Compliments of

Pivotal eRelationship™ Architecture

ENABLING eBUSINESS RELATIONSHIP MANAGEMENT WITH WINDOWS® DNA

PIVOTAL CORPORATION

White Paper

This white paper compares alternative approaches to enabling electronic business relationship management (eBRM) in an organization's internal front office operations and extended enterprise. It also describes how Pivotal's implementation of the Microsoft® Windows DNA architectural vision is the Internetworking solution of choice for enabling eBRM today, and the foundation of choice for the future.

"Pivotal consistently wins praise and recognition for creating and delivering award winning products. Together we form a powerful team that provides companies with robust eBRM solutions."

JEFF RAIKES
Microsoft Corporation

Publication Date: July 1999

Pivotal Canada
300–224 West Esplanade
North Vancouver, BC
Canada V7M 3M6

Telephone: (604) 988-9982
Facsimile: (604) 988-0035

Pivotal USA
Plaza at Yarrow Bay
10210 N.E. Points Drive
Building 3, Suite 400
Kirkland, WA
USA 98033

Telephone: (425) 455-4230
Facsimile: (425) 455-3972

Pivotal Europe
Hamilton House
111 Marlowes
Hemel Hempstead
Herts, HP1 1BB
United Kingdom

Telephone: +44 1442 248427
Facsimile: +44 1442 243012

www.pivotal.com

Part# 07–00–529A
Revised 10/6/99

CONTENTS

BACKGROUND

Electronic Business Relationship Management (eBRM) is the discipline that is dedicated to improving the effectiveness of front office business operations between organizations through technology. eBRM is the fusion of traditional Customer Relationship Management (CRM), which enables the capturing of customer interactions, and eCommerce the capturing of customer transactions. Since it is now clear that eBRM is delivering on its promise of efficiently providing superior customer value, eBRM is rapidly being adopted by organizations across all business sectors. As a result, these organizations are seeking to extend the reach of their eBRM platforms. They want to reap the benefits they have gained from certain eBRM point solutions throughout the entire breadth of their internal front office operations, as well as their extended enterprise.

As eBRM platforms are extended to address all the front-office needs of the organization and the collaborative needs of the extended enterprise, the choice of underlying technical architecture becomes critical. Organizations need to ensure that they make investments today in the correct foundation, that will allow them to take advantage of new opportunities for improving eBRM with the ever-increasing capacity of the Internet.

Pivotal Corporation, always at the forefront of the Microsoft architectural vision, is the first eBRM vendor to exploit the Windows DNA vision with the launch of Pivotal eRelationship, Pivotal's third generation of Internet products.

Awarded "Best Overall Customer Management Solution" at Microsoft's Industry Solution Awards in 1999 by an independent industry panel, Pivotal Corporation remains at the forefront of exploiting Microsoft technologies to deliver superior eBRM solutions.

This white paper compares alternative approaches to enabling eBRM in an organization's internal front office operations and extended enterprise. It also describes how Pivotal's implementation of the Windows DNA architectural vision is the internetworking solution of choice for enabling eBRM today, and the foundation of choice for the future.

ALTERNATIVES TO ENABLING eBRM

To understand the technical requirements of today's eBRM applications it is helpful to review the technologies that have been used to address eBRM challenges over the past five years.

CLIENT/SERVER ARCHITECTURE

Early client/server applications, such as sales force automation, were widely adopted by organizations in the early 1990s. It had become clear that dramatic benefits emerged when an entire sales force had access to up-to-date information, complete customer histories, and the power of automated workflow.

Along with the benefits of these early client/server applications, however, came a rising chorus of discontent from MIS departments. Their resources were squeezed by the increasing burden of keeping client/server software up to date on all client machines, as well as maintaining banks of modems that permitted remote access to corporate databases. In addition to these infrastructure challenges, database administrators had a difficult time maintaining the integrity of the corporate databases – client machines had direct access to critical database resources, often resulting in corrupted data and many late nights restoring databases from backups.

EARLY INTERNET-BASED APPLICATIONS

Starting in the mid-1990s, the Internet gained rapid acceptance as a way of sending email and publishing static pages to large audiences quickly and easily. eBRM vendors held great hope that the Internet would allow ubiquitous access to corporate databases and deliver low total cost of ownership because no manual client-side software installation was required.

Some Internet-based eBRM applications proved to be successful, but they tended to be limited in their functionality. Although these new Internet-based applications were available anywhere you could connect to the Internet, the reality was that many front office workers did not have uninterrupted access to the Internet. They required an eBRM solution that worked when they were disconnected from the network.

A classic example of this situation is a sales representative who is doing last-minute preparation for a sales call while sitting in a car in the prospect's parking lot. The Internet was not a viable solution in that situation. Therefore, client/server eBRM applications that could replicate a portion of the corporate eBRM database to a user's local machine continued to control the largest portion of the market.

INTERNETWORKING ARCHITECTURE

As organizations familiarized themselves with the potential that the Internet offered, as well as with the drawbacks that are inherent in any immature technology, they began to search for a solution that offered all of the richness of client/server applications, but also leveraged the seemingly endless potential of the Internet. A new architecture emerged as the ideal platform for enabling the extended enterprise: the internetworking architecture.

The fundamental difference between the internetworking architecture and client/server or early Internet applications is that corporate data, the operations performed on the data, and the interface by which users interact with these business operations were separated into three clearly-defined tiers, and all the tiers communicate using Internet standards. The benefits from this architecture are vast and it has many advantages over other architectures.

The main features of an internetworking architecture are described below.

• **INTERNET READY** Applications can have the functionality of client/server applications, as well as the global reach and on-demand communication capabilities of the Internet. All communications are done via the Internet, which saves on long distance charges and makes banks of modems to support dial-up access at the server end obsolete.

• **INTEROPERABILITY** Using open protocols and standards, disparate three-tier internetworking applications can share data easily and seamlessly.

• **REDUCED COMPLEXITY AND IMPROVED RELIABILITY** IT professionals can focus on solving business problems rather than acting as system integrators because key services are an integral part of the operating system, exposed in a unified way through components. All database operations are performed through components in the middle tier assuring data integrity is maintained.

• **LANGUAGE AND TOOL INDEPENDENCE** The Component Object Model (COM) of the three-tier internetworking architecture gives developers the flexibility to use the language and development tool most appropriate to the task.

• **LOWER TOTAL COST OF OWNERSHIP** Three-tier internetworking applications are easier to deploy, manage, and modify, reducing total cost of ownership on the desktop and server administration side.

• **FASTER TIME TO MARKET** Three-tier internetworking applications can be developed and deployed rapidly using mainstream tools.

THE WINDOWS DNA (DISTRIBUTED INTERNET APPLICATION) ARCHITECTURE

The Microsoft Windows DNA framework is an internetworking architecture. It specifies how to develop robust, scalable, distributed Internet applications that support a wide range of client devices to maximize the reach of an application.

Like the familiar PC environment, Windows DNA enables developers to build tightly integrated Internet applications by accessing a rich set of application services in the Windows platform using a wide range of familiar tools. These services are exposed in a unified way through COM.

Windows DNA is a three-tiered internetworking architecture model. The three tiers are defined as:

PRESENTATION SERVICES | **BUSINESS SERVICES** | **DATA SERVICES**

PRESENTATION SERVICES TIER

The presentation services tier defines the interface through which a user interacts with the application. Different users, as defined by the roles they play within the organization or the extended enterprise, will have different access methods to an application depending on the tasks they are required to perform. For example, a technical support representative who must query several knowledge bases and view complex support histories will have different interface needs than a manager who primarily views summary business reports.

Due to the different task requirements of users, Windows DNA defines three types of presentation in the presentation services tier:

- **THIN CLIENT** Browser-independent and focused on routine querying of information.

- **BROWSER-BASED** All the advantages of a thin client application, with the added feature of being able to function when disconnected from the network. Browser-based solutions are usually browser specific.

- **WINDOWS-BASED** Full Internet functionality merged with the richness of the Windows environment that power-users demand.

The presentation services tier gathers information from the user, sends information to the business services tier, receives results from the business services tier, and presents those results to the user.

BUSINESS SERVICES TIER

The business services tier is where the logic of a three-tiered application resides. The business services tier receives input from the presentation tier, interacts with the data services tier to perform business operations, and sends results to the presentation tier. It is at the business services tier that interoperability between disparate three-tiered internetworking applications takes place.

DATA SERVICES TIER

The data services tier comprises the corporate data. This tier stores data, retrieves it, and ensures that its integrity is maintained.

HOW PIVOTAL eRELATIONSHIP IMPLEMENTS WINDOWS DNA

Pivotal enables eBRM for the extended enterprise through Pivotal eRelationship.

Pivotal eRelationship has been implemented entirely based on the collection of technologies that form the Windows DNA framework.

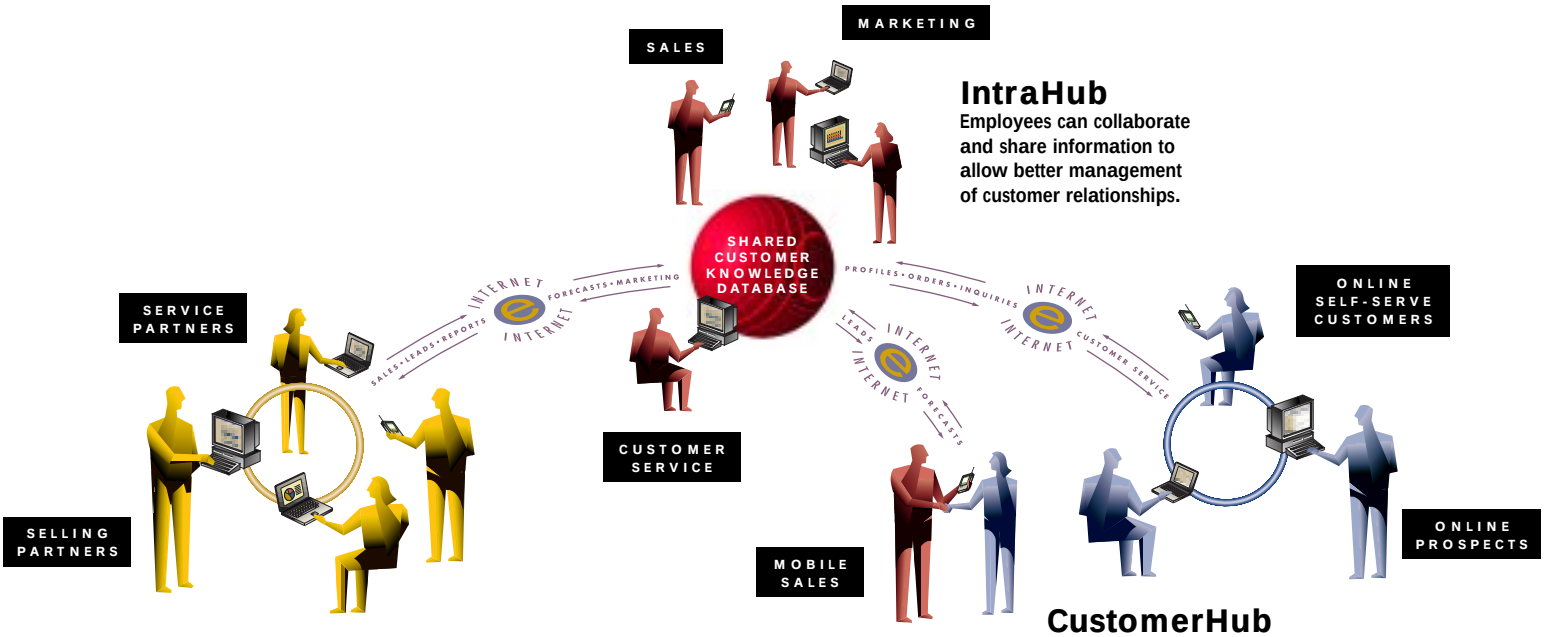
PRESENTATION SERVICES

Pivotal's eRelationship vision includes the three presentation interfaces defined by Windows DNA. Each interface is targeted to a specific group of users with specific functional needs. The Pivotal eRelationship suite consists of:

• **PIVOTAL eRELATIONSHIP INTRAHUB™** an Intranet solution that unifies front office operations and automates best practices to enable sales, marketing, customer support and operations to more accurately target prospects, decrease sales cycles, provide exceptional support and increase customer share.

• **PIVOTAL eRELATIONSHIP CUSTOMERHUB™** an Internet solution that enables businesses to transform a static information Web site into a dynamic collaborative tool used to service and sell to both existing and prospective customers.

• **PIVOTAL eRELATIONSHIP PARTNERHUB™** an Extranet solution that enables companies to establish Web sites that allow sales, marketing and customer service employees to coordinate their activities with partners that assist in the selling process.



PARTNERHUB, CUSTOMERHUB AND INTRAHUB THIN-CLIENT OPTION

PartnerHub and CustomerHub are thin-client options that use the power of Microsoft Internet Information Server (IIS) and Microsoft Active Server Pages (ASP) to provide browser-independent access for customers and partners in the

extended enterprise. PartnerHub and CustomerHub are designed to allow Pivotal customers full access to the source code if required. This enables them to modify the applications and merge them seamlessly with the look and feel of their own Web sites.

IntraHub provides three client options: IntraHub Thin-Client option, IntraHub Active Client option, and IntraHub Windows Client option.

• **INTRAHUB THIN-CLIENT OPTION** IntraHub Thin-Client option uses IIS and an Internet Server API DLL (dynamic link library) to provide an organization's front office workers with immediate access to the centralized corporate eBRM database. IntraHub Thin-Client option supports a variety of browsers and requires no client-side download. It can be integrated with existing Pivotal installations without any modifications to the existing system. The thin-client option is an ideal tool for users who require quick access to review data or reports.

• **INTRAHUB ACTIVE CLIENT OPTION** IntraHub Active Client option uses Microsoft Internet Explorer 5 and ActiveX controls to provide the richest possible functionality, while retaining all of the administrative benefits of a browser-hosted application. The ActiveX controls in IntraHub Active Client option also permit Pivotal to design for restricted bandwidth between the client and the application server.

Pivotal minimizes bandwidth requirements by giving application developers a powerful scripting environment to design "emissaries" that verify data before passing it back to the server. This scripting power is also the basis for extensive new application functionality.

Scripting allows users of Pivotal eRelationship to keep a library of scripts in the eRelationship meta database. These scripts can be used in multiple locations, in both the presentation and business services tiers, and can be replaced easily through synchronization stream. IntraHub Active Client option can be used either connected or disconnected from the Internet.

• **INTRAHUB WINDOWS CLIENT OPTION** IntraHub Windows Client option maintains all of the benefits of Pivotal's established Win32-based Pivotal Relationship Client, such as simple graphical workflow design, flexible multiple-window interface for power users, and training wizards. These features are augmented by powerful new integration with the Internet.

BUSINESS SERVICES

The Pivotal eRelationship business services tier (or middle tier) application server enforces business rules. It allows IntraHub to easily participate in distributed transactions with other enterprise applications, such as Internet commerce systems or ERP applications. To facilitate these distributed transactions, Pivotal eRelationship

applications are designed with the COM philosophy in mind – reusing important elements and designing all components with interfaces that are well-defined and discoverable. Customers who want to extend the platform can replace objects in the eRelationship middle-tier application server to suit their specific needs.

• **BIZTALK™** All forms used in Pivotal eRelationship have a metadata tier that can be used to automatically generate Microsoft BizTalk-compatible schema for eBRM.

• **XML** XML (Extensible Markup Language) can then be generated that matches the BizTalk schema from data associated with any eRelationship form. Pivotal is a member of the Microsoft BizTalk Steering Committee and is therefore at the forefront of the process to establish the Internet eBRM framework that will be at the core of Internet commerce.

• **MTS** All key database transactions in Pivotal eRelationship use Microsoft Transaction Server (MTS) to provide distributed transactions. MTS provides pooling of resources that eRelationship uses to offer unparalleled scalability.

• **MSMQ** Pivotal eRelationship uses Microsoft Message Queue Server (MSMQ) – which forms part of the COM infrastructure for data synchronization with mobile systems. MSMQ's guaranteed message delivery simplifies and streamlines synchronization. The eRelationship synchronization infrastructure underlies the eRelationship clients, allowing both the browser and Windows clients to be used on untethered computers. The MSMQ infrastructure also allows efficient distribution of meta information to a distributed enterprise, making the updating of application functionality an automatic process.

• **ACTIVE DIRECTORY SERVICES** With the release of Windows 2000 the administration of Pivotal eRelationship will become much simpler thanks to Active Directory Services (ADS). ADS allows eRelationship to dynamically query the directory to find key services and resources, rather than requiring manual configuration. In addition to reducing the initial setup cost, ADS completely removes the need for ongoing administration of individual machines as an organization expands and resources are reassigned to distribute load.

DATA SERVICES

The core of the Pivotal eRelationship data services tier is Microsoft SQL Server™ 7.0 – the only database that uses the same code base for both its server version and desktop version.

• **SQL SERVER 7.0** Using the same code base for the server version and the desktop version of the database greatly reduces administrative burden and data integrity issues. These issues were common when mobile users synchronized large volumes of data stored in one kind of database with the main data store on the server which was using another type of database.

• **ADO** All data in eRelationship is stored using ActiveX Data Objects (ADO) record sets – a lean, low-memory-footprint, data access model that's optimized for access over the Internet and intranets.

SUMMARY

The rapid adoption and large investments in eBusiness Relationship Management systems is being driven by the superior customer value that organizations with eBRM systems have been delivering, compounded by increasingly competitive markets. As recently as two years ago, eBRM point solutions were enough to remain competitive. Organizations now realize that an all-encompassing approach is required to create a sustainable, competitive advantage in today's Internet-driven marketplace. This approach must address the eBRM needs of the internal organization, the extended organization, and an organization's customers.

The Internet has caused a fundamental shift in nearly all facets of an organization's operations. The Internet is also at the heart of a fundamental shift in the architecture of information systems that make up the digital nervous systems of these organizations. Windows DNA is emerging as the clear internetworking infrastructure of choice. The benefits of investing in proven industry-standard technologies that are integrated into a unified application platform are rapidly becoming evident. Organizations who have adopted Windows DNA as their internetworking architecture are achieving reduced complexity, improved interoperability, language and tool independence, lower total cost of ownership, and faster time to market.

Pivotal Corporation, winner of the "Fastest Growing Windows CRM ISV" award in 1999, has a proven track record as a leader in exploiting new opportunities that can be leveraged from the Microsoft platform.

Pivotal was the first eBRM vendor to launch a 32-bit eBRM application for Microsoft Windows 95. Pivotal has continued this leadership by releasing the first Internet eBRM application, the first second-generation Internet application, the first eBRM application to leverage Microsoft SQL Server 7.0, and now the first eBRM application designed exclusively using Windows DNA technologies.

Pivotal customers enjoy the product leadership, support, and commitment of the unique partnership between Microsoft and Pivotal today, and will continue to enjoy these benefits into the new millennium as Pivotal continues to deliver outstanding eBRM solutions that leverage the Internet and Windows 2000.

"Pivotal sets the standard on exploiting all Microsoft platform technologies. They've taken our Windows DNA vision and created an innovative line of customer management business solutions."

CLARK GILDER
Microsoft Corporation

"Since its founding, Pivotal has consistently provided the leading customer management solutions for the Microsoft BackOffice platform. It comes as no surprise that Pivotal ranks among the fastest-growing ISVs for Windows."

TOD NIELSEN
Microsoft Corporation

PIVOTAL®

www.pivotal.com

Microsoft®

Microsoft Certified Solution Provider Partner

Industry Solution Awards 97 WINNER

Industry Solution Awards 98 WINNER

Microsoft BEST SOLUTION IN 1997 BY A SOLUTION DEVELOPER