

# Service Providers & Outsourcing

NETWORK COMPUTING COVER STORY

## Mobile-Commerce ASPs Do the Legwork

January 22, 2001

By Peter Rysavy

We sent a detailed RFI (request for information) to 18 companies that provide products or services customers can use to build m-commerce applications. This RFI asked for background information on the company and its partnerships, customers, technology approach, security methods, networks supported, devices supported, and mechanisms to facilitate mobile commerce, such as financial settlement or electronic wallet.

The recipients of the RFI were Aether Systems, AvantGo, Broadbeam Corp., GoAmerica, InfoSpace, i3 Mobile, Novarra, OmniSky Corp., OracleMobile, Outercurve Technologies, Palm, Proxi-com, Research in Motion (RIM), 724 Solutions, Snaz Commerce Solutions, 2Roam, VeriFone and WolfeTech Corp. These companies are categorized as wireless ASPs (application service providers), wireless middleware vendors, wireless Internet portals, wireless ISPs, financial-transaction system vendors or Web-page developers.

Although ten companies responded, one (VeriFone) provides very different services, so we cover its response separately. We did not receive responses from the Internet portals and wireless ISPs (AvantGo, GoAmerica, InfoSpace, i3 Mobile and OmniSky) mostly because, though these companies provide platforms that can deliver m-commerce applications, they are not directly involved in the development of those applications. Palm and RIM also did not respond, but their hardware devices are supported by the other vendors, and so are well-represented. Finally, Aether Systems' AirLoom service was represented by Proxicom.

In general, we found that all the companies we spoke with were looking at m-commerce applications very seriously, and some had plans they would not yet disclose. So consider this a snapshot of the industry at this moment. A year from now, the landscape will have evolved significantly.

Our RFI was based on a hypothetical business-to-consumer m-commerce scenario in which an enterprise called TicketGo promotes and sells tickets to sporting events via wireless devices. We asked each vendor whether it could support the scenario, and if so, how. We also requested pricing based on different levels of subscribers.

Nearly all the vendors responded with middleware or ASP solutions that would make TicketGo's deployment of the m-commerce application far easier than developing one itself from the ground up. VeriFone was the one exception, but only because this company is concentrating on a financial-settlement infrastructure that other vendors can take advantage of in the future.

The most common vendor response was to use the architecture shown in "[Wireless ASP](#)". With this approach, the vendor would provide a platform, hosted or licensed, that would receive requests from mobile devices. Then, acting as a proxy for the mobile client, it would use standard Internet protocols to retrieve information from TicketGo's Web site, often in XML format. The platform would deliver the information in a format specific to the device --- whether WAP, HDML or another handheld format. With the exception of that in Novarra's innovative approach, this formatting would not be automatic. Rather, TicketGo would use the vendor's tools to create the mobile application but could do it without worrying about the details of each mobile device.

Except for 724 Solutions and Snaz Commerce Solutions, none of the vendors would provide any assistance with financial settlements. Instead, they would rely on TicketGo to handle this portion of the scenario. According to some industry insiders, customers prefer to handle their own financial settlements. But we believe this will become an important service offering for these vendors, especially as the number of electronic-wallet and electronic-cash mechanisms on the Internet increases. On the other hand, customers may have to interface with these payment systems for their non-mobile-commerce applications anyway.

Although most of these vendors have similar architectural approaches, they differ in several ways. Only a few offer financial-settlement services, for example. Other distinctions include the types of applications with which they have experience (vertical markets, financial trading and so on), whether they can host the applications, how they integrate with the customer application, the types of networks and mobile devices they support, and what level of integration assistance they provide. The following profiles outline the salient features of each offering.

When we began this project, we expected to find only a few companies active in this area. But as we dug deeper, the list kept growing. Not wanting to exclude any companies, we sent our RFI to those we discovered along the way. We also came across other companies providing products and services that customers could use to build m-commerce solutions.

Although we used a detailed RFI, we found it challenging to compare vendor offerings, primarily because of differences in how vendors explained their features and architectures. Our goal in this project was to cast as wide a net as possible in an immature industry that's still growing and changing rapidly. Our write-ups emphasize what distinguishes each of the vendors. We did not pick a winner, however, since our experience tells us that the quality of wireless middleware offerings can vary widely. We suggest you use this RFI as a basis for choosing one or more platforms on which to run a thorough technical evaluation.

Some of the vendors deserve special mention: 724 Solutions stands out based on its solid track record in deploying m-commerce applications, especially in the demanding financial area, where security

issues are paramount. Broadbeam impressed us by the length of time it has worked in the wireless industry, and the breadth of the devices and networks it supports. OracleMobile is noteworthy as it has the backing of a large corporation, Oracle Corp., which has operated in the mobile space for many years, initially with its Oracle Mobile Agents software. Finally, Snaz Commerce Solutions deserves special mention for its large number of commerce customers and for an innovative mobile wallet that represents an excellent solution for customers wanting to outsource the payment portion of the scenario. Customers will have to decide which aspects are most important to them; for example, broad device support might be critical for one application, and a mobile-wallet mechanism might be critical for another.

We were disappointed that only some of the vendors provided pricing information for the TicketGo application. Typically, those omitting this information explained they did not want to reveal their pricing to their competitors. This wasn't surprising: Many ASPs we've worked with keep their pricing notoriously close to the vest.

### Broadbeam Corp.

Broadbeam is one of the oldest wireless-platform companies in the wireless-data industry. Having started its business in 1992, it has deployed technology in 100 wireless applications over five continents. The company supports nearly every mobile device and wireless network that exists--even a satellite network. Its architecture consists of a platform that interfaces to the customer's network (such as TicketGo's) using XML/XSL over HTTP, and presents information to the end user based on the device being used. Alerts can be generated based on data resident at the customer's server. Broadbeam could readily support the TicketGo scenario.

Broadbeam's platform has been used by large integrators, including Andersen Consulting and SAIC (Science Applications International Corp.), and by specialized integrators such as Zamba Solutions, Malam Group, Computer Associates (United Kingdom) and ST Systems.

Broadbeam supports a wide range of networks. Packet-switched data networks include BellSouth Wireless Data (Cingular), CDPD, DataTAC, GPRS, iDEN, Mobitex and Motient. Circuit-switched data networks include CDMA, DoPa, GSM, iDEN, PCS, PDC, PHS, LANs, wireless LANs, dial-up and AMPS (Advanced Mobile Phone Service). Broadbeam also supports the Norcom satellite network.

Device support is equally impressive, including support for EPOC 32-based devices (Psion, Symbian), Palm (III, V, VII), RIM (950/850, 957/857), Windows CE/Pocket PC, notebook computers using Windows 95/98/NT, WAP-enabled devices, i-mode phones and some specialized devices.

Broadbeam does not support any financial-settlement systems, leaving that portion of the scenario to its customers. The company integrates security tools from Certicom Corp. Broadbeam licenses the platform or

hosts it as an ASP offering 24x7 service. The company can even host the customer application, but leaves support and management to the customer. Broadbeam provides integration assistance, though it relies on the customer to install and support any licensed software.

Pricing would consist of a one-time setup fee, a monthly management fee for each server hosted, and a monthly fee for each user--in TicketGo's case, this would be each customer using the service. Users' monthly fees would range from \$7 to \$10.

*Broadbeam Corp., (609) 734-0300; fax (609) 734-0346.  
[www.broadbeam.com](http://www.broadbeam.com) or [info@broadbeam.com](mailto:info@broadbeam.com).*

## Novarra

Unlike most of the vendors in this roundup, Novarra is not an ASP. Customers must license Novarra's software platform, integrate the platform and operate it themselves.

Rather than rely on customers to format their content in a mobile-specific manner, Novarra uses its PocketScape platform to automatically convert existing content for delivery to WAP phones, PDAs and RIM two-way pagers. Novarra refers to this process as "folderizing." The company also provides a microbrowser for Palm, Pocket PC and RIM. The Novarra server reads HTML, WML, WMLScript, JavaScript and XML/XSL, and delivers the content in XML to the PocketScape microbrowser, in WML to WAP-enabled devices, or in HTML to other browsers. This approach would support the TicketGo scenario. TicketGo could brand Novarra's microbrowser as its own, and let customers download the microbrowser from the TicketGo site. Incorporated in 2000, this new company is in field trials with applications based on its platform.

Networks supported include BellSouth Wireless Data (Cingular), CDPD, DataTAC (Motient/Ardis network) and cellular/PCS networks (CDMA, TDMA and GSM) via WAP network protocols.

Mobile devices supported include RIM devices; WAP phones; the Palm IIIxe, V and Vx with Minstrel modem; the Palm VII; and the Pocket PC.

Novarra's platform does not provide any support for financial services, leaving this to the customer. The company has licensed Certicom's security tools, which support SSL, RSA, DES and 3DES. Novarra quotes a security handshake time of three to 10 seconds. The company does not provide any hosting services, nor does it provide integration services, though it is considering partnerships in this area.

Novarra declined to provide pricing for the TicketGo application.

*Novarra, (800) 490-9557, (847) 368-7800; fax (847) 590-8144.  
[www.novarra.com](http://www.novarra.com) or [sales@novarra.com](mailto:sales@novarra.com).*

## OracleMobile

OracleMobile, a wholly owned subsidiary of Oracle, provides a service creation and hosting platform that reformats Web content for presentation to the appropriate mobile device, with the platform acting as a proxy for mobile devices. Oracle can license this platform to customers, or OracleMobile can host the platform as an ASP. Customers develop their content using Oracle-defined XML markups called Portal-to-Go XML, and they can use OracleMobile-supplied tools or any XML editor. OracleMobile could support the TicketGo scenario.

OracleMobile has been in business since early 2000, and supports a large number of customers, including Beenz.com, eBay, Evite, Food.com, FTD.com, TheStandard.com, Lottery.com and Waiter.com. The company also operates a complete wireless-portal showcase and has an innovative partnering program that lets customers present content from other sites as a value-added service for their own sites.

OracleMobile can support any carrier network that provides an HTTP gateway, including CDPD, digital cellular, Palm and pager networks. Device support includes smart phones, handhelds, two-way messaging devices, voice-based devices and pagers. Protocols supported include HDML, WML, Palm HTML, Windows CE, VoxML and plain text.

OracleMobile relies on customers' existing settlement systems. However, the parent company provides a commerce server called iStore for customers that wish to purchase their wireless platform and settlement system from the same company. OracleMobile employs whatever security mechanisms are in use by the wireless carriers and the customer site, typically SSL and certificates. To smooth the way, OracleMobile provides extensive integration assistance.

OracleMobile declined to provide pricing information with respect to the TicketGo scenario.

OracleMobile, (650) 506-4300. [www.oraclemobile.com](http://www.oraclemobile.com).

## Outercurve Technologies

Outercurve Technologies, in business since June 1999, offers a wireless application service that takes content from customers' legacy systems and Web sites using standard Internet protocols (XML, HTTP, SSL and FTP) and formats it for the particular mobile device. Outercurve's approach differs from those of other vendors in that it provides a thin-client interface (launcher) that activates applications using Over-the-Air Programming (OTAP). These applications can be hosted via Outercurve or behind the customer's firewall. Outercurve's launcher technology has the ability to download applications for operation on the mobile device without the need for syncing or cables.

The company's first product, the Financial Management System, provides detailed stock market quotes, graphs, news and research. Outercurve's technology has also been deployed by Biztravel.com, with support for the RIM Interactive Pager. Users now can obtain only travel

information, but soon they will be able to actually purchase tickets. Outercurve could handle the TicketGo scenario, but the company supports fewer networks and devices than do many of the other vendors.

At present, Outercurve is emphasizing the BellSouth Wireless Data (Cingular), Motient and Rogers AT&T Wireless networks. It is also planning to support GPRS via British Telecom. Current device support is oriented toward the RIM Interactive devices, WAP telephones, the Pocket PC, the Palm OS and Motorola.

Outercurve does not provide financial-settlement capabilities, leaving this to the customer. Security methods include ANSI X9.9 authentication and 3DES encryption. The company does not support PKI (public key infrastructure). Outercurve can provide a wide range of integration services.

For the TicketGo scenario, Outercurve would charge a per-month license fee of \$10,000 for the first 5,000 ticket purchasers. For each additional 10,000 users, Outercurve would charge \$5,000 per month up to 30,000 users, and \$2,500 per month from 30,000 to 100,000 users.

*Outercurve Technologies, (732) 906-6638, Ext. 148.*  
[www.outercurve.com](http://www.outercurve.com).

## Proxicom

Not focused solely on wireless applications, Proxicom is a leading provider of business solutions, including e-commerce, for Fortune 500 companies such as America Online, General Electric, General Motors, Merrill Lynch, Marriott International and NBC. Proxicom has developed and delivered enterprisewide e-commerce applications, enterprise information-management systems, inventory-distribution notification systems and commerce-specific remote-banking applications such as Abbey National Bank's interactive banking arm, Cahoot. For the TicketGo scenario, Proxicom would use its preferred wireless-technology partner, Aether Systems. Aether and AlterEgo Networks have created a wireless service called AirLoom that, with the aid of rules and templates, converts HTML content to XML and delivers it to the appropriate mobile device.

Proxicom supports applications that run on all the cellular networks (CDMA, TDMA and GSM), as well as on data-only networks, such as CDPD, Mobitex and Metricom. Device support includes WAP and HDML phones, Palm devices, RIM Interactive Pagers, Pocket PCs, Internet appliances and interactive TV.

The AirLoom service does not provide financial settlements, leaving that to the customer. For security, AirLoom uses SSL to secure communications with the customer site and carrier network. With its considerable experience in integrating complex applications, Proxicom can provide customers with a variety of integration services.

Regarding pricing for the TicketGo scenario, Proxicom indicated that pricing would vary based on the scope of the solution and the partnering model provided via Proxicom and the AirLoom service.

*Proxicom, (877) 776-9426, (703) 262-3200; fax (703) 262-3201.*  
[www.proxicom.com](http://www.proxicom.com).

### 724 Solutions

724 Solutions provides a platform that delivers a customer's specially developed HTML and XML content to wireless devices. The company typically licenses its M-Commerce Services Platform to wireless-portal operators, though 724 Solutions may host the platform on behalf of the operator. What distinguishes 724 Solutions is deployment of real-world commerce solutions in the financial sector (banking and investing) and its support for financial settlements involving interfacing to electronic-wallet systems. 724 Solutions' architecture also has a flexible mechanism for sending alerts, which would be particularly useful for TicketGo's application. 724 Solutions could readily support the TicketGo scenario.

Practically an old-timer in this industry, 724 Solutions has been in business since 1997. Customers include the Bank of Montreal; its affiliate, Harris Bank; and Indigo.ca. Applications today operate over the Bell Mobility, Rogers AT&T Wireless and Telus Mobility networks in Canada.

724 Solutions supports WAP 1.1, WAP 1.2 and HDML devices, regardless of the underlying wireless network. Among PDAs, it supports Palm OS devices, the RIM family and Pocket PC devices.

724 Solutions uses Certicom's security toolkits, and supports a variety of authentication, encryption and PKI mechanisms. The company offers extensive integration assistance, and can actually host the complete customer application, with 724 Solutions providing application and infrastructure support. This is done through an arrangement with Exodus Communications that provides Internet data centers on a global basis. 724 Solutions can even support end-user calls.

724 Solutions did not furnish exact pricing information for the TicketGo scenario, but indicated that pricing would include license, transaction and hosting fees, as well as fees for implementation and integration services. The company also offers time-based, per-user and transaction-based pricing.

*724 Solutions, (416) 226-2900; fax (416) 226-4456. [www.724.com](http://www.724.com) or [sales@724.com](mailto:sales@724.com).*

### Snaz Commerce Solutions

Snaz Commerce Solutions, founded in March 1999, provides a commerce platform as an ASP to its partners. Called the Wireless Commerce Solution, it communicates with e-merchant networks using standard Internet protocols to access XML or HTML format, and

reformats the content for presentation on the particular mobile device.

Snaz stands out in that it offers a complete mobile-wallet solution that can contain a user's credit-card, shipping and other information. Snaz provides an SDK for this m-wallet that uses a secure Java messaging protocol with XML structures to interchange wallet information across the merchants to complete a mobile-commerce transaction for the end user.

Snaz's partners are wireless carriers, mobile portals and wireless-content providers such as AvantGo, Chaitime.com, GoAmerica, Go2Systems, Nextel, OmniSky, Palm, Shadowpack and Zkey.com.

Snaz's merchant network includes relationships with about 300 merchants in North America and roughly 100 in Europe. Among them are Amazon.co.uk, Argos, Audiostreet, Barnes&Noble.com, Borders.com, Buy.com, Country.com, Dell.com, 800.com, Gamestreet, Gap, Godiva.com, OfficeDepot.com, OfficeMax.com, The Sharper Image and Toys R Us. Snaz could readily support TicketGo.

Snaz supports the Palm OS, Windows CE, WAP, i-mode and SMS (short message service), in addition to the Web. In the works is a solution for interactive TV and a local-area commerce solution based on Bluetooth and infrared technologies that could be available early this year. Security is based on SSL between the customer sites and wireless carriers. Snaz has a professional-services team that takes care of merchant and partner integration issues.

With respect to TicketGo pricing, Snaz says it would charge a fee for the transactions completed, but it did not specify the amount. Snaz also charges its partners fees based on the platform, number of users using its single-click solution and dollar amounts of transactions conducted over its platform.

*Snaz Commerce Solutions, (212) 943-1822; fax (212) 943-1825.  
www.snaz.com or Newyork@snaz.com.*

## 2Roam

2Roam's Catalyst Wireless Server--a component of the company's Wireless Website Toolkit, along with a graphical-content interface called the Nomad Wireless Publisher--sits between a customer's Web site and mobile networks, and reformats content for presentation to the appropriate mobile device. Requests from mobile systems go directly to the 2Roam server or are redirected by the customer's site. The 2Roam server then acts as a proxy for the mobile device. 2Roam also can license this server to customers, though the company did not provide us with details about a licensing scheme. 2Roam supplies a tool, the Nomad Wireless Publisher, that lets customers create the Web content that 2Roam reformats. Alternatively, 2Roam will develop the customer application under a consulting contract. 2Roam could readily support the TicketGo scenario.

2Roam's architecture allows easy integration of additional services

such as advertising and location. Thus, the company has partnered with advertising services including Avenue A, DoubleClick, Engage and Mediaplex, as well as location-service provider SignalSoft. Major customers include eBay, Hoover's Online, iWon, J2 Global Communications and uBid.com.

2Roam says its technology is agnostic with respect to the network, device and protocol, and that it supports all the digital cellular standards, including CDMA, TDMA and GSM. Device support includes smart phones and handhelds. Protocols include WAP, WML, HDML, and Web clipping for Palm and Pocket PC devices.

2Roam does not provide financial-settlement systems, instead relying on the settlement systems that customers already have in place. Similarly, 2Roam employs whatever security mechanisms are being used by the wireless carriers and the customer site, typically SSL and certificates. 2Roam will work with the customer to provide whatever level of integration is required. The company does provide service-level agreements.

For the TicketGo scenario, 2Roam would charge \$20,000 to license the Nomad publisher. Actual transaction costs would depend on the number of pages served; a tiered monthly fee starts at \$5,000.

*2Roam, (877) 992-7626, (650) 480-1100; fax (650) 306-0676.  
[www.2Roam.com](http://www.2Roam.com) or [sales@2Roam.com](mailto:sales@2Roam.com).*

### **WolfeTech Corp.**

WolfeTech, a wireless ASP and Internet portal, offers mobile users access to some 200 services, including stock quotes and financial data, news, sports, driving directions, entertainment services, weather, flight schedules, package tracking, and directories. Initiating its service in 1997, WolfeTech has focused on the RIM Interactive Pager for the BellSouth Wireless Data (Cingular) network and two-way paging networks but is expanding its scope to include phones with microbrowsers.

Like most of the other vendors described here, WolfeTech accesses Internet or customer content using Internet protocols, reformats it for the mobile device, and delivers it to the particular wireless network. WolfeTech's system, called PocketGenie, provides mobile users with a list of content sources; it would add TicketGo to its "server-hosted" category. For non-WAP devices, WolfeTech uses an "over-the-air" updating procedure that would add the TicketGo client application to the user's interactive messaging or PDA device.

WolfeTech has enabled a major wireless-commerce application involving a nationwide floral chain. Other partners include Google, InfoSpace, Maps on Us, MovieLink, NewsAlert and Yahoo.

WolfeTech's PocketGenie technology works with most wireless networks and devices. Device support includes RIM and Motorola two-way paging devices and WAP-enabled cell phones, and networks

supported include Arch, Ardis, BellSouth Wireless Data (Cingular), Metrocall, Movil Access (in Mexico), PageNet, Rogers AT&T Wireless, SkyTel, Verizon Wireless, WebLink and WorldCom. WolfeTech plans to add support for Motient.

WolfeTech doesn't provide financial-settlement services. For non-WAP devices, the company uses an end-to-end security model. Encryption originates on the mobile device using 128-bit Blowfish and the Diffie-Hellman Key Exchange. Transaction messages are forwarded from WolfeTech's service to the customer's network without decrypting them. WolfeTech provides consulting to assist with integration.

For TicketGo, WolfeTech says development of the application would be done at cost (because of its flagship nature), and estimated this at \$5,000 to \$15,000. The company did not provide any transaction-cost information.

WolfeTech Corp., [www.wolfetech.com](http://www.wolfetech.com).

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## **TicketGo Scenario**

We asked actual companies how they would make this fictional scenario a reality: TicketGo sells tickets to popular sporting events. It operates in most major metropolitan areas. TicketGo wants to use wireless technology to alert its customers of tickets going on sale for new events and to allow customers to purchase tickets using their wireless devices. Typical ticket prices are \$20 to \$50 each, depending on seating, and customers should be able to interact with the system to choose the type of seats they wish. Seating information can be provided using graphics or text.

Customers can also have accounts listing their preferences. TicketGo has a Web site for direct sales and can accept secure credit-card orders using SSL connections. It uses a back-end SQL database for ticket and customer information, and third-party software and associated services via the Internet for credit-card processing. TicketGo does not employ any other B2B connections. The company also has an 800 number. TicketGo primarily uses Windows-based systems.

TicketGo wishes to enlist the most appropriate products and services to develop an application that supports mobile customers. The company would prefer to support any wireless-enabled device that customers may already have, though it realizes it may not be able to support every possible device.

Nine real-life solutions appear on these pages.

## VeriFone Handles Financial Settlement

VeriFone doesn't fall into the same category as the rest of the vendors surveyed, as it handles only the settlement side of the m-commerce equation and does not involve itself in the content of the commerce application.

But what VeriFone is developing vividly illustrates how mobile commerce will evolve. VeriFone learned about our RFI and asked to participate. A division of Hewlett-Packard Co., VeriFone already provides secure electronic-payment solutions for financial institutions, merchants and consumers, and is best known today for its terminals for swiping credit cards and associated back-end communications.

The company is moving into the mobile-commerce space with two initiatives: The first is to enable secure payment via Palm PDAs. Working with Palm, VeriFone intends to permit secure transfer of financial and payment information from a Palm handheld to a VeriFone point-of-sale terminal using infrared technology. In the future, this could be Bluetooth technology. The VeriFone terminal would then communicate with financial institutions' payment networks, as is common today. A user's Palm device with an infrared link would effectively replace a credit- or debit-card swipe.

The vendor's other initiative is called Payment Roaming. This consists of an electronic wallet that a user can access from any device that's payment-roaming enabled. Although short on details now, this initiative will provide one more method for simplifying transactions from any device that has an Internet connection, whether a mobile phone, set-top box or handheld computer.

*VeriFone, a division of Hewlett-Packard Co., [www.verifone.com](http://www.verifone.com).*