

**Web Enabling @ Trigyn**  
**using**  
**QuickWeb and EnWeb**  
**A Functional Perspective**

## **Web Enabling and Legacy Applications**

Web-Enabling is the development of the presentation layer and data access layers of legacy applications in a way that they can be accessed by a browser over an intranet, extranet or the Internet.

Legacy systems are the mission critical, important information resources currently available to an organization. They include existing mainframes, serial terminals, networks, databases, operating systems, application programs and all other forms of hardware and software that an organization owns. Typically they are, like most legacies, of great value to the organization, and are mission critical for an organization's business. Hence it is not viable to replace an entire system, nor is it feasible to change some of the programs that run on these.

Unfortunately, most legacy systems cannot easily or economically be extended to fulfill new requirements. There are however, a number of approaches by which a company may change from a legacy system to a state of the art solution without changing a single line of code and fully leveraging the benefits of existing systems.

Additionally, for mainframe systems, there is the requirement of 3270 terminals, which require direct connectivity to the mainframe. In today's world, it is personal computers and laptops that are common and not 3270 terminals or emulators. This is especially true in cases where employees need to access applications while on the move.

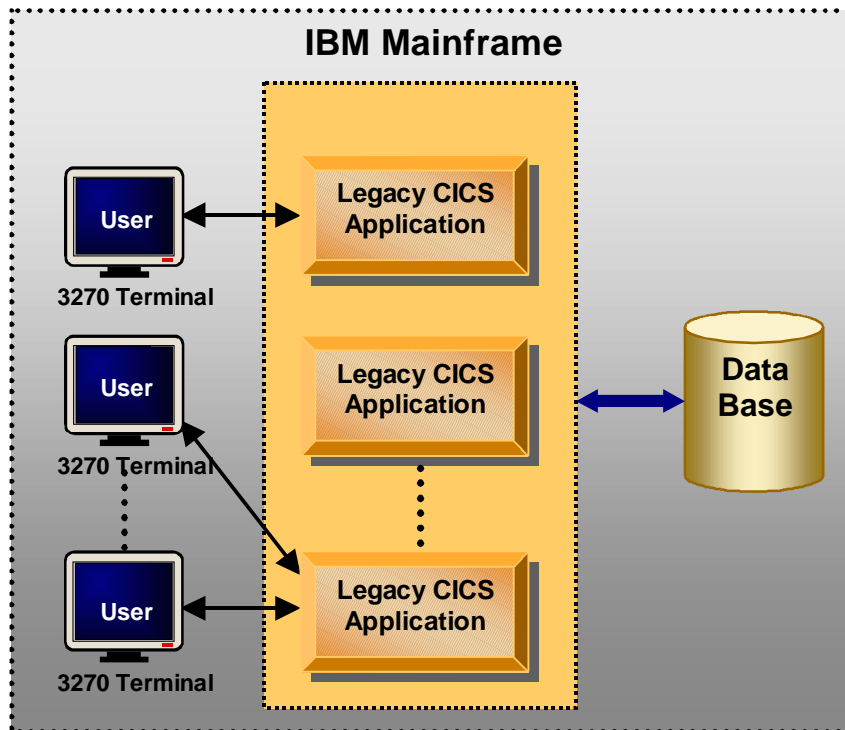
### **Why web enable?**

Web enabling extends the life of legacy applications and legacy databases that probably required quite an investment to create and install in the first place. It can be done quickly and efficiently without reinventing the wheel or modifying existing legacy code.

Accessing legacy applications from a web browser also gives all of the old applications a new, modern look and feel. In addition, the legacy applications can now be deployed on any web-based environment including corporate Intranets, the public Internet, and newer Extra-nets.

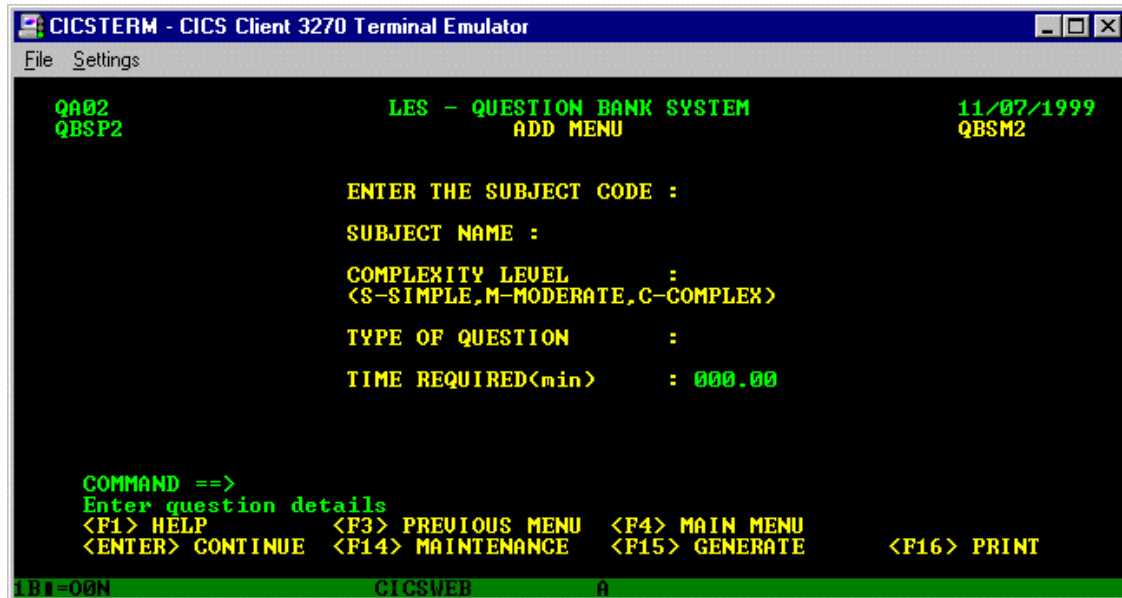
If an organization has a CICS-based application that it would like to be made accessible to its users over the Internet, then it is perfectly feasible with today's latest high productivity development tools to produce a solution at a cost much lower than one can imagine.

## World without Web Enabling



### Traditional Mainframe Environment

In a traditional mainframe environment, applications run in a closed kind of network requiring direct connectivity to the mainframe. Terminal emulators are used to connect to mainframe applications. These terminals need to be registered with the mainframe to allow them to access applications. The drawback of this environment is that remote connectivity is not possible and people on the move have no access to legacy applications. This proves a hindrance especially in cases of growing organizations where more and more people need access to applications on a daily basis from wherever they operate.



Terminal Emulated IBM Mainframe Screen

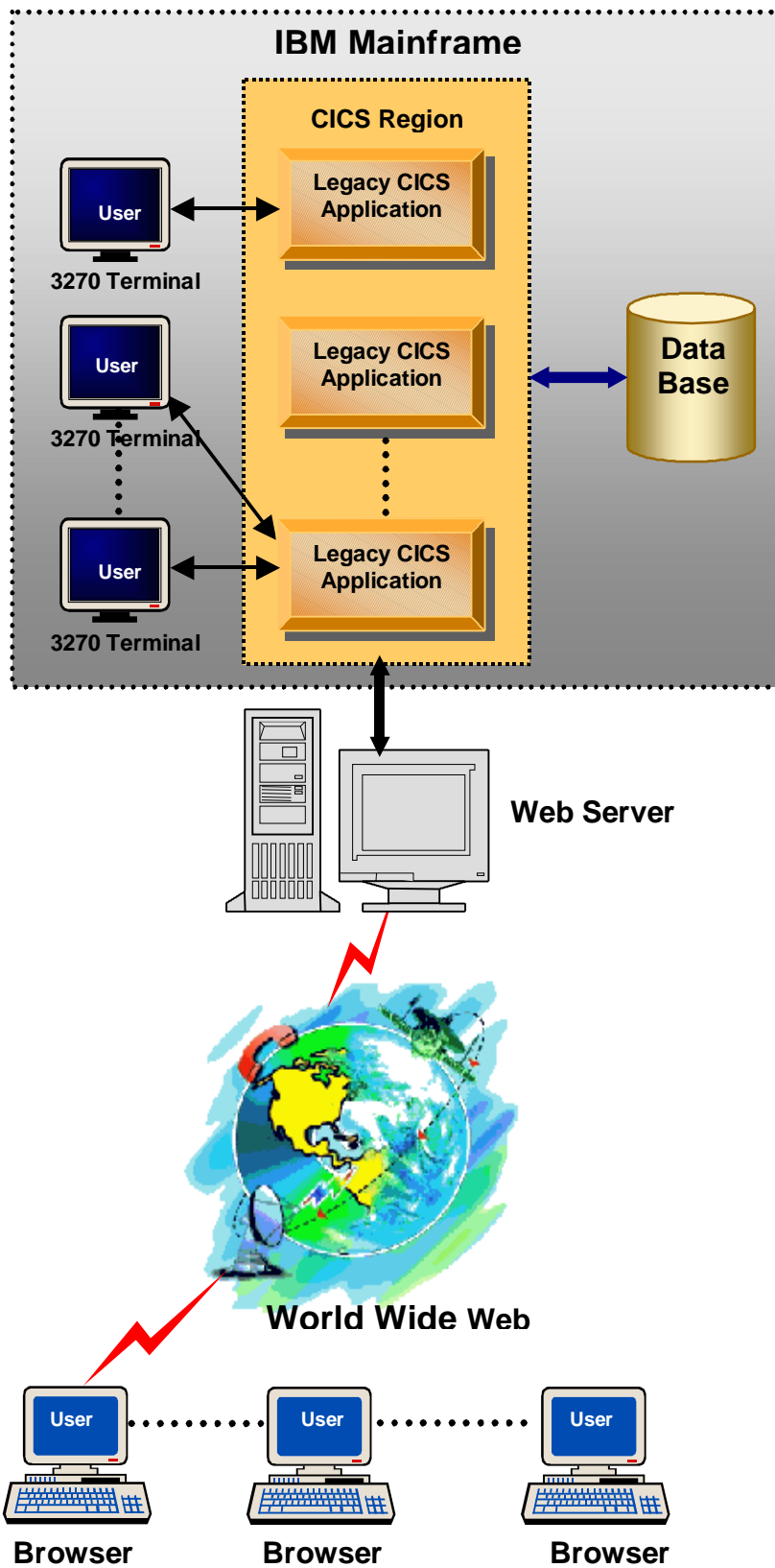
This is how the IBM Mainframe screen looks when emulated using terminal emulator. In this environment, user needs to be connected directly with the IBM Mainframe and hence remote connectivity is not possible.

## Trigyn's Web Enabling Solutions

Trigyn offers solutions to the above problems WITHOUT touching tried and tested legacy code and at the same time making existing CICS-based legacy applications accessible from the web. Trigyn has developed solutions to quickly web-enable legacy mainframe applications using CICS and any back-end. These are the 'on-the-fly' **QuickWeb** with a text-based user interface (similar to a legacy CICS screen) and **EnWeb**, which provides rich GUI. Both these tools use state of the art Internet technology and are developed with a view to avoid any changes to the existing legacy application.

The only thing needed by the end-user is a web browser and mainframe connectivity is achieved. The only direct connection needed to the mainframe is from the web server, which runs in a highly stable and secure environment.

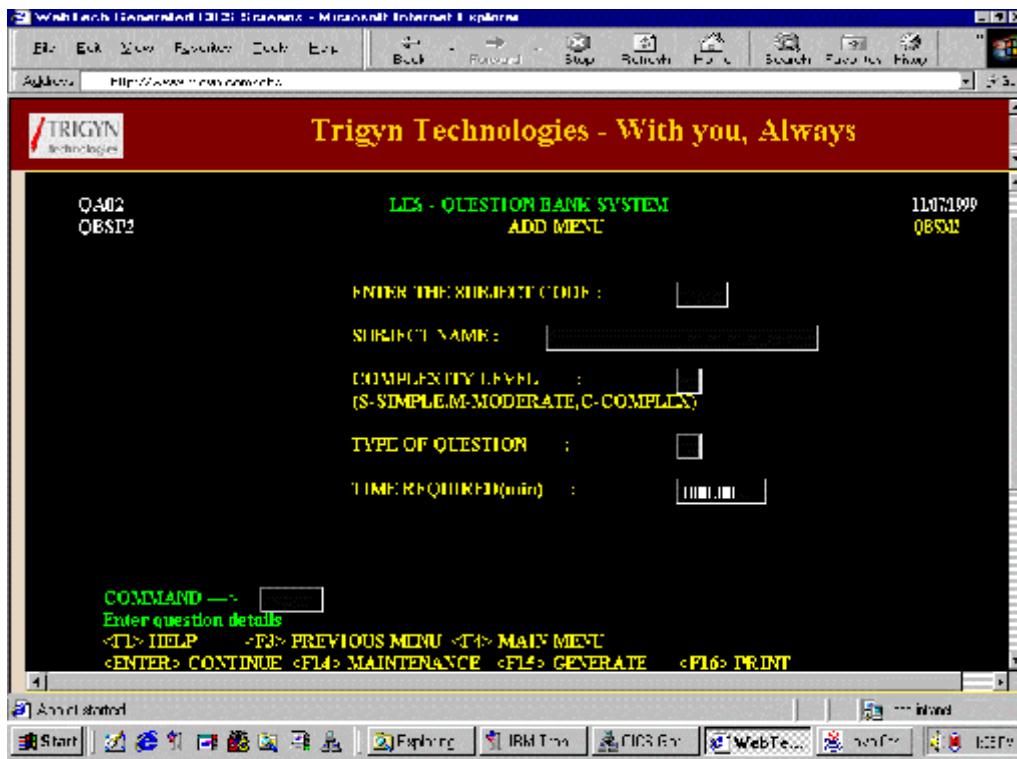
QuickWeb and EnWeb – A Functional Perspective



**Web Enabled IBM Mainframe Legacy Environment**

## QuickWeb – Making it work for you - INSTANTLY

QuickWeb is a solution that does exactly what its name suggests. It helps an organization web enable legacy applications in very quick time. QuickWeb gives access to legacy CICS-based applications from the web with the same look and feel as a CICS screen. It is a platform independent, backend independent and web server independent solution developed using state of the art Internet technologies.



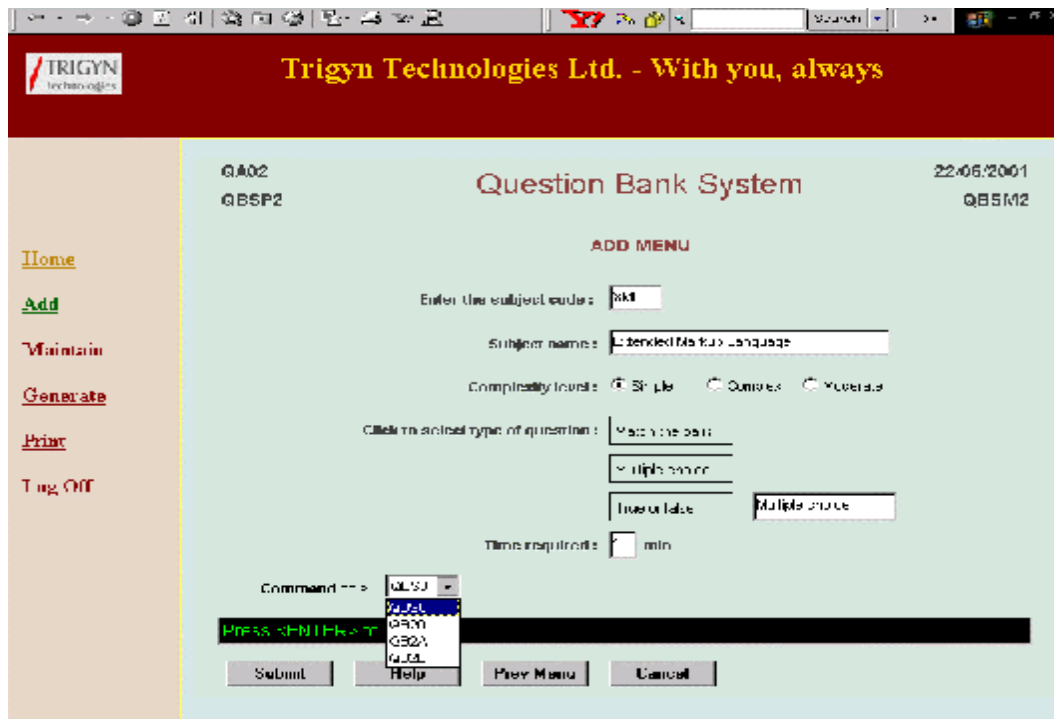
QuickWeb Enabled IBM Mainframe Screen

This is how the QuickWeb enabled IBM Mainframe screen would look like. Because it is web enabled, user can access it from anywhere in the world depending upon the access privileges allowed. Standard GUI features like background color, font, font size can be provided in this approach.

## EnWeb – Look and Feel the way you want

EnWeb is an advanced version of the QuickWeb solution BUT with a rich set of GUI features. The architecture of EnWeb supports any kind of CICS screen and results in a reasonably quick solution to the web enabling needs of an organization. The time factor involved is related to studying the existing UI for mapping to GUI features and screen specific client-side validations.

Client-side validations, which are not possible in a traditional mainframe environment, can be provided with EnWeb as the solution. This helps in reducing network traffic and improved performance since frequent trips to the mainframe are avoided for basic validation errors.



Web enabling using EnWeb approach changes the look and feel of the traditional IBM Mainframe screen. In addition to being able to connect remotely, user can enjoy the convenience and comfort of rich GUI features, as per his requirement. Also, screen level validations can be specified so that all the required screen specific validations can be done at the browser level. This will increase the performance of the application.

**Both these solutions result in legacy investment being protected since they DO NOT involve any legacy code change.**

## **QuickWeb AND EnWeb - SALIENT FEATURES**

- **Remote connectivity**
- **Investment protection**
- **Absolutely NO CODE CHANGES to the mainframe legacy application**
- **Improved performance and reduced network traffic with client-side validations resulting in HUGE cost SAVINGS**
- **INSTANTLY web enable existing legacy applications using QuickWeb**
- **Rich GUI features with EnWeb – the way you want**
- **QUICK and efficient solution**
- **No retraining of users with QuickWeb and minimal retraining with EnWeb**
- **Ease of use**
- **ZERO DEPLOYMENT – just a link on your web page is enough**

### **System Requirements**

In order to web enable legacy applications using Trigyn's approach of QuickWeb and EnWeb, customer will need to satisfy some networking and access control requirements. A few third party software (available as free downloads) would need to be installed at customer site. It is assumed that users would have a PC (Pentium II or above) available with them, from which they can run the web browser.

In addition to setting up of networking, access control and software environment, minimal legacy application study will need to be done by Trigyn consultants, before Trigyn solution can be implemented.

All these requirements are described below:

#### **Networking and Access Control Environment -**

- Mainframe with TCP/IP connectivity
- Access to the CICS region running the application to be web enabled
- In case TCP/IP connectivity is not available, SNA server can be used for communicating with the legacy application

#### **Software -**

- CICS Client
- Middle-ware for communication between the mainframe and web server
- Web Server like IIS or Apache

These are freely downloadable software

### **Application study for -**

- Screen navigation flow in the existing legacy application (for QuickWeb and EnWeb)
- Common and specific GUI requirements (for EnWeb)
- Screen specific validations (for EnWeb)

### **How the Trigyn solution works -**

Following steps explain the processing flow of Trigyn solutions for a user with a web browser. It is assumed that required hardware, software and access setup is done before a user can start using a legacy application from the web.

- The web browser (the user) invokes QuickWeb / EnWeb from a web server by typing the URL of the web server on the browser.
- The server displays a login screen and user authentication takes place on the web server.
- A correct login takes the user to the required CICS application through the CICS client and the user can start working with the application.
- Through the web server, QuickWeb / EnWeb now connects to the CICS region (via the CICS client) where the application is running.
- The web server returns the required application screen to the user in the form of a HTML page and the browser starts loading QuickWeb / EnWeb in the memory of the user's machine.
- QuickWeb / EnWeb interprets the data-streams from the browser and sends it to the CICS region via a middle-ware on the web server.
- The middle-ware receives the request, unpacks it, and makes a corresponding call to the CICS Client, which forwards the call to the intended CICS region.
- The CICS region processes the call and passes control and user data to the application program.
- When processing is complete, the application program returns control and data back to CICS region, which returns the requested data to the middle-ware through the CICS Client.
- The middle-ware packs this data and returns it to QuickWeb / EnWeb running on the web browser.
- QuickWeb / EnWeb interprets the data and after validating & processing the data, builds a Graphical User Interface (GUI) for the CICS screen.

## QuickWeb and EnWeb – A Functional Perspective

- In case of QuickWeb, the GUI is an exact look alike of a 3270 terminal screen but on the web browser. In case of EnWeb, the GUI is like a Windows based application with client-side validations.

## Trigyn solutions - The Benefits

- Remote connectivity
- Minimal Implementation effort
- Investment protection – no need to re-invent the wheel
- Improved performance
- Reduced support costs
- Industry standard security
- Infinitely better look and feel
- Improved capacity and scalability

Many companies find that the cost saving achieved by removing the need for a private network is sufficient justification on its own.

### Remote connectivity

Web enabling provides remote connectivity to legacy applications that could operate only in a closed network environment till now. It also eliminates the need for dedicated connectivity to the mainframe for each terminal or user.

### Minimal Implementation effort

The relative ease and speed of implementation varies widely among potential solutions. Programming is a primary factor in both the cost and delivery date, and so the tools available and staff skills determine which solution is best for an installation.

The implementation effort required by the Trigyn solution is minimal and deals only with the presentation layer of an application. Thus, the time needed for implementation is minimal since testing of business logic (which is already present in the legacy code) is completely avoided.

### Investment protection – no need to re-invent the wheel

The Trigyn solution does not require any legacy code change. Trigyn solution uses only the presentation layer of an application resulting in the legacy application remaining intact. The major reason for this is that legacy applications are tried and tested over decades and the risk factors in touching the code of these mission critical applications is extremely high.

### Improved performance, reduced network traffic

Performance is improved by including client-side validations, thus saving unnecessary server trips for basic UI level validations. Some business level restrictions can also be

imposed on the UI with client-side validations, thus reducing network traffic and huge savings in costs.

### **Reduced Support Costs**

Cost is a primary consideration, but some of its components are neither obvious nor easy to assess. In estimating cost, one needs to consider both the short- and long-term costs. While web enabling, the cost of not providing web access - that is, lost business, the effects of inadequate service on customer satisfaction, competition also needs to be considered.

Web enabling results in reduced support costs since addition of terminals and their maintenance is eliminated. Connections are required only to the web servers, which in turn can support hundreds of concurrent users.

### **Industry standard security**

Legacy applications usually run in secure and stable network environments, but the Internet applications are designed to cope with unreliable communication and network failures. Trigyn's multi-protocol solutions are designed to seamlessly access legacy applications from industry-standard web browsers.

Trigyn provides security solutions using industry standard Internet security using Secure Socket Layers (SSL). This ensures that sensitive information like passwords and credit card numbers are encrypted when transmitted across the network. Additional security is provided on the web server side using access control mechanisms.

### **Infinitely better look and feel**

Web enabling can lend rich, with-the-times look and feel to character based application screens. Applications can now make use of industry standard GUI features like selecting from drop-downs, clicking to select, copy and paste features, buttons, shortcuts, links, etc.

### **Improved capacity and scalability**

Improved capacity comes with the use of web servers since they can handle hundreds of concurrent users. This results in more people being able to access applications, that too remotely. Use of multiple web servers ensures scalability of the applications.