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SMART CLIENT APPLICATIONS

The Best of Both Worlds—The Desktop and the Web

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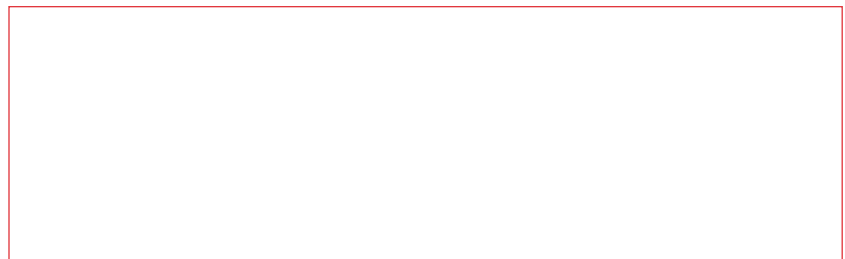
Business Benefits
• Driving Worker Productivity
• Driving IT Productivity

SMART CLIENT APPLICATIONS

The Best of Both Worlds—The Desktop and the Web

The Internet boom in the mid to late 1990s promised end users efficient access to a host of business critical information on any device, creating a widespread trend toward Web-based applications with browser-based user interfaces (UI). In some cases, end user usability and productivity have been sacrificed, while high server loads and high bandwidth are impacting IT organizations.

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Executive Summary

The Internet boom in the mid to late 1990s promised end users efficient access to a host of business critical information on any device, creating a widespread trend toward Web-based applications with browser-based user interfaces (UI). In some cases, end user usability and productivity have been sacrificed, while high server loads and high bandwidth are impacting IT organizations.

Key Questions

- What are the issues facing corporate users of Web-based applications and browser-based UIs?
- What is on the enterprise application agenda for IT decision makers?
- How can software providers leverage the operational benefits of Web-based applications and the higher-fidelity user experience benefits of rich client technology?

Key Findings

More than one-third of IT decision makers from mid-sized and large enterprises who have Web-enabled their core applications report migrating some applications back to a more client-server-like rich user interface. Usability issues hampering end-user productivity is a major factor. On the IT side, high bandwidth consumption and high server load are driving corporations to reevaluate the purely Web-enabled model. Worker productivity is hampered by the problems of a Web-based world and limited browser interface capability—this is particularly evident in application scenarios that could benefit by, but do not support, off-line environments. Twenty-two percent of those remotely connecting to corporate applications frequently can't get access to the corporate applications they need to work.

IT decision makers seek software applications that leverage the transport capabilities of the Web, but also leverage the power of the desktop for superior usability.

An opportunity exists for software application providers to leverage smart client technology to align with IT decision makers' needs for improving usability and leveraging the Web for application management (e.g., deployment, update, and version of the client application). Enterprises seeking the panacea of rich user experiences and low-cost centralized application management now have a new set of priorities. The core opportunity for software providers is to begin to capitalize on this need by employing these new tools and technologies to deliver solutions that allow corporate workers to seamlessly access and integrate information in a way that is most cost-effective and productive regardless of application location, connection, or device.

Key Definitions

Smart Client: Applications and devices that can take adantage of the power of local processing, but have the flexibility of Web-based computing.

Overview of Executive Survey Results

In December 2003, Jupiter Research fielded an executive survey to users of Web-based applications utilizing browser-based interfaces to gain greater insight into attitudes and behaviors associated with corporate applications. The following (all non-IT purchase decision-makers or influencers) was the end-user target audience:

- Non-remote workers
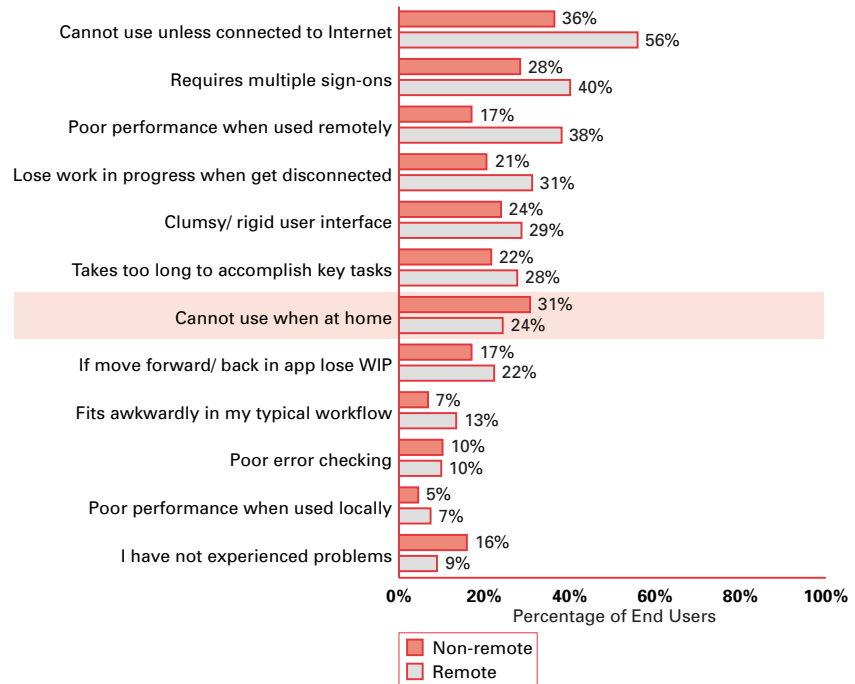- Remote and traveling workers

The survey was also fielded to IT decision makers from IT and non-IT lines of business. The objective was to better understand current initiatives and decision factors with respect to software application purchases and development.

Respondents from both segments were from mid-sized enterprises (500 to 1,000 employees) and large enterprises (more than 1,000 employees).

Web-Based Does Not Guarantee Utility

Fig. 1   Top Issues with Web-Based Applications

Issue	Non-remote	Remote
Cannot use unless connected to Internet	36%	56%
Requires multiple sign-ons	28%	40%
Poor performance when used remotely	17%	38%
Lose work in progress when get disconnected	21%	31%
Clumsy/ rigid user interface	24%	29%
Takes too long to accomplish key tasks	22%	28%
Cannot use when at home	31%	24%
If move forward/ back in app lose WIP	17%	22%
Fits awkwardly in my typical workflow	7%	13%
Poor error checking	10%	10%
Poor performance when used locally	5%	7%
I have not experienced problems	16%	9%

Percentage of End Users

Question: Which of the following have you encountered when using Web-based (Web-enabled) corporate applications to access, enter, or retrieve company information? (Select all that apply.)
Source: Jupiter ERI Executive Survey (12/03), n = 202 (remote users, US only); n = 88 (non-remote users, US only)
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Seventy-three percent of corporations surveyed reported that they had migrated at least one enterprise application from a client-server model to a Web-based model.

Taking a look into the Web-based user experience reveals some insights. While not surprising, the vast majority of corporate workers surveyed reported they have experienced problems using Web-based applications. Perhaps most interesting is the primary reason: the *"inability to use when not connected to the Internet."* This most basic problem translates directly to lost productivity and was reported by more than 50 percent of respondents that work remotely and 36 percent of non-remote workers. And problems don't stop once connected. Workers complain of losing work in progress when disconnected. Beyond general performance, remote workers (44 percent) want the ability to be productive off-line. Even those who do not currently work remotely are lobbying for more off-line corporate application capabilities, suggesting even they are frustrated with general application performance online.

Furthermore, with Web-based applications, end users are 100 percent reliant on connectivity. When a connectivity problem occurs, end users are most likely to abandon their current or intended activity, and more than 65 percent of corporate workers experiencing connection difficulties shut down their browsers and tried again later.

Applications that are meant to foster productivity can often hinder it because features are

hard to use. Whereas desktop software typically adheres to well-accepted interface models (e.g., drag and drop), Web-enabled applications often have customized (or more likely awkward) interfaces that at best slow the learning curve (driving training costs) and at worst inhibit adoption. Even spending significant time and cost on training end users is not always enough for Web-based applications. In one case, a $100+ million SAP deployment was deemed an almost complete failure because its interfaces were utterly unusable, even after heavy investments in end-user training. (Employees started to prefer manual, paper-based workarounds to using the software.) Driving worker productivity by supporting online and off-line access, and creating enriched, more intuitive user experiences, represents an opportunity for software providers to speed adoption and drive higher customer productivity and satisfaction with their products.

Mobile Workers—An Underserved Market

Fig. 2   Remote/Traveling Corporate Application Access
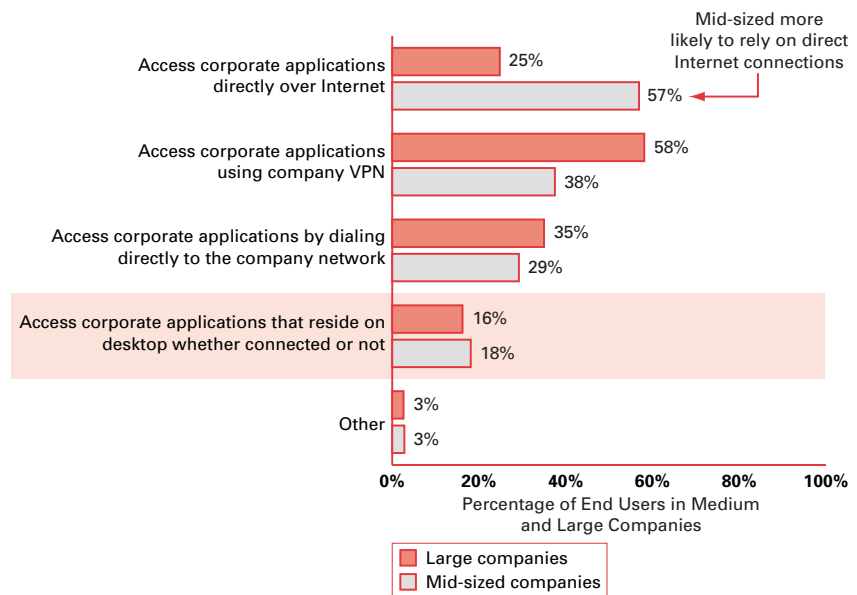
Question: Which of the following best describes how you access corporate applications when traveling or working remotely?
Source: Jupiter ERI Executive Survey (12/03), n = 72 (end users in mid-sized companies, US only); n = 117 (end users in large companies, US only)
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Today, supporting mobile users is no longer a convenience, but a necessity for the majority of corporations that have employees who regularly work from remote locations, or at least occasionally travel with their laptops. IT decision makers and influencers from another recent Jupiter Research survey found that on average 26 percent of corporate workforces telecommute occasionally to regularly. Today's corporate workforce demands to function in an occasionally unconnected world, and needs full functionality and relevant data when off-line, with capabilities to synch and access up-to-date data when online.

The most recent Jupiter Research survey showed that approximately 33 percent of end users who report doing any work from remote locations estimate spending at least one week per month doing so. With 95 percent of remote workers accessing corporate

applications via a VPN, company network, and/or or the Internet, there is a heavy reliance on connected environments. Lack of access to necessary corporate applications is a significant problem for overall corporate productivity.

Connectivity Is Not the Only Answer

Fig. 3   Problems Regularly Encountered When Remote/Traveling
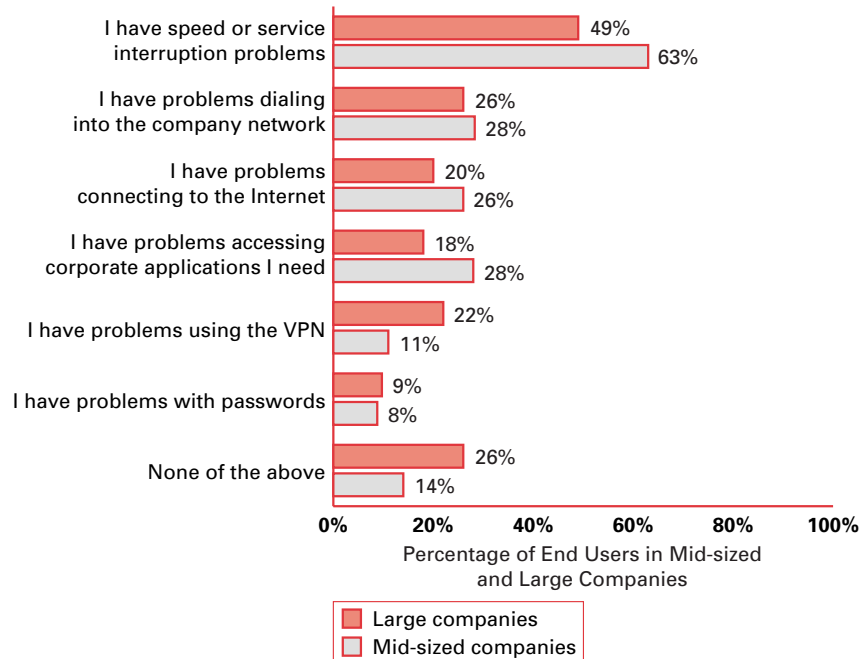
Question: Which of the following problems do you regularly encounter when traveling or working remotely? (Select all that apply.)
Source: Jupiter ERI Executive Survey (12/03), n = 72 (end users in mid-sized companies, US only); n = 117 (end users in large companies, US only)
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In the end, an astounding 24 percent of remote workers say they "frequently can't work," and nearly 50 percent say one or more of the following is experienced on a regular basis when working outside the office:

- Data entry is not possible when not in the office

- Inability to respond to customers

- Inability to provide information to a colleague

- Delayed view of current statistics (e.g., sales, inventory, financial, etc.)

- Frequently cannot work

- Relying on old information/data until able to get an update.

The reality of today's world is that workers must make decisions regardless of environment. While Web-based applications provide limited capabilities for remote workers, they do not provide a seamless and well-integrated in-office/out-of-office experience.

Creating mobile work environments that more closely parallel the in-office experience represents another opportunity for software providers. Not only do remote workers need

off-line capabilities for environments without connections, but workers also need to have the ability to connect to information to make timely, informed decisions and respond quickly to customers.

IT Executives Cast A Cautious Eye Toward A Purely Web-enabled Approach

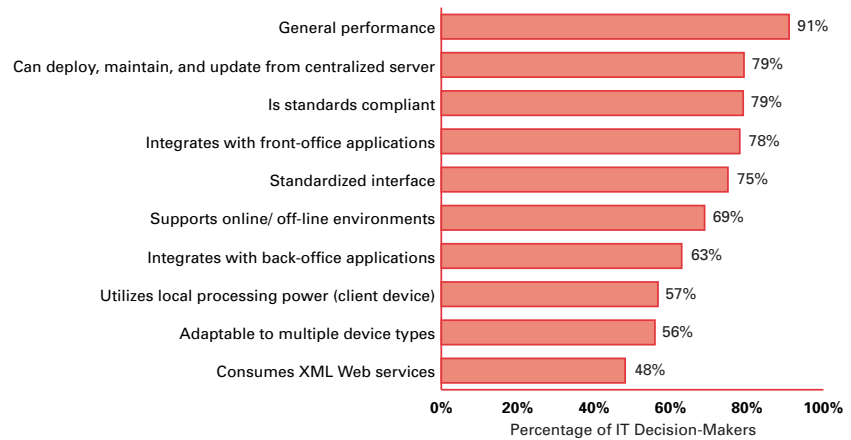**Fig. 4   Client-Server and Web-Based Application Migration Agenda**
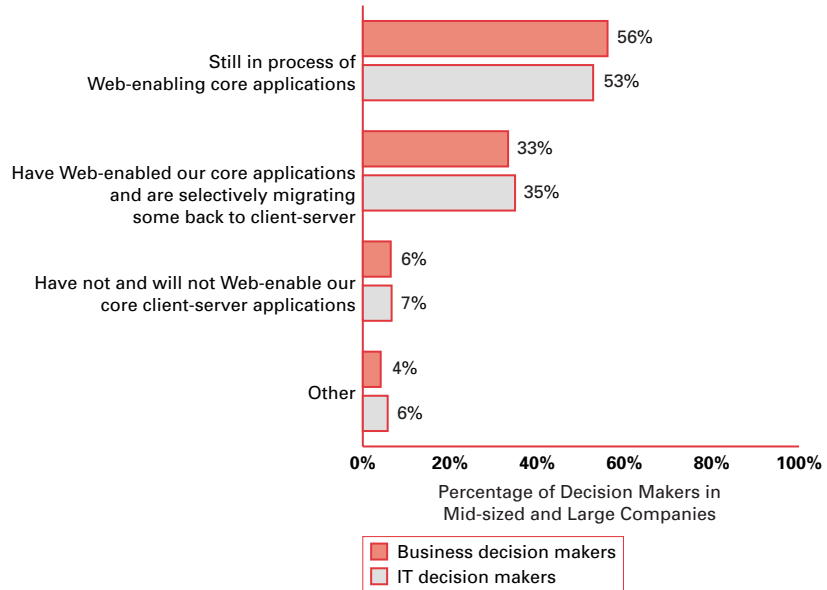
Question: Which of the following best describes your company's agenda in the next one to two years?
Source: Jupiter ERI Executive Survey (12/03), n = 106 (IT decision makers in mid-sized and large companies, US only); n = 171 (business decision makers in mid-sized and large companies, US only)
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Still in process of Web-enabling core applications
- Business decision makers: 56%
- IT decision makers: 53%

Have Web-enabled our core applications and are selectively migrating some back to client-server
- Business decision makers: 33%
- IT decision makers: 35%

Have not and will not Web-enable our core client-server applications
- Business decision makers: 6%
- IT decision makers: 7%

Other
- Business decision makers: 4%
- IT decision makers: 6%

Percentage of Decision Makers in Mid-sized and Large Companies

■ Business decision makers
□ IT decision makers

In order to better understand how the Web-only approach is faring inside enterprises, Jupiter Research surveyed IT decision makers and influencers to gain insight into the next generation of software investment.

If software vendors have been slow to respond to issues with Web-enabled applications, Jupiter Research's recent survey finds that IT decision makers and influencers are reevaluating the viability of a fully Web-enabled, browser interface approach. As proof of their disillusionment, a staggering one-third of IT decision makers and influencers (ITDMs) report having plans for migrating some applications back to richer client environments over the next one to two years. This follows a period where nearly 80 percent of ITDMs reported migrating at least one client-server application to a Web-based format, and more than 50 percent reported they were still in the process of Web-enabling their core applications. While Jupiter Research has not seen a substantial migration back to a client-server approach at this point, it is clear that issues with usability, such as the SAP deployment noted above, have caused ITDMs to reexamine the efficacy of browser-based and client-based models. ITDMs are looking for software solutions that offer the best of both worlds: rich integrated experiences and ease of deployment.

Web-based Features Important; New Features Desired

Fig. 5 **Corporate Application Purchase Factors**

Feature	%
General performance	91%
Can deploy, maintain, and update from centralized server	79%
Is standards compliant	79%
Integrates with front-office applications	78%
Standardized interface	75%
Supports online/ off-line environments	69%
Integrates with back-office applications	63%
Utilizes local processing power (client device)	57%
Adaptable to multiple device types	56%
Consumes XML Web services	48%

Percentage of IT Decision-Makers

Question: Please rate the importance of the following features regarding your software application purchase decisions. (Top two box scores.)
Source: Jupiter ERI Executive Survey (12/03), n = 106 (IT decision makers in mid-sized and large companies, US only)
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When considering features of importance to future software application decisions, nearly 80 percent of ITDMs reported they want applications that can be centrally managed, deployed, and maintained. This capability—which once lured many IT organizations to browser-based applications—is now a key capability delivered by smart client applications technology. Furthermore, ITDMs, are clearly looking for features not delivered by browser-based applications alone. Smart client features resonate with ITDMs, and represent a reemerging opportunity for software vendors. Standards compliance, standardized interfaces, ability to integrate with front-office applications, and ability to support off-line/online environments, were reported as ITDM top purchase considerations.

A New Software Generation Is Needed

The reality is that for the past five to 10 years, developers had to make tradeoffs when building clients. IT operations want clients that are easily deployed and maintained. Today's users, as we just saw, want rich functionality and responsiveness no matter where they are working at that moment. Therefore, vendors have the opportunity to combine the benefits from both approaches, and deliver smart clients that are easily deployed and maintained.

Deciding on which approach to follow is of the utmost importance. Not only is the migration itself expensive, but a company's productivity may rise or fall on the ability of its end users—remote and non-remote—to do their work. Companies must take a hard—if sometimes painful—look at whether purely Web-based applications employing only browser-based interfaces (installed or planned) are helping or hindering their operations.

For software providers who seek to continue to add solution value by enhancing customer productivity and providing more integrated experiences, problems with browser-based applications create a well-defined opportunity. And, while IT executives

were lured to the promise of the Web-enabled world, there is clearly an opportunity for providers to offer the features associated with the Web-based world while bringing back some benefits from a client-based model.

In general, the applications industry must find the middle ground. The IT-focused benefits of a Web-based world are not valuable unless applications are built to enhance the decision-making and productivity of the mobile workforce. Applications developed with this intent will have a blend of management capabilities found in Web-based clients and the user experience capabilities found in traditional rich clients.

Leveraging the Web and the Desktop: An Opportunity for Software Providers

To find the sweet spot, software providers should consider the following:

- **Focus on usability to drive worker productivity.** Software vendors need to focus renewed attention on usability, as poorly designed and difficult-to-access applications hamper adoption and undercut the ultimate value Web-enabled applications provide to a company.

- **Consider smart client technology to drive productivity.** There is an opportunity for software vendors to leverage smart client technology as an alternative environment for building enhanced user interfaces supporting off-line/online and more integrated activities and experiences.

- **Smart client technology should be considered to align with ITDM Priorities.** Vendors should also examine the use of smart client technology to capture those IT decision makers that have become disillusioned by a purely browser-based world, and those decision makers that are still in the learning process. Applications that not only drive end-user productivity but also build on the benefits from a Web-based world, such as centralized deployment and maintenance, will be critical. But crucial to the decision, these applications should also include features that are on the minds of IT decision makers, such as standards compliance, integration with front-office applications, and standardized interfaces.

Case Study

Salesforce.com Delivers Connectionless Work Environments Using Smart Client Technology

Bottom Line: Smart client technology and Web services provides a technology set that broadens the opportunity for Salesforce.com and its partners to enhance customer success. Today, there is a lot of developer and channel enthusiasm around Sforce and smart client technology, as it allows customers and partners to deliver enhancements around their specific business problems and vertical markets. While Salesforce.com may build one, two, three, or four smart clients, they believe partners will build many, many more smart clients. Salesforce.com customers and partners have embraced the Salesforce.com smart client extensions and development model as a key value differentiator.

Participants: Salesforce.com delivers CRM software as a service to its customers— client-service computing.

Goals: Salesforce.com's vision is to provide software services to its customers whether connected or not, regardless of client, device, or interface used.

Execution: Salesforce.com recognized the need to architect its software services so they supported the interface best suited to customers' environments. By utilizing a Web services approach, it provides a standardized interface to Salesforce.com's back-end services, which can be interfaced using both browser-based and rich client interfaces developed by either Salesforce.com, its customers, or its value-added partner channel. Today, to help meet customer demand for a more integrated, productive experience, Salesforce.com delivers Salesforce.com Office Edition, which ties Microsoft's Office productivity suite with its leading customer relationship management solution. This creates a compelling approach because it allows ease of integration with desktop applications like e-mail that have already gone through the corporate learning curve and are linked to the CRM process. For instance, an e-mail can come into the corporate e-mail application and with one click that e-mail can be attached to an 'opportunity' within Salesforce.com. About two years ago, the company introduced Sforce—the first client-service application platform, enabling enterprises to customize, integrate, and extend Salesforce.com using standards-based Web services and development tools. To provide users access to important information and processes while disconnected, Sforce also provides a Windows PC that synchronizes via Web services when it's connected. The company has also developed an add-on to Outlook through which customers can perform certain Salesforce.com operations.

Economics: Salesforce.com partners who take advantage of developing smart client applications can cut development down to 25 percent of what it used to be, because the back-end, synchronization protocols, and the Web services are already defined.

Case Study

Amazon.com Improves User Experiences and Expands Touch With Smart Client Technology

Bottom Line: Future expectations around non-browser clients are a reality for Amazon.com through the application of smart client technology. The company believes that applications that consult with Web-based data, but that are not Web browsers, are going to be a huge growth area over the next couple of years. Smart client technology allows Amazon.com to run the infrastructure and provide data to its community of 40,000 developers. Amazon.com provides support where necessary, but will continue to foster an environment where developers in the community can be creative and become experts to their peers while developing rich and innovative solutions for managing inventory and selling products.

Participants: Amazon.com began delivering Web services—exposed in XML and SOAP form—to the development community in the middle of 2002. Amazon Web Services enable third parties to leverage the Amazon.com platform by creating applications for merchandising products and data from Amazon.com, and for managing product listings on Amazon.com Marketplace.

Goals: Amazon.com seeks to grow the affinity for use of Amazon.com by integrating with commonly used desktop applications, and to create a better user experience than that offered by the bland generic browser.

Execution: Amazon.com felt that user experience, loyalty, and sales would be strengthened if customers could access Amazon.com through commonly used application interfaces (e.g., productivity suites such as Microsoft Outlook, Microsoft Word, and Lotus Notes). The company believed that smart client technology would make this vision a reality. From the development perspective, Amazon.com found that the smart client technology enables its community of developers to leverage the smart client platform and concentrate on building applications on top of that infrastructure. Adopting a smart client approach has allowed, and continues to allow, Amazon.com to streamline the customer experience one step further by making interactions more transparent and proactive—moving from implicit uses of network resources to explicit uses of network resources.

Economics: Leveraging the smart client platform decreased the development time Amazon.com needed to devote to interface design. Amazon.com created an XML document and fed it to the research pane infrastructure. The application took care of all the details of presentation and layout, saving time and resources. Adopting the smart client platform is a core component to its vision around consumer interaction. Providing an experience where consumers can work in a client-based application that allows information retrieval and/or purchase from Amazon.com, without having to go through the cumbersome process of opening a browser and navigating to the site, creates the user-experience Amazon.com is working toward.

Report Methodology

The core of Jupiter Research's products is the perspective and opinion of Jupiter Research's professionals. Jupiter Research's analysts are immersed in the industries they cover through ongoing contact with corporate and technology leaders, daily study of trends and events in the online world, and their collective professional experience. Individual analysts' perspectives are filtered through rigorous collective debate and deliberation, producing research that reflects the combined sensibility of Jupiter Research's entire team.

Analysts' perspectives are enhanced and refined through Jupiter Research–designed market research. Jupiter Research uses many data research tools, including consumer surveys, systematic polling of leading industry executives, comScore Media Metrix measurement data, and a rigorous approach to building market forecasting models. Specialists with Jupiter Research's data research group assist analysts in the technical development of these tools, such as survey design, sample building, data weighting, and data analysis.

This report benefited from a number of specific market research projects, described below.

Jupiter Research/ERI Executive Survey

In December 2003, Jupiter Research conducted a formal survey of IT executives selected from the E-Rewards, Inc. executive panel. Respondents were targeted by function (IT Manager or above) and company size (500 employees or more), and screened for decision-making responsibility on software purchases and solutions for in-house development. A total of 702 qualified individuals completed the survey. Respondents received an e-mail invitation to participate in the survey, with an attached URL linked to the Web-based survey form. As an incentive, respondents were awarded with frequent flyer points.In this survey effort, Jupiter Research worked with its research partner E-Rewards, Inc. on the technical tasks of sample building, survey fielding, and data processing. E-Rewards maintains one of the largest executive research panels, with more than 200,000 IT and Business Executives in the U.S. Panel-based market research with E-Rewards enables Jupiter Research to field successful, highly targeted surveys to hard-to-reach executives such as purchasing managers and VPs of IT.

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