WHITE PAPER

Enterprise Mobility

How to unshackle your mission-critical applications:
Two cases studies describe different approaches to providing employees with secure access to corporate information systems.

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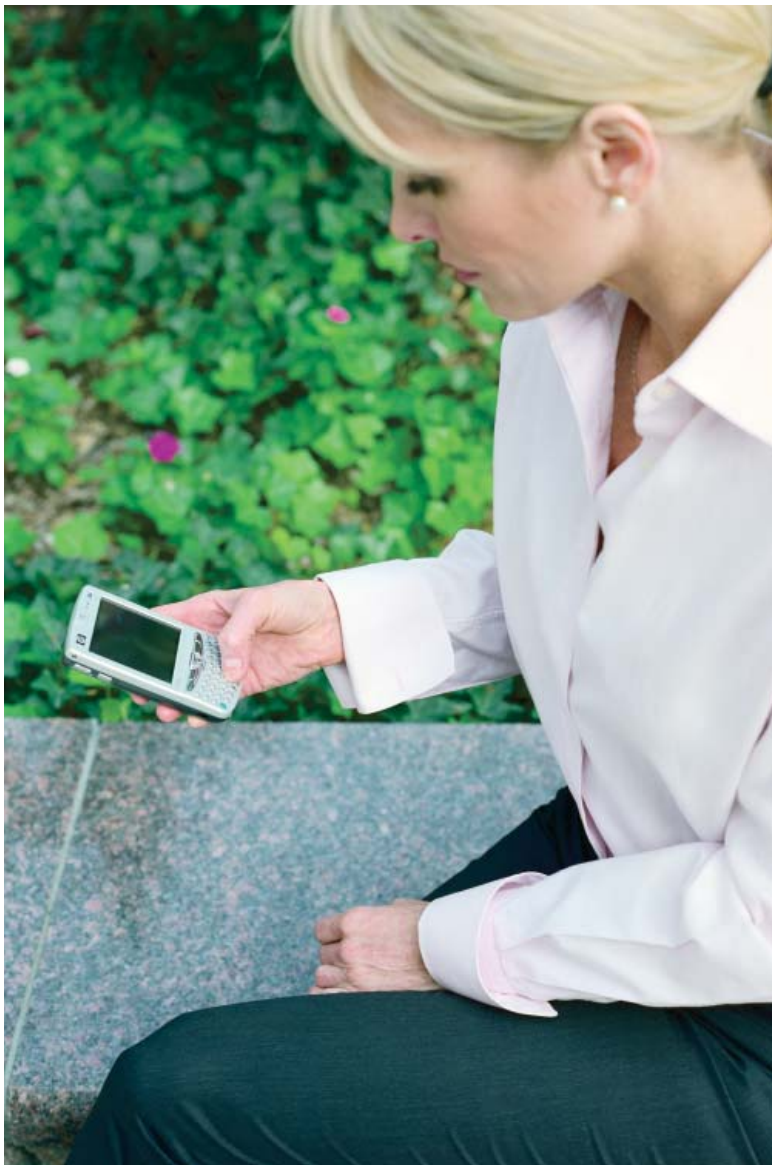

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Enterprise Mobility: Unshackling Your Mission-Critical Applications

2007

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What's Inside?

During the last 5 years, the mobile landscape has been swept by change. While telecommunications providers have been investing in faster networks to support multimedia and data services, falling prices and shrinking components have put significant power into affordable devices that slip comfortably into a pocket. Beyond enabling an increasingly mobile workforce with basic email and calendar synchronization, however, enterprises have been slow to capitalize on these advancements. Although enterprise mobility remains in the nascent stages, traditional arguments against deploying mobile applications – cost, performance, management and security – have largely been countered by mobile platforms that make unshackling your enterprise applications surprisingly easy and cost effective.

In this paper, two case studies illustrate different approaches to unlocking the value of existing investments through mobilization. Each case study provides an overview of an application we mobilized, identifies the characteristics that made the application a good candidate and explains the value realized by enabling access to these applications from mobile devices. The paper concludes with some lessons learned and steps you can take to bring similar value into your organization.

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Opportunity Awaits

Since the mobile telephone was first introduced, network effects and wireless deployment costs vis-à-vis traditional wire-line networks have propelled global adoption of cellular technologies along an exponential growth curve. The high cost and bulky nature of early phones often relegated them to the province of the elite. The evolution of computing and communications technology eventually drove down prices, putting corporate-sponsored phones in the hands of knowledge workers beyond the Fortune 500 executives alone. Sales, Service, or Technical workers in companies large and small alike began enjoying access to the earliest of mobile devices, the cell phone.

"The number of workers with mobile access to corporate email has grown wildly as mobile email platforms such as Good Mobile Messaging have become broadly available and priced within reach of many tiers of workers below the executive ranks."

Mobile services evolved rapidly as the networks became more robust and advanced. Although early phones were limited to analog voice service, the introduction of digital cellular networks in the early 90s paved the way for services such as the Short Messaging System (SMS). The following decade saw SMS traffic explode. In 2006, global SMS traffic is expected to exceed one trillion messages and contribute $55 billion to carrier revenues[1]. The number of workers with mobile access to corporate email has grown wildly as mobile email platforms such as Good Mobile Messaging have become broadly available and priced within reach of many tiers of workers below the executive ranks. With carrier introductions of HSDPA and EVDO, network speeds continue to increase dramatically, providing broadband-like access to a mobile device that now shares more functionality with a laptop than it does the pager-style, text-centric device it evolved from. Voice and email over a carrier network are readily available and in widespread use. Applications typically have web-based interfaces, web services, APIs, or other forms of access points making them a legitimate target for a mobile interface. Yet the majority of corporations who have adopted mobile email have not exposed additional applications or services beyond intranet access or small line-of-business applications with very narrow focus.

Reasons for this are many. In the long history of cellular communications the ability to transfer data over the network to a device is not new. But the ability to do so in a secure and encrypted manner, with bandwidth approaching and even exceeding the speeds available in many users' homes, is a very recent occurrence and will be followed by a wave of corporate users accessing a variety of corporate-sponsored services, applications, and content on their mobile devices, email being just one of them.

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[1] *Mobile Messaging Futures 2005-2010.* Portico Research. June 27, 2005. Summary online: http://www.portioresearch.com/MMF05-10.html

At the same time, problems have plagued enterprise deployments of tools such as Sales Force Automation (SFA) and Customer Relationship Management (CRM) with many organizations wondering when they will see a return on their investment. Why? There are many contributing factors, but one of the most significant is that the people who stood to benefit most from managed customer data were rarely connected to the network frequently enough to leverage it. Thus, traveling sales professionals were often forced to rely on office staff to fetch data from corporate information systems – an inflexible process fraught with inefficiency. At best it meant that after a day on the road, the corporate traveler would be forced to connect to the corporate network from a hotel room, entering stale and partially forgotten information while extending their work day. Not the best model to drive utilization! Convenience and simplicity are keys to the productivity of the mobile worker.

Although wireless e-mail has become an indispensable tool for the mobile workforce, it has several shortcomings. Despite being able to quickly create and dispatch messages, road warriors must still wait until their requests are manually fielded by support staff; true self-service remains elusive. Nonetheless, amid these problems there is significant opportunity. As carriers work to improve network bandwidth and enhance mobile services, corporations can take advantage of the infrastructure to construct a mobile enterprise, unshackle their mobile applications from the PC and allow sales staff to focus on building relationships with current and prospective customers. This is the promise of Enterprise Mobility – a concept long in history but only now developing to the point of meaningful enterprise platforms and widespread access to applications beyond email.

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Getting There from Here

In a September 2006 research report[2], Gartner discussed the six styles of mobile application architecture:

1. **Thick Client.** Code and data stored on the device
2. **Rich Client**. Code stored on the device; little or no resident data
3. **Streaming.** Streaming client on the device
4. **Thin Client.** Browser or similarly generic client
5. **Messaging.** E-mail, SMS, instant messaging or other messaging technology used as data transport and user interface
6. **No Client.** Uses native device features, such as voice or tone generation

While current phones natively support the no-client interface, the latest release of Good Mobile Intranet complements the popular Good Mobile Messaging with secure mobility solutions that support many of these architectural styles.

One of the most compelling benefits of our approach is the ability to quickly move web-based applications from enterprise desktops to wireless devices. In the case studies that follow, we describe two different approaches to mobilizing existing applications. We also explain the rationale that led us to choose one approach over another, identify the tools that we used and quantify the benefits to both the mobile workforce and customers. Following the cases studies, we offer some advice on how you can achieve similar success within your organization.

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[2]Nick Jones and William Clark. *Choosing Between the Six Mobile Application Architecture Styles.* Publication ID: G00141462. Gartner. September 1, 2006.

Case Studies

Each case study provides an overview of the application, identifies the characteristics that made it a good candidate for mobilization and explains the value we realized by enabling access to enterprise applications from mobile devices. We begin with Account360 and then move on to the Mobile Device License Audit (mDLA) software.

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ACCOUNT360

Account360 is a Java-based web application that provides sales professionals with a 360° view of current customers, including details related to license compliance, invoice history and support contracts. The application is crucial to the sales organizations because it allows quick access to a customer profile. Since its introduction, it has reduced the time required to respond to customer requests from days to minutes.

Why Mobilize?

Being attentive to the needs of current and prospective clients can help improve customer satisfaction and shorten sales cycles. Although Account360 helped improve customer interaction, it was being designed primarily for access by desktop web browsers. The information maintained by Account360, the need for remote access to the data and the applications current status as a web-based application all made it a good candidate for mobilization.

The Road to Mobilization

In order to choose the optimal deployment model, we conducted interviews with our sales professionals to understand their pain points. Here are some of the things they said:

- "I want to be able to look up all of a customer's information including billing, invoicing, compliance and IT contacts, and I don't want to have to haul out my laptop to do it."
- "When I find what I'm looking for, I want to be able to export, modify and e-mail it to my customer."
- "I do not have the time to sit through an additional training class to use this [new application]."
- "I regularly carry a few different devices to show customers, and this has to work on all of them. "
- "I do not need access while I'm flying [or otherwise offline]."

We knew that the sensitivity of the data required high security and that our engineering group was busy working on other projects, so requests to change Account360 would be carefully scrutinized. Given all the requirements and considerations, we determined a thin client approach (Table 1) to be the most appropriate.

	Thick	Rich	Thin	Message	Account360
Usability	High	High	Moderate	Low	Moderate
Sophistication	High	High	Moderate	Very low	Moderate
Typical Total Cost of Ownership (TCO)	High	High	Low	Low	Low
Supports Peripherals	Yes	Limited	No	No	No
Out of Signal Operation	Yes	Limited	No	No	No
Security	Flexible, high	Flexible, high	Inflexible, limited	Inflexible, often weak	High
Device Range	Very limited	Limited	Broad	Very broad	Broad

Table 1: A Comparison of Mobile Application Architectures[3] - Account360

Account360 is a relatively young application and, as it evolves, the interface is apt to change. Further, tight deadlines and a focus on customer solutions precluded dedicating engineers to design and build a customized mobile client. Fluid interface specifications and a shortage of engineering resources introduced several risks. However, the content transformation technology embedded in Good Mobile Intranet (GMI) helped mitigate project risk by reducing complexity.

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[3]Nick Jones and William Clark. *Choosing Between the Six Mobile Application Architecture Styles.* Publication ID: G00141462. Gartner. September 1, 2006.

GMI tailors the intranet and internet to the handheld device by providing a facility to apply out-of-the-box transformations such as table manipulation, image removal and data filtering. It also allows custom XSLT[4] logic to be applied to the data and features the same secure mobile platform as Good Mobile Messaging.

In order to deliver the right solution, we followed a structured process beginning with careful analysis of the Account360 application. We determined which portions of the application warranted mobilization, assessed the complexity of each screen and studied the current authentication and authorization schemes.

Next we worked with the IT Department to request minor changes to Account360[5]. The changes had no impact on the application, but the addition of semantic markup information helped GMI readily identify content containing HTML tables.

Finally, we worked with the development team responsible for the application and provided input on markup and naming structures so that we could provide a mobile-specific user experience but leverage the existing user interface design. This and further collaboration insured the most relevant components of the application were inherently ready to mobilize. With the semantics in place and specific use cases in mind, it was time to begin executing.

Writing XSLT tools was the first step in execution. We started with common tools to transform the navigation bar and remove formatting specific to large screens. With that complete, we then created specific transformations for select Account360 components.

When the transforms were complete, we deployed the solution to a pilot group within the sales organization. Our pilot team was quick to provide feedback and offered additional ideas for supporting additional workflows and tweaking the mobile interface. Suggestions were incorporated, tested and quickly released to the pilot users. This iterative process of quick releases continued until everyone in the pilot was comfortable with and excited about the new solution. Demand had been built within the greater sales group and the initial users became more familiar with and used to interacting with this system on their mobile device.

After insuring the validity and integrity of the transforms and winning initial user adoption, not much additional effort was required to release the application to a broader audience. The infrastructure complete and the application requiring very little training for a user familiar with the Account360 application, the sales team simply received and email notification about the availability of Account360 through their GMI client, with a link directly to the login screen. A link to the login screen was also added prominently within the 'Good Mobile Portal' which all of our users see as their default home page.

Finally, a short module about the mobilized Account360 was added to the standard training curriculum so that new employees with access to Account 360 would be exposed to the mobile version from the beginning.

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[4]e**X**tensible **S**tylesheet **L**anguage **T**ransformations. More information about XSLT and be found at http://en.wikipedia.org/wiki/Xslt.

The Good Mobile Intranet transformation engine first ensures the HTML is standards compliant, converts it to XHTML, and then applies the XSLT logic based upon a selector. The final result is translated into GDOM (a proprietary Document Object Model) and sent to the Good Mobile Intranet client.

[5]Several ID attributes were added to tables in order to make it easier to identify them. While it remains important for companies to introduce and establish development standards, the migration toward stricter semantic markup will help propel presentation and content on their separate journeys. The support for sophisticated CSS-based layout within current browsers is encouraging in this regard.

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Mobile Results

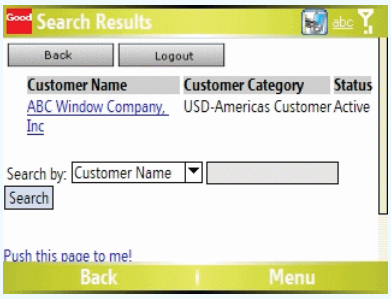
With a three week investment in development and testing, an application that was previously confined to the province of the desktop was now available on a variety of handhelds (Treo 650/700p/700w, HTC Wizard, and Motorola Q to name a few).

Using GMI to mobilize Account360 provided users with a better experience than accessing the application directly from a mobile browser. By using GMI to dynamically transform the existing but robust presentation layer we were able to deliver a solution that:

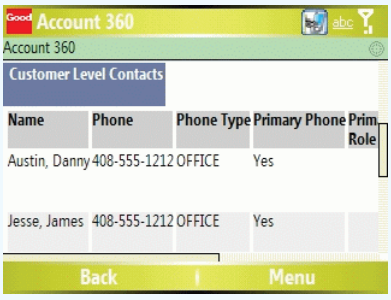
- Improved navigation and minimized horizontal scrolling by removing formatting designed for large screens and by targeting specific data elements
- Decreased the time to customer (time to market), allowing for a rapid cycle of providing functionality to meet user requests
- Improved the value on investment. Only slightly more development time was required to deliver a mobile version of an enterprise application
- Did not have any significant impact on the development team during this project or for future development
- Secured the data by leveraging the mobile security incorporated in all of our products and honoring user-specific attributes
- Incorporated existing authorization and authentication mechanisms to support single sign-on.
- Delivered a mobile application that delighted and improved the effectiveness of the sales organization

When users arrive at the mobile application, they are greeted by a familiar login screen that is tied to their Windows credentials.

Following successful authentication, they can search for customers based on various fields.



The results of the search are returned to users, who may then export, download or e-mail Word, Excel and PDF versions of the information.



Tools We Used

Creating this solution required neither complicated nor expensive tools; all we needed for the job was

- A basic text editor
- Internet Explorer (for debugging)
- Good Mobile Intranet, including the Good HTTP Transform Proxy tool

In the next case study, we'll take a look at another application that underwent a facelift, the Mobile Device License Audit (mDLA) application.

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MOBILE DEVICE LICENSE AUDIT

The Device License Audit (DLA) report provides sales professionals with an efficient way to reconcile variations between the number of purchased licenses and the number of active users for a particular Good product. With this information, the sales team can be more responsive to customer needs and initiate value-added conversations while ensuring license compliance.

Why Mobilize?

Although the current DLA report is valuable to sales staff, its delivery and display for mobile devices is ineffective. Based on Oracle Discoverer, it is data-intensive and cumbersome to generate and analyze. When traveling, members of the sales team requested a different internal group, the owners of the DLA Report, to extract and e-mail the report to them. Consequently, access to the current data was dependant on human intervention, through a separate team, and required a high-degree of individual contact. This process frustrated the sales team: if current and accurate data was readily available to them, they would be able to respond to customer inquiries quicker. Typically, they were most interested in the summaries for one or two customers only, and sifting through the low-level data was time consuming. They needed an easier way to find just the information they wanted: it was not just a matter of mobilizing an existing web interface; it was the creation of a new user interface that provided the summary data our sales team needed.

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The Road to Mobilization

We recognized that selecting an appropriate deployment model was an important contributor to success. To help us make the appropriate choice, we sat down with our sales staff to understand their pain points and our IT Department to ensure our solution would be supported by enterprise Privacy and Security policies. These two groups told us what they wanted:

- An application that worked the same way on any of the devices they carried: Palm Treo 600/650/700p/700w, Motorola Q, HTC Wizard, etc.
- A light-weight and speedy solution that made efficient use of memory, returned results in under ten seconds and didn't require synchronization with a cable.
- A cost-efficient program that didn't require client access licenses for enterprise reporting software.
- Access to live data so they could proactively see the progress of strategic deployments and easily obtain status of other customers
- Reliable, end-to-end security. Given the sensitivity of the information, this requirement was vital.
- A solution that required minimal training.

The requirements-gathering process also revealed two other facts. Offline access to all data was not crucial, but the product had to support future integration with applications such as Salesforce.com. This feature was requested to allow future versions to restrict visibility to additional account information based on Saleforce.com profiles. Given these requirements, we assembled a familiar table (Table 2).

Although a thick-client would have supported our requirements, it would also have involved a greater investment in development and testing for each device, as well as increased customer support. Moreover, a thick client would have required database synchronization, a specialized authentication mechanism, and device-side data encryption which would increase complexity and expand the memory footprint, limiting concurrent operation of other device features. Once again, a thin-client approach was agreed on.

Although the sales team didn't require access to all license data offline, they did want selective offline access. This feature is not available using a strictly thin-client approach. Fortunately, Good Mobile Intranet includes a Push Service that allows users to subscribe to data feeds. Each of these subscriptions is called a Push. When creating a Push, users establish their own delivery schedule and may even opt to be notified when new the content of the push changes. Once a Push is established, background processes silently replicate the appropriate information to mobile devices. Since the replica exists in the device cache, it is available even when users are outside of coverage areas. And, since the cache is managed by Good's software, if the device is lost or stolen, it can be remotely erased by the Good administrator before unauthorized users gain access to corporate data.

	Thick	Rich	Thin	Message	mDLA
Usability	High	High	Moderate	Low	Moderate
Sophistication	High	High	Moderate	Very low	Low
Typical Total Cost of Ownership (TCO)	High	High	Low	Low	Low
Supports Peripherals	Yes	Limited	No	No	No
Out of Signal Operation	Yes	Limited	No	No	Limited
Security	Flexible, high	Flexible, high	Inflexible, limited	Inflexible, often weak	Limited
Device Range	Very limited	Limited	Broad	Very broad	Broad

Table 2: A Comparison of Mobile Application Architectures[6] - mDLA

In order to enable these features, we spent ten days designing, developing and testing several custom ASP.NET pages. Following on the heels of our success with the Account360 pilot, we asked the same group to help evaluate and refine the mDLA solution. Several iterations of development, testing and pilot deployment followed in rapid succession. Once the pilot group was satisfied, the application's front page was distributed to the entire sales organization using the Good Mobile Intranet Push Service.

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[6]Nick Jones and William Clark. *Choosing Between the Six Mobile Application Architecture Styles.* Publication ID: G00141462. Gartner. September 1, 2006.

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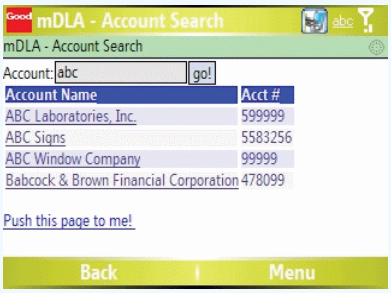
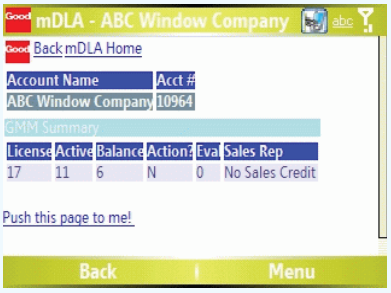
Mobile Results

Using some of the features included with Good Mobile Intranet and two weeks of development, we provided a twenty second solution to a problem that used to take several minutes at best. We also gave the sales team access to the right data, at the right time; the ability to answer the specific questions of , "How many active users does this customer have? How many licenses have they purchased? How close are they to being out of compliance?" And this they can do from wherever and whenever they need it. The mDLA solution provided the sales organization with

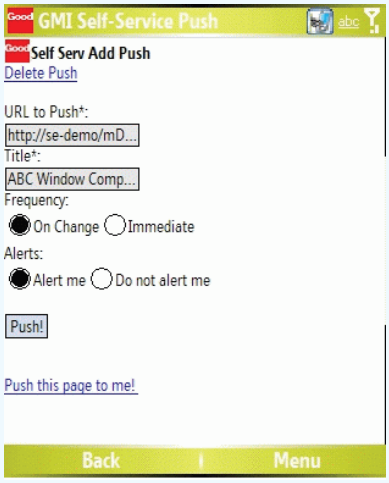
- A new and radically simplistic solution to a complex problem, literally saving members of the sales force several minutes several times per day every day
- An application available on a variety of handhelds
- A device-side experience that required no time for users to master and requires the bare minimum of input
- The ability to immediately provide accurate license and activation statistics to customers and management.
- A solution that replicated very specific "as needed" information and left the rest securely stored behind corporate firewalls.
- An architecturally simple solution that minimizes the device-side memory footprint, requiring no additional reporting licenses and supports future integration with Salesforce.com.

The following images shows the mDLA home page, where uses can search for account information based on customer name or number.





Once the results are provided, users can create a new Push, which will be silently delivered to their device based on the schedule they establish.



Tools We Used

Although the mDLA solution was slightly more sophisticated than Account360, it relied primarily on Commercial-Off-The-Shelf (COTS) software, incorporating little custom development. We used the following tools:

- Visual Studio 2005
- Internet Information Services v6.0
- SQL Server 2000
- Internet Explorer (for debugging)
- Good Mobile Intranet, including the Good HTTP Transform Proxy tool

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Discoveries & Next Steps

As we went through the exercise of mobilizing these applications within Good Technology we learned several things that we believe contributed to our success here and on subsequent mobilization projects:

- There are a variety of ways to mobilize enterprise applications. Choosing the one that best fits your budget, technical capabilities and devices is important to success.
- As you begin to mobilize applications, keep the application requirements to a minimum. Support critical workflows and data elements first, and make it very easy and fast to get to this information. Keep it simple.
- Selecting industry-standard tools will help ensure ample talent is available to create and evolve the solution as your users embrace the mobile enterprise, and will quickly provide a template and methodology for further projects
- Identify pilot users, who can help shape the application. When they feel like they're part of the process, their enthusiasm will spread to their peers, and their input will help you provide the most focused and powerful application possible.
- Focus on optimizing content for handhelds and complementing (instead of replacing) existing workflows. By expanding self-service capabilities or enabling workflow approval, you'll be helping users help themselves. By empowering users, you'll mitigate some of the risk associated with enterprise mobilization, improve the user experience, encourage application adoption and enhance business value of the underlying system to the business as well as the end user.
- The very nature of mobile devices makes them more likely to be lost or stolen. Consequently, security must be thoughtfully woven into the fabric of mobile solutions. Choosing a platform like Good Mobile Intranet that incorporates device-side security, auditing capabilities, encryption and fleet management will help protect your corporate data.

Through the two case studies, we've explained how you can be this Good. Call us.

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Derek is the Solutions Consultant with Good's Professional Services team. He spends most of his days musing about enterprise applications that would benefit from mobilization. Prior to joining Good Technology, Derek worked as a Senior Technology Consultant with Manugistics, where he helped members of the industry vanguard realize dramatic improvements to their supply planning practices. Besides his consulting work, Derek has developed and delivered courses on the Perl programming language and holds a Bachelors degree in Commerce and Management Science from Wilfrid Laurier University. When he's not conjuring up new mobility solutions, he can often be found playing bluegrass guitar at his home in Palo Alto.

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Harley is a Manager with Deloitte Consulting's technology integration practice. His professional activities relate to enterprise architecture and large-scale system development projects for public sector clients, especially those concerned with public health. His interest in enterprise mobility is driven by observations he made while sitting at a system console during various disease outbreaks. He knew that provider response would be more effective if data could be collected, analyzed and distributed more quickly and so he set about creating ways to accomplish just that. Harley has previously written about the use of electronic social networks as a foundation for enterprise talent management and published research related to the use of expert systems in personal computer configuration and the evolution of corporate IT departments toward a network organization. He holds an M.S. in Management from Queen's University and spends most of his time in a United Airlines jet traveling between clients and his home in San Francisco.

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For More Information

Please visit www.good.com. On our web site, you'll find additional case studies describing the benefits industry leaders have realized with Good solutions.

If you would like to arrange a demonstration of Good Mobile Intranet and discuss how your business can benefit from our solutions, we'd be delighted to speak with you. Please call our Solutions Management group: 408 327 6314.

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