

*MAS 90*  
*MAS 200*



*Technology*

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*MAS 90 & MAS 200 Technology  
White Paper*

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*November 2004*

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software

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## ***MAS 90 & MAS 200 Technology Overview***

Which technology is appropriate for Windows®-based business management software as we enter the 21<sup>st</sup> century?

To answer this question, we must first understand how business management and accounting software differs from other business applications, such as word processing or spreadsheet products, and what the unique requirements are for a business management software application. These requirements must incorporate the specific business and accounting needs of a particular business, and the associated workflow. Secondly, with the tremendous strides made in browser based development and Internet connectivity, there is the ongoing debate of when to use the browser and when not to.

In general, business management systems, especially accounting software, place much higher demands on computer hardware, operating platforms and communications protocols. In addition, since companies rely on their software to generate the invoices that bring in the cash flow, reliable systems are critical to business success.

This white paper discusses the capabilities of MAS 90 and MAS 200 technology, addressing the vast majority of business management system requirements, from small to mid-market businesses in virtually any industry. In discussing the technology, this white paper focuses on the advanced personalization and customization capabilities of MAS 90 and MAS 200 and the client server version of MAS 90. This paper will also discuss the technology future of MAS 90 and how the Internet can be leveraged for solving business issues today and into the future. For the purposes of this paper, MAS 90 and MAS 200 will be referred to as MAS 90. Unless noted, any capability within MAS 90 is also available within MAS 200.

## ***Technology Requirements of Business Management Software***

A high-level view of the specialized requirements of business management software platforms follows.

### ***Accounting is Transaction-Intensive***

While it may take several hours to create a single document in Microsoft® Word® or Excel® software, accounting systems can create several documents a minute. In addition, thousands of lines of detail may need to be posted to historical files several times a day.

### ***Many Users Need Access***

A fully integrated business management system removes the necessity of entering information twice, and can therefore contribute greatly to streamlining business processes. In order for all modules to be fully integrated (so that subsidiary modules can post to the General Ledger, for example), all users must have access to the database. A method of limiting the tasks each

*Accounting data contains crucial information businesses need to analyze profitability and the cost of business processes.*

user has access to is required as well; therefore security must be definable at the task level (i.e., invoice data entry).

### ***Data Integrity and Auditability are Critical***

Accounting data contains crucial information businesses need to analyze profitability and the cost of business processes. It has to be right for the company to succeed. Accurate business logic and a secure database ensure data integrity. Well-designed business management and accounting applications also provide a full audit trail of the data and prevent improper transactions from being added to the database.

### ***Access to Data for Reporting is Essential***

Pre-configured reports often do not present information in a way that is most meaningful and useful to corporate executives and business owners. Moreover, most companies prefer to standardize on a particular report writer for all of their applications to minimize the learning curve of staff members. Access to the data using the tool of choice to obtain precise, timely reporting from the accounting data is required to run businesses successfully. The information must be easily represented within these tools allowing customers to rapidly deploy reports that will help them make more informed decisions.

### ***Personalization is Unique by Individual***

Each user of a business management application has their own unique way of using the system to meet their own personal preference. These applications must offer facilities for users to make appropriate changes in the system that will ultimately help them streamline their day-to-day operations. They can range from task organization and reusable report settings to modified inquiries and report presentation. They must be easy to configure while still offering a robust set of usability options by user without compromising security and system integrity.

### ***Customization is Often Required***

Entering transactions into the system is often one of the most time-consuming tasks of running a business. Optimizing the system so that data flows quickly and accurately can ultimately lower the total cost of ownership. The ability to create modified screens that move or remove unused fields, change the tab sequence for data entry, and add lists of allowed entries to specific fields – without costly programming changes – can be an important strategic advantage. On the other hand, if a major modification or add-on module to automate business processes is needed, the availability of qualified developers and consultants and the ability to use the programming tools of choice are essential.

### ***The System Must Run Reliably***

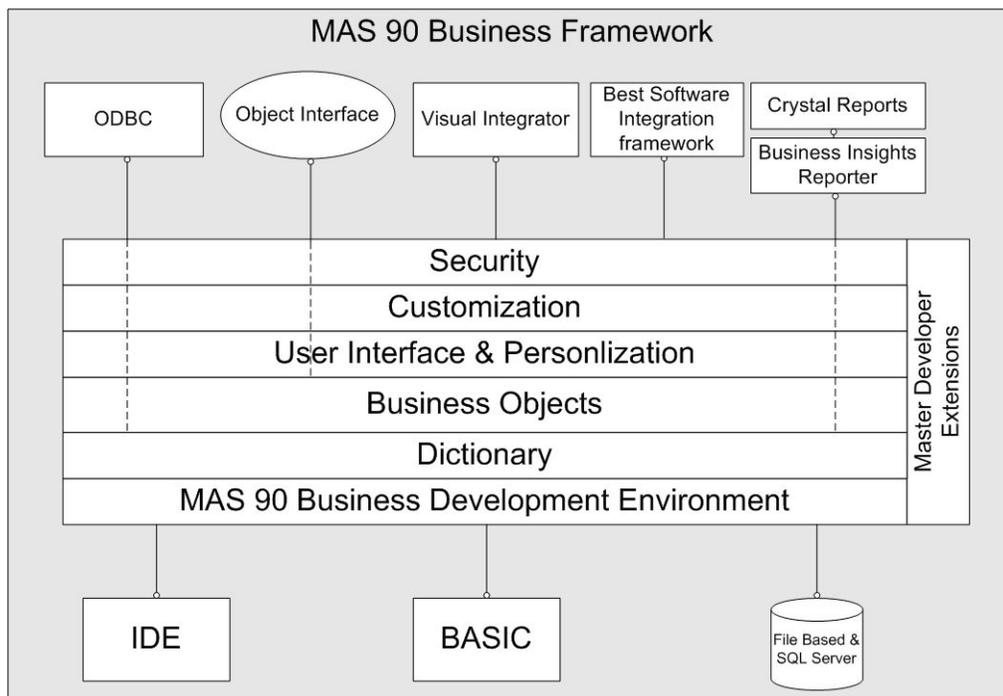
Although a system crash while editing a spreadsheet is an inconvenience, chances are it won't result in the business losses that can occur when the system goes down. In order to avoid database administration headaches and possible loss of data, the database that the system uses should expand dynamically as more transactions are added.

### Consider Future Requirements

A business management system is a major investment in both time and money for most companies. A system that can continue to meet corporate needs in the long term is required. With the increasing pace of technological change, a business management system should be easily transportable to take advantage of new hardware, operating platforms and database environments in addition to leveraging the internet for remote administration, data access and consumer interaction.

## MAS 90 Business Framework

Based on today's business management and accounting software requirements, MAS 90 offers a proven technology through a comprehensive architecture - the MAS 90 Business Framework. The image below illustrates the multiple layers of the Business Framework from the MAS 90 development environment through the user interface and integration points. The following pages will explain the primary developer and user benefits of each layer within the Business Framework. The MAS 90 Business Framework has been incorporated within the General Ledger module as of this writing. The remaining MAS 90 modules will leverage the Business Framework over subsequent releases including Accounts Receivable, Sales Order, RMA, Bank Reconciliation and eBusiness Manager in the next major release of MAS 90.



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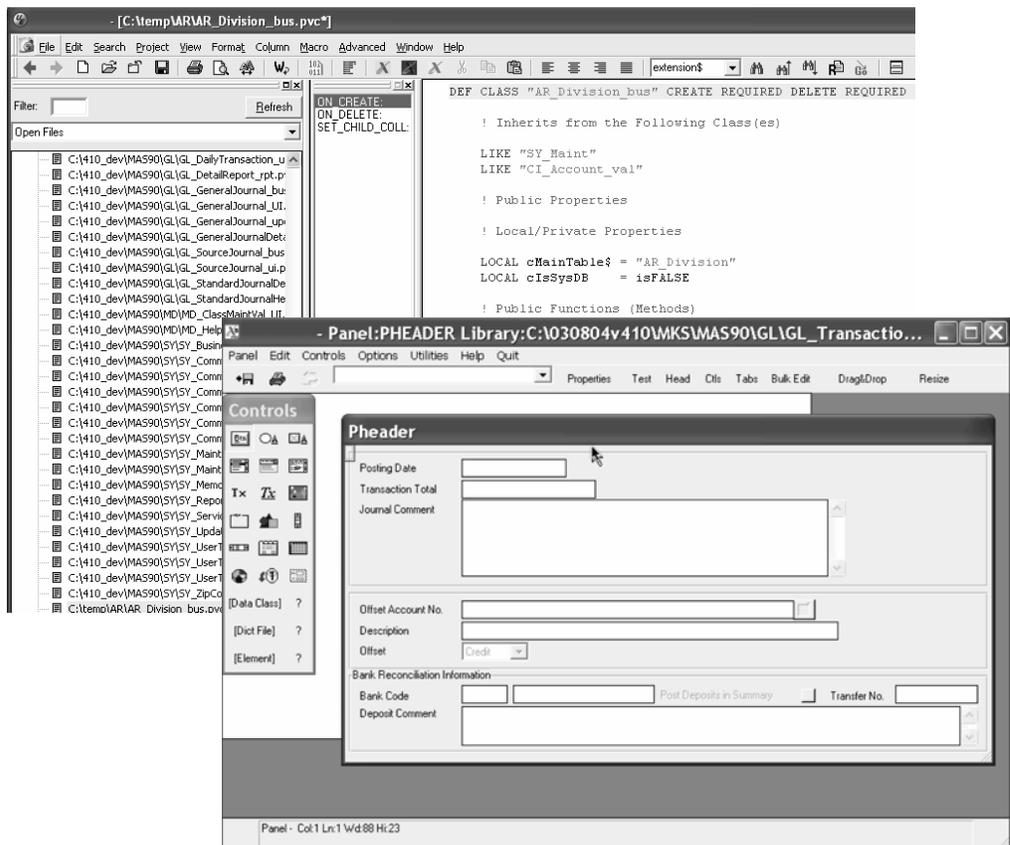
## MAS 90 Business Development Environment

The MAS 90 Business Development Environment (powered by ProvideX®) included with the Business Framework is the development language, database and tool set used by both MAS 90 Developers and a network of over 100 Master Developers. The MAS 90 Business Development Environment is a 32-bit graphical, object-oriented development platform written in C++. The C++ language yields programs that are extremely fast and efficient. C++ programs can be amassed with industry-standard compilers from Microsoft and other providers, and can operate on multiple platforms such as Windows and Linux. Best Software leveraged C++ as the foundation for the MAS 90 Development Environment to take advantage of the speed and stability of 32-bit compiled applications.

Like Visual Basic®, the MAS 90 Business Development Environment language has its roots in the original BASIC language. Unlike many "BASIC" languages, The MAS 90 BASIC syntax was specifically developed and optimized for efficient handling of business transactions.

The Integrated Development Environment, or IDE, included with the MAS 90 Business Development Environment is used for code editing as well as designing the Windows user interfaces for MAS 90 and MAS 200 applications. The MAS 90 IDE is used by MAS 90 engineers and Master Developers to quickly and easily enhance or modify the application interface.

*The Integrated Development Environment, or IDE, included with the MAS 90 Business Development Environment is used for code editing as well as designing the Windows user interfaces for MAS 90 and MAS 200 applications.*



Best Software has found that if significant additions to functionality or entire vertical modules are required, most companies choose to contract with an outside consultant. More than 100 Master Developers nationwide, authorized for the MAS 90 Development Environment, make this service readily accessible. In fact, since thousands of enhancements have already been created, the specific solution a company needs may already be available

For developers who prefer to augment the MAS 90 Development Environment with other tools to create additional modules and functions for their specific MAS 90 extension, a direct interface to popular programming languages such as Visual Basic, C++ and Delphi is provided. Programmers are able to create seamless links between MAS 90 programs and vertical applications using this interface. Programmers can also take advantage of popular add-ins such as DLLs, OCXs, and ActiveX controls. Using these ready-made objects saves programmers time and expands the functionality available for custom applications.

### ***Open Database Architecture***

MAS 90 Business Framework leverages an open database architecture that is specifically developed and optimized for handling business transactions in a network environment. Rather than allocating large portions of expense budgets on complex computer systems and IT departments, most companies prefer to focus spending on their employees to successfully sell products and services. The computer system and business management software should run with a minimum of attention and staff. The MAS 90 database offers a secure container that is not readily accessible from the outside without the ODBC data access kit. The database installs automatically with MAS 90, and requires no specialized knowledge to maintain or run. Therefore, no database administrator is needed to run the software. The data files inside the database expand dynamically, so there is no need to worry about running out of space — this is limited only by the capacity of the hard drive.

The MAS 90 database is able to process large numbers of transactions, and effectively handles the dynamic nature of those transactions (for example, item number and comment line types in an invoice). MAS 200 offers customers the option of Microsoft SQL Server in addition to the embedded database, allowing MAS 200 users to take advantage of other industry standard relational database management systems. Please refer to the MAS 200 for SQL Server White Paper for more information regarding SQL Server.

MAS 90's open database platform provides accessibility to the myriad of reporting and business intelligence tools on the market such as Cognos, Crystal and Microsoft Office. The architecture also allows data to be shared with outside applications through ODBC and for reporting, validation and integration purposes. Users and developers accessing MAS 90 data through ODBC are required to pass login credentials' ensuring sensitive accounting information is kept from unauthorized access. By leveraging ODBC, users can create ad-hoc reports and inquiries using the SQL syntax they are accustomed to. Access to MAS 200 data residing within SQL Server is also easily reached using ODBC with specific ODBC drivers available from Microsoft.

### ***User Interface and Business Object Layer***

At the core of the MAS 90 Business Framework is the business object and user interface layer. The user interface layer provides the visual aspects and personalization features of the

***MAS 90 Business Framework leverages an open database architecture that is specifically developed and optimized for handling business transactions in a network environment.***

application such as the maintenance and transaction entry screens as well as the dual grid controls and calendar lookups. The business object contains the required business rules for inserting, updating and deleting entity and transaction information. The MAS 90 Business Development Environment provides the infrastructure for merging the two together at runtime. Separation of the user interface from the business object also allows the business object to be used in other scenarios such as middle tier integration, various import routines and 3<sup>rd</sup> party integrations that may or may not require user interaction.

By providing a business object layer, MAS 90 objects can act as a central repository for all MAS 90 business rules, which ultimately eliminates duplicate code and increases maintainability. A consistent methodology was used when developing each of the business objects within MAS 90. Standard object classes for maintenance, transaction, validation and posting were used which defined the default properties and methods to ensure a consistent programmatic interface across all business objects. All validations are enforced within the business object such as; maximum field sizes, upper case field, range validation and numeric vs. alpha. All customizations that affect validation are automatically reflected and enforced within the business object.

Another benefit of separating the user interface and the business object is to allow for interchangeable user interfaces, from windows and browser-based forms to wireless devices. It also provides a consistent interface for external integration and import routines. Whether exposed through a COM interface or XML integration, the business rules within the Business Object are enforced the same as they are through the standard user interface.

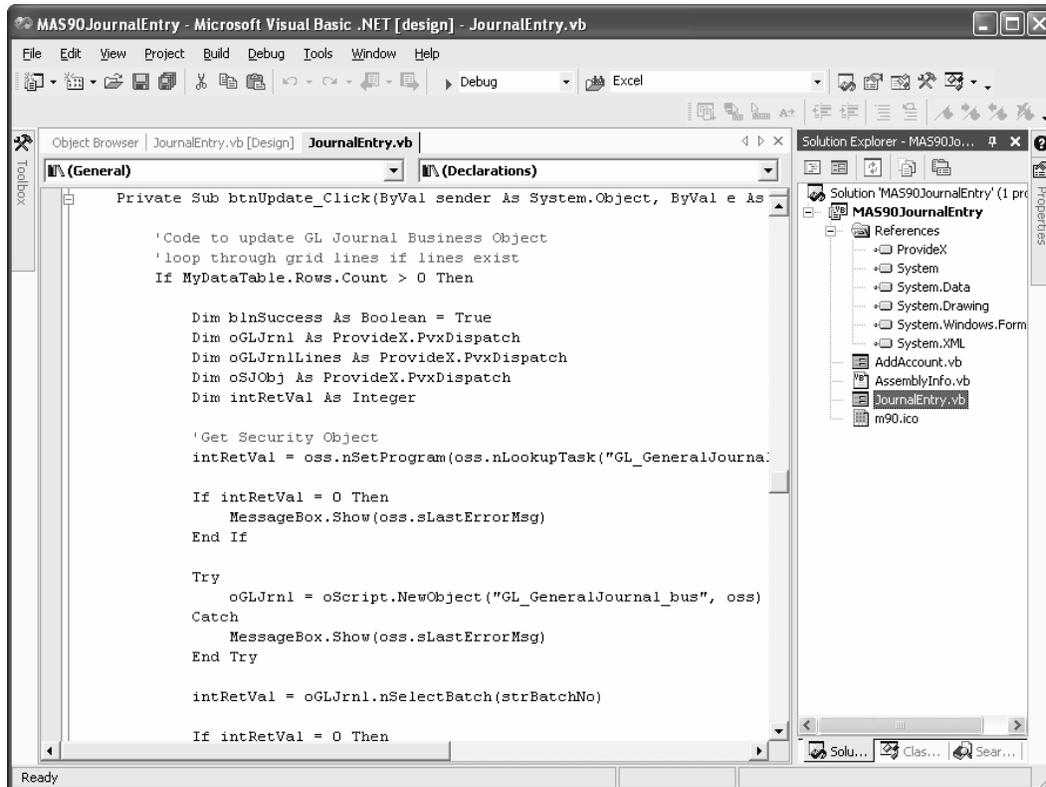
### ***Integration Platform***

MAS 90's robust integration platform provides an extensive set of tools and Application Programming Interface's (API) for developers and software vendors to integrate with MAS 90. By providing different options, developers can choose the optimal integration method that will best suit their custom solution or third party integration.

### ***Object Interface***

The MAS 90 Business Framework Object Interface provides developers and partners access to business objects within MAS 90 through a common and secure interface while offering them a development language of choice such as Visual Basic, C++, or Delphi. The object interface can be used for data retrieval and updates as well as complex transaction inserts. This ultimately provides developers with the ability to perform tight integrations with MAS 90 by leveraging the data validation routines within the MAS 90 business objects without modifying or reengineering the underlying source code of the application.

***By providing different options, developers can choose the optimal integration method that will best suit their custom solution or third party integration.***



Another aspect of the Object Interface is the ability to control the user interface associated with the business object. This can be extremely useful when user intervention is required by the user as part of the communication between the custom program and the MAS 90 business object. Portions of the user interface can be rendered to the user such as a dialog box or inquiry form.

### *Visual Integrator*

Providing write-back access to accounting data files directly, invariably will bypass audit trails and business rules within the MAS 90 application. MAS 90's Visual Integrator (VI) module, coupled with the object interface provided in the Business Framework, facilitates integration with other applications through a combination of import/export, scheduling, and scripting capabilities. This simplified end user driven interface excels at bringing two disparate data-driven applications together by synchronizing their data on a predetermined schedule without bypassing the business rules of the MAS 90 application. For example, you can create a tight integration with a Microsoft® Access® application in which VI automatically imports the Access data into MAS 90, performs MAS 90 tasks and exports the processed data back into Access, every evening. As an alternative to write-back ODBC access, Visual Integrator provides the robust import and export capabilities with the ease-of-use required by MAS 90 customers. VI is also used as the import hub for data migrations from other Best Software

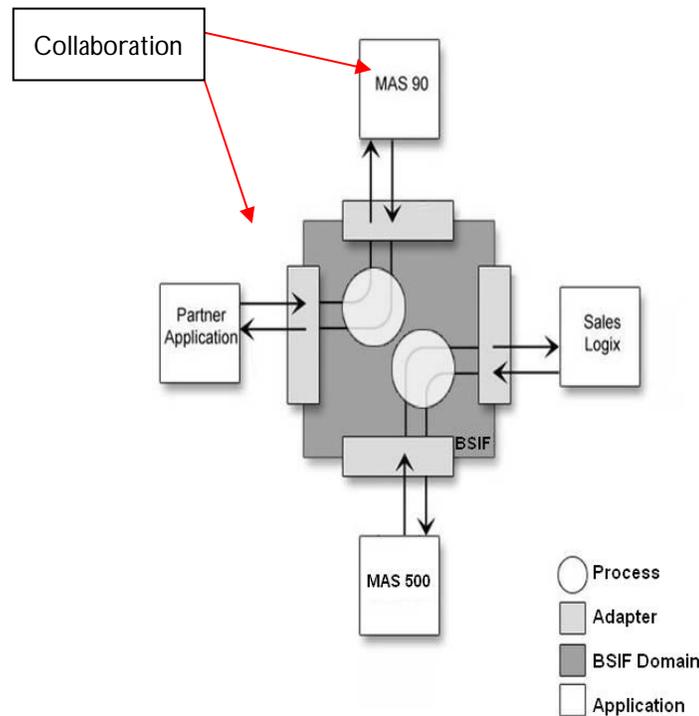
*As an alternative to Visual Integrator, the Best Software Integration Framework (BSIF) provides a common protocol based on XML Standards that enables data and process integration between various Best applications and third-party solutions.*

business management applications such as Peachtree and Business Works in addition to QuickBooks and other legacy applications.

**Best Software Integration Framework**

As an alternative to Visual Integrator, the Best Software Integration Framework (BSIF) provides a common protocol based on XML Standards that enables data and process integration between various Best Software applications and third-party solutions. The MAS 90 Business Framework provides a critical service to BSIF through its business object architecture.

At the heart of any integration leveraging BSIF are Collaborations. A Collaboration is the collection of adapters, processes and transformations that make an integration solution usable. (See illustration)



run in the Collaborations  
 (core), which is responsible for determining end points for communications, data  
 transfer/transformation between adapters, synchronization and scheduling of integration  
 events. BSIF domain

In a Collaboration, each application has an adapter that is responsible for controlling access to the application's data. This is done by an adapter's entities. An instance of an entity is the granular unit of information that is correlated between systems, e.g., account, vendor,

customer, and product. Entities both encapsulate a logical representation of tables and fields within the application database and their associated application logic, therefore providing external access to the underlying data. Adapters for MAS 90 can be easily developed by leveraging the various business object interfaces within the system.

A BSIF process is the data transfer driver between collaborated applications that effectively instantiate an adapter's functional components to make read only information available to another application as well as insert, update and delete information.

### ***End User Services***

The End User Service layer of the Business Framework provides the power and flexibility in security, customization and personalization with the ease-of-use that MAS 90 customers are accustomed to. MAS 90's guided wizards and drag and drop interfaces help alleviate the training burden a new system can place on an organization with the capabilities that can have an immediate impact on business operations.

### ***Security***

Security is an important aspect of any software system where sensitive financial information resides. MAS 90 includes role-based security as part of the Business Framework— a very flexible security system that allows customers to choose exactly who has access to system data and tasks, without requiring a large effort to implement. Users can be assigned to one or more roles, such as Payroll Supervisor or Accounts Payable Clerk. Each role in turn would then have specific task rights assigned to them.

Advanced security options within the Business Framework provide an even greater granularity including: full control, create, modify, delete, and view only. These can be set for each task within a particular role, allowing the administrator exceptional control over who can create, modify or delete entries.

MAS 90 leverages Windows Unified Logon as the default authentication option, which allows IT departments to configure user accounts and passwords once within their network infrastructure and apply them to various applications like MAS 90. These user accounts can be assigned to one or more roles within MAS 90.

### ***Customizer***

The powerful Customizer module allows users to change the application interface without programming knowledge. Unused fields on screens may be hidden, fields may be reorganized to reflect the way a company prefers to enter data, tab sequences may be modified to skip fields that rarely require input and lists of allowed entries for certain fields may even be added. In combination, these features can significantly improve the accuracy and speed with which data is entered into the system.

Command buttons can also be added using Customizer to run scripts that link application data to productivity tools such as Microsoft Word®. For example, a sample script that ships with the Customizer module launches Word, opens a template dunning letter, and populates

*Security is an important aspect of any software system where sensitive financial information resides.*

the letter with the customer information on the screen including; name, address, telephone number and balance due.

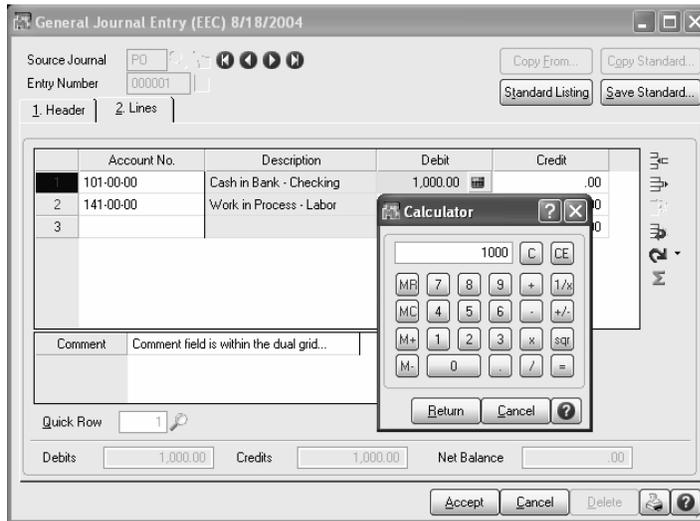
In addition to standard interface modifications, the most powerful feature of Customizer is the ability to add user defined Fields (UDF's) as extensions to the underlying MAS 90 database. UDF's can be added to data entry forms, inquires and embedded Crystal reports. MAS 90's easy-to-use administration tool for defining UDF's within the system, keeps the user shielded from the complex alter tables commands being performed behind the scenes. This gives the user the added capability they need to extend the system without being a software engineer. User defined fields created within the Business Framework can also be configured to automatically flow from current to history tables as well as across modules. This is made possible through the business object architecture, which automatically incorporates all UDF customization as a core layer within each MAS 90 business object.

As an extension to UDF's, users can also create User Defined Tables (UDT's). UDT's can be used as a means for creating validations and referential integrity against the UDF's within the system. For example, a list of valid custom project codes that a user could create and assign to a UDF within a given transaction entry form could be established as a UDT. The combination of Customizer and the business object layer provides a means for creating the UDT's and assigning the UDF's to them. The business object ensures that data entry is validated against the UDT and carried through the system from current to history tables in the exact same manner as the supplied database.

### *Personalization*

The MAS 90 Business Framework includes a wide range of features that increase efficiency and give users more of the tools they need to make informed decisions including:

- Dual Grid Design - Data entry interface can be personalized to individuals' workflow needs, for faster data entry. Columns can be resized and moved, between grids, according to how often they are used, or sorted and hidden within the grid. Lines are easily added, deleted, and reordered.
- Calendars and Calculators – Wherever a date or an amount is entered, a calendar or calculator dialog is available. The dialog will automatically populate the field selected, saving time and potential data entry errors.



- Saved Reports Settings – Pre-defined selection options for each report including sort, filter and printer selections. This makes running reports faster and prevents incorrect selection criteria during report processing.
- Desktop Task Organization – Users can choose to organize their daily tasks in a personalized task folder within the MAS 90 Desktop and base it on the workflow that best suites their day to day functional needs.

Another important capability in data entry is the ability to reset individual lines or return all modified lines back to their original values at the beginning of the session, should manual errors occur during entry.

**Advanced Lookup Engine**

One of the most powerful usability features incorporated within the Business Framework is the Advanced Lookup Engine or ALE. The ALE contains options that allow users to filter and customize the search criteria for any built-in lookup window. Users can create custom lookup views into the MAS 90 data by leveraging the data views definitions associated with the ALE lookup. Each data view contains a superset of information that a user may wish to inquire on giving them the ability to include information that other organizations may not require. The image below illustrates an example of adding Sales information to the customer lookup window. Users can also print or export the display list to Excel for further analysis and reporting. The ALE has advanced customization features that allow users to create custom numeric lookup fields as well as modify the attributes of an existing lookup field. Attributes such as the column heading, size and mask can be configured to a user’s personal preference.

*One of the most powerful usability features incorporated within the Business Framework is the Advanced Lookup Engine or ALE.*

The screenshot shows a 'Customer List' window with a table of customer records. A 'Lookup Customization Wizard' dialog box is overlaid on top, allowing the user to select or modify columns for a lookup. The wizard has two panes: 'Available Fields' and 'Selected Columns'. The 'Available Fields' pane lists various fields, with 'SalesPTD' selected. The 'Selected Columns' pane lists the current columns: 'Customer No', 'Name', 'Zip Code', 'Phone Number', 'Sort Field', and 'DateLastPayment'. The wizard also includes navigation buttons like 'Back', 'Next', 'Finish', and 'Cancel', as well as a 'Delete' button at the bottom left.

Customer No	Name	Zip Code	Phone Number	Sort Field
01-A&H	Adams & Hanks	92626	(714) 540-1414	
01-COLDWEL	Coldwell Banker	92670-1227	(714) 556-3824	
01-KDLL	Koll Development Company	92680	(714) 997-6251	GENERA...
01-NEXUS	Nexus Construction Co.	92714	(714) 332-4751	GENERA...
01-PENSKE	Penske Leasing	92850	(213) 544-3212	PENSKE
01-SADDLE	Saddleb...			
01-SIMMONS	SIMMONS			
02-FARWEST	Far Wes...			
02-LIBERTY	Liberty M...			
02-PRECISN	Precision			
02-SIMMONS	Simmons			
02-STEELE	Steele T...			
02-TAYLOR	Taylor D...			

## ***Business Insights Reporter***

As an extension to the embedded Crystal Reports included with MAS 90, the ability to create custom reports is an equally important component of any business management system. The inherent issue however is that not everyone has the time to learn the intricacies of data structures or the complexities of creating formulas within Crystal Reports. Business Insights Reporter helps alleviate those issues through a wizard-driven environment with the presentation-quality output and formatting options of Crystal Reports.



Data is presented in logical views provided through the Business Framework. The wizard guides users through all of the required steps to create a report such as the report format and output options including Excel, Adobe PDF or XML. Users can easily create calculated fields with simple point-and-click calculations.

The Crystal Reports design interface can then be used to enhance reports generated by Business Insights Reporter. Users may also create new reports completely within the Crystal Reports application by leveraging the data views provided through the Business Framework and ODBC

## ***MAS 200 Client/Server Technology***

### ***Addressing Expanding Business Management Technology Requirements***

For larger companies with expanding business management and accounting needs, the following key system requirements become critical:

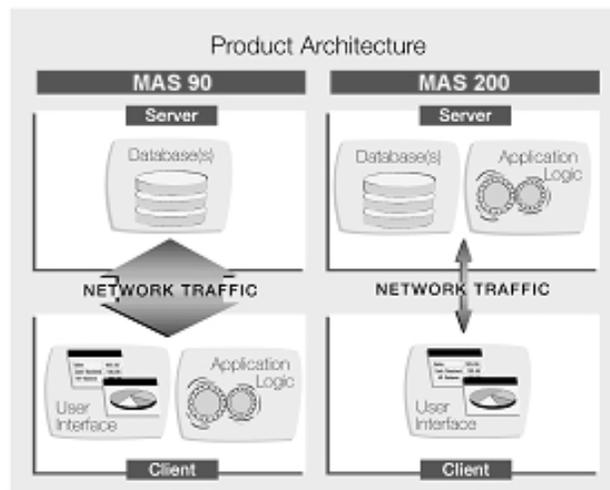
- Supporting large numbers of concurrent users.
- Functioning effectively in remote access environments.

- Harnessing Internet technologies.
- Processing large transaction volumes efficiently.
- Maintaining security, data integrity and reliability.
- Leveraging the power and scalability of the server.

### ***MAS 200 Client/Server Overview***

MAS 200's client server technology superbly addresses each of the above system requirements, making it an excellent solution for clients requiring a high-performance business management system. Let's examine in detail how MAS 200 technology addresses each of the key system requirements.

*MAS 200's client server technology superbly addresses each of the above system requirements, making it an excellent solution for clients requiring a high-performance business management system.*



MAS 200 technology separates the program logic, processing and data management tasks from user-interface processing tasks. All program logic, processing and data management tasks are performed on the application server, and all user interface tasks are performed using a thin client installed on the workstation.

Data transmission across the network is minimized; only the commands used to display the current screen and data are sent across it. Reduced network data transmission per user means that more concurrent network users can be supported using the same network bandwidth and, equally importantly, that MAS 200 can be run in low bandwidth environments like modem and WAN connections.

All data processing and data management tasks are performed on the server, rather than across the network, providing a 300% to 1000% increase in data processing throughput when using a dedicated application server. Data files are stored centrally on the server and are not transmitted across the network, enhancing the data integrity and reliability.

## ***Leveraging the Power and Scalability of the Server***

The client/server architecture of MAS 200 takes advantage of the power and scalability of the server to permit cost-effective performance upgrades. In the case of most LAN-based business management and accounting systems, in order to provide a performance upgrade to all users on the network, it would be necessary to upgrade not only the file server, but also every workstation on the network. This can be a very expensive project if there are a large number of workstations on the network.

In contrast, with MAS 200, upgrading the server to more powerful hardware – such as multiple processors, more memory and faster hard disks – can result in dramatic improvements in MAS 200 performance. Furthermore, these performance benefits are enjoyed by every MAS 200 workstation on the network, resulting in a lower total cost to achieve a significant performance boost.

MAS 90 and MAS 200 program code runs through the use of an interpreter optimized for each platform – allowing MAS 90 or MAS 200 to take full advantage of the server environment. Both MAS 90 and MAS 200 run using an interpreter that has been optimized for the 32-bit environment (both the server and the client component are 32-bit applications), providing enhanced performance and stability.

## ***Supporting Large Numbers of Concurrent Users***

The first step many businesses take to address growing needs is to move from a single PC to multiple PCs connected via a local area network (LAN), with the business management application running across the LAN. Typically, a central server is used to store the data files and the application files. PC workstations are connected to the server, thus allowing multiple users to access the same data files. Network users launch MAS 90 from their workstations, causing the MAS 90 application to be transferred across the network from the server to the workstations, and loaded into the workstations' memory space. Once loaded, MAS 90 applications access MAS 90 data files from the central server. This architecture is referred to as network computing.

This type of MAS 90 LAN configuration is inexpensive, simple to install and maintain, and works very effectively in modest LAN environments of two to 10 users. Since there are relatively few concurrent users, network performance is good, resulting in a responsive system that's easy to install and maintain. Users can work effectively because they gain the benefits of Windows, the ease of use and workflow of MAS 90, and the convenience of a central server for administration and backup of data.

As the number of concurrent network users increases beyond 10, performance begins to degrade due to network saturation – the amount of data that must be transferred across the network begins to exceed the capacity of the network. Network saturation manifests itself in a number of symptoms, one of which is slower application performance. With most LAN-based systems, the upper limit on the number of network users is determined by network capacity.

The optimal solution, therefore, is to use MAS 200, which minimizes network traffic between the workstation and the server and requires less network bandwidth. MAS 200 can operate

with a minimum bandwidth of 28.8 Kbps per workstation (56 Kbps per workstation is recommended). This is a fraction of the network bandwidth required to run LAN-based packages.

### ***Processing Large Transaction Volumes***

Businesses just starting out typically have modest daily transaction volumes. MAS 90 in a LAN environment can easily handle the posting of hundreds of transactions per day. In order to post transactions, MAS 90 retrieves data from the server, updates the data in the memory of the workstation, and then writes the data back to the server. Complex update transactions, such as daily sales order posting operations, require updating sales order data files, inventory data files, accounts receivable data files, and finally, General Ledger data files, all of which must be done across the network. The speed at which MAS 90 can perform complex update transactions is limited by the speed at which data files can be transferred across the network. Update transactions can be performed more quickly if the business data and the business logic can be kept together in the same memory space.

MAS 200 keeps the business logic and the business data in the memory space of the server. As a result, MAS 200 can perform complex update operations in a fraction of the time required by MAS 90 on a LAN — from 300% to 1000% faster. As a result, MAS 200 can handle thousands of transactions in minutes. Thus, for transaction volumes of hundreds of transactions per day, MAS 90 on a LAN is a good solution. As transaction volumes increase to the thousands and tens of thousands per day, MAS 200 provides a solution that can handle high transaction volumes quickly and effectively, minimizing the duration of daily processing activities.

### ***Functioning Effectively in Remote Environments***

Growing businesses often have a need to expand to multiple locations, or employ traveling salespeople in order to service customers more effectively. Remote locations have a requirement to access the system for functions such as entering orders or updating inventory. Typically, remote locations such as warehouses or retail outlets are linked to the main office using an ISDN line, or dedicated lines such as frame-relay or DSL, creating a Wide Area Network (WAN). The emergence of Virtual Private Networks (VPN) has given companies the option of doing away with the WAN architecture and utilizing the Internet as their network backbone. A modern business management solution must work effectively in both of these environments.

A salesperson on the road may need to dial in with a modem to the office, access the system, enter orders or check the status of a pending order. To achieve dial-in remote access capabilities, many systems require the purchase and installation of additional hardware and/or software, such as PC Anywhere®, or Citrix® MetaFrame® software. A modern business management solution should not need to rely upon additional hardware or software for remote access configuration; it should work effectively with standard remote access software provided with the current Microsoft Windows operating systems.

Even though MAS 200 does not require the use of additional software for effective remote usage, Best Software does support Windows Terminal Services and Citrix MetaFrame for MAS 90 and MAS 200. Terminal Services Software is included with Windows Server and

Advanced Server, (although additional Client Access Licenses may be required) and provides basic remote access to applications running on the Terminal Server. Citrix MetaFrame is an add-on to standard Terminal Services and provides greatly enhanced functionality; for example, MetaFrame gives users the flexibility to use devices attached to the remote client, even networked printers.

The cost of communications is another important consideration in choosing a multi-user business management solution. In recent years, the Internet explosion has resulted in the availability of a very low cost wide area network — the Internet itself —, which can be accessed from millions of locations worldwide at a fraction of the cost of a long distance phone line or other dedicated connection. The global span of the Internet, based on TCP/IP, has dictated the future standard of networking. Businesses and corporations are migrating to TCP/IP networking due to its robustness, connectivity flexibility, and of course, its widespread use as the fundamental networking architecture of the Internet. Today, the TCP/IP protocol is used both for the public Internet and on private corporate networks, referred to as intranets. It is clear that in the future, the requirement will be for all network applications to run on TCP/IP.

A business management system must be able to work effectively in both WAN and remote access environments, and have the capability to operate effectively in TCP/IP networking configurations in order to take advantage of the communications cost savings. In short, it must be able to run efficiently in an intranet (internal corporate TCP/IP network) environment or over the public Internet (public TCP/IP network).

The communications between the MAS 200 server and a MAS 200 client workstation is performed using TCP/IP sessions. The MAS 200 Host is responsible for handling all application and data processing, and the MAS 200 client workstation is responsible for presenting the user interface. Once a connection has been established, the MAS 200 server and workstation communicate with each other by sending commands across the network.

For example, to display a window filled with data, the MAS 200 Host will send commands to the MAS 200 workstation application instructing it to draw a window and fill it with appropriate data. The MAS 200 workstation processes the instructions and draws a window containing the data received — only the data necessary to fill the current screen is transmitted to the workstation. This thin-client architecture results in exceptional performance in low bandwidth TCP/IP networks, such as intranets and the Internet.

An additional consideration for operating across the Internet is security. Encryption of the TCP/IP session is desirable to ensure that anyone on the Internet who may be capturing data transmitted during the MAS 200 session would be unable to decipher the sensitive accounting data. Additional encryption functions, such as point-to-point tunneling protocol (PPTP), are already embedded in the current Windows operating systems. Security of the MAS 90 Client/Server host server is provided exclusively through the MAS 90 Client/Server application.

### *Data Integrity and Reliability*

Data integrity and reliability are critical requirements of any business management system. For larger businesses, these requirements become even more important, as any compromise of data integrity, security or reliability creates serious disruption to business activities.

As a business grows, and more concurrent users are added to the system, network traffic may increase to the point where network capacity is filled, resulting in network saturation. Networks with multiple network nodes that are functioning at or above network capacity are subject to increasing numbers of network transmission errors. Network transmission errors may result in corrupted files. In business management and accounting applications, this can have serious implications; key accounting information may be permanently lost or damaged. In another example, if power should be lost while the system is in the process of writing an updated accounting data file across the network back to the server, the data file could be damaged. Finally, there is also the risk that a workstation may corrupt the data due to faulty hardware (e.g., a bad memory chip, an intermittent hard disk failure, etc.). In the above configuration, the more workstations that reach across the network to touch (update) the data, the greater the risk of file corruption. Moreover, as the network grows in complexity, and the number of network nodes increases, the risk of data corruption grows.

MAS 200 addresses this issue through the innovative use of a client/server architecture that keeps both data and applications on the server, and minimizes network traffic. Since the data files are never transferred across the network, they are never exposed to the risk of network data corruption or workstation data corruption. Also, by minimizing network traffic, more concurrent users can be supported on the same network bandwidth.

### *Conclusion*

MAS 90 and MAS 200 technology provides the best possible basis for a business management system that may be quickly implemented, is low-cost, provides for efficient processing of accounting transactions, and runs on the platform of choice. For larger organizations, MAS 200 provides high performance business management and accounting (with an easy upgrade path from MAS 90), and a two-tiered TCP/IP-based client/server technology that is Internet-enabled. MAS 200 takes advantage of a thin-client application server model for exceptional performance on standard modem connections and across wide-area TCP/IP networks. For those businesses that require the functionality of relational database, MAS 200 is also available for Microsoft SQL Server providing a high performance yet cost effective SQL solution. MAS 90 and MAS 200 technology delivers excellent price/performance value – high performance and top-notch business management and accounting functionality in a competitively priced package.



insights for the life of your business™

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