because every company communicates and collaborates in some way with customers, vendors, partners, and other business entities, the Microsoft Dynamics team wanted to help its customers streamline business processes through online services. Scheduled to be released in summer 2010, Sites Service for Microsoft Dynamics is the answer to streamlining those processes.

By using the Windows Azure platform, Sites Service for Microsoft Dynamics enables employees to build simple Web sites that support business processes and can be built in a matter of minutes, without IT intervention. Using Web roles in Windows Azure, the Sites Service publishes information and collects input for business processes, such as job applications, request for quotes, customer support requests, and warranty information through the Web. That information is stored using Windows Azure and is then integrated into the business system through a Worker role. The result is a Web site that supports a number of key business processes. "If you are an HR manager and want to publish a new job request to a Web site and accept applications online, it is nice to bypass IT and simply publish a page that integrates into the related business process—without interrupting other business processes and without the delay that normally comes along with internal Web development," explains Ashvin Mathew, General Manager of Online Services for Microsoft Dynamics.

"Windows Azure and online services for Microsoft Dynamics together are solving the business challenges that our customers face every day." —Ashvin Mathew, General Manager, Online Services for Microsoft Dynamics

As a result of running Sites Service for Microsoft Dynamics on Windows Azure, the Microsoft Dynamics team not only has the scalability it needs to meet demands, but is able to deliver a strong value proposition to its customers. Though the team could scale the service with a traditional infrastructure, it would require significant personnel resources to deploy, configure, and maintain that infrastructure. Instead, with Windows Azure, scalability is simple and on-demand. "Windows Azure allows us to literally focus all of our attention on delivering the solution to our customers, and not on the technology on which it runs," says Mathew. "Windows Azure and online services for Microsoft Dynamics together are solving the business challenges that our customers face every day."

Microsoft Hohm: Respond to Changing Needs with Agility

Microsoft Hohm helps consumers better understand and manage their energy consumption, while sharing ideas about how to positively impact the environment. After consumers log in to the Microsoft Hohm Web site and enter information about their home, an analytics engine runs simulations based on that information to provide consumers with detailed reports about their energy usage; the site then offers personalized recommendations to help consumers save energy and money.

The analytics engine and the energy model that Microsoft Hohm uses are key to its success. There are more than 200 variables that are used in the energy model. The logic behind the energy model and analytics engine is CPU-intensive, and the group expected a large number of consumers to take advantage of the Microsoft Hohm site. “One of the simulations literally takes up an entire server for several seconds,” explains Rod Toll, Director of Development at Microsoft Hohm. “You can imagine that as the number of users grows, it would be nearly impossible for us to scale up and make this work with a traditional infrastructure; scaling down would also be difficult.”

In April 2009, mid-development cycle for Microsoft Hohm, the team decided to develop the application on the Windows Azure platform and was able to deploy the solution to consumers in just three months. The team uses Web roles for the consumer-facing front end and also to expose a Web service to partners. The team uses Worker roles in three ways: to host the CPU-intensive analytics engine, to download weather data and other information that the service requires to provide personalized energy recommendations, and to process partner messages from the Web service. The team also uses Windows Azure storage services for the Microsoft Hohm application. It uses Queue storage to communicate between roles and Table storage to store user data and additional metadata about queue messages. To manage content and configuration data for the Web site, as well as other metadata, the team uses Blob storage in Windows Azure.

With the July 2009 launch of Microsoft Hohm, the team exceeded expectations of its initial user base. As the site’s user base increases, Windows Azure enables the team to quickly scale to meet traffic demand. In addition, Windows Azure provides the compute power needed to run the CPU-intensive analytics engine—a competitive differentiator of the application. Finally, the team was able to take Microsoft Hohm to market quickly with Windows Azure. “Windows Azure was a key component that allowed us to go to market when we did,” explains Toll. “Day-to-day development was faster and deployment was easier. We’ve done more than a dozen updates since we initially deployed—almost all with zero downtime. Zero-downtime deployments aren’t impossible with traditional models, but Windows Azure simplifies and speeds the process.”

As a result of using Windows Azure, ... the [2009 Giving Campaign] site hosted auctions for 875 items, had 15,838 unique visitors, supported 56,346 total sessions, and raised nearly U.S.\$500,000—including \$505 for the world’s best bologna sandwich.

The Microsoft Giving Campaign Auction Tool: Efficient Development for a Grassroots Initiative with Limited Resources

The Giving Campaign Auction has been a grassroots initiative at Microsoft since it started in 2006. The campaign runs an online auction site, called the Giving Campaign Auction Tool, where donors can list items and services for buyers to bid on, with all of the proceeds going to charity. The Auction Tool is a yearly volunteer effort within Microsoft IT; without dedicated resources to develop and run the site, the volunteer teams usually struggle to find available resources.

In a scenario where developer and hosting resources are limited, there is often a scramble to launch the Web site in time for the fundraising initiative. With an initiative that only runs once a year for one month, the Auction Tool is highly cyclical in nature—and it boasts a high volume of site traffic. For instance, during the 2008 Giving Campaign, the Auction Tool went down in

the last minutes of the auction—a time when the site sees the most activity. The team suspected that the increased load was one of the reasons for the downtime.

To avoid the site from failing during the 2009 Giving Campaign, the team required a solution that could quickly scale to handle traffic throughout the campaign, including the burst of activity that it experiences at the end of the auction. Also, because it is an all-volunteer staff, the team wanted a simple solution that would enable developers to build the solution in their free time based primarily on their existing skill sets.

The team turned to Windows Azure, taking the existing Giving Campaign Auction Tool and migrating it to Windows Azure with only minor code changes. The Auction Tool uses Windows Azure Web roles for the front-end service. The team started with four Web roles but eventually added an additional 20 Web roles. “That’s one of the great things about Windows Azure,” says Pankaj Arora, Senior Solution Manager on the 2009 Auction Tool team. “You can just click a button, add more Web roles, and scale up without worrying about what is going to happen at the end of the auction.” The team also used Microsoft SQL Server as an on-premises server, highlighting the ability to use a software-plus-services model, with components hosted in the cloud and on-premises.

Even though the team had never used Windows Azure, it took the equivalent of one-and-a-half developers less than two weeks to modify the existing code and migrate the site. Developers leveraged their existing expertise with the Microsoft .NET Framework and the Microsoft Visual Studio development system—both underlying technologies in Windows Azure. The team also developed a brand new user interface for the tool based on the Microsoft Silverlight browser plug-in.

In fact, the development process was so efficient and simple that other groups at Microsoft with local auction-driven initiatives are taking advantage of the same model. “We can basically hand off the deployment package that represents our application, along with some simple instructions, and other teams can set up an instance and are up and running in minutes—this kind of simple solution is highly sought after,” explains Arora.

As a result of using Windows Azure, the 2009 Auction Tool team successfully sponsored the initiative without any interruption in service. In one month, the site hosted auctions for 875 items, had 15,838 unique visitors, supported 56,346 total sessions, and raised nearly U.S.\$500,000—including \$505 for the world’s best bologna sandwich. Using Windows Azure for the Giving Campaign Auction Tool was such a success that Tony Scott, Chief Information Officer at Microsoft, demonstrated the solution at the 2009 Global CIO Summit; Bob Muglia, President of the Server and Tools Business at Microsoft, highlighted it in his keynote address at the 2009 Professional Developer Conference.

The H1N1 Response Center: Deliver a Time-Sensitive Web Site with Simplicity

The H1N1 Response Center (www.H1N1responsecenter.com) combines Microsoft technologies with a self-assessment, which is licensed from medical and public health experts at Emory University, to provide consumers with timely and relevant content that enables them to gauge symptoms and receive guidance using an H1N1 self-assessment service. By providing people with an at-home tool that can help evaluate whether they need to see a healthcare provider, the H1N1 Response Center strives to help reduce the burden on the public health system and keep healthy individuals from being exposed to the virus unnecessarily.

In September 2009, with the flu season rapidly approaching, the Health Solutions Group at Microsoft identified the need for the H1N1 tool to support consumers and healthcare professionals in the United States. However, with traditional hosting methods, a dynamic Web site could not handle a significant burst in traffic. “The traffic to this site is not something that slowly rises or is steady over time,” explains Sean Nolan, Distinguished Engineer in the Health Solutions Group at Microsoft. “What happens is there is news coverage about the H1N1 virus, and the site sees an

immediate surge in traffic. The ability to handle that kind of burst traffic was crucial to making the site a viable solution for people.”

To get the service up and running in a timeframe that would make it a useful response to the H1N1 pandemic, the team decided to use the Windows Azure platform for the H1N1 Response Center Web site. When visitors go to the site, they enter information about themselves or someone that they are worried about, including age, gender, and any symptoms they are experiencing. The logic employed by the self-assessment tool from Emory University includes a highly tuned set of questions that can quickly elicit whether the person’s situation is likely to be serious enough to warrant a visit to the physician or, in severe cases, the emergency room. The H1N1 Response Center uses Microsoft HealthVault, an online personal health management platform, and Microsoft Amalga, a real-time data aggregation solution for healthcare enterprises. It uses Queue storage and Worker roles in Windows Azure to transfer data from Microsoft Amalga to public health organizations and to Microsoft HealthVault.

As a result of using Windows Azure, the team developed and deployed the H1N1 site in only three weeks, going live in October 2009 and in time to support people during the peak H1N1 pandemic season. “Our development skills are rooted in Microsoft ASP.NET and Visual Studio,” says Umesh Madan, Principal Architect for the H1N1 response site team. “The integration of familiar developer tools with Windows Azure means that we were able to get up and running without having to learn new technologies. For us, it was practically a turnkey solution with one-click deployment capabilities.”

Windows Azure provided the on-demand scaling that the team required to support unplanned, high-volume burst traffic. For example, in one 14-week period, the H1N1 response site had a total of 2.2 million page views. The site saw its peak traffic on November 9, 2009 with 123,746 page views—an unexpected 365 percent increase from the previous day, which had 33,858 page views.

Summary

With Windows Azure, organizations can create, deliver, and manage Web applications and services without making upfront capital investments in infrastructure. Because organizations can rely on Microsoft data centers to host applications and store data, they benefit from a cost-effective, efficient model with high scalability options. By providing a familiar development environment that is compatible with multiple standards, Windows Azure enables developers to focus on their business logic, as opposed to operational hurdles.

Though the idea of cloud computing is new to many organizations, it is gaining popularity as people begin to realize the advantages that the cloud computing model offers. With a cloud computing model and, more specifically, with Windows Azure, organizations can focus on creating compelling, innovative applications that deliver high value to customers and differentiate them from competitors.

About the Windows Azure Platform

The Windows Azure platform provides an excellent foundation for expanding online product and service offerings. The main components include:

- **Windows Azure.** Windows Azure is the development, service hosting, and service management environment for the Windows Azure platform. Windows Azure provides developers with on-demand compute and storage to host, scale, and manage Web applications on the Internet through Microsoft data centers.
- **Microsoft SQL Azure.** Microsoft SQL Azure offers the first cloud-based relational and self-managed database service built on Microsoft SQL Server 2008 technologies.
- **Windows Azure platform AppFabric.** With Windows Azure platform AppFabric, developers can build and manage applications more easily both on-premises and in the cloud.
 - *AppFabric Service Bus* connects services and applications across network boundaries to help developers build distributed applications.
 - *AppFabric Access Control* provides federated, claims-based access control for REST Web services.
- **Microsoft Codename "Dallas."** Developers and information workers can use the new service code-named Dallas to easily discover, purchase, and manage premium data subscriptions in the Windows Azure platform.

To learn more about the Windows Azure platform, visit:

www.windowsazure.com

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