ENTERPRISE 21 ERP
TECHNOLOGY INFRASTRUCTURE DOCUMENTATION

SECTION I – BACKGROUND

To maximize its opportunity to leverage information systems and achieve a strategic competitive advantage, an organization must choose from among many environments that are available today. Broadly speaking, a technology platform consists of three basic components: (1) an operating system; (2) a database; and (3) an application development environment. Platform selections must be based on the desired technological capabilities, the potential for future viability based on historical growth, and on the ability of the organization (information systems) to implement them in a reasonable time frame. More specifically, the technology platform that is chosen will directly impact the ability of the organization to implement their operating environment quickly and on the future options which will be available to the organization. In this section, we will examine the available technology platforms, and provide our recommendation regarding choices in each of the three areas.

SECTION I.1 - THE OPERATING SYSTEM

The Enterprise 21 application suite is designed to be utilized with essentially any operating system environment available on the market today. We have specifically chosen to take an 'open systems' approach to the application to insure its operability across any systems infrastructure which our customers might choose. Table I.1 shows a 'technology matrix' which defines the various operating environments which the Enterprise 21 application supports. The table is organized based upon the operating system environment of the database server. To use the matrix, simply identify the database and application server environments. If the far right hand column is GREEN, then the Enterprise Series products can operate in than environment. If the column is RED, then we have no solution for the listed combination of environments. The key element to this table is the wide range of available hardware and operating system platforms supported by the Enterprise 21 application. For organizations using the software, this translates directly into the ability of the application to readily migrate to new platforms as the organization grows. This, in turn, means that you will never be in a position where you will outgrow the software.

Database Server Operating System	Application Server / Client Operating System	Viable Enterprise Series Solution
Linux	Intel-Based Linux	Yes
Linux	Windows NT/ME/98/XP/2000/2003	Yes
OS/400	OS/400	No
OS/400	Windows NT/ME/98/XP/2000/2003	Yes
OS/400	Intel-Based Linux	Yes
Unix	Unix	No
Unix	Windows NT/ME/98/XP/2000/2003	Yes
Unix	Intel-Based Linux	Yes
Windows NT/2000/2003	Windows NT/ME/98/XP/2000/2003	Yes
Windows NT/2000/2003	Intel-Based Linux	Yes

Table I.1 – Database and Client Environments Supported by Enterprise 21

At a high level, the best way to think about the viability of a solution is simply to ask yourself whether the end-users would prefer to interact with simple character based terminals (green screen devices in the common nomenclature). If the answer to this question is yes, then the Enterprise Series products do not represent a viable solution.

The Enterprise Series products are all GUI based applications requiring an Intel architecture hardware environment on the client side (either Windows or Linux operating system). This can be provided either by placing a PC on each end-users desktop (a **thick client** environment) or by using a virtual PC (a device that 'looks' like a PC, such as a dumb terminal, hand held device, etc.) on each desktop (a **thin client** environment). Figure I.1 shows a pictorial representation of the thin and thick client environments. Within Enterprise 21, the thin and thick client environments can also be readily co-mingled, with any number of devices operating simultaneously in both environments. As a result, the user does not need to choose to be exclusively in one environment versus another.

Note that with any of the various environments, any ODBC compliant database can be used. However, we would strongly suggest that the chosen database be Oracle, Informix, DB2 or SQL Server. Please also note that SQL Server can only be utilized when the database server operating system environment is a Windows environment (NT/2000/2003).

Similarly, the hardware vendor used to supply the operating system for any of the listed scenarios is immaterial. The application will work with the hardware and

operating system flavor of any of the providers of UNIX (including, but not limited to, AIX, Solaris, SCO, HP-UX, etc.) as well as Linux (Red Hat, IBM, etc.).

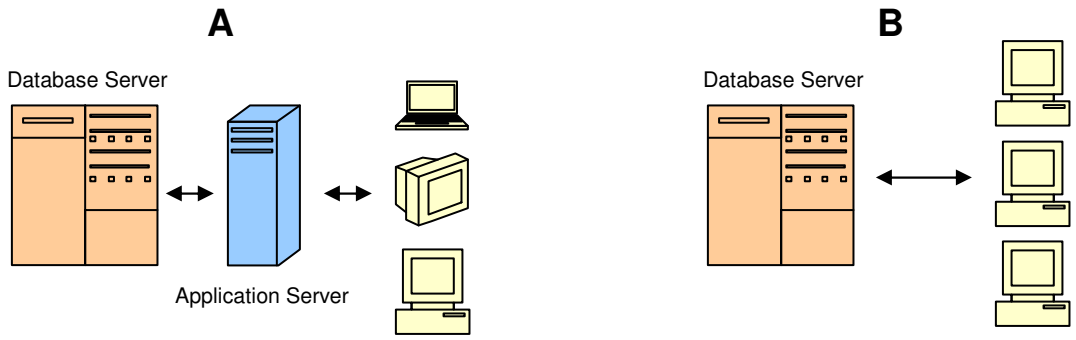

Figure I.1 – Illustrations of (A) thin client and (B) thick client environments

TGI proposes that our customers adopt open systems, and specifically the Windows 2003 operating environment for enterprise-wide database server systems. In addition, our proposal is to utilize Intel architecture PC's to provide "client" processing capabilities on an as needed basis throughout your organization.

SECTION I.2 - APPLICATION DEVELOPMENT ENVIRONMENT

Currently, there are three application development environments which can be utilized in any viable application: (1) "C" / Java programming; (2) programming utilizing the language native of the database product; and (3) a database independent programming environment.

The most important aspects of any development environment are:

1) The ability of the tool to utilize native drivers supplied by each of the database vendors;

2) The ability of the tool to utilize the concepts of class inheritance in a GUI environment;

3) The ability of the tool to support all current SQL standards for database query, update, and insert;

4) The ready availability of programmers who are familiar with the environment.

By utilizing a development environment with these characteristics, applications can be readily moved from one database environment to another. This allows an organization to have multiple databases installed, and still make use of the same

application development environment and software. In addition, migration from one database environment to another is readily facilitated with the use of a database independent development environment.

We have chosen ***Delphi*** as our pure GUI development environment because it satisfies all of the requirements for such an environment. It is the most widely utilized graphical development environment in the world today, significantly outpacing Visual Basic in terms of number of users. In addition, Delphi provides a direct web interface which allows application written in Delphi to easily be compiled to run on the web. Finally, the Delphi environment also is fully .NET compliant.

SECTION I.3 - HARDWARE

Precisely what hardware is utilized will depend upon exactly how you choose to operate (i.e., in a thin client, thick client or mixed mode environment). Below, we provide the base characteristics of Windows 2003 servers for the database server, application server(s) and thick client PC's. The suggested configurations represent the minimum recommended characteristics. Based upon transaction volumes, the database server can be upgraded to a quad processor machine.

A database server capable of handling the volume at you will need to have the following **minimum** characteristics:

Dual / Quad PIV Processor
Windows 2003 Server
4 GB RAM Memory
200 GB RAID 5 +Hot Swap Disk

An application server for each 15-30 users (based upon transaction volumes), each with the following **minimum** configuration:

Dual PIV Processor
Windows 2003 Server
3 GB RAM Memory
50 GB RAID 5 +Hot Swap Disk

In a **thick client** environment, each individual user PC should have the following characteristics:

Pentium Processor (as fast as affordable)
Windows XP/98/ME/2000
512 MB RAM
Any size IDE hard drive.

In a **thin client** environment, each desktop workstation can be any device with the following characteristics:

Windows XX / CE / Mobility
800 X 600 Screen Resolution.

Any Windows based PC's can also be used in a thin client environment.