Smartphone sales are rapidly outpacing PCs. Android devices alone grow at more than 1.3 million activations per day. Google Chairman Eric Schmidt predicts that by the end of 2013 there will one billion Android devices deployed. And that is just Android!
Today’s consumers take their pocket computers for granted. Phone calls, pictures, mail, maps and directions, text messaging, menus, news, and games, to name just a few, are available, on demand from a singular portable device. It’s only natural that at some point this convenience would reach enterprise computing generally and the IBM i specifically. We will be desktop-bound to the IBM i for a long time but there is no doubt that smartphones and tablets are dramatically changing the ways we’ll use the IBM i in the future. These pocket computers will not only change when and where we use the IBM i, but they will (very quickly) impose a sea change on the future of IBM i application development.

In this ASNA white paper we’ll take a look at the business case for mobile computing with the IBM i. We’ll look at its payoffs, the risks, and what challenges it provides. We’ll also introduce ASNA Mobile RPG®—a new product that resolves your IBM i mobile application programming challenges.

The browser revolution arrives—for some

Two of the biggest technology changes for the enterprise over the last 25 years or so have been PC desktops and browser-based applications. PC desktops changed things, but probably not in a revolutionary fashion as far as IBM i workflows and business processes were concerned. We certainly used spreadsheets and other office products to improve productivity but the IBM i didn’t know or care that we were connecting with a PC instead of a dumb terminal. PCs may have streamlined some processes but PCs alone didn’t bring wholesale change to IBM i business models.

Browser-based applications, especially when used across the Internet, did usher in a business model revolution far more so than PC desktops.
Processes that were once the exclusive domain of the back office were pushed out to end-user fingertips. Paying property taxes no longer requires long lines at the assessor’s office (and the county employee at the desk) and it no longer requires back-office keypunching. That kind of business process change is revolutionary (if you don’t believe that, ask travel agents how browser-based applications changed their business model!).

The change brought about by browser-based apps was quickly adopted by large companies and start-ups, but for smaller companies that change was slower coming—and for some small businesses still hasn’t quite arrived. Creating and deploying browser-based applications imposed substantial changes to long-standing ways of creating applications—it’s hard to break out of the comfort zone of traditional development for the untested value of creating browser-based applications. And the problem isn’t just about comfort zones; it’s also about legacy application dependence.

We long ago learned that screen scrapers don’t solve legacy application problems; they only buy you time until you can do something strategic about those legacy applications. End-users aren’t fooled by the charade that screen scrapers pose—they know they are using a “skinned” character-based application. ASNA has products that migrate IBM i RPG applications to .NET (ASNA Monarch®) or provide a true browser-based alternative UI for IBM i RPG programs (ASNA Wings®). These products are in use by many companies today to help resolve their legacy application dependence. Alas, even with the great ASNA products available, not every IBM i business has yet embraced a browser-based world. The browser revolution arrived for some, but it didn’t arrive for all.

Although many IT decision makers understood the general value of browser-based applications, the payoff for this type of application was often hard to identify and qualify. With an unknown ROI, many businesses simply avoided the issue by simply not doing anything. Remember that we’re talking here about applications in the browser, not the business’s marketing presence. Most businesses of any size today at least have a simple Website with static HTML pages—the ROI were talking about here is delivered when your users can work interactively (that is, read and write) with enterprise business data in a browser. For many businesses, even in 2013, this type of Web application remains elusive.
Pocket computing is changing the rules

Because C-level executives are consumers too, they have intimately learned the value of the smartphone over the last five years. They know the value of being able to get an answer, wherever they are, at any time. Mobile devices work 24x7. And, not only do these executives intrinsically understand the value of pocket computing for themselves, they understand the value it can bring to their team. It’s not hard for them to extrapolate the value the entire team gets when everyone gets answers quickly wherever they are. In the case of mobile applications, C-level executives are leading the charge. They are coming to their developers and waving their smartphones saying, “How quickly can I see sales results on my phone?” This is a critical point for mobile application adoption—the ROI of mobile devices is perceived to be very high by executives and business decision makers.

Businesses who ignore the mobile wave will quickly find themselves at a competitive disadvantage

Another part of the attraction of mobile computing is how its existence is enabling executives to reimagine business workflows and processes. Mobile computing’s appeal isn’t just making existing things more convenient, but making new things possible. For businesses of any size, the maturation and ubiquitous distribution of mobile devices serves up notice that for any business that hasn’t yet, it’s time to join the mobile revolution. Businesses who ignore the mobile wave will quickly find themselves at a competitive disadvantage.

One of the compelling aspects of using mobile applications in the enterprise is that it provides access for virtually all types of users. While in many cases executives are championing the need for mobile, users from all parts of the organization’s strata will benefit—and mobile redefines the meaning of “user.” Mobile applications can be made available for employees, customers, prospects, business partners, and those in other business units. These applications can make critical IBM i data available to these users anytime, anywhere, dramatically improving their efficiency and productivity. Think about how many times a day you reach your phone to glance at something. Now imagine your business users being able to do that with your business data.
“The Mobile Web Initiative is important—information must be made seamlessly available on any device.”

—Timothy Berners-Lee, inventor of the World Wide Web
For many businesses, it may be necessary to implement mobile computing not just for a business edge, but simply to stay in the game

For virtually every business, mobile computing must be seriously considered. It extends the reach of your business in ways simply not possible until now. And, beyond the growing pressure that users (of all kinds) create for mobile computing, it’s important to remember that your competition is eyeing mobile as well. It may be necessary to implement mobile computing not just for a business edge, but simply to stay in the game.

Need established. Now what?

With the need for mobile applications established how does a business go about acquiring mobile applications? There are several challenges most businesses face when acquiring mobile applications:

- **There generally is no such thing as a useful canned mobile package for enterprise businesses.** The intrinsic value of mobile computing is extending your business’s ability to improve and hone the unique value it offers your customers and prospects. “Unique” is the key word here. You need mobile apps with very specific capabilities. You can’t buy the mobile apps you need—they need to be written for you.

- **Creating mobile applications usually requires a unique skillset not generally found today in most line-of-business application developers.** There are two types of mobile applications today: native and HTML5. Creating native mobile applications requires many very specialized skills and tools—and they must target a specific device (i.e., you need separate versions for iPhones, Windows phones, and Android devices). For most enterprise needs, the HTML5 approach does a great job and it works across multiple devices. But even the HTML5 approach requires a mix of technologies that often takes several months to learn. Businesses with developer teams who have already built browser-based applications have a head start on the learning curves—but even then don’t assume too much. Mobile applications require specialized skills and impose challenges that aren’t found in traditional browser-based development.
• **Mobile applications require an infrastructure that traditional green-screen applications don’t.** Mobile applications (native or HTML5) require a Web server in some capacity. Native apps require the Web server for it to provide data and HTML5 apps require the server for presenting the UI and the data. Many businesses have an aversion to putting their IBM i on the internet—so this is something that must be carefully considered. You’ll want to select a path to mobile that protects your IBM i from direct exposure to the Internet.

• **Mobile applications impose security concerns and constraints.** This is closely related to the previous “infrastructure” bullet, but businesses must consider the security of mobile application very carefully—even more so than with traditional browser-based applications. It’s easy to leave a smartphone in a restaurant’s restroom. Depending on how the device and its applications are configured, the potential exists that the person who finds that phone will enjoy reading your business data! Beyond the physical security concerns, you need to consider the social concerns as well.

### The need for new applications

Beyond these bulleted items, another mobile consideration is that mobile devices almost always require new applications. Attempting to “mobilize” your green-screen applications would probably not only fail but it probably also wouldn’t solve the problems you need to solve with mobile. These back office applications were very broad in their focus with lots of data displayed on the screen. This is not the kind of application that works well on mobile devices and it’s probably not providing the kinds of information your mobile application users need.

If you have graduated to browser-based applications it may be feasible to consider using those browser-based apps on mobile devices. However, there are many considerations for rendering a browser-based application on mobile devices and it’s not likely your browser-based apps were written with those considerations in mind. There are several reasons that existing applications may not fit the mobile model:

• Mobile applications are narrowly focused and aim to do a few things very well. Traditional back-office applications are broadly focused and do lots of everything.
Mobile applications are rendered on a device that is constrained by connectivity issues and limited capacity. Mobile applications must purposely limit how much data they present at any one time.

Mobile devices have a limited display area—typically about 15-20% of that of a traditional desktop-bound browser. It is true that a mobile device’s display can be dragged around as a “viewport” over a much larger virtual screen, but pinching and dragging provides an unpleasant user experience. Users don’t want to pinch and swipe to see things—they want data that is easily displayed.

Although mobile apps will usually need to be new applications, there is good news. With mobile applications, you are rarely, if ever, be replacing monolithic back-office application. Rather you are supplementing that back-office application with additional capabilities. Consider, for example, performing a customer inquiry to determine the current collection days for that customer. That functionality probably exists in a back-office application, but is deeply embedded in that app—with lots of other functionality not needed on mobile devices. Mobile apps certainly need validation and business rules, but they probably don’t need the full complement present in your existing desktop bound applications. Remember, too, that if you select the right mobile development environment, you may be able to reuse much of the code present in your existing apps with your new mobile apps.

There is another definition of “mobile computing” where using existing applications may apply. If one of the challenges you need to resolve is providing a table to use as a wireless workstation for existing apps for shop floor workers or realtors on the go (or other workers of that ilk), ASNA has a great solution for that. ASNA Wings can display existing green-screen applications very effectively in its browser-based emulator. This renders 24x80 or 27x132 character-based displays quite effectively. Although this is arguably “mobile” computing—it’s not the kind of computing typically associated with pocket mobile. Please see the ASNA whitepaper Mobile computing and the IBM i for more on this.

The ASNA answer: Mobile RPG

Let’s define a couple of assumptions about the typical IBM i shop:

- Your primary line-of-business data resides on your IBM i
“This [mobile computing] has been a growing trend in the i community over the past couple of years. Most businesses are at least examining the use of mobile devices, and some are mandating that a connected workforce use them.”

—Steve Will, IBM i Chief Architect
• Your development team spends most of its time with RPG on the IBM i and doesn’t have a substantial amount of Web development skills—and the team especially doesn’t have any expertise in development of mobile applications

• You need mobile applications for a variety of business reasons

Given these assumptions, and the challenges previously explained that mobile applications impose, acquiring mobile apps for the typical IBM i shop is clearly going to be quite challenging.

We’ve given these challenges substantial thought at ASNA and have reached several conclusions that we think are true for most IBM i businesses:

• Approached traditionally, creating mobile apps is tough for RPG development shops

• Your RPG development team has limited time to devote to learning new tools, languages, and application development models

• You need mobile applications results that provide a high-quality user experience

• You need results quickly

Considering all of these assumptions led us to create ASNA Mobile RPG (MR). MR easily enables the creation of mobile applications (for smartphones and tablets) for the IBM i using ILE RPG. With MR, your RPG development team doesn’t need to learn:

• HTML 5, JavaScript, or CSS

• Sophisticated new programming models

• The vagaries of multiple mobile devices

• Obtuse RPG APIs or other sleight-of-hand programming tricks

With MR, the only code your programmers write is ILE RPG. Period. With MR, your RPG programmers can create great mobile applications in a matter of hours—literally.

MR provides a Windows-based mobile user interface designer that uses drag-and-drop operations to create the interface. There are variety of user interface elements included that provide the look and feel of the application. Beyond the basics of buttons, text, and numeric input, other important con-
controls are included such as navigational bars, maps, charts, images, and many others. In short, Mobile RPG includes everything your developers need to create a superb mobile user interface. These controls all have an affinity for RPG and are governed by the same rules (such as RPG indicators) that govern a traditional green-screen user interface.

This paper purposefully keeps the technical details to a minimum, but, briefly, the mobile UI created with MR is exported to the IBM i as a traditional display file for use with the underlying RPG program at compile time. Once this UI is created, your programmers create a new RPG program to communicate with the MR user interface. RPG programmers write to typical RPG elements such as fields and subfiles to populate the mobile user interface—virtually all of their RPG skills work unchanged with MR.

RPG programmers are very familiar with RPG operations such as EXFMT (which shows a display file record format) or READC (which reads changed records in a subfile). These, and all other RPG operations, are used with the Mobile RPG display file just as the RPG programmer would use them with a traditional green-screen display. Many of Mobile RPG’s controls (such as the graph and map controls) are seen by the RPG program as a simple RPG subfile. So, for example, to populate a Mobile RPG bar chart, an RPG programmer simply writes a few rows to a very simple RPG subfile—and Mobile RPG does the rest. What would have been a boring grid of data on the IBM i is rendered by Mobile RPG on a smart phone as data points on a great looking graph. For a more in-depth look at the technical details, please see the ASNA Mobile RPG product page⁵ on our Web site.

In the time you’d spend explaining your business needs to an expensive mobile consultant, with Mobile RPG, your RPG programmers will have the app written!

For IBM i businesses needing mobile apps, we think it is very important to put the existing value and capability of your RPG programming team to work building these apps. These are programmers who intrinsically understand your business data flows, your programming logic, and your database access. Putting a development platform in these programmers’ hands that makes them instantly productive on a new generation of mobile application is very powerful. In the time you’d spend explaining your business needs to
an expensive mobile consultant, with ASNA Mobile RPG, your RPG programmers will have the app written!

ASNA Mobile RPG makes your RPG programming team mobile developers virtually overnight. They will very quickly be cranking out the kinds of mobile applications your business needs to keep your users informed, beat your competition, and continue to deliver your unique business value to your customers.

Don’t let the mobile revolution pass your business by. Get mobile today with ASNA Mobile RPG.

For more on ASNA Mobile RPG, please visit the Mobile RPG product page at http://asna.com/mobilerpg.
Endnotes

1. Eric Schmidt on Android activations

2. Timothy Berners-Lee on the importance of mobile computing
   http://www.impactlab.net/2006/03/25/interview-with-tim-berners-lee/

3. Steve Will on mobile computing on the IBM i
   http://www.itjungle.com/tfh/tfh061112-printer03.html

4. ASNA Mobile computing and the IBM i whitepaper

5. ASNA Wings product page

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