

A PCA executive white paper

Client-Server and the Internet Converge: The Smart Client Application

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Client-Server & Internet Converge: Smart Clients

This Whitepaper is intended to help business owners and operational managers better understand the relative merits of “Smart Client” software applications — robust business applications that you use over the Internet — with Client-Server-like functionality and Browser-like reach.

The Problem

On-Demand Applications, Software-as-a-Service, Smart Client, Rich Client, Fat Client, Thin Client, the Executable Internet, Browser Apps etc., etc. Why all these new high-tech catchphrases for describing a computer program? Maybe because ~30 years into the software revolution, we are still chasing the elusive “cake and eat it too” goal of delivering robust functionality to End Users, while not going broke managing all the technical complexities associated with developing, deploying and supporting software to run our businesses.

Most tech-savvy professionals recognize one important fact by now: the ongoing costs and complexity associated with owning and maintaining a robust software solution (the Total Cost of Ownership or “TCO”) is usually a *multiple* of the up-front development effort or licensing fees. Network investments, application customization, professional service fees, training, annual maintenance and support contracts, upgrade fees — and all the people needed to manage all of these areas — represent a substantial distraction and financial burden to a business.

Small and large businesses alike are exposed to many recurring software operational costs that *follow the initial purchase* of a commercially-packaged software solution. Fixed IT budgets are particularly vulnerable to these recurring costs — as fewer resources or expertise is available to tackle and manage these ongoing needs, and smaller financial buffers are available to absorb unanticipated software TCO expenses.

Everyone wants the biggest bang for the buck ... the most functionality and ease-of-use deployed to the widest audience, at the lowest up-front and ongoing cost. No one will argue that software is the basis for the “information economy.” Even packaged software, despite its high up-front and recurring cost, is a must-have to run a business — and is therefore a justifiable business investment.

Business professionals are now beginning to recognize the availability of a more efficient, more cost-effective approach to their software needs: the Smart Client.

Traditional Software Options

Prior to the emergence of Internet Browser-based applications, businesses were limited to two options for adopting a software solution: Buy or Build. If your line-of-business operational needs were generic e.g. a standard sales process, standard accounting functions, standard customer support functions, you could probably license a shrink-wrapped software package from a vendor. If your business needs were unique, you could use standard office productivity tools like MS Excel, Filemaker Pro, or MS Access, or outsource a custom software solution.

Enter the new breed of Browser-based software application vendors — whose business has shifted the software industry from the traditional packaged software model of “Pay upfront for the software license; pay for whatever professional services you need; and pay for annual maintenance and support — you’ll eventually get a return on your investment” ... to “go to your browser; click here to subscribe, and pay as you go.” The new value proposition: by leasing “software as a service,” your business will pay lower up-front cost, incur fewer technical hassles and IT burden, and you will be able to measure your ROI at the end of every month!

Sounds good right?

Software Economics

To help you weigh the relative pros and cons of Browser-based applications versus traditional Client/Server software, and the newest breed of Smart Client applications, it is useful to separate in your mind the following *software economics*:

- The Tool: *what you pay* for (the application itself)
- The Business Model: *how you pay* for it (e.g. up-front, monthly, yearly, etc.)
- The Value: the *economic return* to your business

Internet Browser Applications

In the past, traditional Client/Server applications have been difficult to deploy and maintain. It was not uncommon to install one application, only to have it break another, which made installing and maintaining business applications difficult, frustrating, and costly. Developers refer to this as "DLL Hell."

Browser Apps offer a new alternative: access the business application directly through a standard Internet Browser. Reaching End Users thru a web browser overcomes many of the traditional TCO *technical* obstacles, for example:

- IT infrastructure: the entire Internet infrastructure required to drive browser-based applications — the server hardware and software and bandwidth — can be outsourced cost-effectively.
- Software installation: little to no installation is required. With Browser applications, any software that is required to run an application can be installed in the form of a Browser add-on or plug-in (like Macromedia Flash). While not completely bullet-proof, this eliminates most of the typical IT complexity and burden with deploying and managing installed software applications on every End User's PC.
- Software maintenance: Users access a single application that is hosted on the Server, so traditional software maintenance — how the Vendor deploys updated versions of their product — becomes a thing of the past. In the Browser application world, traditional software Maintenance and Support contracts are now being replaced by Service Level Agreements (SLA), which establish the minimum acceptable application availability and performance criteria.

Many companies are lured into thinking that, due to the ubiquitous reach of the Internet Browser, developing business applications "Inside the Browser" is the way to go. Following several years of experimenting with browser-based applications, many businesses now recognize that the "Application inside a

"Like browsing the eBay website, the notion of what version of the webpage you are using is irrelevant; it's always the most up-to-date available."

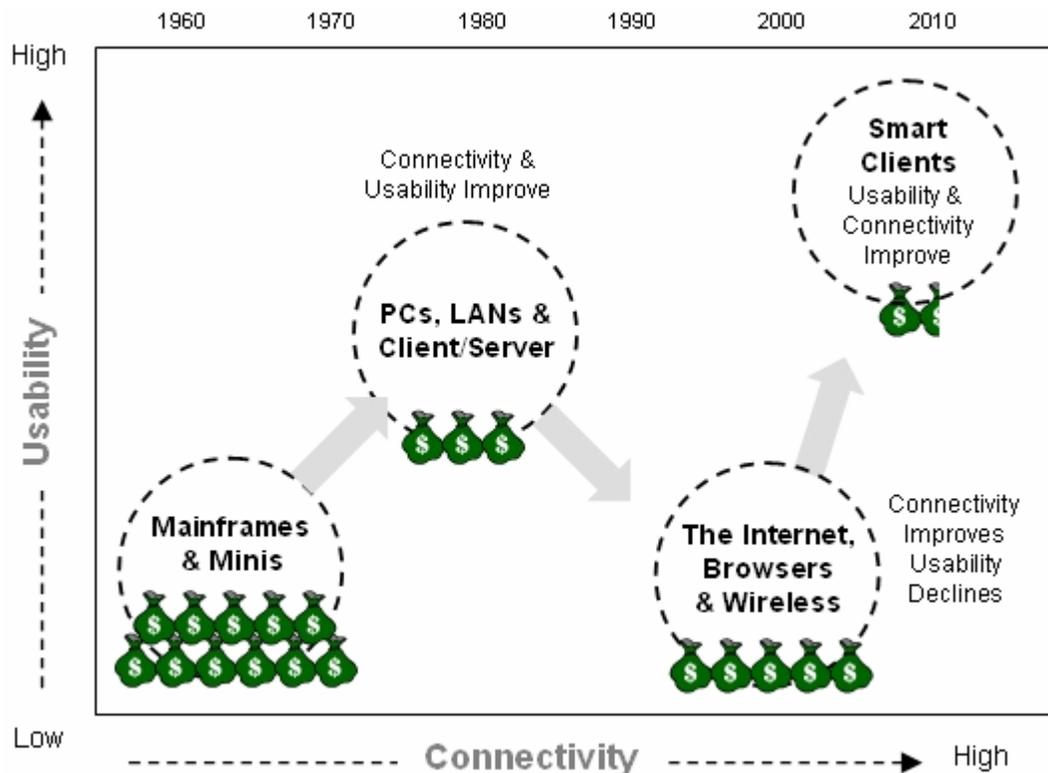
Browser" has real business limitations. While the software subscription business model is certainly a step in the right direction (pay-as-you-go monthly vs. large up-front licensing fees + ongoing TCO expenses), browser-based applications are limiting in several important respects: reduced functionality, simple linear workflows, End User control and flexibility, integration with data on the desktop, offline use, and limited performance and ease-of-use. As a result, many businesses view browser-based applications as one step forward, two steps back: the right business model, albeit the wrong tool, more expensive to develop, with significant functional limitations.

So, while the IT Departments do in fact gain an important advantage with the Browser-based approach — a centralized way to control application deployment and security — this comes at a significant cost to Management (higher price to develop), and at a significant cost to End-Users (far less functionality, and loss of flexibility and control over the application and the data at the Desktop).

Smart Client Applications

Smart Client applications address the well-known functional deficiencies of Browser-based Applications. A true merger of the desktop and the Internet, Smart Clients are viewed by many to represent the next major wave in computing platforms. As many vendors scramble to grab this new category of applications, different marketing terms are also used to describe Smart Client applications, e.g. "Rich Internet Applications" (RIA), "X Internet" (Executable Internet, coined by The Forrester Group), and most recently, "Internet 2.0".

Smart Clients combine the robust functionality and performance, control and ease-of-use of standard MS Office applications, with the global networked capabilities of the Internet. They also cost on average less than 50% to development and maintain than much more complex Browser-based Applications.



MS Outlook is a great example of a Smart Client application: the application is installed on your local PC; updates can be installed automatically over the Internet; the application is packed with functionality; Users are able to work in offline mode; and everyone in the organization can share data (Email, in this case) instantaneously over the Internet. The .NET platform is Microsoft's answer to applications that run inside an Internet Browser, and the foundation for this new generation of Smart Client applications on the Microsoft business platform.

5 Capabilities that Make a Smart Client "Smart"

Enhanced Desktop Application Functionality

Smart Client solutions offer a hi-fidelity end-user experience by taking full advantage of the Microsoft® Windows® platform, specifically, the controls now available in the .NET framework.

Web-enabled Smart Client applications look-and-feel and perform just like standard Microsoft Office Applications. To see the difference between Smart Client and Browser-based application, check your email in Outlook, then go to the web URL for your email. You will undoubtedly notice a substantial difference in features and performance.

Hardware Efficient

Because Smart Client applications are always installed on the End Users' PC they are able to fully utilize local resources available to that PC. These resources can include the CPU, graphics processor, local memory (RAM) and disk storage. Because Smart Clients use "local horsepower," Server CPU needs are generally ~100x less than pure Server-based browser applications. As such, the Smart Client Servers are 2-3 times less expensive.

Local Data & Local Device Integration

Smart Client applications can also fully integrate with the software resources available to the PC, including exchanging data directly with local Microsoft Office applications e.g. MS Access, MS Excel, MS Outlook, etc. Conversely, browser-based applications are "locked" inside the browser, and have no easy way of communicating data with your local applications. Common workarounds include copy-and-paste and data export and import.

Smart Clients can connect directly with any data resources or data services available on the Internet e.g. Google Earth, D&B database (any data source that is IP-addressable).

Smart Client applications can work directly with any local devices that are connected to the PC e.g. telephone, bar-code reader, RFID reader, etc.

Offline Capable

One of the key benefits of Smart Client applications is they can be used whether you are connected to the Internet or not. When connected, Smart Clients access and update the database in real-time over the Internet. When disconnected e.g. on a Laptop in the field, Smart Clients allow you to make any changes to the data you wish, and automatically synchronizes your updates the next time you connect to the Internet.

Smart Client applications work exceptionally well, connected or not. For traveling and field-based professionals, being able to work while disconnected is not a nice to have, it is essential.

Intelligent Installation & Updates

Smart Client applications are "Shipping & Handling Free." The Smart Client installation and maintenance (update) process is completely automated. No I/T support required. Like a webpage, everyone automatically gets the latest version of the application with most current set of data. This solves the traditional headaches and expenses associated with distributing and maintaining distributed business applications.

Smart Client Software installs itself and maintains the latest version of itself over the Internet. You can think of Smart Clients as well-behaved, Internet-connected Client/Server applications.

Client-Server & Internet Converge: Smart Clients

The tables below shows the relative Pros and Cons of traditional Client-Server software with the new breed of Browser-based software:

Browser-Based Applications

Advantages

- Straightforward to deploy
- Good Web/Intranet compatibility

Disadvantages

- Severe User Interface limitations
- Dependent upon Browser compatibility
- Slow Load & Display time (performance)
- High Server CPU consumption
- No off line capability
- Weak Desktop Integration
- High Price

Client/Server Applications

Advantages

- Low Server CPU consumption
- Simple integration with MS Office
- Robust User Interface

Disadvantages

- Poor Web/Intranet compatibility
- Complex deployment & maintenance

Smart Client Applications

Advantages

- Straightforward to deploy
- Good Web/Intranet compatibility
- Strong Desktop Integration
- Fast Load & Display (performance)
- Off line capability
- Low Server CPU consumption
- Low Cost to Develop/Maintain

Feature/Function		Browser-Applications	IT	End Users	Smart Client Applications	IT	End Users
Exploits local PC processing power		Display-only	-	-	Full Power	+	+
Web server requirements		Powerful / Expensive	-		Simple / Inexpensive	+	
Application Development Cost		Expensive & Difficult	-		Cost is 3-5x Less	+	
Application Deployment Complexity		Extensive	-		One-Click Hyperlink	+	+
Data Integration		Server-end (EAD): Expensive	-		Client-end (Desktop Office Apps): Inexpensive		+
Application Performance		Dependent on Multiple factors	-	-	Always Fast	+	+
Application Usability		Yahoo! & EBay Look & Feel		-	MS Office Application Look & Feel	+	+
Offline Computing		Usually No or Pay Extra	-	-	Yes		+
Complex Data Manipulation		No (HTML)		-	Yes (SQL)		+
Simple Point-and-click		Yes		+	Yes		+
Internet / Intranet capable		Yes		+	Yes		+
Bandwidth requirements		Med-High	-	-	Low (Minimal)	+	+
Scalability of Applications		Server-dependent	+	+	Excellent	+	+
Based on standards		Yes	+		Yes	+	

In conclusion:

- Client/Server Software: Wrong Tool, Wrong Business Model
- On-Demand Browser applications: Wrong Tool, Right Business Model
- PCA Smart Client applications: Right Tool, Right Business Model