Large-scale Smartphone-based deployments enable hospital-wide communications

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Introduction

This Spyglass Consulting Group white paper identifies the market opportunities and challenges for hospital IT to widely deploy a Smartphone-based communications platform to support patient care teams and other mobile hospital workers across the enterprise.

In January 2016, Spyglass interviewed (19) leading hospitals and medical centers nationwide who had successfully deployed a large number of Smartphones to support mission and patient-critical communications.

Spyglass found that provider organizations are developing comprehensive mobile communications strategies, and expanding the usage of their communications platforms beyond clinical messaging to support other hospital workers and workflows across medical departments, standalone hospitals, ambulatory environments, and integrated delivery networks.

Spyglass also identified the following four critical success factors for hospital IT to consider when widely deploying a Smartphone-based communications platform:

- ***Scalability***. Deploying a highly reliable, manageable, and scalable platform to support mission and patient critical communications.
- ***Interoperability.*** Integrating with hospital IT systems infrastructure and medical devices to support data driven closed-loop communications.
- ***Multi-device support.*** Providing support for hospital-owned Smartphones, personally owned Smartphones, and a desktop client for enhancing and expanding care team collaboration within the hospital and across the community.
- ***Hospital leadership.*** Driving widespread end user adoption through hospital administration leadership, commitment and investment.

Market opportunity

Clinicians and hospital workers require a mobile device and healthcare communications platform to streamline clinical communications, improve team-based collaboration, and enhance care coordination across the healthcare continuum.

The Joint Commission, the nation's predominant standards-setting and accrediting body, identified the primary root cause of more than 70 percent of treatment delays and sentinel events as being caused by a breakdown in communications. They also identified improved staff communications as a National Patient Safety Goal for hospitals in 2010.[1]

Mobile devices such as Smartphones are replacing fixed location computers, pagers, and landline phones as the preferred platform for securely accessing patient data and communicating with team members from any location and at any time. Smartphones integrated with the hospital's communications system enable nurses and other hospital workers to use voice, text messaging, alarm and alerts, and mobile apps to communicate the right patient data, at the right time, to the right team member, and in the right format to improve team-based collaboration regardless of their physical location.

With the passage of the Affordable Care Act and the transition toward patient centered care models and value-based purchasing, hospital IT has an imperative to evaluate and make investments in Smartphones and mobile healthcare communications solutions. These solutions must address the needs of clinicians and other hospital workers requiring real-time communications and collaboration tools to support team-based care within the hospital and across the community.

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[1] Joint Commission, Sentinel Event Data, Root Causes by Event Type, 2012

Providers are developing enterprise wide mobile communication strategies

> *Forty-four percent of provider organizations surveyed had developed and 56 percent were in the process of developing enterprise-wide mobile communications strategies to support patient centered care and team-based collaboration across the enterprise.*

Nursing informatics supervisor at an **academic medical center (California)** reported, "Hospital IT developed an enterprise-wide communications strategy after breaking ground on a new $1.5B hospital tower with 250 patient beds. The strategy focused on using a Smartphone-based communications platform to support the current and future messaging, communications, and collaboration requirements of patient care teams and other hospital workers across medical departments, standalone hospitals, and ambulatory environments.

"An interdisciplinary team comprised of nursing, physicians, pharmacy, IT, ancillary care, biomedical engineering, and finance was created to
- conduct time-motion studies to identify communication gaps and inefficiencies within key clinical workflow processes,
- explore end user communication requirements to support data driven closed loop communications, and
- evaluate leading Smartphone-based communications platforms to replace antiquated communications tools including desktop phones, pagers, VoIP handsets, and overhead paging."

"The communications platform selected enabled mobile hospital workers to use an Android-based Smartphone for communicating via VoIP, exchanging secure text messages, and receiving and responding to critical care alerts, alarms and notifications. It was initially deployed within a limited number of patient care departments including med/surg and critical care to address the communications requirements of registered nurses and their support staff. After receiving positive feedback from the nursing staff, hospital IT quickly expanded the deployment to other patient care areas around the hospital including critical care, ED, and operating room to address the communication needs of an expanded care team including hospitalists, pharmacists, LVNs, and ancillary healthcare professionals."

"Communications strategy has helped drive the deployment of more than 1,200 hospital-owned Smartphones across the enterprise to support patient care services, ancillary care (lab, radiology, rehabilitation, case management), environmental services, and housekeeping."

Providers are deploying a highly reliable and scalable communications platform

> *100% of providers identify a successful platform as reliable, manageable and scalable.*

All provider organizations surveyed report that a critical success factor for supporting a large-scale Smartphone-based communications system was ensuring that the underlying platform was highly reliable, manageable, and scalable to support mission and patient critical communications.

Reliability

Optimized technology stack. Communications platform must be highly reliable and able to provide 99.9 percent uptime availability, which is especially critical for emergency response teams. Key technical components including mobile devices, communications servers, wireless network, security infrastructure, and middleware to support legacy system integration must be optimized and tested for high availability, reliability and performance individually and as a part of the overall end-to-end solution.

Medical grade network. Communications platform is dependent upon the hospital's 802.11 network to provide high-quality, reliable, and uniform wireless coverage throughout the facility. Majority of organizations surveyed conducted comprehensive site surveys and generated detailed coverage heat maps enabling the engineering team to visualize the overall network, identify potential dead zones and optimize network access points for voice and data performance.

> *56% of organizations have standardized on an enterprise-class smartphone.*

Enterprise-class mobile device. Communications platform requires a highly reliable Smartphone to support the communications and collaboration requirements of nurses and other hospital workers across the enterprise. Fifty-six percent of organizations surveyed have standardized upon a more expensive enterprise-class Smartphone such as the Zebra MC40-HC and Spectralink Pivot after conducting extensive pilot projects where they found consumer grade Smartphones were difficult to
- ***optimize for VoIP communications*** resulting in poor call quality and dropped calls,
- ***restrict or limit end user control*** for operating system updates, application usage, and system capabilities based upon end user profiles, and
- ***clean and disinfect*** with standard hospital cleaning agents which can easily damage the screen, casing and internal electronics.

Manageability

> **61% of organizations expressed concerns with existing administrative tools.**

Centralized administrative tools. Communications platform must provide hospital IT with centralized web-based administrative tools to automate and simplify the registration, provisioning, management and support of end users and Smartphones for use on the corporate network based upon well-defined roles, responsibilities and functions. Sixty-one percent of organizations surveyed expressed concerns that existing tools require manual device provisioning, which is a labor-intensive and time-consuming process requiring upwards of 10 minutes per device. This is not scalable, cost-effective, or efficient for an organization to actively manage a fleet of several thousand Smartphones.

> **50% of organizations stated existing tools have limited options for analytics and reporting.**

Robust analytics and reporting tools. Communications platform must provide hospital IT with robust analytics and reporting tools to monitor and analyze communication usage models within and between different medical departments and to assess worker accountability to respond to specific events in a timely manner. A real-time dashboard and customizable reports enables hospital IT and other departments to track communication metrics against specific business, clinical and operational objectives. Fifty percent of organizations surveyed expressed concerns that existing tools have limited options for analytics and reporting. They are reliant upon the vendor to manually access the raw audit logs (CSV files) and generate monthly reports identifying the aggregate number of calls, text messages and alarms that have been received per department, which they believe provides limited value, context, and insights.

> **72% of organizations have deployed an MDM solution.**

Mobile device management. Communications platform requires integration with a mobile device management (MDM) solution. Seventy-two percent of organizations surveyed have deployed an MDM solution from companies such as VMware AirWatch, Symantec Mobile Device Management, and Citrix Systems XenMobile to help manage mobile device inventory, monitor end user activity, control mobile application updates, and protect the mobile device and content from unauthorized access.

Scalability

Communications platform must be able to support thousands of Smartphones and end users to address the communications and collaboration requirements of patient care teams and other hospital workers across the enterprise with minimal professional services required for installation. Sixty-three percent of organizations surveyed have deployed or plan to deploy a mobile communications platform supporting more than 500 Smartphones over the next 12 to 18 months. The average size deployment included 1,100 devices while the largest deployment included more than 5,000 units.

Providers integrating with hospital systems to support closed loop communications

78% of organizations believe a tightly integrated IT infrastructure is a success factor for supporting a large-scale smartphone communication platform.

Seventy-eight percent of provider organizations surveyed believe a critical success factor for supporting a large-scale Smartphone-based communications system was ensuring the underlying platform was tightly integrated with hospital IT systems infrastructure and medical devices to support data driven closed loop communications.

Nursing Informatics Supervisor at an **academic medical center (California)** explained, "Communications platform must provide support for closed loop communications enabling hospital workers to exchange text messages with adequate situational context so they can act upon incoming messages and close the communications loop without requiring multiple rounds of telephone tag or being forced to login into a computer for additional information."

"Hospital IT is using Connexall's middleware solution to integrate with Philips physiological monitors, Rauland-Borg nurse call system, and Epic EMR. A workflow engine routes notifications to specific individuals or groups based on pre-defined rules and protocols OR escalates notifications to a supervisor if it has not been responded to within a defined period."

"Hospital IT is also evaluating alarm management software to address Joint Commission's national patient safety goal focused on alarm fatigue. The software can adjust alarm settings based on a patient's condition and industry best practices, filter and reduce clinically insignificant alarms, and direct to alarms to the appropriate care provider or team members based on acuity levels."

"Hospital IT remains cautious about increasing the number of secondary notifications to a nurse's Smartphone for fear of overwhelming the nurse at point of care, which could negatively impact patient care quality and outcomes."

Providers are providing multi-device support to expand team-based collaboration

> *83% of organizations surveyed indicated the need for a communication platform that spans inside and outside the hospital.*

Eighty-three percent of provider organizations surveyed indicated that a critical success factor for supporting a large-scale Smartphone-based communications system was ensuring the underlying platform supported hospital-owned Smartphones, personally owned Smartphones, and a desktop computer interface for enhancing and expanding team-based collaboration within the hospital and across the community.

VP of Operations at a **regional hospital (Ohio)** reported, "Hospitalists, medical specialists, and affiliated community-based physicians applied a significant amount of pressure on hospital IT to provide them with access to the hospital's Smartphone-based communications platform after they had an opportunity to observe its successful deployment and usage by nurses and other care team members across the hospital and health system."

"Over the next 12 months, hospital IT plans to roll out a BYOD (Bring Your Own Device) program that would allow 1000+ providers and advanced practice nurses to use their personal iOS and Android-based Smartphones to access the hospital's communications platform. Hospital IT believes the BYOD program will enhance and expand team-based collaboration both inside and outside of the hospital's 4-walls ensuring all care team members are more accessible and on the same page."

"Increased BYOD support for physicians working within ambulatory and clinic-based environments also requires us to provide desktop communications tools enabling physicians to communicate with their medical and support staff."

"Hospital IT continues to work and address logistical concerns about the BYOD deployment including technical support, on-going maintenance, security, and costs."

Provider leadership is encouraging widespread end user adoption

> *100% of organizations report the need to secure hospital administration leadership, commitment and investment to support large-scale communication platform.*

All provider organizations surveyed report that a critical success factor for supporting a large-scale Smartphone-based communications system was securing hospital administration leadership, commitment and investment.

Project manager at a **community hospital (Illinois)** reported, "Smartphone-based communications platform is a personal project of the chief nursing informatics officer who is responsible for driving change and leveraging innovative technologies across the enterprise. She developed the overall mobile communications strategy, secured the required budget and resources, and oversaw the deployment of the communications platform across the organization."

"While this is no formal policy requiring nurses and patient care team members to use the platform, they are rapidly adopting it for all clinical communications across the care continuum. Hospital IT continuously monitors end user feedback and tries to identify new opportunities to address specific communication challenges across the enterprise."

"Nurses and other hospital workers are introduced to the communications platform during in-service training or during the new hire on-boarding process where they are shown how to effectively use the communications tools to support their functional roles."

Conclusion

With the passing of the Affordable Care and the transition toward patient centered care models and value-based purchasing, leading hospitals and health systems surveyed are making significant investments in Smartphone-based communications platforms to address the real-time communications and collaboration requirements of nurses and other mobile hospital workers across the enterprise.

Spyglass found that 63 percent of organizations surveyed had deployed or plan to deploy a healthcare communications platform supporting more than 500 Smartphones over the next 12 to 18 months. The average size deployment included 1,100 devices while the largest deployment included more than 5,000 units. These organizations were carefully selecting their hardware, software, and services partners based upon their track records for successfully installing large-scale Smartphone-based systems within hospitals and their willingness to collaborate to develop next generation close loop communications systems.

Spyglass identified the following four critical success factors for hospital IT to consider when widely deploying a Smartphone-based communications platform:
- *Scalability*. All organizations surveyed report that a highly reliable, manageable, and scalable communications platform is important to support mission and patient-critical communications.
- *Interoperability.* Seventy-eight percent of organizations surveyed believe that tight integration with hospital IT systems infrastructure and medical devices is critical to support data driven closed-loop communications.
- *Multi-device support.* Eighty-three percent of organizations surveyed report that cross platform support including hospital-owned Smartphones, personally owned Smartphones, and a desktop computer interface is important for enhancing and expanding care team collaboration within the hospital and across the community.
- *Hospital leadership.*   All organizations surveyed believe that strong hospital administration leadership, commitment, and investment are critical for deploying, supporting, and maintaining a large-scale Smartphone-based communications platform across the enterprise.

About Spyglass Consulting Group

Gregg Malkary is the Founder and Managing Director of the Spyglass Consulting Group. Spyglass is a market strategy firm focused on the mobile technologies and digital health. Mr. Malkary has more than over 25 years' experience in the high technology industry with domain expertise in the mobile computing, wireless, and broadband technologies within the healthcare industry. He has worked for both public and private companies in senior management operational roles. Most recently, Mr. Malkary was an Associate Partner at Outlook Ventures, a San Francisco-based venture capital firm focusing on early stage investments in enterprise software companies.

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