Whitepaper

October 2008

Mobile Applications: A Different Breed

A J.Gold Associates White Paper

"Our research indicates that greater than 85% of businesses expect to deploy wireless applications to their end users within the next 2-3 years. With a preponderance of organizations now deploying wireless email capabilities to end users, the extension of this environment to encompass back office applications is inevitable. This increasingly mobile phenomenon is not confined to any single class of workers, but affects all workers within the organization. Yet mobile applications are a different breed. They need optimization for the mobile specific infrastructure and work styles of the mobile user. Mobility remains a moving target for many companies. They must provide for maximum flexibility to optimize their investments, achieve a realistic ROI, and create an environment where mobile workers can be as productive as when in front of a fixed PC, or preferably even more so."

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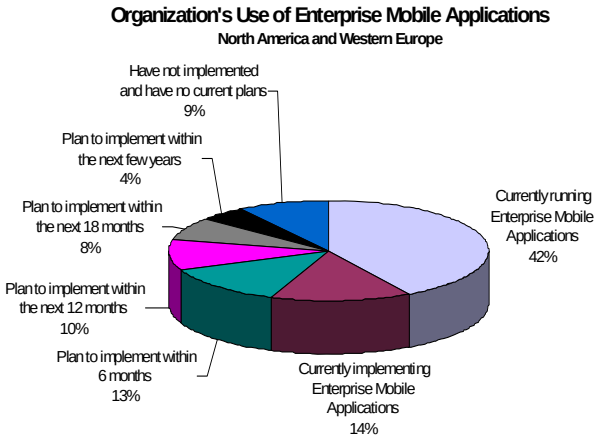
Why You Should Care About Mobile Applications

Business users are increasingly becoming mobile, and businesses, both large and small are responding. With the ability to obtain cost effective mobile devices that are un-tethered from traditional fixed networks, companies are finding ways to empower their end users no matter where they may be. Indeed, we see a number of trends that will materialize in the near term driving an ever greater need for companies to deploy mobile and wireless applications. First, our research indicates that greater than 85% of businesses expect to deploy wireless applications to their end users within the next 2-3 years (see figure 1). Further, many of these same companies expect smart phone devices, which are growing ever more capable, to displace a growing portion of PC devices for mobile users. And with a preponderance of organizations now deploying wireless email capabilities to end users, the extension of this environment to encompass back office applications is inevitable, and highly desirable by end users. Moreover, this increasingly mobile phenomenon is not confined to any single class of workers, but affects all workers within the organization from the executive ranks to field force workers.

However, there are a number of factors that make the deployment of mobile devices and applications difficult, and in some cases prohibit organizations from moving forward. First, security remains a key concern, as companies struggle to defend their data integrity from the growing exposure caused by small portable devices which are easily lost or stolen. Further, the lack of a single standard across all mobile platforms, and the continued diversification in mobile devices, means companies will not be able to easily standardize on a single device platform and will therefore need to deploy solutions that support multiple platforms and device types equally. This is not an easy challenge to overcome. And finding the most appropriate applications to deploy will require that companies fully understand all aspects of the workforce and how to best enable them to become more productive while mobile. This will often mean tailoring specific applications for specific types of users. Management and control, always a challenge even in a fixed and always connected world will become even more challenging for the mobile workforce. However, companies must provide a manageable environment for their workforce if they are to keep costs reasonable and levels of support high, both prerequisites to successful mobile deployments. And finally, because of all of these challenges, many organizations will struggle to define and achieve a payback on their mobile investments. Device diversity and overall worker requirements will necessitate companies make several deployment decisions as they move increasingly into the mobile realm.

Figure 1 – Organizations' Use of Enterprise Mobile Applications



Mobile Applications are Different

Deploying mobile applications means understanding the requirements and challenges of such deployments. Companies that fail to understand the ramifications of mobility will likely find failed deployments and limited opportunity for productivity improvements in their workforce, and as a result, an ROI that is less than optimum. Some of the limitations of mobile infrastructure that require adjustments compared to fixed solutions within the confines of the company, include:

- ***Connectivity constraints*** - Wireless networks are relatively slow and unreliable. It is not uncommon for users to find dead spots or slow networks getting in the way of their usage, particularly when substantial interaction with back office systems is required.
- ***Device physical and computational limitations*** - Small screens, difficult navigation, memory/processor constraints, and overall ease of use are all factors that can make mobile applications more difficult to design and deploy.
- ***End user interaction limits*** - End user "Frustration Factor" with slow, unresponsive systems can often doom a mobile solution. Users expect at least a comparable experience on their mobile devices to the one they are used to having on their PC.
- ***On board vs. off device data store and synch*** - How much of the application and data are local to the device can be a factor in how usable the solution is and how susceptible it is to network problems and work challenges. Putting more onboard and

relying less on network traffic can compensate for poor connectivity, but may stress the on board resources of the device. The best solution requires balancing the needs of connectivity, usage factors, and device performance, with a reasonable development and deployment cost.

- ***Extending Business Processes*** – Mobile workers on small form factor devices do not utilize the same process/workflow as PC users with relatively unlimited resources. Optimizing the solution to fit the device and work requirements of the end user are prerequisites to any successful mobile implementation.

It is important that organizations take all of the challenges into account when designing and implementing a solution. Getting the right balance is not a trivial exercise, but can make the difference between a successful solution and a failed implementation.

Components of a Mobile Deployment

Organizations contemplating mobile solutions have a number of choices to make during the design and deployment phases of the project. It is important that companies understand the various decision points in order to maximize the utility of the mobile solution so that the end user will gain maximum benefit from the application. Among the many criteria needing to be evaluated, companies should include the following in making the right deployment choices:

- ***Push or pull*** – Will the solution provide data delivery to the user's device, or will it require user intervention? Push solutions provide data to the user and device in an automated fashion based on any changes in data or conditions, while pull solutions require user intervention to retrieve the latest information. Which technology is utilized will depend on the strategy of the application and the type of server components. However, most modern applications are now being deployed around push technology that transparently delivers information to the user's device.
- ***Data display choices*** – Will the solution provide a rich media/graphical format or simply provide text? Plain text is the least desirable for complex data presentation to end users as it generally requires a longer time to interpret the data than graphical representations. However, for very simple informational delivery, text does provide an easy to deploy capability that graphical user interfaces can't match.
- ***Home grown or vendor supplied*** – Will the solution be an extension to an existing application provided by the vendor of that application or will it be a specifically designed solution and if so, who will do the data integration? While many off-the-shelf mobile application extensions are tempting due to relatively easy deployment and integration requirements, it is important to assess whether these components actually provide capabilities that will maximize the end user's effectiveness, rather than simply making users fit into the paradigm of the solution provider.
- ***Browser or specific client*** – Will the solution be delivered as a thin client browser-based application, or will a feature-rich thick client implementation be required? Enabling applications through a browser interface is a relatively simple procedure but may lead to a relatively simplistic approach to the solution. Further, it requires full time

connectivity to operate. An application-specific client is often more versatile, but at the cost of requiring a more extensive development effort. Which approach is chosen often depends on the complexity of the user requirements and the abilities of the network and the device employed.

- ***Standards-based or proprietary*** – Will the solution be enabled through standards-based technologies (e.g. Java, .Net) or will it require proprietary technologies designed for that specific solution? Providing standards based clients allows the re-use of that client on a variety of platforms (with minor modifications) that support the standard. Quite often, a proprietary approach requires a specific project for each type of platform, and is most often deployed within companies that have chosen a common platform to deploy to all its users. With changes occurring on a regular basis in device and platform technologies, this may not be the most flexible approach.
- ***Independent or tied to existing platform*** – Will the solution be a separate entity requiring its own server-based components or will it be an add-on to an existing mobile server? Many companies are examining extending exiting infrastructure, especially those based upon wireless email systems. Most such systems have included enabling technology to allow the extension of back office applications within the same framework, usually with minimal added complexity, while utilizing the inherent functionality, management and security infrastructure.

The Genesis of a Client Architecture

Once many of the above technology and strategy choices have been made, it allows an organization to begin the work of selecting and implementing a client architecture. As a requirement of this stage of the process, companies should investigate a number of issues, including:

- ***What types of devices will be supported?*** Companies must ask whether the solution will be deployed to just one device or whether it will be required to be supported on many device types ("device agnostic"). This is a critical determination, as it will have a major impact on the choice of client architecture. With so many devices available in the marketplace, few companies are limited to a single device type supported within their user base, although limiting the number of devices/platforms to as few as possible is advantageous.
- ***What type of client will be deployed?*** Client architecture falls into three primary characteristics:
    - "Thin" – thin clients incorporate no on-device application or data storage. These are generally the easiest to implement, manage, and secure, but require full time connection to operate.
    - "Thick" – thick clients include full on-device application code and data storage. These clients require significant development effort but have the advantage of working off-line when no connectivity is available.
    - "Smart" – smart clients are a hybrid of thin and thick clients incorporating the best of both techniques. They provide the best use of device and connection

assets and provide a way to bypass the often unreliable networks available to mobile workers.

- ***What type of enabling technologies will be included?*** Many different approaches to enabling clients exist, including J2ME, Browsers, .NET, C++, Flash, etc. The choice of enabling technologies needs to be based on familiarity with the technology, support for the technology by the back office solution and finally, support by the chosen mobile platforms.
- ***What type of development tools are most appropriate?*** Several Rapid Application Development (RAD) tools and technologies exist, including Microsoft Visual Basic, Eclipse, and vendor proprietary RADs. As in the above enabling technology choices, companies should make a choice based on any existing familiarity/expertise (including the availability of internal resources already skilled in the use of the tools), the compatibility with the back office application being extended to the mobile users, and the compatibility with the chosen mobile platforms.
- ***What type of connection is most reliable and safest?*** Companies need to evaluate the most appropriate connectivity technologies, including whether to utilize a virtual private network (VPN) to maximize security, and whether to utilize a connectivity path through a network operations center (NOC) instead of directly through the corporate firewall. Choosing these technologies are often dependent on what is already being utilized internally and what the mobile platform will support.

The technologies chosen for the client architecture will have a substantial effect on many of the other technologies chosen to enable a mobile solution, so this selection should not be made in a vacuum.

Mobile Middleware: Requirement or Burden?

Many companies will require an “intermediary” service to enable their mobile solution. This service acts as a bridge between the mobile and fixed deployment world, providing a number of access and delivery options to enable the transformation of previously PC targeted systems into mobile-ready solutions. Organizations should evaluate mobile middleware based on a number of criteria that strike the right balance in cost, complexity, ease of deployment, security, flexibility and functionality, including:

- ***How are connections to back office systems made?*** - There are two primary ways to connect. “Loose Connections” via HTML, XML, TCP, etc. provide a convenient and standards based approach, but are not the most flexible or necessarily the most efficient. “Tight Connections” integrated directly via the platform and application APIs provide the most flexibility and customization capability, but also require a greater deal of skill. Trade-offs between loose and tight connections should be made while assessing the challenges required in skill levels, time to deployment and overall budgets and cost constraints.
- ***New vs. re-Use*** – Many organizations already have some form of mobile middleware in place, often through the deployment of wireless email. This provides a convenient starting point to deploy additional applications to the end user who already is email

enabled. Although this approach may be more limiting than utilizing a fully customized client and middleware deployment, its ability to get solutions to the end user quickly and to the platforms already in use make it a preferred platform for many organizations and mobile solutions.

- ***Cost vs. flexibility*** – Companies should evaluate any solution for its flexibility and overall cost to deploy. Universal middleware services can often be leveraged and extensible for many additional mobile needs, while unique vendor specific extensions often do not allow use with other vendor's applications. The choice needs to be evaluated based not only on current needs, but also on what the long term mobile strategy is and how many solutions will be deployed throughout the organization.
- ***Behind the firewall or managed service*** – Many companies prefer to deploy their applications totally behind the firewall to limit exposure and maximize control. While this is a valid approach, it may not serve all the needs of every solution. Managed services in some cases may offer the best value and most appropriate approach for a number of mobile solutions, especially if they are less than strategic to the business.

Companies have a number of choices to make in middleware services, and defining what runs where will have a major impact on the amount of time it takes to deploy, the cost of such deployment, and the flexibility and extensibility of the mobile infrastructure to future needs.

Conclusions

Nearly all organizations require mobility if they are to run efficiently and effectively. More and more end users will spend a significant amount of time outside of the four walls of the company. Therefore, getting a handle on mobile application deployment is critical. Yet mobile applications are a different breed than traditional PC based applications. They need optimization for the mobile specific infrastructure and work styles of the mobile user. To succeed in mobility, organizations must know what users require to get their work done, and must not overwhelm the end users with too much complexity or information on their small form factor mobile devices. Companies must also balance strategic deployments against tactical, task specific projects, so as to maximize investment and make the best choice in platforms and technologies. Companies also must remember that adding management, security and end user support as part of the solution can dramatically affect the overall success or failure of the deployment. Effective management and support is the only way to keep overall cost low long term and to keep user satisfaction high thus maximizing productivity. Finally, organizations must remember to consider mobility a strategic investment and to make their choices accordingly. Mobility remains a moving target for many companies. They must provide for maximum flexibility to optimize their investments, achieve a realistic ROI, and create an environment where mobile workers can be as productive as when in front of a traditional PC, or preferably even more so.

About the author

Jack E. Gold is Founder and Principal Analyst at J.Gold Associates. Mr. Gold has over 35 years in the computer and electronics industries, including work in imaging, multimedia, technical computing, consumer electronics, software development and manufacturing systems. He is a leading authority on mobile, wireless and pervasive computing, advising clients on business analysis, strategic planning, architecture, product evaluation/selection and enterprise application strategies. Before founding J. Gold Associates, he spent 12 years with META Group as a Vice President in Technology Research Services. He also held positions in technical and marketing management at Digital Equipment Corp. and Xerox. Mr. Gold has a BS in Electrical Engineering from Rochester Institute of Technology and an MBA from Clark University.

About J.Gold Associates

Founded by an internationally recognized expert and industry veteran with over 35 years of experience in engineering, product marketing, market research and analysis, and technology advisory services, J.Gold Associates provides its clients with insightful, meaningful and actionable analysis of trends and opportunities in the computer and technology industries. We offer a broad based knowledge of the technology landscape, and bring that expertise to bear in our work. J.Gold Associates provides strategic consulting, syndicated research and advisory services, and in-context analysis to help its clients make important technology choices and to enable improved product deployment decisions and go to market strategies.

J.Gold Associates, LLC
6 Valentine Road
Northborough, MA 01532 USA
+1 508 393 5294
www.jgoldassociates.com