

Building and Hosting an Efficient I-Forms Portal

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Most forms managers have now settled on a platform for creating E-Forms and I-Forms. The challenge in 2002 is to provide easy access to the catalog of I-Forms for the (Internet and/or intranet) user community, to manage large numbers and versions of I-Forms, and to efficiently process the fill data submitted by users. One successful method is to host the I-Forms using a Portal.

What is an I-Forms Portal?

The word Portal is used here as a marketing term to describe a Web Site that is intended to be the first place people see when using the Web. Typically a Portal has an organized list of web sites, a directory of departments or subjects, a search engine, and may also offer other services (news, bulletin boards, maps, etc.) to entice people to use that site as their main point of entry to the Web. For organizations that manage large numbers of forms, an I-Forms Portal is a great way to offer user convenience while exercising control and maintaining data.

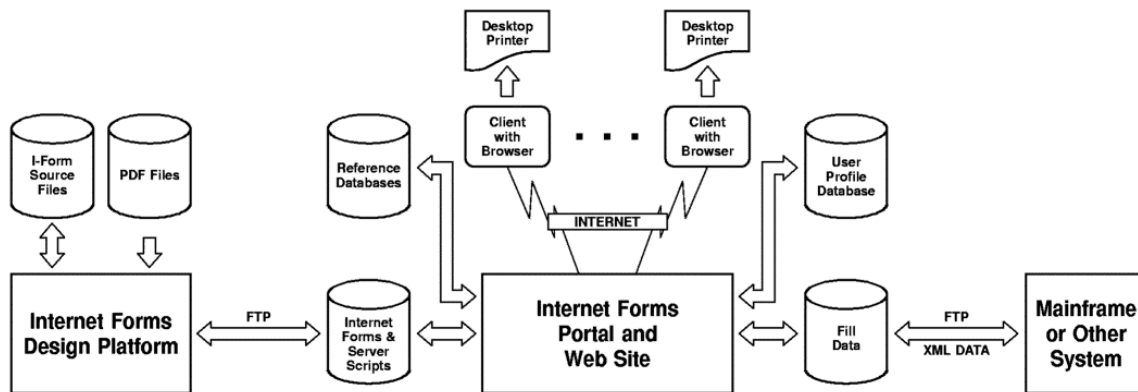


Figure 1: Diagram of a Basic I-Forms Portal Architecture

Building an I-Forms Portal is not as complicated as it may sound. As shown in Figure 1, the key components of the Portal are the I-Forms Designer platform, the Web Site module, and the databases and networks that connect these systems. Databases are critical to the value of the Portal. Often it is important to have links to reference databases such as account, product, or employee information. It is usually adequate to use copies of reference databases that get updated periodically as needed, which reduces the security risks. Another important aspect is that most filled-in I-Form data needs to be transferred to some other system after it has been validated, and often that requires communication with mainframes or other central servers.

With this system architecture, the I-Forms designer(s) create both I-Forms and web server scripts to display and capture data. It may also be practical for the home page and supporting pages to be created by the same staff to reduce costs and keep the “look and feel” of the portal consistent. Once I-Forms are stored on the Web Server, clients using Internet browsers can access the forms by logging in to the site, and then fill, print, save, submit, and e-mail the I-Forms as needed.

Building the I-Forms Portal

To get started, a web site hosting system must be set-up. Many forms managers already have web sites in place, so for those this section can be skipped. After the hosting system has been configured, web pages must be created, along with the I-Forms. Database connections for reference, user profile, and fill data must be established and tested. Finally, the entire web site must be tested as a whole to determine if it functions well as a Portal.

If you need a new web address, you can register your Uniform Resource Locator (URL) by going to www.register.com. For a small fee, you will be able to obtain a unique address for your Portal.

You will also need a computer server to act as the hardware/software platform and a physical connection to the Internet. There are two popular choices: Self-hosting and co-locating at an Internet Service Provider (ISP). Self-hosting is complicated, requires technical expertise, and a staff willing to maintain a 24/7 vigil to make sure the system runs reliably. Installing (co-locating) your computer system at an ISP may be more practical unless you already have strong computing resources at your disposal.

Technology Platform Choices

Most web sites today are based on the Unix (Linux and FreeBSD are open-source versions of Unix) or Microsoft Windows operating systems (O/S). The predominant web server managers are the Apache (open-source) and Windows IIS hosting software.

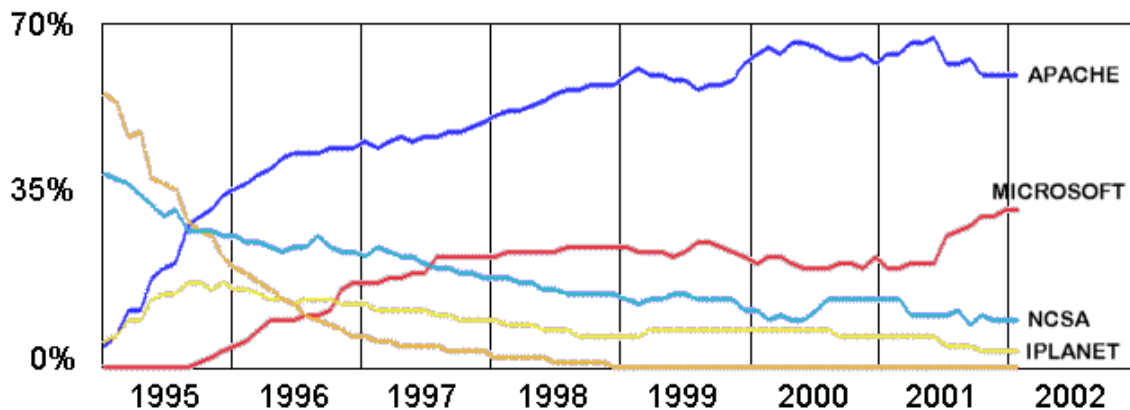


Figure 2: Web Site Server Software Utilization (Source Netcraft.com)

If you are also selecting database manager software, we strongly recommend relational database systems (RDBS) such as Oracle, IBM DB2, MySQL (open-source), and Microsoft SQL Server.

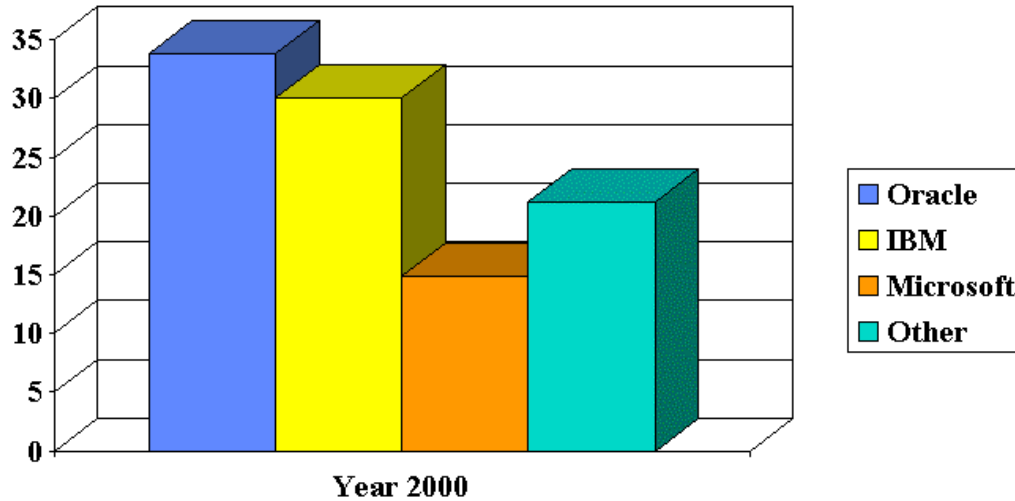


Figure 3: RDBS Market Share (Source Gartner, Inc.)

If you choose PC hardware with open-source (free license) software products for the O/S, web server manager, and RDBS, the acquisition costs are very reasonable (less than \$5,000). Co-location services at a reputable ISP start at around \$300 per month, but will cost more for a busy site with dozens of simultaneous users.

Design and Organize Your Web Site

Nothing you do is more important than the overall graphical design and content organization of your web site. Building a web site is much like building a house. Both require planning, a sound knowledge of basic construction methods, and an ability to use the tools required. Your home page will need to deliver a good first impression, and explain the purpose of the site and its features for users.

The home page should be arranged so that the normally used links are prominently placed. There should be paths through the site for regular users and for first time visitors. Black text on a white background is the safest combination for viewing legibility and printing purposes, so use color with care and mainly for accents. Logos and photos should be checked for file size so that the download time is minimized. If possible, make your home page fit in a single screen so that the client does not need to use the scroll bars. Avoid flashy graphics, moving images, sound, music, or other “gimmicks” that do not add value to the I-Forms portal.

Interior pages are used to display more specific, targeted information. Typically, separate interior pages are used for user registration and log-in, searching, and news articles. Since forms are often grouped by department and category, it may be useful to have an interior

web page for each of these groupings. For consistency, it helps to establish a graphical grid and theme on the home page and carry that theme along into the interior pages as well.

Many web page authoring tools are available to simplify web site design and maintenance. My favorite is the GoLive software from Adobe Systems.

Creating Internet Forms

Once the web site has been developed, it is then time to create I-Forms to display and capture data. I-Forms are different from ordinary web pages due to the fact that they have “input” blanks that can be used to key information into or be filled from databases.

I-Forms creation software resembles a desktop publishing program. The image of a business form is either imported, or drawn using the ruling and typesetting tools. Next, fill fields are overlaid where input information is to be keyed or displayed. Some programs allow fill fields to be restricted to only accept numerical digits, or dates, or formatted values like social security numbers. Help messages can be attached to fill fields to assist the novice user. Logical testing and calculations can also be programmed inside of the I-Forms to (for example) add rows and columns of numbers as they are keyed.

I-Forms are triggered to display by clicking on a link for a new blank I-Form, or performing a search for a previously filled-in I-Form. I-Forms also have the ability to submit data back to the web server. If the web site requires a user to log-in before the I-Forms are accessible, the user’s profile is available to retrieve data when needed. For instance, a user may key his social security number or employ ID, which then causes the name and address fields to be auto-populated from the database. Digital signing of the I-Form is also possible when the user is known.

Because of the data capture, data display, and submit functions, I-Forms must have server-side scripts (or applets) to communicate with while the browser client uses them. Each I-Form and its corresponding scripts and databases are stored on the web server. These scripts query, read, and write databases as required to perform a transaction such as taking an order or submitting an employment application. Other functions can also be included within an I-Form, such as e-mail, local saving/opening, and printing.

Many I-Form creation tools are available to convert paper-based forms to I-Forms. Some of these products also produce the server-side scripts and database connections. Some also have the building blocks of a complete I-Forms portal already in place. My favorite I-Form creation product is the OneForm Designer Plus software from Amgraf, Inc.

Outsourcing the Portal Development

Another alternative to consider is outsourcing. You may choose to have a systems integrator take responsibility for building and installing the I-Forms portal according to

your specifications. Once you are up and running, you should be able to maintain the web site and add new I-Forms as needed without requiring further outside help.

Testing the I-Forms Portal

It's exciting to start testing a new web site. There are many resources available to help find problems in your pages, particularly when viewed with different computer platforms and browsers. This presentation will not discuss that level of testing. However, it is worth mentioning that the Microsoft IE browser and the AOL version of the IE browser together have over 80% of the market, so be sure to support that segment.

Browser Market Share by Vendor - Historical Trend

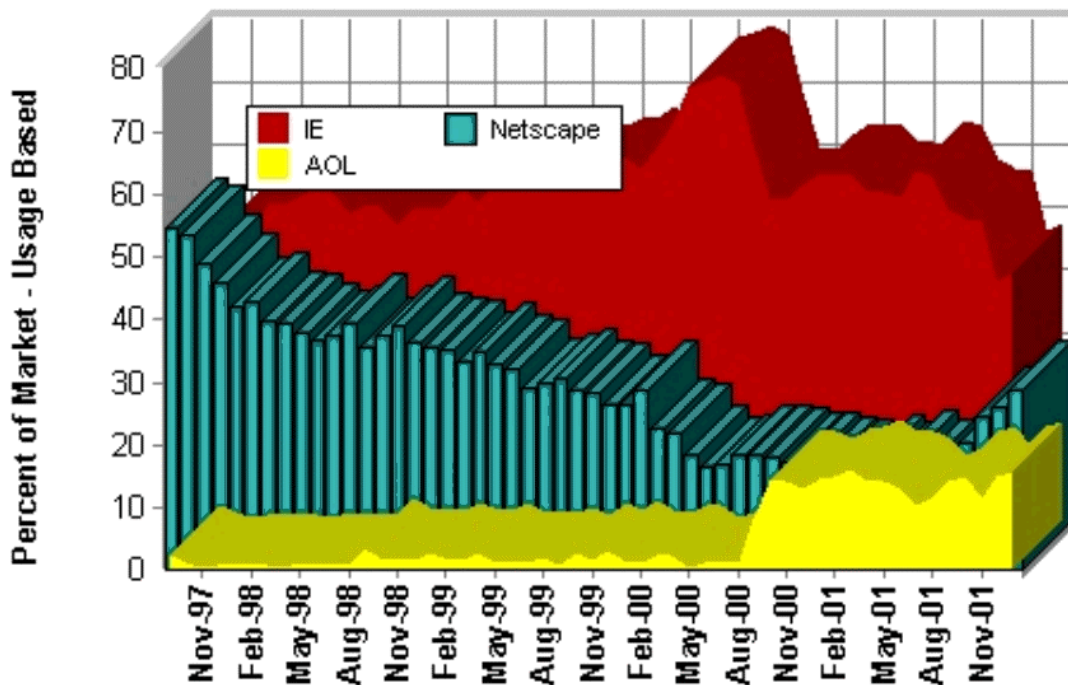


Figure 4: Browser Market Share (Source Janco Associates, Inc.)

Begin your testing by checking the home page and each of the interior page links. Check the log-in and search pages. Then check each I-Form to make sure it properly opens as a blank form, that the fill data is stored correctly within the correct database, and that the functions for printing, submitting, and e-mail are working. Check that the I-Forms can be recalled after they are saved, and that no data is lost or partially missing. Look for browser errors when loading the web pages and I-Forms and fix the problems that are identified. Verify that collected data can be sent to your mainframes or other systems. Once these steps are completed, it is reasonable to begin testing with a few trusted users.

Getting to this point is the easy part. Your I-Forms portal should now be usable in a controlled environment where the users are known and the data is not at risk. To go to the

next level where you are dealing with the Public, or where data must be considered confidential, requires a great deal more planning.

I-Forms Portal Management Issues

You will need a backup/restore procedure and plan for recovery if your computer system fails. If you use the services of an ISP, make sure they are included in this plan.

Security is a broad topic and covers many areas. There are security concerns for the safety of the web site itself, the I-Forms you host, the reference databases, user profiles, log-in files, fill data, etc. If you are processing transactions that have monetary value, or I-Forms that include medical, criminal, or voter data, you may need to hire consultants and pay for security software and services to shield your I-Forms Portal from special risks.

Ask and answer these kinds of questions: What would you do if a hacker entered your site and copied and/or corrupted data files? How do you verify that a user filled in an I-Form if they deny it? How do you manage user log-ins when user turnover is a problem?

I-Forms version control is another issue that requires a clear management procedure. Once an I-Form is hosted, it must be maintained for the life of the I-Forms Portal. Fill data is only valid relative to the I-Form that it was originally captured on. As an example, the IRS 1040 income tax form changes slightly every year, and it is possible to display one year's data on a prior year's form. However, this could result in a miscalculation of taxes due to the government and a problem for all parties involved. You must make sure that when archived fill data is recalled, that it is properly displayed on the exact I-Form it originated on.

Tracking and confirmations are essential to the smooth operation of the I-Forms Portal. By default, every party to a transaction should receive an e-mail notification when the transaction is completed. This helps to catch errors and omissions when problems occur, and raises the confidence of users that the process is working as it was intended.

You will need to produce management reports detailing Portal activity, database growth, user problems, etc. Many of these reports can be created using the tools available in the web server and database manager software programs. The reports can be generated automatically at selected time periods, or when a threshold is reached in a counter or value.

Costs and Return on Investment

Costs depend on a variety of factors, including Portal complexity, and the numbers of I-Forms, log-in users, and databases that are connected. For a forms management department within a government agency or medium-size company, based on open-source software, it is reasonable to budget \$35,000 and 90 calendar days for the I-Forms Portal design and development.

The ROI can be calculated based on the process improvement factors. I-Forms capture keystrokes 24/7, and the data is extremely accurate due to the real-time validation functions built into the forms. Transactions are initiated faster, and if the process reduces paper, there can be real material savings as well. In addition, user convenience (especially if the users are customers) can translate into increased sales.

Conclusions

I-Forms can be used to replace and/or supplement paper business forms used within industry and government. An I-Forms Portal is ideal for making these forms available to users and customers anytime and anywhere. Building an I-Forms Portal is reasonably simple to do with the current technology. Standard PC's with open-source software products can be utilized as the technology platform to reduce costs and obtain a quicker return on investment.

Managing the I-Forms Portal requires an understanding of issues such as security, version control, tracking, and reporting. Although these are complex issues, there are solutions available depending on the requirements of your organization.