Progress Delivers the OpenEdge eBusiness Platform

An IDC White Paper

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The eBusiness Platform

Although ebusiness strategies and technologies are still developing, the computer industry has already been through several years of trial and error on both fronts. The companies that have been experimenting with ebusiness the longest have already built and rejected several types of ebusiness infrastructures, from static, "brochureware" sites, to custom-built, interactive ecommerce sites, to integrated, standards-based, customer-driven portals. Some companies have stalled at one of these points because of cost or complexity. Others have shifted their attention to limited access intranets or extranets in a bid to generate return on investment (ROI).
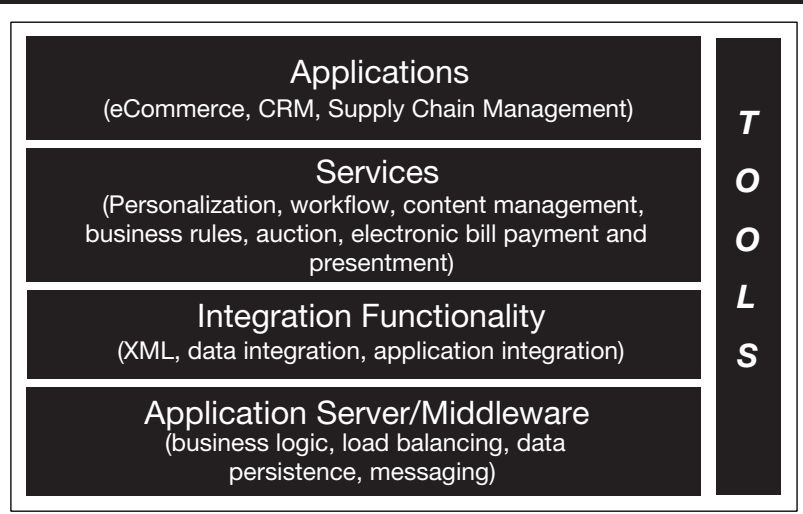
Through this trial-and-error process, the industry has identified the key attributes and core functionality of an ebusiness platform. It is now demanding software that is:

- Flexible, scalable, and reliable

- Capable of integrating and being integrated with existing systems

- Based on well-established industry standards

- Secure

- Cost effective

- Manageable

To provide products with all of these attributes and the required core functionality, a number of software vendors have shifted their strategies from products that solve specific ebusiness problems to suites that provide a comprehensive ebusiness platform. IDC defines the ebusiness platform as follows (see Figure 1):

Figure 1
The eBusiness Platform

Applications	
(eCommerce, CRM, Supply Chain Management)	**T**
Services	**O**
(Personalization, workflow, content management, business rules, auction, electronic bill payment and presentment)	**O**
Integration Functionality	**L**
(XML, data integration, application integration)	**S**
Application Server/Middleware	
(business logic, load balancing, data persistence, messaging)	

Source: IDC, 2001

- **Infrastructure.** The bottom layer provides the framework for developing and deploying ebusiness applications. Most vendors consider this layer to include an application server and/or middleware functionality. Most vendors have standardized on Java2 Enterprise Edition (J2EE)-based application servers.

- **Integration.** The integration layer brings together both applications and data by using technologies such as XML. This layer often blends tightly with the application server; as such, it can represent functionality added to the core application server, or it can be a separate product such as an integration broker or XML server.

- **Services.** This layer includes functionality that most ebusiness applications leverage, but which are not required for basic application development and deployment. These functions include presentation (such as enterprise portal support), security, workflow, business process and business rules support, and personalization.

- **Applications.** The majority of ebusiness applications today have been custom built, but, increasingly, independent software vendors (ISVs) are building ebusiness applications such as ecommerce that are designed to take advantage of the lower layers of the ebusiness platform. The more applications that are built on this common platform, the easier it will be to integrate them and leverage them to build a comprehensive ebusiness infrastructure.

- **Tools.** The development tools that are used to build ebusiness applications are often the same tools that have been used for years to build other types of applications (integrated development environments [IDEs], for example). Nevertheless, a comprehensive tools strategy is crucial to the successful development of an ebusiness infrastructure, whether that means administration tools for prebuilt applications or development tools for custom-built applications.

The Role of Standards

The importance of building an ebusiness infrastructure on well-established industry standards was mentioned above, but this point cannot be made too strongly. Given the speed at which ebusiness strategies continue to evolve, using a proprietary solution can be fatal if industry trends move away from the functionality provided by that proprietary solution. Such solutions also make it difficult to extend ebusiness infrastructures to encompass suppliers and partners, whose own ebusiness infrastructures are more likely than not to be built on industry standards.

The key high-level standards for ebusiness today are Java and XML. These languages are being used to build everything from ecommerce solutions to emerging Web services applications. An ebusiness platform vendor must have a strong Java and XML story to compete in today's market.

The Evolution of eBusiness

Of course, ebusiness is not just about technology — it is about the fusion of business and technology. It is about leveraging IT infrastructures to improve interaction with suppliers, customers, and employees. It is about cutting costs, generating revenue, and improving productivity. And it takes a company that recognizes the importance of both technology and business to make it work.

Only ebusiness infrastructure software companies that understand both technology and business can help solve real-world business problems and provide solutions that generate real ROIs. Under the right circumstances, end users can leverage the products provided by such companies to generate competitive advantage, exploit new business opportunities, realize cost savings, integrate with their suppliers, expand their geographic reach, and improve their business processes.

On the other hand, end users who are swayed by enticing marketing messages and empty promises can find themselves in worse shape than when they started, having wasted time and money taking an inappropriate technology and applying it to a business problem.

In *Crossing the Chasm*, Geoffrey Moore addresses the significant problems technology companies face in attracting a mainstream audience to a new product. These companies are often shocked when Main Street does not embrace the technology that early adopters welcomed so enthusiastically.

Although the concept of ebusiness has been embraced by thousands of companies, in some ways technology companies offering ebusiness solutions are still struggling to cross Moore's chasm. Mainstream enterprise customers are looking for proven solutions that provide a strong ROI, not just promising technology that hints at enormous but unproven new business opportunities. It is difficult to generalize about a market as large as ebusiness infrastructure, which encompasses software that automates activities such as collaborative commerce, business to business (B2B), business to consumer (B2C), and corporate intranets. These interactions can be accomplished in a variety of ways: through people or strictly automated by process-to-process interaction. They can address problems of integration, communication, collaboration, or commerce.
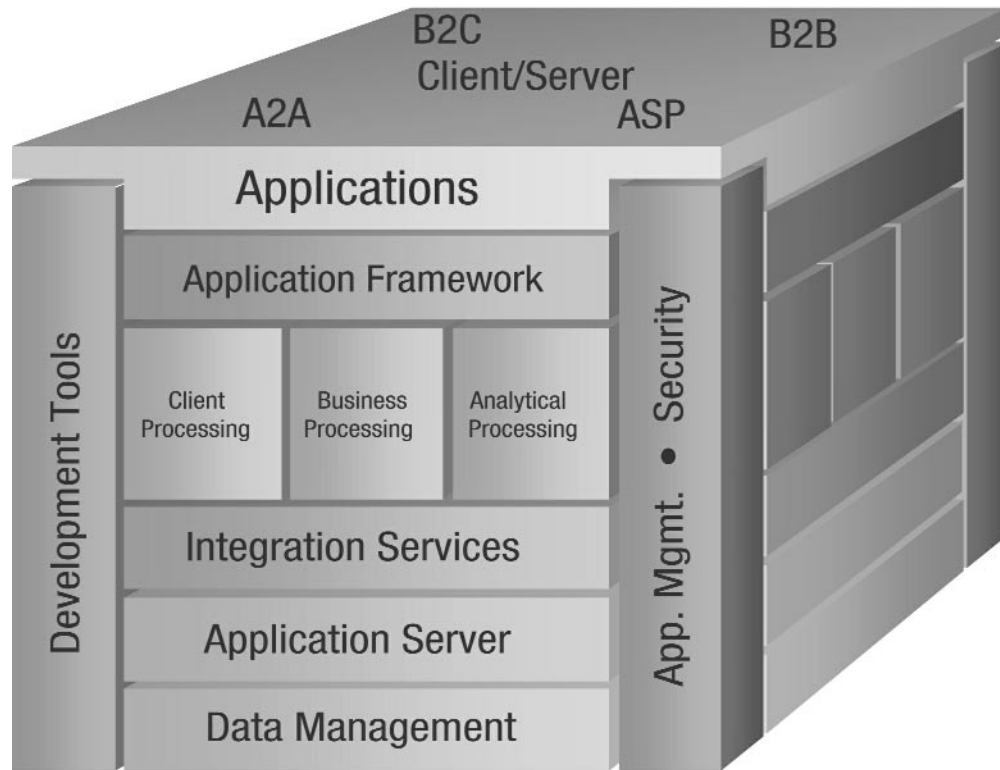
The Progress Company Overview

During its 20-year history, Progress has specialized in providing software that focuses on ensuring optimal ROIs for ISVs and application service providers (ASPs). Progress' customers then deliver value-added software and services to the enterprise. As a result, despite its worldwide scope, Progress is less familiar to many end-user companies than many smaller and younger players in the software industry.

More than 2,000 ASPs and ISVs use Progress Software's products to build and deliver packaged software applications. These applications — more than 5,000 are currently under active development — generate more than $5 billion annually. Progress Software applications are used by more than 2 million people worldwide, second only to SAP.

By using Progress' platform, ISVs and ASPs can concentrate on developing business functionality for solving the problems of midsize companies and enterprise departments in specific vertical industries. Because Progress has worked hard to make its products reliable and requiring little maintenance, end-user companies can successfully use Progress-based applications without much expertise in Progress skills at all. Many end-user companies have one or two Progress developers to maintain and customize their solutions, while the largest end-user sites have between 10 and 20 Progress developers. The Progress development tools are also designed to be easy to learn for programmers with experience in other visual development environments.

In January 2001, Progress Software split its business into three operating units. The Progress Company will continue to focus on the company's OpenEdge platform for ISVs and application developers. Sonic Software is focusing on Progress' SonicMQ messaging software, and NuSphere provides "productized" versions of a number of open-source software development and deployment products, including the MySQL database and the PHP programming language.

Figure 2
OpenEdge: The Progress eBusiness Platform

B2C

B2B

Client/Server

A2A

ASP

Applications

Application Framework

Development Tools

Client Processing

Business Processing

Analytical Processing

Security

App. Mgmt.

Integration Services

Application Server

Data Management

Source: IDC and Progress Software, 2001

OpenEdge: The Progress eBusiness Platform

In order to provide its ISV and ASP customers with the tools they need to build applications that leverage the latest ebusiness computing paradigms, Progress announced its OpenEdge ebusiness platform in June 2001. OpenEdge brings together a number of Progress applications into a cohesive architecture that addresses all of the major components of the ebusiness platform described above (see Figure 2).

OpenEdge Core

The OpenEdge platform relies on a foundation consisting of the Progress RDBMS and DataServers and the Progress AppServer.

Progress RDBMS is designed to provide a maintenance-free data repository for developing ebusiness applications. Because of the data-intensive nature of many ebusiness applications, Progress rightfully considers the RDBMS as a key part of the foundation of the ebusiness platform.

Because ebusiness applications are never developed in a vacuum, Progress also provides its DataServer product line, which provides developers with transparent access from the 4GL to Oracle, Microsoft SQL Server, DB2/400, and other databases through ODBC.

The OpenEdge core also contains the Progress AppServer, a deployment environment for multi-tier, Progress 4GL-based applications. While Progress has not followed the industry trend by making AppServer J2EE-compliant, it has added many features for integrating with Java applications. And while standards compliance is a key requirement for the ebusiness platform, Progress is able to deliver greater compatibility, reliability, and cost effectiveness by controlling the database, application server, and development environment when compared to ebusiness platform solutions that cobble together offerings from several vendors.

The AppServer's integration capabilities are focused on providing communications between AppServer and Java-based systems. Several features are already available, with more planned in the forthcoming release. Java components can make calls to 4GL components through Progress' Open Client technology. This allows Java servlets running on a J2EE application server to access 4GL-based business logic.

Progress is working to build additional Java integration capabilities into AppServer in the version to be released late next year. The 4GL will be able to make calls to Java components, and developers will be able to wrap 4GL components with an EJB wrapper.

OpenEdge Integration Layer

The SonicMQ ebusiness messaging server provides a broker-based infrastructure focused primarily on connecting Java-based applications. SonicMQ can also route and manage XML-based messages.

SonicMQ's Dynamic Routing Architecture has been developed to handle the complexity inherent in asynchronous integration by providing parallel clustering technology, active route optimization, Internet connection management, and end-to-end security.

In addition to the core messaging server, the SonicMQ family includes a number of bridges to extend the messaging server's integration capabilities. The MQSeries Bridge provides message forwarding between Java Messaging Service (JMS) topics/queues and IBM MQSeries queues. The JMS Bridge provides forwarding between JMS domains. The SMTP bridge allows sending of JMS messages from SMTP, POP, and IMAP-enabled email systems, and the FTP Bridge allows automatic exchange of messages via FTP.

OpenEdge Services Layer

Progress divides its definition of the services layer into four categories: client processing, business processing, analytical processing, and an application framework. This is quite different than the definition of services in IDC's ebusiness platform model, but it provides an interesting, alternative way of looking at the concept of services. It also highlights two issues — client processing and analytical processing — that deserve more attention in discussions of the ebusiness platform.

Client Processing

Progress includes several of its products, including WebClient, WebSpeed, and Open Client, in the client-processing category. Progress' focus on client processing is an important differentiator for the OpenEdge platform. Most ebusiness platform vendors have standardized on Web-based interfaces, either delivered as static HTML or pages dynamically generated using one of a number of techniques such as Java Server Pages (JSPs). While Web interfaces provide distinct advantages such as low deployment overhead (through use of the browser as the standard graphical user interface [GUI] container), they cannot provide the level of functionality delivered in native client applications.

Recognizing that different ebusiness applications will lend themselves to different client solutions, Progress provides a full spectrum of options for delivering client functionality.

For applications that are to be deployed to Web browsers, Progress provides WebSpeed Workshop, an integrated development environment that marries SpeedScript to standards-based Web application languages such as Java, JavaScript, XML, and HTML.

In addition, the Progress Open Client provides access to the AppServer for Java applications and applets and ActiveX applications. The Open Client Toolkit also contains Proxy Generator, a graphical tool used to define proxies for ActiveX and Java user interfaces.

Progress' most innovative client development and deployment technology is the Progress WebClient for deploying rich graphical clients and delivering them to desktop systems over the Web. With WebClient, Progress is addressing a critical weakness inherent in Web-based applications: the limited ability of the browser to display fully functional client interfaces (compared to native interfaces).

Because it provides both rich GUI development tools and deployment capabilities, WebClient eliminates the two greatest problems with native GUI applications: namely, the need to develop multiple client applications for multiple desktop operating environments, and the need to redeploy those applications each time a change is made. The WebClient software itself can be remotely deployed by making it available as a self-extracting executable file on a Web server. Users can then be sent to a Web page to download the client, which then installs itself on the client computer.

For future upgrades, WebClient's IntelliStream capability allows it to detect when WebClient applications need to be updated, and it automatically and securely downloads only the necessary changed resources.

WebClient also provides user-friendly features such as secure single sign-on for all WebClient applications.

Progress is adapting future versions of WebClient to provide a framework for delivering Web services, delivering applications to mobile/ wireless devices, and enabling peer-to-peer computing.

Business Processing

For business processing, Progress offers the Progress 4GL and its ProVision development environment. Originally designed for developing host-based applications, Progress 4GL now supports client/server applications and Web-based applications. Currently, OpenEdge includes hooks through the 4GL to JMS, Remote Method Invocation (RMI), and Java Database Connectivity (JDBC).

The Progress 4GL also supports XML. The Xerces XML parser has been built in. Developers have the option of handling XML through 4GL syntax or automating the process using B2B-purposed business objects. Progress also plans to add support, for Simple Object Access Protocol (SOAP), the new XML standard that addresses Web services.

Analytical Processing

For analytical processing, Progress provides a variety of online analytical processing (OLAP) applications through the CorVu product line and reporting applications through the Actuate product line.

In particular, CorVu and Actuate help users organize and compare data, find patterns and correlations in data, and compare results to company goals.

By integrating CorVu and Actuate into its ebusiness platform, Progress has accurately recognized that the value of OLAP tools can be extended far beyond their traditional role. Such tools have generally been associated with data warehouses and related products. In the ebusiness platform environment, analysis tools can provide the data necessary to iteratively evaluate and improve its ebusiness processes.

Tools such as the Actuate e.Reporting Suite enable companies to distribute this analysis not only within the company but also to vendors, suppliers, partners, and even customers. In this way, Progress is not only leveraging its OLAP tools to help enterprises monitor the ROI of their ebusiness platforms but also leveraging the ebusiness platform to deliver relevant information. This efficient use of technology is exactly what enterprises are looking for in today's climate, where technology purchases are increasingly driven by ROI.

Internet Component Framework

Progress has also taken the services layer described in IDC's model of the ebusiness platform one step further by adding an Internet component framework called Progress Dynamics. In OpenEdge, the framework layer sits on top of the processing tools already discussed. Progress Dynamics is a repository-based development and deployment

environment that includes a number of components designed to ease the process of ebusiness application development.

Developers using the Progress 4GL can leverage these components, which embody frequently used ebusiness functionality, to speed the development process. Progress Dynamics components provide services such as context and session management, language translation, customer profile, design repository, and security functionality.

Developers can also use Progress Dynamics components to ebusiness-enable legacy Progress applications. In the future, new ebusiness functionality based on new standards can be added to applications through new Progress Dynamics components, ensuring the flexibility that is so important to maintaining an ebusiness infrastructure.

Case Studies

Case Study: Holiday Autos

In 1999, Holiday Autos was one of many companies facing a dilemma: how to get a stalled Web site construction project back on track. Holiday, one of Europe's largest car rental agencies, had begun building a static Web site project to capitalize on the growing trend toward ecommerce. But, like many others, the first attempt didn't go quite as planned.

After evaluating several options, Holiday chose the Progress Company to not only complete the project but also take it one step further. Holiday had some challenging requirements for Progress: to not only build a multicurrency, multicountry, dynamic Web site but also integrate it with a centralized booking project that was already under way, and to do it all within two months.

Progress' professional services division proved up to the task. Progress' consultants used Progress WebSpeed, SonicMQ, and the Progress RDBMS to develop Holiday's Web reservations system. Progress WebSpeed manages process flow between the customer and database. Then the system uses SonicMQ to synchronize data with the central reservations database. Having the Web database separate from the central database insulates the core booking system from the Web site's high transaction volume and provides an additional layer of security. Today, Holiday's online bookings account for up to 25% of the company's total daily bookings.

Progress OpenEdge also enables Holiday to publish an XML messaging schema to partners, which allows it to retrieve data and send bookings to Holiday's central system. Holiday also provides an XML feed to partners to embed the booking system into their Web sites. Thanks to SonicMQ's ability to guarantee message delivery, Holiday can provide the quality of service partners such as airlines demanded for their Web sites.

As it turns out, Holiday's project to integrate its disparate standalone reservations systems around the world into a centralized system didn't go as well as planned, either. Now the company has decided to start over, using Progress software for the entire reservations system initiative. Holiday has been able to hire developers with Progress skills, who will work with Progress' professional services group to complete the project.

Case Study: The Greenery

Time to market is a key metric for many companies, but for The Greenery, it's absolutely crucial. The Netherlands-based company operates one of the world's largest produce auctions.

To help improve information flow between its more than 7,000 growers and buyers, The Greenery launched a major integration project in 2000.

Because The Greenery was formed in 1996 as a result of the merger of nine independent produce auctions, the company had to contend with dozens of different backend systems. Because of the complexity, Rene Santagoets, The Greenery's Manager of Software Development and R&D, decided to select a single vendor to provide the software for the integration project. After evaluating the company's needs, The Greenery selected The Progress Company.

Traditionally, produce growers had faxed or called to receive information about produce orders and report on produce yields each day. That meant The Greenery had to employ dozens of data-entry clerks to take the calls and enter the data into the auction management system. To automate this process, The Greenery used Progress' WebClient and SonicMQ messaging software to deliver intuitive data-entry programs to growers' computers.

WebClient provides a familiar, Windows-based look and feel to growers. The Greenery originally expected that growers would need two hours' training to learn how to use the software; in the end, most growers learn how to use the program by reading the manual — training is voluntary, but most growers don't use it. In fact, the WebClient program was judged to be so successful that all existing and future Progress applications used in The Greenery back office are being converted to use WebClient.

The new system cuts costs and increases revenue in a number of ways. The Greenery no longer has to employ as many back-office clerks to input information from the growers. Also, produce can now be sold before it arrives at the auction house because sellers know earlier how much produce will be available, As a result, produce arrives in the United States an entire shopping day earlier than it did previously.

The integration project was so successful that The Greenery has now decided to build 12 additional applications for the growers based on OpenEdge, including tools for:

- Uploading and downloading financial information

- Tracking produce quality and providing the growers with feedback from inspections

- Ordering packing materials

- Reporting for international shipping regulations

Challenges and Recommendations

With OpenEdge, Progress is providing ebusiness application developers with all of the functionality they need to build flexible, reliable ebusiness applications. Progress is paying particular attention to two difficult ebusiness development and deployment problems: namely, flexible user interface development and deployment and application integration. Progress Dynamics automates the generation of multiple types of client interfaces. SonicMQ, together with the 4GL's XML capabilities and SmartBusinessObjects, provides an open integration mechanism. Progress is also working hard to provide extensive integration capabilities between OpenEdge and Java and XML. Of course, no one ISV provides a perfect ebusiness platform. Progress could further enhance its offering by focusing on the following areas:

- Releasing more information about the internals of its 4GL

- Adding more functionality to OpenEdge for integrating with Java and XML-based ebusiness software. A further step would be adding a Java runtime environment to OpenEdge as an alternative to the existing execution environment.

- Extending WebClient so that other types of client interfaces, such as those written in Java, could run in the WebClient container. This move would greatly broaden demand for WebClient, as no similar mechanism currently exists for delivering Java software to the client.

Progress is already working on adding much of this functionality to OpenEdge, particularly in the area of Java and XML, to the next version, to be released late next year. Thanks to the functionality Progress has already incorporated, the existing version provides a strong foundation for an ebusiness infrastructure, with ample room to grow as the prevailing strategies and technologies continue to evolve.

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