



# Transforming Healthcare with mHealth Solutions

*The Opportunities, Efficiencies, and ROI of Mobile Technology*

## EXECUTIVE SUMMARY

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Many healthcare professionals are looking to new mobility technologies as a way to solve some of the industry's most pressing problems. These thought leaders believe society is on the cusp of dynamic change in the way healthcare is both provided and consumed. Mobility in the general workforce is expected to increase at an unprecedented rate in the coming years, both in the United States and overseas. Mobility in the healthcare sector will mirror that trend as healthcare providers, insurers, consumers, and government leaders all search for ways to increase efficiencies, lower costs, and improve patient care.

Mobilizing healthcare employees, as well as extending enterprise applications to customers, requires a significant commitment and the redirection of vital resources. To the discomfort of some legacy healthcare application developers, it may mean rethinking the value of the current enterprise roadmap against the potential mobility ROI gains. After all, not all projects can be green-lighted. Theoretically applications that deliver the most value to the widest audience should take precedent - or so most CIOs would like to believe. There is no guarantee that the disruptive invasion of mobile initiatives will drive value in healthcare organizations. But if the concept of mobility does not challenge the healthcare IT status quo, which one could argue needs to be challenged regardless, then it is hardly disruptive. Nevertheless, we believe mobility in healthcare has the potential to transform – indeed, has already begun to transform – the medical arena.

This study includes the latest research on the healthcare industry's mobile successes as gauged by two fundamental measurements, revenues and costs. Given the sensitive nature of healthcare, we parse these topics into relatable, human metrics.

- **Revenue opportunities** come in many forms. Had we only looked at hard data, this would have been an easy point to miss. In speaking to our subject matter experts, we uncovered the subtleties of how putting patients first is not only good medicine, but good business. More to the point, we reveal how healthcare organizations are harnessing emerging mobile technology to create new markets and forge deeper patient/provider relationships too.
- **Cost efficiency:** We chose to focus on the healthcare vertical precisely because of its well-publicized cost management issues. If mobility has a valid value proposition for lowering costs and improving productivity, one could not ask for a better testing ground than healthcare IT. Specifically, we explore how the marriage of smartphones and tablets with applications and mobile Web enables progressive operational changes, improves information accessibility and increases data accuracy in healthcare systems.
- **Mobility ROI:** Any seasoned technology research analyst will attempt to derive or extract some measure of an implemented technology's Return on Investment. Most seasoned technology analysts acknowledge that organizations do not make this an easy job for those analyzing a technology's value to the business. We pressed our subject matter experts, who in many cases were responsible for allocating significant portions of their enterprise's budget, to articulate their expectations of tangible returns.

The following table encapsulates the primary research findings uncovered through interviews with healthcare providers and executives, insurers, pharmaceutical industry representatives and mHealth solution developers. mHealth solutions described in the table are featured throughout the study.

**Overview of mHealth Use Case Findings across the Healthcare Continuum**

User	mHealth Solution	Benefits
<b>Hospitals</b>	<ul style="list-style-type: none"> <li>▪ Electronic Health Records, Health Information Exchange</li> <li>▪ Telehealth/remote care</li> <li>▪ Patient self-registration using tablets</li> <li>▪ Bar code scanning</li> </ul>	<ul style="list-style-type: none"> <li>▪ Accessibility of patient data; reduction in procedures and tests; fewer medical errors</li> <li>▪ Improved patient access to physicians; increased billable hours</li> <li>▪ Lower administrative costs; faster service</li> <li>▪ Improved supply chain efficiency/accuracy; increased productivity; lower risk of compliance breaches</li> </ul>
<b>Doctors, Nurses</b>	<ul style="list-style-type: none"> <li>▪ Electronic Health Records, Health Information Exchange</li> <li>▪ Telehealth/remote care</li> <li>▪ Peripheral devices integrated into mHealth solutions</li> </ul>	<ul style="list-style-type: none"> <li>▪ Accurate and timely feedback to patients; ease of coordinating remote providers; streamlined consultations</li> <li>▪ Regular patient monitoring; increased productivity; reduced travel time</li> <li>▪ Real-time updates of patient data; ability to offer “untethered” care outside of traditional settings</li> </ul>
<b>Insurance Companies</b>	<ul style="list-style-type: none"> <li>▪ Consumer self-help apps</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ease of locating specialists and services in network; lower costs with drug cost-comparison shopping; increased consumer usage of plan benefits; better management of medical expense accounts</li> </ul>
<b>Suppliers</b>	<ul style="list-style-type: none"> <li>▪ Mobile apps replace paper-based forms; bar code scanning</li> </ul>	<ul style="list-style-type: none"> <li>▪ Increased accuracy and lower costs; compliance-certified apps meet regulatory requirements</li> <li>▪ Community-based retail stores use mobility to improve ACO care coordination</li> </ul>
<b>Pharmacies</b>	<ul style="list-style-type: none"> <li>▪ Drug reference and drug interaction apps</li> <li>▪ Mobile access to back-office systems</li> </ul>	<ul style="list-style-type: none"> <li>▪ Real-time access to data to advise doctors and patients on drug therapies and associated risks</li> <li>▪ Enables pharmacists to interact with patients “in the aisles” with access to real-time patient data</li> </ul>
<b>Drug and Medical Supply CRM</b>	<ul style="list-style-type: none"> <li>▪ Mobile CRM apps for “detail” sales representatives</li> </ul>	<ul style="list-style-type: none"> <li>▪ More efficient and accurate order processing; improved compliance in sample distribution; digital signature capture</li> </ul>
<b>Federal Agencies</b>	<ul style="list-style-type: none"> <li>▪ Electronic Health Records, Health Information Exchange</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ability to identify and catalog worldwide epidemiologic trends</li> </ul>
<b>Consumers</b>	<ul style="list-style-type: none"> <li>▪ Symptom checker</li> <li>▪ Apps with integrated peripheral devices</li> <li>▪ Telehealth/remote care</li> <li>▪ Social engagement-based solutions</li> <li>▪ Insurance benefit apps</li> </ul>	<ul style="list-style-type: none"> <li>▪ Interactive apps to identify appropriate care providers</li> <li>▪ Accurate and timely feedback of health data; rapid throughput of test results to providers</li> <li>▪ Improved care/lower costs through home healthcare</li> <li>▪ Greater emphasis on patient-centered care; reduced isolation of convalescing patients</li> <li>▪ Increased knowledge of cost/benefit trade-offs</li> </ul>

## Technology Overview

In examining mobility in healthcare, both mHealth buyers and sellers report the enabling technology is fundamentally horizontal. At the same time, however, the technology garners favor from vertical industries based on application development environments, mobile operating system (MOS) stability and security, availability of hardware form factors, application distribution ecosystems and third party support.

- **Mobility Vendor Business Models:** Arguably, there are four industry giants – Apple, Google, Microsoft and RIM – that dominate the mobile space. By dominate, we mean impact almost every mobility decision a healthcare organization will make. Apple, Google, Microsoft and RIM are regarded foremost as mobile operating system (MOS) developers. But each company's span of influence is much broader than its MOS and should be considered in the full context of how it can influence healthcare objectives.
- **Form Factor/Hardware:** The hands-on nature of healthcare places specific demands on hardware manufacturers. There are physical considerations – making sure that the device being used in the healthcare setting is appropriate for the task at hand. We address rapid adoption of tablets by healthcare professionals and the associated tangible benefits for healthcare providers and their patients.
- **Application Type:** Finally, we turn to mobile applications, where even more difficult choices loom for organizations charting their mobile strategy. Until very recently there were primarily three application development options: native, Web and hybrid. HTML5 applications, viewed by a large contingent of developers as the necessary evolution in application types, have only recently become available. Although viewed as the most progressive and affordable option, HTML5 is not the panacea the market desires. The study presents a parallel technical analysis of each application type.

The mobility platform vendors, hardware and application types cannot be considered individually. Together, they form a mosaic – which is not to imply that all combinations of MOSs, hardware devices and application types are perfectly balanced. These mobility building blocks should be well understood before any healthcare organization considers building or managing mHealth solutions.

## RESEARCH COMPONENTS

### RESEARCH COMPONENTS

#### Technology Overview

1. Mobility Vendor Business Models
2. Form Factor/ Hardware
3. Application Type: Native, Web, Hybrid and HTML5

#### TABLES

- Mobility Platform Features Relevant to Healthcare Settings
- Native, Web, Hybrid and HTML5 Applications

### Mobile Enterprise Application Platform (MEAP) Summary

We profiled a select group of MEAPs, each of which has a specific connection to the healthcare industry. While there are many other MEAP companies in the market, the profiled vendors were selected due to their portfolio of packaged mHealth applications, legacy within healthcare organizations or specific technology attributes that align well with healthcare application objectives.

A holistic view of the profiled MEAP vendors instantly reveals key differentiators. Additionally, there are specific sub-divisions among the ten MEAPs that merit further attention:

- **Single Platform MEAPs:** While the era of single MOS adoption is basically over in most enterprises, primary research reveals a strong niche in the SMB market for allegiance to a select MOS such as Apple, Microsoft or RIM.
- **Multi-platform MEAPs:** These vendors can be found in the largest of enterprises due to their broad support of application types (HTML5, Hybrid, Native and Web) and MOSs. Yet no two MEAPs offer the same support, challenging healthcare vendors to carefully match MEAP vendors to their organizations' unique requirements.
- **Rising Niche Mobile Developers:** Developing mHealth solutions is a costly endeavor. The study identifies vendors that break from mHealth development convention to offer alternative, and often more affordable, options for mobilizing healthcare professionals.
- **Packaged Healthcare Applications:** Some MEAPs distinguish themselves by offering an effective development platform and utilizing their tools to create off-the-shelf mHealth solutions. We showcase these MEAP commercial offerings.
- **MEAP Technology Differentiators:** MEAP technology selection cannot be myopic; it must be compatible with an enterprise's existing technology stack and in-house development talent. Furthermore, each MEAP must pass the compliance and security litmus test. We profile the development approach and security features of each vendor.

The MEAP vendors are reviewed from multiple perspectives so that organizations can understand the specific advantages, or challenges, each platform offers. We profile each vendor by horizontal offering, plus specific benefits and value propositions to the healthcare industry.

#### RESEARCH COMPONENTS

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##### Mobile Enterprise Application Platforms (MEAPs)

1. Apple
2. Antenna
3. Microsoft
4. MobileFrame
5. Pyxis Mobile
6. RIM
7. SAP
8. Spring Wireless
9. Syclo
10. Webalo

##### TABLES

MEAP Profiles by Platform and OS Support of Native Applications

MEAP Focus on Healthcare and Security Features

### Mobile Device Management (MDM) Summary

Primary research uncovered that “Shadow IT” departments – workers who use mobile devices even when they are unsupported – among other variables, have necessitated the use of MDMs. IT departments are forced to do *something* to enable these users and allow permission to different resources. The healthcare sector is no exception. Even with HIPAA constraints bearing down on the medical community, physicians and staff are spurring IT departments to adopt formal support of their personal smartphones and tablets. Senior management is urging IT staff to find a technological hedge against mobile data security breaches. MDMs offer a credible insurance policy to buffer compliance risk.

Once mobile applications are developed and deployed, Mobile Device Management software allows IT managers to secure, monitor, manage, provision, and audit mobile devices deployed across an enterprise. Like the MEAP segment, the MDM space offers many choices – too many for some IT customers to completely absorb. MDM vendors appeal to organizations for specific reasons, ranging from their technology, to healthcare industry knowledge, to compatibility with an organization’s existing infrastructure. The study delineates each MDM’s offering in terms of:

- **Focus on Healthcare:** Healthcare organizations seek the security MDMs offer to comply with HIPAA and a range of other regulations. We present which healthcare organizations depend upon MDMs and each vendor’s specific value proposition to the sector.
- **Security Offerings:** There was no theme echoed more prominently in this study: data vulnerability. We present the security technology solutions that address uncovered healthcare mobile technology needs.
- **Features for Healthcare Settings:** MDMs are becoming increasingly sophisticated, in lockstep with complex mHealth deployments. We provide a feature-by-feature account of security audits, deployment efficiency, OTA management and expense management.

In addition to offering a feature-by-feature comparison, we describe the current MDM landscape, including technology alignments, partnerships, and recent acquisitions. While MDMs are still working to gain mindshare in some healthcare organizations, savvy IT managers recognize that MDMs are critical to managing data that is increasingly mobile and walking out the door every night.

#### RESEARCH COMPONENTS

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#### Mobile Device Management (MDM) Solutions

1. AirWatch
2. Good Technology
3. McAfee
4. MobileIron
5. Motorola Solutions
6. SAP
7. SOTI
8. Syclo
9. Wavelink
10. Zenprise

#### TABLES

MDM Focus on Healthcare

MDM Security Offerings

MDM Features of Special Interest to Healthcare Customers

## INTENDED AUDIENCE FOR THIS REPORT

*Transforming Healthcare with mHealth Solutions* serves a multi-faceted audience within enterprise, operational, end-user and public agency settings. The research results and analysis target enterprise managers and executives tasked with mobilizing workers in hospitals, healthcare organizations, rehabilitation clinics and other healthcare settings, specifically:

- **Regional healthcare operation managers** can learn about significant savings realized by small-to-medium operations that successfully deploy mobile applications.
- **Mobilized healthcare providers** including physicians, nurses, technicians, and all other caregivers in the healthcare continuum that wish to leverage smartphones and tablets for improving productivity and patient care will find the study highly relevant.
- **Healthcare-focused executives** at insurance companies, federal and state health regulatory agencies, healthcare industry organizations, and groups with a vested interest in improving patient outcomes and lowering overall healthcare costs, can learn how mobility enables efficient workflow processes.
- **Enterprise vendors** selling mobility solutions to the healthcare industry, including both products and services, can translate the study into a guide to the key drivers, opportunities, efficiencies and ROI healthcare end-users seek, both today and in the future.

## ABOUT THE ANALYSTS

Galvin Consulting and Technology Coast Consulting publish syndicated research on mobile technology, including *Smartphones in the US Enterprise*, published in December 2010 and followed by vertically-focused mobile studies. Additionally, the analyst firms have supported direct clients and mid-tier research firms on hundreds of market intelligence and primary research projects over the past decade. Analyst expertise extends from mature hardware and software technology to emerging markets. Through their in-depth analysis and ongoing conversations, the analysts have developed relationships with global subject matter experts and industry influencers. Deep connections with technology professionals put these analysts in close proximity to the tactical and strategic information end-clients seek. Galvin Consulting and Technology Coast Consulting researchers have a highly tuned perspective on the integration of technology within corporate enterprises. They also understand the vertical application of technology within a given industry, by virtue of interviewing thousands of technology consumers.

**Galvin Consulting:** Carolyn Galvin has over 14 years of experience in market research, customer research, and market intelligence working for large corporations, research agencies, and independent consulting, including Alcatel-Lucent, Juniper Networks, and Frost & Sullivan. Ms. Galvin has also conducted research and analysis in government intelligence. Ms. Galvin has two master's degrees, one from the Thunderbird School of Global Management and a second from Georgetown University.

**Technology Coast Consulting:** Amy von Kaenel of Technology Coast Consulting is responsible for global research projects across a variety of industries, with specific expertise in mobile enterprise and consumer solutions. Ms. von Kaenel's background includes four years of pharmaceutical and healthcare industry experience, as well as 16 years of technology industry experience for leading companies, including Canon Computer Systems, Comcast, HP, and Oracle. Ms. von Kaenel holds a BA in Economics and an MBA from the University of California Irvine.

## METHODOLOGY

Primary and secondary research for this study took place during April – July 2011 and included interviews with IT executives, participation in Webinars and online forums, and live discussions at industry events. Respondents were typically at the director or executive level and had a strategic overview of their organization's mobile technology. Other participants included hospital executives, healthcare organization executives, MEAP, MDM and mHealth solution vendors, their partners and industry subject matter experts. Interviews and analyses were carried out by a team of seasoned research analysts.

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## CONTACT INFORMATION

### **Galvin Consulting**

Seattle, WA

**Ph:** 206.347.7552

**Email:** [info@galvinconsulting.net](mailto:info@galvinconsulting.net)

**Web:** [www.galvinconsulting.net](http://www.galvinconsulting.net)

### **Technology Coast Consulting**

Los Angeles, CA

**Ph:** 949.858.6700

**Email:** [info@technologycoastconsulting.com](mailto:info@technologycoastconsulting.com)

**Web:** [www.technologycoastconsulting.com](http://www.technologycoastconsulting.com)