

The Business Requirements for Integrated Mobile Device Management

Executive Summary

The projected meteoric growth in demand for data services on mobile devices creates an enormous opportunity for mobile operators and device manufacturers. In the wired Internet ecosystem, access providers were relegated to second tier status while content providers such as Google, Yahoo!, and eBay reached out directly to subscribers. Today, mobile operators have the opportunity to avoid this and achieve an equivalent level of market leadership. To do so, they need to successfully deliver a compelling subscriber experience. Yet only those mobile players able to provide such a subscriber experience - effectively deploying and then managing, controlling, and repairing mobile devices once deployed - will realize the billions of dollars of annual projected global revenue.

Existing standalone approaches to deploying, updating, configuring, and repairing handsets result in an unacceptable overall subscriber experience that jeopardizes carrier revenue. Only integrated Mobile Device Management (MDM) has proven to effectively alleviate this problem.

This paper describes the evolution of MDM, the limitations of some current methods, and the business benefits of integrated MDM. The paper then provides an overview of the key considerations for selecting an optimal integrated MDM solution and vendor. It concludes with a brief summary of the integrated MDM solution that InnoPath Software offers.

Wireless Data Service Challenges

Despite the growth in mobile data services to date, the market is on the brink of a major disruption driven by rapid technological change. Broadband networks (e.g., 1xEVDO and WCDMA) are now in place, and handsets have gained increasingly powerful, PC-like functionality. Mobile operators are experimenting with multiple permutations and combinations of services, hardware, and applications to attract consumers.

Amidst these swirling changes, operators face the following three main challenges:

- Effectively delivering new data services to increase average revenue per subscriber (ARPU)
- Lowering support and operations costs
- Increasing customer loyalty and reducing churn

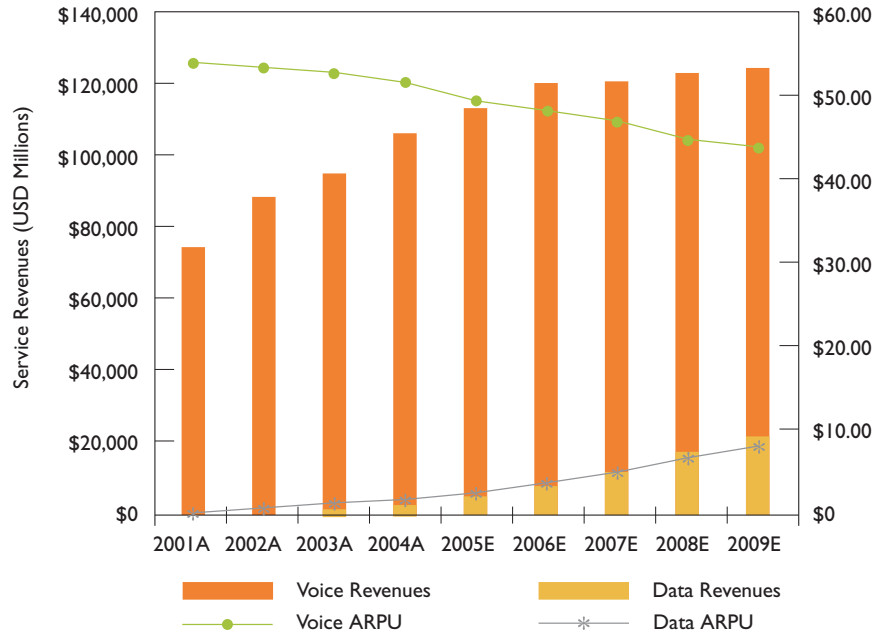
ARPU for traditional voice service is declining. Yet the data services market provides the opportunity to not only increase ARPU (see Figure 1), but also lower costs and increase customer loyalty. In short, this growing market allows carriers to establish a sustainable market leadership position. Only by extending their control of the overall subscriber experience can operators strategically defend their "turf" from a myriad of competitors (e.g., Wi-Fi, WiMax, and emerging VOIP).

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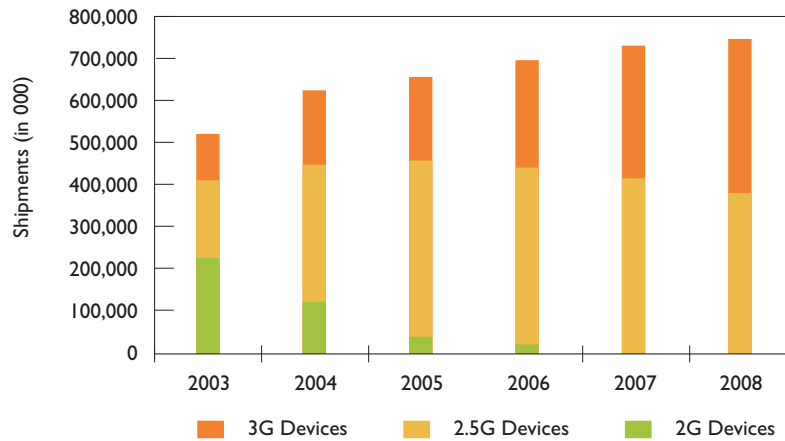
ARPU Trends - Voice and Data



Source: Yankee Group

Figure 1 — Voice ARPU is declining, while data ARPU and total revenue are rising

One measure of the growth in the data services market is the rise in the number of devices that support these services. Virtually all new mobile devices today are data devices (either 2.5G or 3G), and their numbers are increasing rapidly. Ovum predicts that worldwide new device shipments will approach 800 million per year by 2008 (see Figure 2).



Source: Ovum

Figure 2 — Device shipments by technology (worldwide)

While the number of mobile handsets is increasing, so is their complexity. Many carriers have observed that the number of data applications per device has tripled in the last 24 months; and InnoPath projects a continued rise in the future. At the same time, the relative size per application, as measured by both software code size and number of configurable settings, has increased three to four times. When voice was the only device application, the mobile world was quite simple, and after-sale customization of the device was not needed. But with broadband data network buildouts (e.g., 1xEVDO and WCDMA) and the introduction of data services, the level of complexity in the mobile market increased virtually overnight.

Today, operators (and through them, content providers) and device manufacturers feel the pressure to rapidly bring products and services to the market. Yet there is a "services gap"; many operators are unable to effectively manage and control new mobile devices once they are deployed (see Figure 3). While driving data services on these new devices is important, operators are also challenged with how to best deliver new data services on existing deployed feature phones; the operators do not want to depend on the sale of new handsets to current subscribers to drive data services revenue.

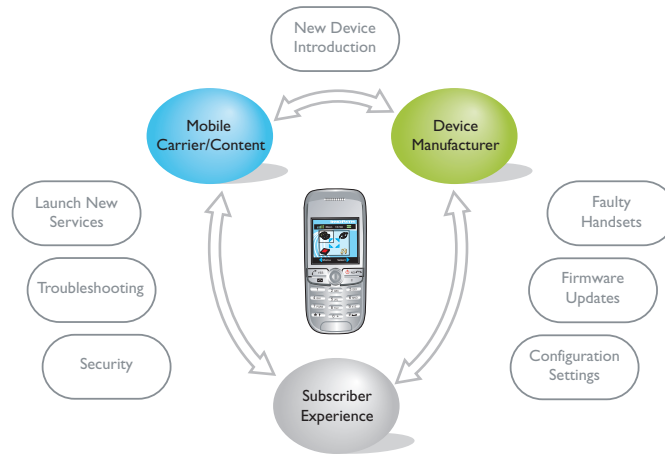


Figure 3 — The introduction of data services increased the level of complexity in the mobile ecosystem

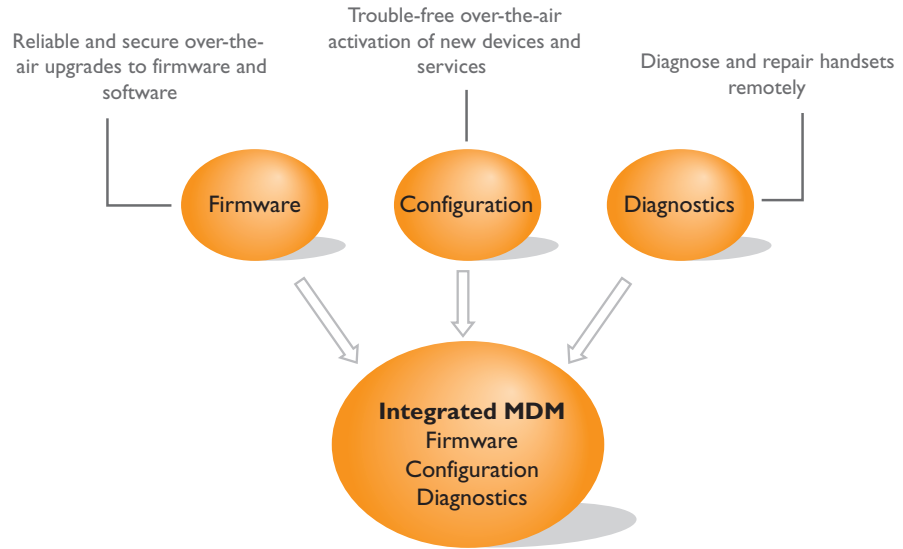
Recent data illustrates the magnitude of this services gap. Market Insight found that 29 percent of respondents required a phone repair at least once in the six months prior to the survey. This results in a veritable flood of subscribers to mobile device retail outlets, or costly and time consuming calls to customer support organizations. If a device recall is required, the costs can be staggering. Strategy Analytics estimates a recall cost per handset of \$56 for the hardware alone - not accounting for the customer service cost, revenue loss from devices out of service, and potential churn. Clearly, these methods of updating and configuring handsets after they are deployed in the field are flawed - resulting in an unacceptable subscriber experience.

The financial risks for carriers are significant. According to the Yankee Group, the mobile data (non-SMS) market in Japan, North America, and Western Europe will reach \$64 billion in 2009. Much of this revenue depends on the adoption of new data offerings such as multi-media services, location-based services, customization/branding, and VOIP. Tapping this enormous source of potential revenue relies on fast, trouble-free deployments, activations, updates, and repairs.

The Definition of MDM

Mobile device management (MDM) is the transparent "glue" that ties the operator, device, and subscriber together in a kind of wireless ecosystem. MDM can be defined as a unified solution that enables carriers to securely provision, install, activate, manage, support, and update services and applications on mobile devices remotely using over-the-air technology, resulting in a hassle-free experience for subscribers. A complete, unified and integrated MDM solution includes three core applications: firmware management, configuration management, and diagnostics management (see Figure 4).

Three essential capabilities for success today



Integration - More than just the sum of the parts

Figure 4 — Integrated Mobile Device Management provides the synergy of three essential capabilities - firmware upgrades, configuration updates, and diagnostics management

Firmware management supports over-the-air (OTA) upgrades, which enable mobile device manufacturers and network operators to remotely upgrade the firmware and software that controls handset functionality. Firmware management applies the model for automated software updates successfully used in the PC industry to the mobile device. This technology is being deployed today. Using firmware over-the-air (FOTA) upgrades, a Tier 1 Japanese operator has upgraded millions of handsets in the field, avoiding costly device recalls. And analysts predict that it will soon become the method of choice. Strategy Analytics predicts that 69 percent of all devices will use OTA technology by 2009.

Configuration management allows carriers to not only activate handsets, but more importantly to provision new and existing data services. Using a systemized process, configuration management automatically establishes the settings on a handset necessary to support a new application, service, or network configuration. These settings can be quite complex and vary from device to device. This means that managing these settings is beyond the capabilities of a subscriber. Imagine activating a new data service that requires each subscriber to complete a ten-step process - how many subscribers will be successful? Some business plans require that millions of subscribers adopt a service to ensure market success. At one North American operator alone over the last 12 months, 72 million handset configurations were performed (an average of four per data device). To further increase customer

adoption of these new services (and reduce support costs), configuration management can also be used to correct settings on an improperly configured mobile device. Clearly, configuration management is critical to widespread, efficient adoption of new data services.

Diagnostics management allows operators to gather information OTA from devices for remote diagnosis of problems and repair. Customer care agents can query handsets while speaking with subscribers to identify and resolve problems remotely and in real-time. Devices can also remotely execute self-diagnostic functions to identify and log hardware and software problems for analysis and action. The operator can then use this data, either automatically or through a customer care agent, to initiate firmware or configuration updates. This data also helps operators identify trends and quantitative information to proactively address issues.

The synergy (i.e., integration) of these three core applications creates a powerful solution. Integrated MDM enables mobile carriers to access detailed information about each of the mobile devices in their network, including the firmware levels of the devices, the applications used, the versions of these applications, and the subscribers who are using them. At the same time, carriers can use MDM to systematically make changes, perform updates, and introduce new services and applications. All of this can be accomplished at lower cost and without disruptions in service to customers.

Imagine the scenario of enabling a new video service to an existing subscriber. Using integrated MDM, self-care diagnostics would automatically determine the specific hardware and software configuration of the device and then systematically kickoff an upgrade to the appropriate firmware. Diagnostics would re-examine the device, determine that a number of configuration changes are needed, and automatically initiate the changes. The result is a newly enabled service - trouble free and ready to go. Clearly, this integration of MDM capabilities drives a superior subscriber experience. Carriers that successfully implement integrated MDM are likely to increase market share, gain mindshare, and achieve market leadership.

The Benefits of Integrated MDM

MDM is a must-have for mobile carriers for the following reasons:

- **MDM drives new service adoption** - MDM manages mobile device complexity. By systemizing provisioning of new data service roll-outs, MDM helps carriers efficiently and reliably bring new high-value data services to market. A positive, trouble-free subscriber experience facilitates activation of new services, boosts customer satisfaction, increases revenue, and provides a competitive edge.
- **MDM reduces operations and support costs** - MDM provides an effective method of maintaining and updating software and firmware across millions of mobile devices in a network. With customer service calls costing an average of more than \$40 per incident, the business risk of rolling out new data services can be immense. Automating customer service representative (CSR) functions provides a compelling incentive for carriers to implement MDM and return cost savings to the bottom line.
- **MDM increases customer loyalty and reduces churn** - MDM can be used to not only find and fix handset problems, but also to set a service level baseline that avoids and eliminates handset-related problems. This is a major factor in maintaining high levels of customer satisfaction and loyalty to reduce customer churn - particularly as subscribers are becoming familiar with newer data services.

MDM Technology Approaches

Unfortunately, MDM offerings from most vendors to date have used piecemeal approaches. For example, many vendors have offered standalone configuration management capabilities or firmware OTA technology. Similarly, offerings have typically been either server-based or client-based solutions, but not both in an integrated form. Hence, these vendors are not providing an integrated, end-to-end solution for MDM. Instead, the patchwork quilt approach poses complications. Each individual application must be linked to critical backend systems separately, reporting across applications is problematic, and incorporating new applications is onerous. Worst of all, the applications do not work together - the value of integrated MDM is that the sum of the parts far exceeds the value of each individual component.

Another limitation is that many solution providers' MDM offerings have been proprietary and highly customized. In many cases, this limits the ability of these solutions to accommodate a broad range of applications and to interoperate with a wide variety of handset models. With the establishment of the Open Mobile Alliance (OMA) and approval of OMA device management (OMA-DM) standards, solution providers now have an opportunity to offer standards-based solutions that will accommodate all OMA-DM compliant applications and enable interoperability with compliant handset models.

In short, implementing MDM in proprietary pieces severely limits its value. Conversely, implementing an integrated, standards-compliant MDM solution promises much greater value.

Selecting the Right Solution

The most beneficial MDM solution has the following attributes:

- **A complete solution.** The optimal solution offers firmware management, configuration management, and diagnostics management on a common platform, while providing the option of full end-to-end capabilities (i.e., server and device/client).
- **Compliance with emerging standards.** Any viable solution today must be fully compliant with all OMA-DM standards to ensure interoperability with applications and devices. But the optimal solution would be offered by a vendor that not only supports emerging standards, but helps shape them. Further, the solution must be independent of networks (e.g., GSM and CDMA).
- **Incorporation of innovative technology.** While standards are important, offering an effective, reliable, integrated MDM solution virtually requires the incorporation of innovative technology, not simply a culling together of existing solutions. MDM will continue to evolve, with ever increasing capabilities, and selecting a vendor with a comprehensive vision is essential.
- **Proven functionality via deployment experience.** However, all of the above capabilities are moot without real-world experience in large networks that proves the solution is viable and reliable, while delivering tangible benefits. Real world deployments on a Tier 1 carrier scale - tens of millions of subscribers - are the best barometer of the likely success of a specific vendor's MDM solution.

InnoPath Solution

InnoPath Software offers an end-to-end, integrated MDM solution - embodied in its iMDM Carrier and Device Solution Suites - that is fully standards compliant and proven in extensive deployments across the globe. Tens of millions of active subscribers are experiencing the value of InnoPath solutions through leading carriers (e.g., Cingular, KDDI, NTT DoCoMo, and Sprint), and device manufacturers (e.g., LG, NEC, Panasonic, Sanyo, Sharp, and Toshiba). InnoPath iMDM solutions incorporate the following:

- **Comprehensive Solution** - Only InnoPath offers an integrated end-to-end server/client MDM solution. Its iMDM Carrier Suite is a secure, scalable common platform for quickly and cost effectively rolling out current and future applications. Integrated capabilities include remotely configuring settings, diagnosing and fixing device problems, and updating software and firmware OTA - all in real time. Combining this with InnoPath's companion solution, the iMDM Device Suite, results in an end-to-end solution that provides a high quality subscriber experience via management of the entire MDM process from both the carrier and device perspectives. Of course, the iMDM Carrier Suite will also support all OMA compliant handset devices.
- **Deployment leadership** - Tier 1 carriers and device manufacturers worldwide rely on InnoPath iMDM solutions. InnoPath was the first OTA mobile device management company actively updating handset software in commercial deployments. Its best-of-breed firmware and configuration solutions have successfully updated millions of devices in the hands of subscribers.
- **Technology leadership** - InnoPath's patented technology performs updates of mobile hand-set firmware quickly and reliably. Its technology is supported by more than 10 issued and 34 pending patents.
- **Standards compliance and interoperability** - InnoPath is actively participating in all of the OMA standards developments, and plays a leading role in key standards committees. InnoPath products are fully compliant with OMA-DM standards, based on several successful interoperability trials. InnoPath's iMDM Solutions Suite are network-agnostic, working on both CDMA and GSM networks. The services have been widely deployed on both CDMA and GSM 2.5/3G networks. InnoPath has certified more than a 100 mobile handsets models on its iMDM solutions from leading manufacturers worldwide.
- **Breadth of Vision** - InnoPath anticipates future subscriber and operator needs and maintains a clear product development roadmap. New modules are under development that will not only enable wireless operators to control subscriber experiences with handsets, but also their service experiences.

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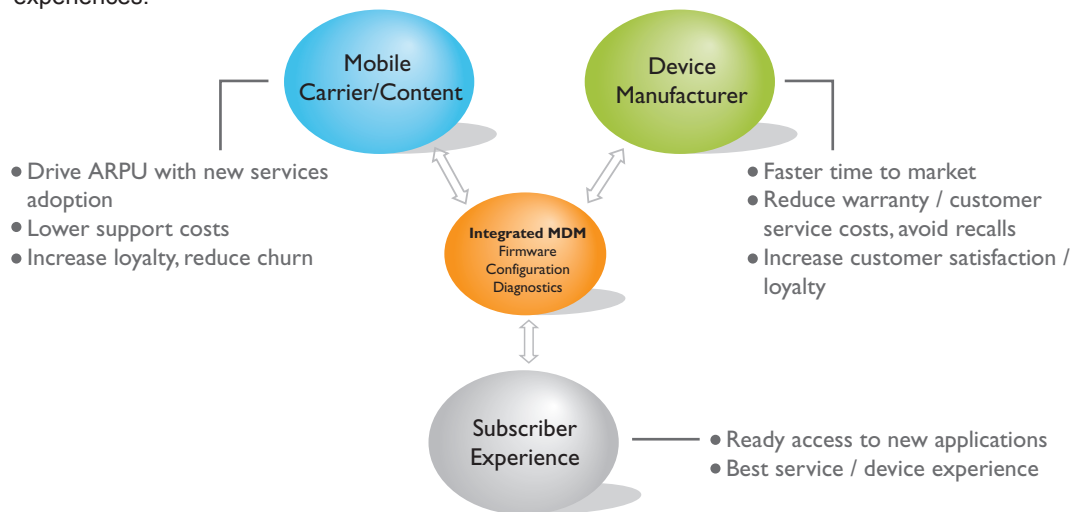


Figure 5 — InnoPath's Integrated MDM Solution enables benefits for mobile carriers, device manufacturers, and subscribers