Getting to E-Business at Internet Speed

The Need for Business Agility

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Introduction

> *"Continuous innovation, both revolutionary and evolutionary, is a necessity. We are either fast or forgotten. In the new economy, there are no speed limits. Agility rules. Speed is all. The need for renewal is something that applies to everything in the organization; it concerns everyone, goes on everywhere, and is non-stop."*
>
> – **Kjell Nordstrom and Jonas Ridderstrale, excerpted from "Funky Business," Financial Times Prentice Hall Publishing**

Agility is a hot topic among software vendors competing in the emerging e-business market. But, what does it mean? The dictionary definition says **quick, nimble, flexible, versatile,** and **active**. How does this relate to e-business? Or, more importantly, how does it relate to your business? The answer is "Speed to market."

Eighteen-month development cycles are no longer acceptable. The market demands application development and deployment to be within months rather than years. And, with the consolidation in the application market, there are fewer and fewer competitors. The need to get to market early, capture business opportunities, and define your business as leader is the essence of e-business success.

Most business applications in use today were custom-developed for companies to meet specific business requirements and optimized for specific hardware platforms, operating systems, user interfaces, and databases, generally without consideration for reuse or accessibility. They were not originally designed with the necessary modularity and flexibility demanded by the rapid pace of business change we have experienced in the 1990s. They were not originally intended to interoperate with other applications created with different tools or written in different languages, nor were they intended to extend beyond the four walls of the enterprise to communicate directly with customers and other business partners.

With the challenges of today, businesses that can reuse existing application components will be able to build systems faster, adapt more quickly to change, and offer their services at a lower cost. To achieve business agility and meet the ever-increasing demands of the user, application providers need to take full advantage of their development environment, utilize rapid development techniques, establish and maintain best practices, and deploy the best e-business applications in record time. And, once the application is deployed, ease of maintenance combined with the ability to respond to change will be key to keeping customers happy.

> *"With the rapid pace of the e-business environment, the ability to quickly change the business requires the ability to quickly change business processes. Rapid change to business processes requires rapid change to the applications that support them."*
>
> – **Randy Heffner, Giga Information Group, "E-Agility Requires Strong Business Service Components," September 29, 2000**

Progress Has the Keys to Agility

> *"Since we developed the solution in Progress we know we are providing our customers with a non-proprietary, open architecture and Web-enabled platform that can accommodate future system enhancements."*
>
> – **Kenneth Weinberg, Vice President, Carrier Logistics, Inc.**

Progress Independent Software Vendors (ISVs), such as Carrier Logistics, Inc. (CLI) whose FACTS2000® transportation freight accounting and tracking system is used around the world, have been developing agile applications for two decades.

One key to this success of these ISVs has been the Progress 4GL, a highly productive and easy to use programming language that provides developers with a function-rich syntax for building e-business applications. The Progress 4GL enables a developer to be responsive and flexible, requiring fewer lines of code to be written than with languages such as Java, Visual Basic or C. The Progress 4GL is used by over 2,000 ISVs worldwide to build high performance online transaction processing (OLTP) business applications.

Today, many of these Progress software vendors are successfully making the transition to the e-business paradigm, and they are building their solutions on a foundation of Progress 4GL code they wrote years ago to address their customers needs. Much as business needs seem to be forever changing due to new technologies, the fundamental business processes at the core of an application remain fairly constant. Isolating the application logic that manages your business processes enables you to protect your investment, yet still maintain a leading-edge solution.

The Progress Universal Application Architecture

To help Progress application developers make a smooth transition to e-business and insure that their applications have built-in agility, Progress announced their Universal Application Architecture (UAA) in 1998. The UAA is both an architecture and a strategy for enabling ISVs and IT organizations to build, deploy, and manage flexible and adaptable systems that can support emerging technologies, standards, and trends. IT departments and application providers today are under increasing pressure to bring Web-enabled applications to deployment in rapid time. This, combined with the growing shortage of IT skills and the increased demand for state-of-the-art applications, means the race to utilize the Internet is on. Application providers need to deliver large-scale e-business applications faster, better, and cheaper than ever before.

In addition to creating new applications, businesses must enhance existing applications to respond to changing needs. These include:

- Web-enabling an existing application
- Integrating an application with other in-house or external applications
- Adding a new interface to an existing application
- Adding a new module
- Customizing an application for a specific customer
- Personalizing a dynamic user interface

Accomplishing any one of these, let alone all six enhancements, would be a significant undertaking with applications of the past. The Progress UAA gives businesses the tools and strategic framework required to transform their existing business applications into open, Future-Proof™ applications that can utilize multiple user

interfaces and communicate easily with other applications, databases, or services available anywhere on the network.

Building Future Proof Applications

> *"We can offer our customers a solution that insulates them from fast-changing user interface technologies; that handles the rise in composite and B2B applications where transactions talk across many applications; that is ready to meet the demand for ASP delivery and e-business solutions; that combines high levels of WAN performance with low communications costs and provides the widest choice of deployment options."*
>
> – **John McAlinden, Product Development Manager, Syscom PLC**

In 1999, Syscom PLC, a leading ERP solutions provider for the textile industry based in the UK, started to re-architect their Darwin application taking their lead from the Progress UAA. Once that process was complete, they were immediately able to deploy their application with the Progress WebClient, a technology that did not exist when the project started. Not only were they able to take advantage of this new technology, which enabled the ASP deployment of Darwin, they were able to implement the interface in three days.

If you design and develop your applications with the future in mind, you will be able to more easily respond to change and take advantage of new technologies. The UAA helps you design and develop component-based applications with the business logic separated from the user interface (UI). A component-based application provides reusability of business components, the ability to distribute the application to take advantage of the infrastructure, and the ability to change existing, or add a new, UI without affecting the business logic. A UAA application is network-, platform- and UI-independent. It enables developers to build GUI, HTML, character, Java, or ActiveX client interfaces depending on customer requirements. Deployment can be on a LAN, WAN, intranet, extranet, Internet, or any combination.

When Progress introduced the UAA, it was well received by those in the analyst community who recognized the need for agility in the coming years.

> *"The warp speed with which technology is changing demands that IT must be both farsighted and flexible. Computing history has proved that there is no crystal ball and no silver bullet. The very viability of future proof software rests in the organization's ability to logically separate the business, application and presentation logic… This ensures flexibility, speed and scalability for creating and adapting applications within a fluid business environment."*
>
> – **SPG Analyst Services, 1998**

The Tools That Speed Time to Market

> *"E-business solutions encompass a number of different architectures, among them centralized Web-based systems for business-to-consumer (B2C) and business-to-business (B2B) systems, including e-commerce and digital exchanges. For maximum efficiency and effectiveness, both types of solutions require integration with back-end systems. Enterprise application integration (EAI) middleware, including message brokers, is also becoming an essential part of an adaptable and flexible infrastructure."*
>
> – **Beth Gold-Bernstein, "Lessons From the Past Impact Business Agility," Application Development Trends, September 2000**

Application developers need to focus on creating and maintaining one application that can be deployed in a variety of ways, rather than creating separate applications for each deployment scenario.

A Complete, Integrated Development Environment

Progress provides a complete environment that enables developers to rapidly build scalable, high-performance, enterprise-class applications for Web-based environments:

- **Smart Objects** — These dynamic components help developers reduce the number of procedures required for an application and implement changes to the application on the fly. Super procedures provide standard "libraries" of application behavior that could be inherited and, where necessary, overridden or specialized by individual application components.
- **Internet Component Framework (ICF) —** These high-level, extensible components are capable of handling the toughest of requirements demanded of e-business applications. ICF components provide services for Progress applications, such as context and security management, resulting in improved productivity for the developer, reduced cost of ownership, unlimited extensibility, and an easier way to adopt new technologies without significantly re-architecting applications.
- **Progress AppServer —** The foundation for Progress' distributed computing strategy, the AppServer enables the development and deployment of Progress 4GL procedures as distributed application components, which can support a variety of interfaces. The Progress AppServer can be accessed locally using TCP/IP or across the Internet using the HTTP or HTTPS protocols.
- **WebSpeed Transaction Server —** WebSpeed is the key to providing optimized processing for high transaction volumes and rapid responses for HTML-based applications. Dynamic load balancing ensures high availability of transaction processing resources in a distributed, multi-tier environment.
- **Progress AppBuilder —** This graphical development tool allows developers to quickly create and modify an application. Complete with wizards, a palette of visual and non-visual objects, and property sheets, the tool is intuitive and simple to use, with drag & drop capabilities for the easy fabrication of components and assembly of applications from those components.
- **Open Client Toolkit —** With this Toolkit, you can easily change the interface to the application to be Java or an ActiveX application (e.g., Visual Basic or C++). The Proxy Generator, a component of the Open Client Toolkit, allows a Progress 4GL developer to identify AppServer functionality to be exposed to Open Clients and generate proxies for these 4GL procedures. The proxies enable Open Client interfaces to transparently access the Progress components on the Progress AppServer.
- **Integration Technologies —** The ability to integrate disparate systems is necessary to achieve e-business agility, and Progress enables data exchange among applications and businesses using a variety of technologies. XML is rapidly being embraced as the preferred method for exchanging

data between diverse applications, because it is standards-based, simple, flexible, and more cost effective than previous methods. Developers can make use of Progress 4GL syntax to read and write XML data in and out of Progress supported data sources. Progress also supports HLC (Host Language Call), UNIX shared libraries, Windows DLLs, named pipes, sockets, ActiveX controls, and automation for application integration.

- **SonicMQ —** In the rapidly growing category of E-Business Messaging (EBM) middleware, SonicMQ is designed to meet the unique requirements of information integration and exchange over the Internet. Offering a highly efficient, robust, cost-effective messaging solution to address enterprise application integration, SonicMQ can scale up to support full-blown highly distributed, highly scalable Internet messaging requirements. Using the Progress SonicMQ Adapter you can add secure business-to-business communication and facilitate enterprise application integration to fully integrate SonicMQ with your 4GL applications. This leading solution is based on the Java Messaging Service (J2EE) specification.

This rich set of tools not only helps developers address every aspect of building an application, it helps insulate the developer and the customer from the underlying technology. With the Progress 4GL and SmartObject components, developers can concentrate on solving the business problem; the 4GL will handle the intricacies of connecting to the messaging server, building the XML document, providing a secure SSL connection through firewalls, etc. And, the resulting application will be as robust and perform as well as any in e-business.

> *"We selected Progress and WebSpeed as our platform for the Internet and intranet, developing both in parallel…. HTML, backed up by a full programming language and database, enabled us to produce Web-based applications with the required complexity and on a single platform."*
>
> – **Paul Barnett, Group IT Manager, Reg Vardy plc**

Reg Vardy plc, Europe's largest motor retail group, has been a Progress end user since 1995. Recognizing the need to quickly embrace the Web as an additional sales channel, they evaluated tools to take them there and decided to migrate their existing character-based systems to browser technology using WebSpeed. They were able to dramatically improve their customer offering while using a high proportion of the existing logic. The interactive Web site is driven by a central Progress database with links to all dealerships and central systems and receives an average of 1,500 hits a day.

Flexible Deployment for E-Business

> *"Progress AppServer is the best product available for building and deploying client/server and distributed n-tier financial applications, giving us all the functionality we needed to make GBST Online™ both robust and scalable."*
>
> – **John Puttick, Managing Director, GBST Pty. Ltd.**

GBST (Global Banking & Securities Transactions) Pty. Ltd, a Progress ISV for 12 years, has captured 50% of the Australian and New Zealand trading market—by volume and value—on the strength of its Shares back-office trading application and GBST Online™, an ASP-based online trading application.

The ability to develop and update applications quickly puts you on the path to success for e-business agility, but unless you can deploy the application quickly and easily, the competitive advantage could be lost. Progress technology supports all e-business deployment models, including B2B, B2C, intranet, extranet, Internet and ASP.

Business agility includes the ability to use the same application code and database no matter what your deployment architecture looks like. Progress gives you the ability to rapidly deploy your application with no restrictions. Deploy a single user or workgroup application today, and Progress will scale with you as your user base and infrastructure grow. Progress applications can evolve as your business evolves, providing you with the tools and strategic framework to transform your business applications into open, standards-based e-business applications that communicate and interoperate easily with other applications, data sources, and user interfaces. From a single-user, single processor PC to an SMP, clustered deployment in a fully distributed architecture, Progress products will scale with your demands.

Progress application servers greatly enhance the deployment options available to you, and allow you to rapidly deploy an application in a variety of environments with no code changes. To take advantage of Progress application servers (Progress AppServer or WebSpeed Transaction Server), you need to partition your application. Once partitioned, the benefits include ease of deployment, performance, security, maintenance, and flexible client access.

The Progress Unified Broker and Administration Framework include the AdminServer, which resides on any machine where a Progress server is installed. The AdminServer is responsible for the configuration and management of all Progress server products and includes the NameServer, which provides location transparency, load balancing, and fault tolerance for the servers. The NameServer also allows you to change your configuration and hardware at deployment, rather than development. As server loads increase, you can re-partition your application while users are active.

Scalability to Manage Future Growth

Deploying on the Internet often leads to greater usage, which can overwhelm an existing system. Today's solutions must scale to accommodate both short-term and long-term growth to achieve agility. Distributed application computing is an architectural approach to designing application software that runs across a network. It maximizes processing capabilities by enabling you to distribute portions of your business application throughout the enterprise. By emphasizing a flexible, modular use of computer resources, your enterprise can gain greater performance returns.

Once the application has been designed and developed for a multi-tier architecture, it is easy to deploy in a variety of environments, with a combination of the WebSpeed Transaction Server, AppServer, AppServer Internet Adapter and clients, including the Progress WebClient. The AppServer Internet Adapter allows the deployment of the application accessing business logic components running on AppServers through the Internet. The WebClient provides the ability not only to run a GUI client over the Internet, but also to host the installation on a Web server. The application can then be remotely deployed, installed, and even updated on a client machine automatically, and transparently, when the user runs the application, thus reducing the deployment and maintenance costs.

As companies grow, their database sizes tend to grow as well. We are now seeing environments where no information is deleted and everything is stored online. Some databases are growing at 1 to 2% per week. Many IT departments are looking to validate a DBMS today that will serve size projections for 2 years out. The Progress RDBMS successfully handles these requirements. As your data needs grow, you do not have to re-architect or reload the data, even the most complex management of large databases requires minimum staffing with no downtime.

The Progress RDBMS is proven to be easiest of databases for deployment, from initial installation to management. Unlike databases from other DBMS vendors, all Progress database products are built on the same code base from Personal to Workgroup to Enterprise. This lets you choose a solution that satisfies your business objectives today and upgrade as your needs grow—all without a single change in your application code. You can continue to enjoy the reliable service and proven technology of an industry leader, and your staff will not lose productivity while learning a new system.

Best Practices to Ensure Agility

Once you have the tools, guidance in the form of best practices will help ensure that you succeed in your objective of building an agile application. The following are best practices that address the issue of business agility:

- **The Progress Application Development Model (ADM)** provides guidelines for building distributed applications where the business logic is partitioned from User Interface components.
- **Dynamic Programming** helps you build and deploy applications more efficiently through the use of dynamic database objects.
- **Progress DataServers and Data Dictionary** enable you to build transaction-processing applications that can run against various databases.

The Application Development Model

> *"With component-based development, you are forced to think in layers and the attributes and methods of each layer. The result is better programming, fewer fatal errors, and you can reuse the components…. The ADM saved us quite a bit of time."*
>
> – **Michael Troelsen, Technical Engineer, EDB Gruppen**

EDB Gruppen, a Progress ISV located in Denmark, has adopted Progress' Application Development Model (ADM) to redesign and avoid a total rewrite of their application. Within eight months, they had deployed a fully distributed application taking advantage of the Progress AppServer with the Java Open Client. Today, they are looking at offering a variety of client interfaces for their applications, including browser and personal digital assistant (PDA).

The Application Development Model (ADM) is a component-based development paradigm for building applications based on reusable SmartObject components. The ADM enables developers to quickly and easily create and modify application components, resulting in supporting quick changes to an application. Combined with the underlying Progress 4GL, the ADM and SmartObjects provide the developer with a powerful combination of an OLTP language with object-oriented capabilities.

The ADM supports clean separation of the UI from the business logic, making it easy for developers to build component-based applications, change the look and feel of an application, or add new screens and modules without changing any of the underlying processes of the application. Adopting the ADM and using components developed as part of its Internet Component Framework (ICF) can ease your development cycles and promote component-based applications, resulting in less coding and efficient reuse of components and development resources.

The use of persistent procedures is at the heart of SmartObjects. This feature is perfect for creating reusable code that is accessible at run time and doesn't have to be compiled into each program. Persistent procedures create and maintain their context after processing returns to the caller program. They can also be accessed by external procedures through triggers and internal procedures.

Super procedures provide an object-oriented approach to Progress programming, allowing the developer to customize, override, or inherit behavior already defined in another procedure. Super procedures provide you with reusable application components implementing specific application behavior (i.e., a super procedure should be a library of standard behavior to be used by many individual application objects.)

For more information on the ADM, please review the ADM white papers at http://www.progress.com/adm/index.htm.

Dynamic Programming

By taking advantage of the Progress Dynamic Database Objects, such as Dynamic Queries, Dynamic Browse, etc., the developer will not only significantly reduce the number of procedures needed in an application, but also provide runtime customization UI and database access. Changing from a traditional, static programming paradigm, in which all procedures are coded individually, will require thought and planning. However, the benefits far outweigh the initial learning curve.

Dynamic programming provides the following benefits:

- Creates a more flexible and maintainable application
- Simplifies enforcement of standards
- Reduces client r-code size and eliminates CRC issues
- Allows for run-time customization to:
  - Translate labels, titles, etc.
  - Hide or disable fields based on security
- Allows for building menus of available components
- Enables modifying UI style for company preferences or standards

Data-Source Independence

In today's heterogeneous world, the ability to access several data sources or take an application written for one data source and, with little modification, deploy it against a different one is another example of e-business agility. Progress DataServers give you the ability to run applications across a variety of data managers to support existing implementations or emerging technologies. They combine the rapid application development benefits of the Progress component-based development environment with the flexibility of providing full read, write, update, and delete capabilities to diverse data management systems. By providing consistent application behavior, such as locking, scrolling, sort order, and case sensitivity, Progress DataServers simplify application development and deployment and enable the developer to write applications against a range of data sources.

The Progress Data Dictionary hides much of the complexity normally associated with the development and maintenance of database definitions, application defaults, and business rules. Progress DataServers can also be used with existing Progress 4GL applications to access non-Progress data sources for integration of new and legacy applications.

Application Flexibility Equals Business Flexibility

> *"For small- to medium-sized ISVs such as Syscom, we have to follow the market. And this is a fashion industry; if the fashion is ASP, then that's where we want to be. If the fashion is integration with mobile phones, then that's where we want to be, too. Tools and services that Progress provide have put us in both those marketplaces right now, and we're confident they'll take us into other marketplaces as IT trends develop."*
>
> – **John Moses, Managing Director, Syscom PLC**

Progress ISVs, such as Syscom, have demonstrated a unique ability to successfully transition applications that have been proven for over a decade into e-business. Whether creating new applications, or re-architecting or adding new modules to existing applications, they have shown the ability to change with the times.

Progress gives you the full advantage of a highly productive, integrated Application Development Environment to meet those challenges. The flexibility of the Progress 4GL, the vision of the Progress Universal Application Architecture, and the best practices of the Progress Application Development Model and the Internet Component Framework help build e-business applications in record time—Progress has the complete toolset to help you deliver e-business solutions.

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