interprise solutions

The

interprise suite™

INTEGRATED CONNECTED CUSTOMIZABLE

TECHNOLOGY

Microsoft© .NET Framework
The Right Technology for Today and Tomorrow

"SQL Server 2005 includes many new technologies that bring significant increases in developer productivity. From .NET Framework support to tight integration with Visual Studio, these features provide developers with the ability to more easily create secure, robust database applications at a lower cost. SQL Server 2005 enables developers to take advantage of existing skills across a variety of development languages while providing an end-to-end development environment for the database. Native XML capabilities also allow developers to build new classes of connected applications across any platform or device. "

- **Microsoft**

"Gartner believes that WinFX (The main technology behind the next version of windows) represents a significant step forward in Microsoft application design, but progress will come at a cost. While established Win32 applications will continue to run, a new application that takes full advantage of Avalon, Indigo and WinFS will not be backward portable to platforms other than Longhorn; although, the .NET Framework will be a backward portable subset of WinFX classes. Furthermore, the changes introduced by the Longhorn OS and the WinFX developer framework should spur developers to migrate to the .NET Framework sooner rather than later."

- Gartner Research

On the average, companies tend to switch business operation systems at least 5 to 7 years. This is most often due to the system's inability to keep pace with the change - specifically changes in the technology and the needs of the business.

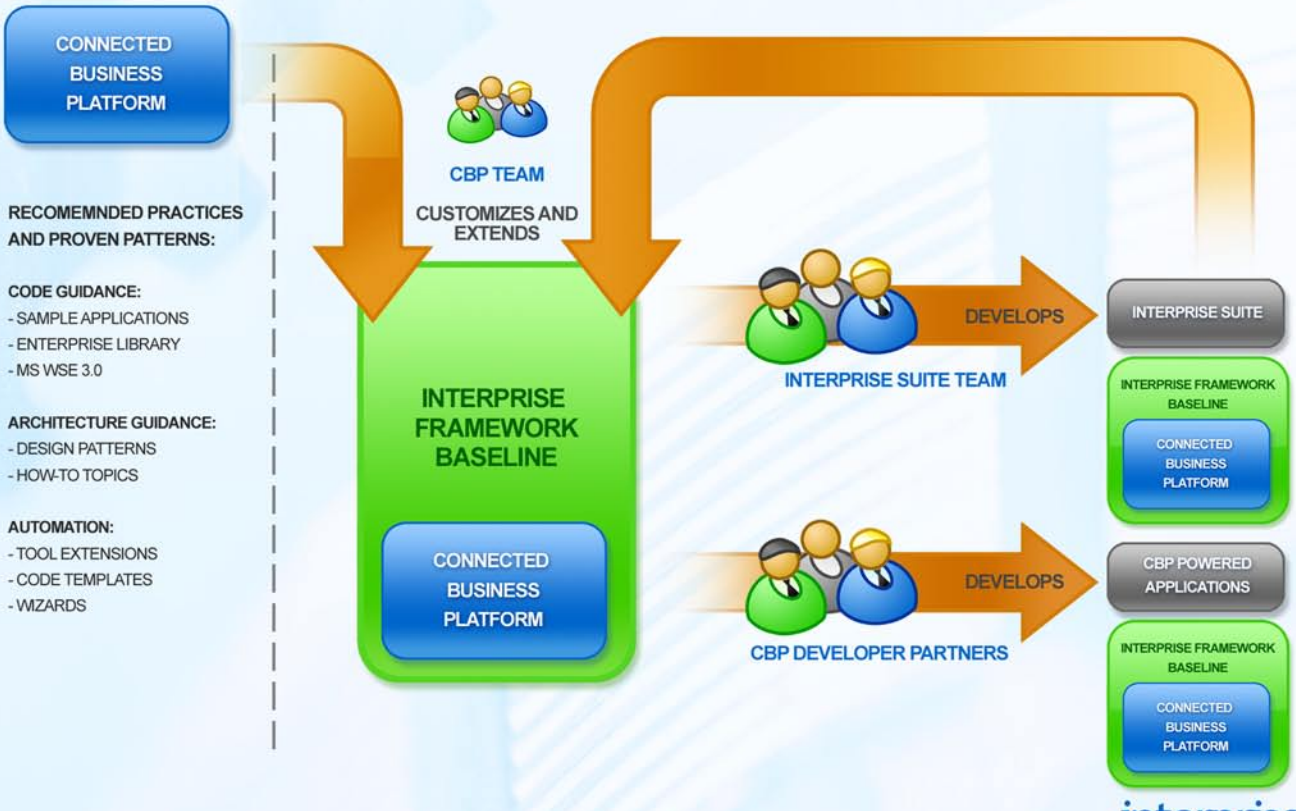
A major change is dawning as the core of windows based, "COM/DLL" "Win32" applications are being replaced with the new ".Net Framework 3.0" (WinFX) platform. Because most Windows applications are shifting to this technology, it would mean that applications based off of the old need to be completely "re-written" to be able to harness the power of .NET. As a developer or business owner looking to invest on time and money on the latest and greatest in technology, it is an important consideration to take in order to have the application endure not just for a couple of years.

The most substantial benefit of .NET applications is the new level of interoperability with other systems via the utilization of XML web services and web services. This interoperability allows data to be shared between company to company and system increasing efficiency, productivity and profitability between trading partners.

Enhancements for development using .NET include:

- Application platform for the future of Windows
- XML and web services
- Interoperability between applications and across platforms
- Expanded language support
- Extensibility of functionalities

Unlike business solutions that have upgraded over to .NET, Interprise Suite was built entirely from the .Net platform, fully realizing the interoperability and connectivity the .NET technology promises to bring. As a native XML application, other applications or functionalities are quickly and easily integrated into Interprise Suite, tightly connected to the business logic. This would be far more difficult to accomplish in an application that needs to translate XML internally. It is calculated that 97% of business would use some form of web services by 2010. The question then is not 'to upgrade or not" but "how to upgrade" to the new technology.



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INTEGRATED CONNECTED CUSTOMIZABLE

Smart Client Technology and Web Services

Developers looking to build a customized solution for their clients' issues need to choose an application that has solid architecture on which to build on. Such an architecture needs to be robust and relevant to the technology of its time; being able to capitalize on the useful features that are available on the current (and future) technological landscape. Selecting an outdated or obsolescent technology will be a waste of resources in the future because the application will be limited by the present environment and will never be able to achieve its full potential.

One of the most promising developments that have come out recently is Smart Client technology, an approach which seeks to bridge the performance gaps between Web applications and desktop applications. A means to achieve this is through Web services, the latest technology that makes for the creation of user-friendly and reliable applications that work in the Internet called Smart Client applications.

Web applications (applications that run within a Web browser) offer the ability to access data via the Internet but suffer from being unresponsive and totally dependent on the Web, limiting the features that the application can present. Desktop applications offer a wider range of features, improved user interface and takes full advantage of the local machine's processing power, yet lack the ability to work within the Internet. Smart Client applications combine the best aspects of Web applications and desktop applications in a single comprehensive solution.

Smart clients provide more and better options for connecting applications to networks and the Internet—and for working with applications even when disconnected from a network. They are designed to help get better speed and performance from applications, which in the long term can help employees be more productive.

- Microsoft

"Through smart clients, organizations can take advantage of a powerful combination: the traditional productivity of business applications and new Web-based technology that can help companies customize and streamline information access to create more connected, responsive, and agile businesses."

- Microsoft

"About 97 percent of large North American companies will have adopted some level of Web services technology by 2010, compared with 14 percent anticipated by the end of this year"

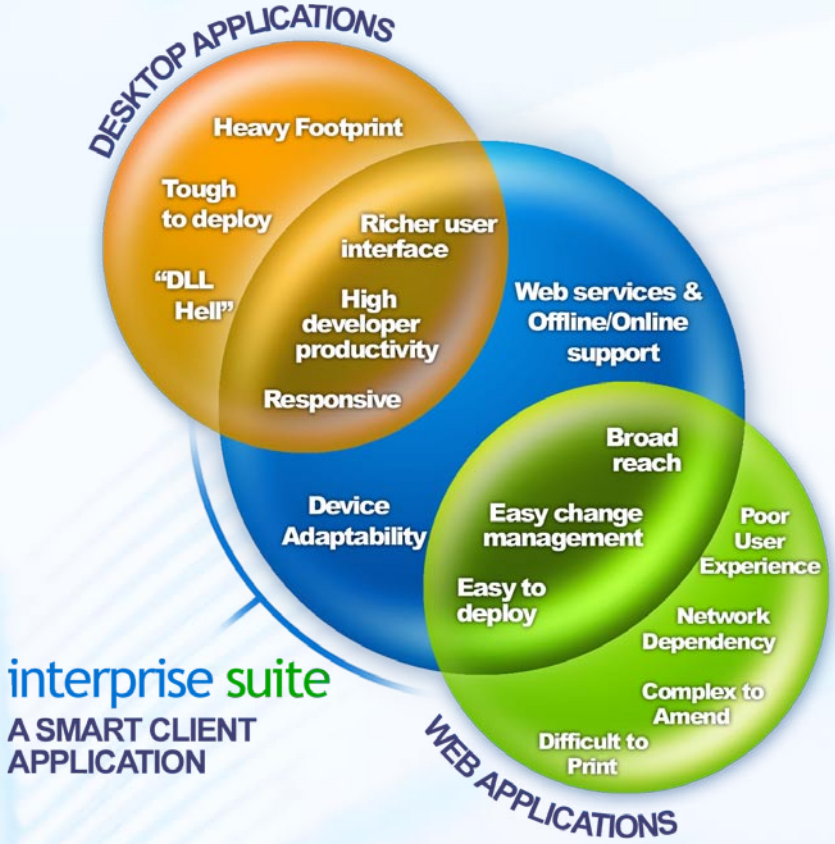
- IDC

"Smart Client Applications: The Best of Both Worlds—The Desktop and the Web"

- Jupiter Research

"Certainly, smart-client environments are the absolute future "

- Bank Technology News



Web services is one of the latest advancements that uses XML to provide a platform and language independent approach for applications to connect and communicate using the Internet. XML is a self-describing markup language that can be used for data exchange among seemingly disparate systems and is the de facto standard for Web communication for a great majority of software developers. XML forms the structure of Web service messages that are sent over the Internet. Typically, a system which utilizes Web services is comprised by a central server and one or many remote client applications. The server "advertises" the available methods that its clients can use through Web services and correspondingly the client application accesses these methods also through Web services.

Interprise Suite is a true Smart Client application. How is this so? Interprise Suite is designed from the ground up to fully accommodate Web services yet it is purposely filled with a myriad of features and functions that is typical for enterprise software. An Interprise Suite client application can connect with an Interprise Suite server application through Web services and exchanges and updates on data on both applications can occur correspondingly.

"XML Web services are the fundamental building blocks in the move to distributed computing on the Internet. Open standards and the focus on communication and collaboration among people and applications have created an environment where XML Web services are becoming the platform for application integration. Applications are constructed using multiple XML Web services from various sources that work together regardless of where they reside or how they were implemented."

- Microsoft

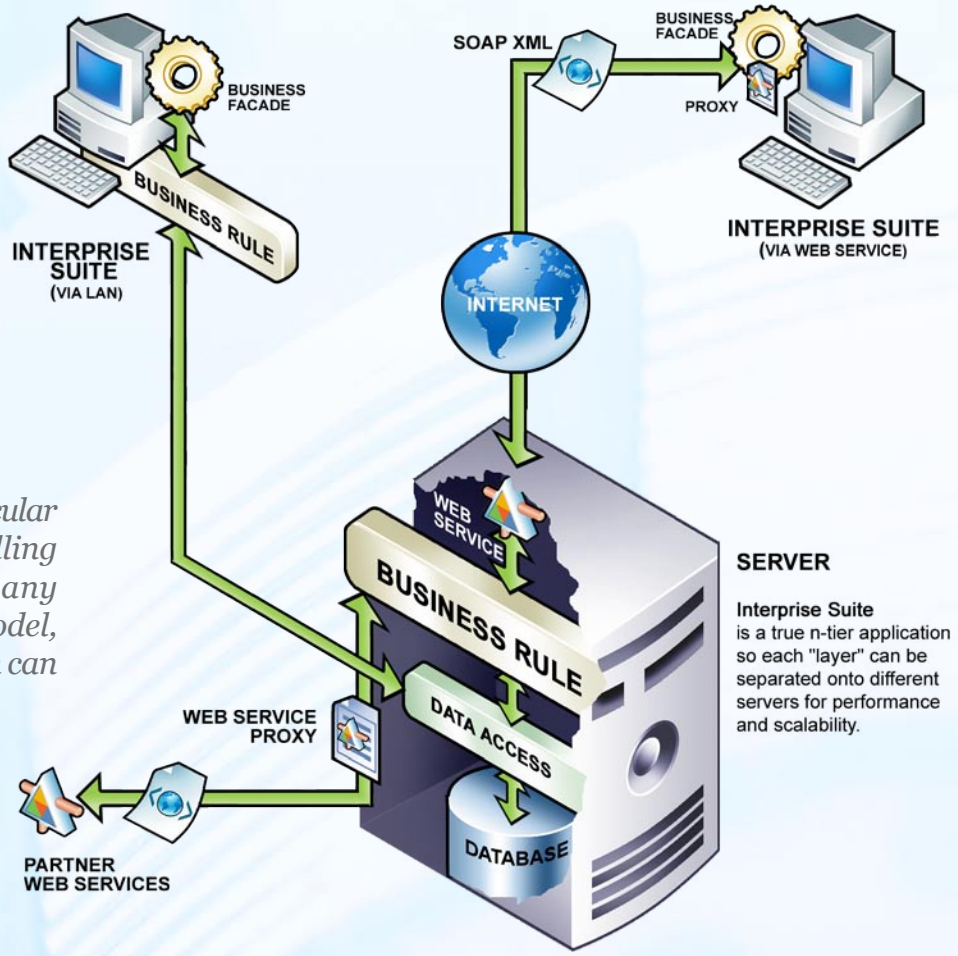
Since a Web service is not tied to a particular component technology or object-calling convention, programs written in any language, using any component model, and running on any operating system can access a Web service.

Having been created with Web services in mind, numerous methods that can be accessed locally are available to the remote client application through an Internet connection. In using Interprise Suite, users can enjoy the accessibility and improved performance of Smart Client applications while developers can tap into a great technology that will be around for years to come. Again, with 97% of businesses expected to use Web services by 2010, why invest your resources into applications that are not Smart Client based?

The Smart Client approach for Interprise Suite offers many advantages. Here are some of them:

- Uses the same user interface for both local and remote users, reducing programming time for the developer and training and implementation expertise for the client
- Optimal performance over the Internet since there are less overhead such as graphics and scripts to download like in Web applications
- Richer, fuller, and an altogether better user interface compared to Web applications
- Better performance in handling data because of the application's ability to cache data locally
- Interprise Suite's proprietary streaming compression reduces the size of data before it is transmitted over the Internet, significantly increasing data access performance. Also, unique compression keys located on both the client and server are never transmitted over the Internet, ensuring data security.
- The ability to use local computing resources for certain processes, reducing the load on the server and increasing scalability

With Smart Client technology, users and developers of Interprise Suite are assured of a product that will do its job locally like a desktop application and remotely like a Web application without sacrificing performance in either respect. Allying itself with a technology of great potential, Interprise Suite will be relevant for a long time.

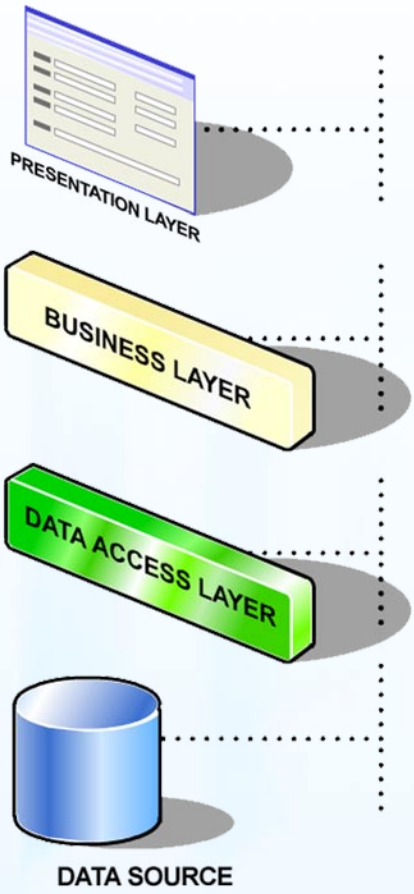


N-Tier Architecture

Business is an ever changing environment and anyone who does business knows this much is true. And so, it is important that the application would allow for the event that businesses would add, replace or modify functionalities of their business system - no matter how complete the system would seem. In view of this, Interprise Suite was designed to be fully customizable without relying too much on technical resources or hurting the stable base code.

How can Interprise Suite be modified or added to without compromising stability? With N-Tier architecture, where "n" is any number of distinct tiers that an application broken into. By deconstructing the main building blocks into tiers, each tier can be separated, can even be put in a remote computer system, distributing the processing load and increasing the scalability of the application.

Interprise Suite's architecture is composed of four main tiers or layers. Each one of these have specific functions:

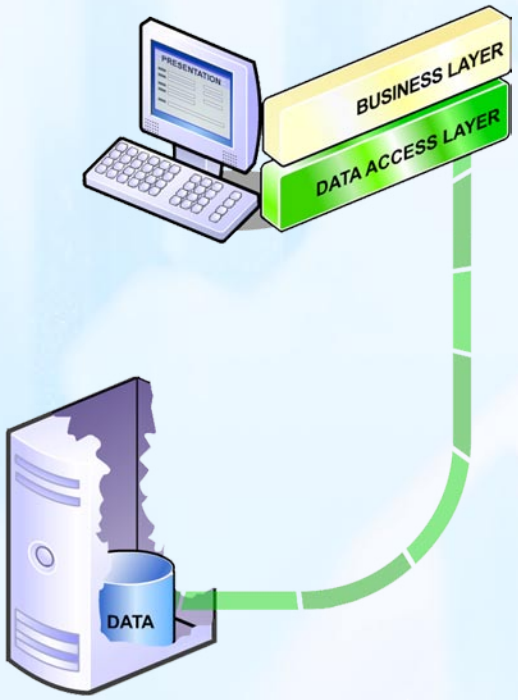


Tier One – The Presentation Layer displays the graphical interface in a manner that is understood by the user, and is also responsible for accepting input from the user.

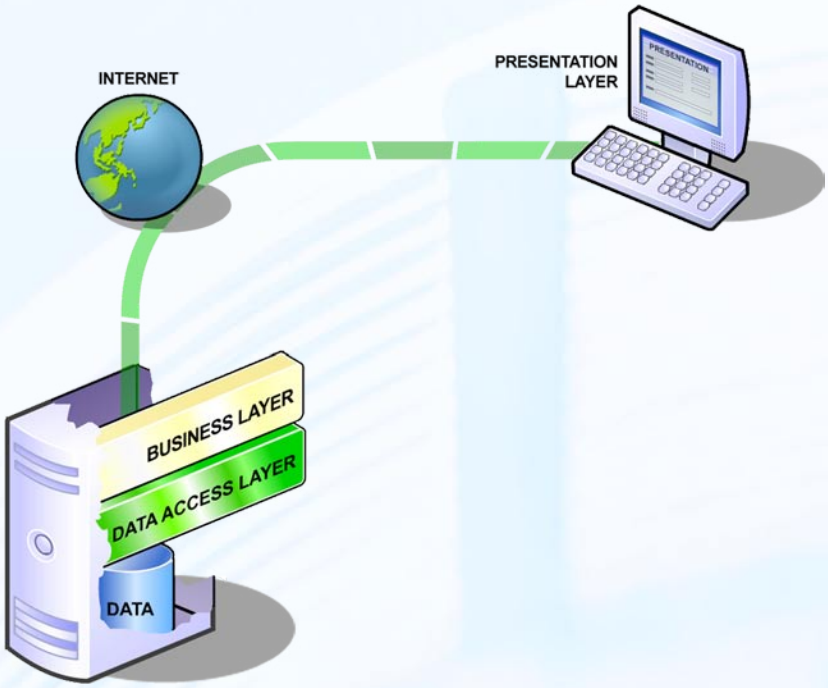
Tier Two – The Facade Layer is responsible for processing the information between the Presentation and Business Layers, and determines the best route that the data will take given that the database is connected either through LAN or the Internet.

Tier Three – The Business Layer (also called the Business Rule) applies the business logic that is used by the application and is the only layer that can communicate with the Data Layer directly.

Tier Four – The Data Layer stores the data that is used by the application and communicates with the Business Layer through a variety of data access tools.



VIA LAN CONNECTION



OVER THE INTERNET

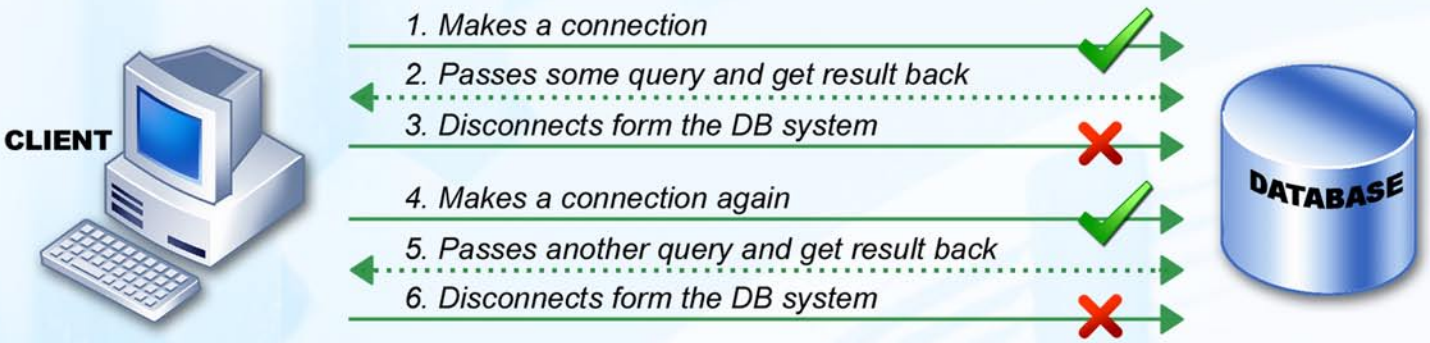
Advanced Data Handling

Interprise Suite uses the “disconnected data” approach in exchanging data with the database server. The “disconnected data” approach involves the application communicating with the database server only when needed; the connection to the database server need not be open all the time. Older applications employed the “connected data” approach with the database server, which means that the connection to the database is kept open while the application remains open. This approach has a number of disadvantages, however. A persistently open data connection is more susceptible to breaches in security and the number of separate applications that can connect to the database at a time is understandably limited. More importantly, having a persistently open data connection for the application’s duration can take a toll on system and network resources, severely reducing the optimum capability of the application and even the database.

Interprise Suite takes advantage of ADO.NET, the data access protocol which employs the aforementioned “disconnected data” approach. Firstly, in the “disconnected data” approach, when an application needs to retrieve or update data to the database, a connection is then opened to the database server. When the required task is finished, the connection is closed thereafter. By reducing the amount of time an application is connected to the database, system and network resources are greatly conserved and connection security is vastly improved. ADO.NET achieves this primarily by using datasets, disconnected, in-memory data caches that temporarily store data directly from an application like Interprise Suite. After the dataset copies data from the main database, the application can then manipulate the data within the dataset, all the while not being connected to the main database. The application can then update the main database from the dataset from time to time when needed. ADO.NET datasets use the XML format when communicating with the database, ensuring that the process is fast and efficient. Here is a diagram which illustrates how the “disconnected data” approach is applied in Interprise Suite.

Benefits of Disconnected Data

- Enhances the versatility of client/server and n-tier architectures
- Can handle a multitude of concurrent transactions with less impact on the system
- Enables greater scalability
- Provides better speed and efficiency by reducing network traffic
- Conserves valuable system resources
- Provides maximum security for the databases



Advanced Data Concurrency

The ability for more than one user to interact with one data record at the same time is called “concurrency”. Typically concurrency is handled on a per record basis with one user overwriting another user’s change. Interprise Suite uses a more advanced method of concurrency called “field level concurrency”.

Interprise Suite can detect changes in data made by another user after a record was opened. If there were changes, it begins comparing the data “field-by- field”. If the system finds that the concurrent users have not edited the same fields (e.g. – user 1 edited the address while user 2 edited the phone number) then the data is automatically saved preserving both users changes. If concurrent users edit the same fields (both user 1 and user 2 edited the address) the system alerts the last person attempting to change the data. The user is then presented with a number of choices of how to handle their changes.

Extendable Architecture

One of the biggest problems that a developer has when customizing the source code of an existing application is how to incorporate the updates and upgrades of the original application into the customized application. Developers have had to either completely "break" from the original application leaving them responsible for bug fixes, new features and technology changes or to spend hundreds of hours "reprogramming" their customizations into the latest versions of the original application "again and again".

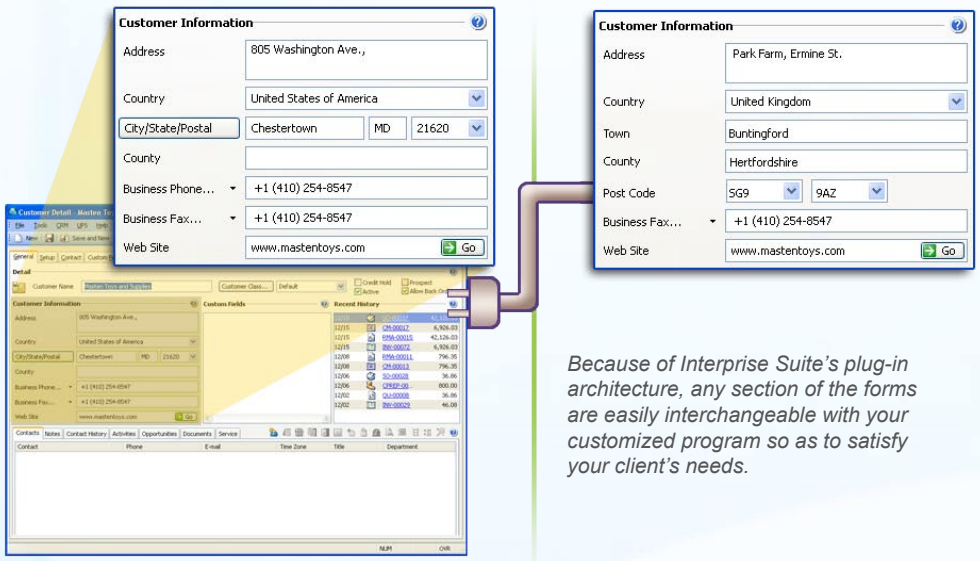
To overcome the problems associated with customizing the source code, Interprise Suite was designed with an extendable architecture that allows you to easily separate custom code from the main application code via .NET user controls that have been designed to "plug-in" to the Interprise Suite forms. In Interprise Suite every form is comprised of a base form that contains multiple .NET user controls (plug-ins) for the presentation of the user interface. By replacing one or more of the existing "plug-ins" with your own custom "plug-in(s)" you can change the functionality associated with that part of the form. As new updates and upgrades are available, you simply re-apply your custom plug-ins and your customizations are back in place.

This approach greatly simplifies a developer's ability to keep their customized application up to date while providing the customizations that their company / clients need. In addition to the extendable architecture, Interprise Suite also contains a number of pre-written code objects that greatly simplify common tasks such as searching for data, reading data, saving data etc. By using these prewritten objects as much as possible you are able to take advantage of the enhancements of these objects as the .NET platform evolves allowing your customized application to move to 64bit windows and Microsoft Longhorn much easier.

SAMPLE PLUG-IN CUSTOMIZATION

US compliant Address Information

UK compliant Address Information



Because of Interprise Suite's plug-in architecture, any section of the forms are easily interchangeable with your customized program so as to satisfy your client's needs.

MAIN APPLICATION

PLUGIN APPLICATION

...the way that components fit together in a plugin architecture as being similar to the way that pieces of a jigsaw puzzle fit together. As long as a jigsaw piece has the right shaped peg, it can connect to another piece that has a corresponding hole.

Thinking about plugins in this way, it becomes clear that some other more sophisticated configurations would be possible if we allow plugin components to have holes as well as pegs, i.e. if we allow plugins to extend other plugins rather than only allowing them to extend the main application. We can then have chains of plugins...

- Imperial College (London)

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