Information Mobility at Hospitals Drives Accountable and Quality Care

An IDC White Paper, Commissioned by Ricoh

Lynne Dunbrack, April 2016

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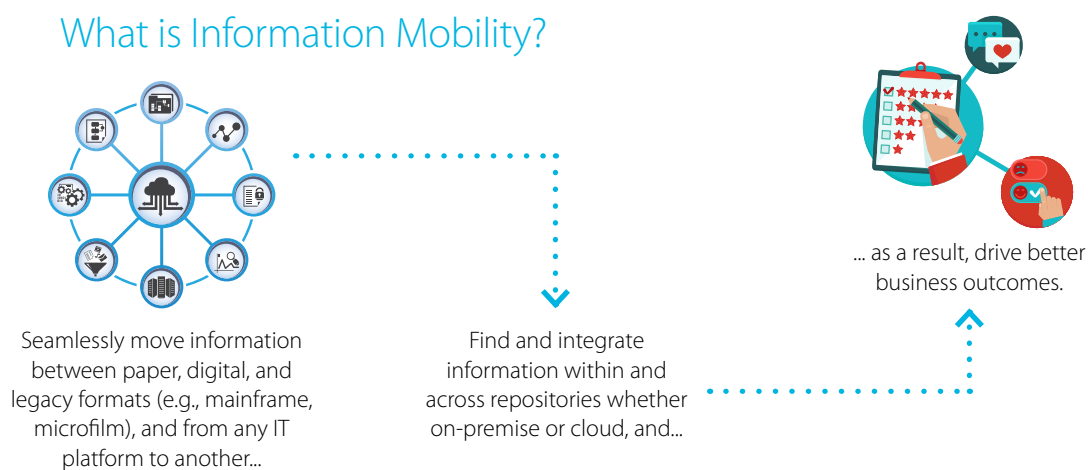
Introduction

Timely access to information is essential in healthcare. Unfortunately, information can be fragmented across the healthcare organization and stored in multiple paper, legacy, and digital formats as structured and unstructured data. Paper-based processes, so prevalent in healthcare, further impede instantaneous access and flow of information. Thus, workflow and collaboration between clinicians and staff are not optimized, which can lead to poor communication, compromising the quality of care and patient outcomes.

Healthcare organizations are seeking information mobility solutions to address these workflow, communication and collaboration challenges. Figure 1 depicts information mobility, which involves seamlessly moving information between various digital and paper-based formats, and finding and integrating information from various sources to drive better business and clinical outcomes.

FIGURE 1

What is Information Mobility?

Seamlessly move information between paper, digital, and legacy formats (e.g., mainframe, microfilm), and from any IT platform to another...

Find and integrate information within and across repositories whether on-premise or cloud, and...

... as a result, drive better business outcomes.

Source: IDC Health Insights, 2016

In This White Paper

This IDC Health Insights white paper explores the research findings summarized in Information Mobility at Hospitals Drives Accountable and Quality Care, an IDC InfoBrief commissioned by Ricoh. IDC conducted a global survey of 100 director-level and above executives from IT and lines of business in US hospitals with 500 or more employees. This was backed up by 12 in-depth interviews with line of business and IT executives from companies with a high level of information mobility.

The study identified four levels of maturity for information mobility: Candidates, Beginners, Contenders, and Champions. Maturity level was determined based on a correlation analysis with business outcomes. Champions were the most sophisticated healthcare organizations and had higher rates of adoption of information mobility technologies.

The goals: understand the business benefits of information mobility and the current state of information mobility across hospitals and learn what sets the most information mobility-mature hospitals apart from other hospitals.

The Imperative for Information Mobility

Evolving care delivery and reimbursement models, such as patient-centered medical homes (PCMHs) and Accountable Care Organizations (ACOs), are focused on improving patient outcomes, especially for patients with multiple chronic conditions.

Evolving care delivery and reimbursement models, such as patient-centered medical homes (PCMHs) and Accountable Care Organizations (ACOs), are focused on improving patient outcomes, especially for patients with multiple chronic conditions, to reduce healthcare costs through better care coordination and using global payments to promote efficiency. New care delivery and reimbursement models will need a technology platform that:

- Correctly identifies patients and provider records managed by multiple healthcare information systems across the ACO.

- Unlocks health information stored across the enterprise in disparate health information systems and formats (e.g., digital, paper, structured and unstructured).

- Combines clinical and financial information to provide a full picture of clinical, operational, and financial performance.

- Facilitates secure exchange of health information among care team members to improve collaboration and care coordination.

Today's new payment models and growing case mix complexity require health professionals and teams to communicate and collaborate more quickly and seamlessly with colleagues within the enterprise. For the first time, care teams must perform as tightly knit, multidisciplinary teams that collectively prioritize their efforts and resources on delivering better outcomes in less time and at a lower cost.

Care teams must overcome the fragmented communication and information handoffs between shift changes which can result in suboptimal workflows, performance of redundant tests and, more importantly, patient safety issues. In fact, the Joint Commission Sentinel Event database reveals that poor communication is the root cause in nearly 70% of reported sentinel events. The Joint Commission defines sentinel events as unexpected events involving death or serious physical or psychological injury, or risk thereof, not related to the natural course of the patient's illness.
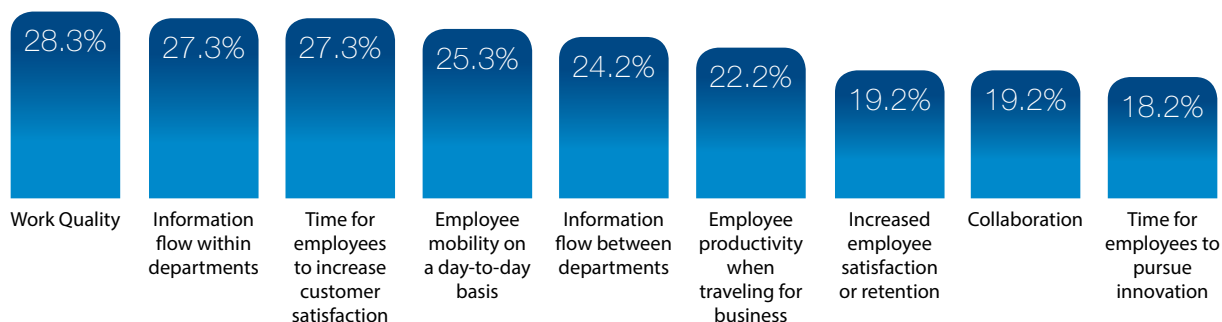
Real-time communication and collaboration — driven by accountable care and meaningful use — demands information mobility. Care teams have a high need for remote access to applications, including from their mobile devices, and for finding and integrating information from different platforms. Information mobility will also help to integrate business and clinical process workflows across departments.

Information Mobility Benefits Dovetail with Meaningful Use and Accountable Care

Hospitals reported the highest information mobility improvements in the areas of work quality (28.3%), information flow (27.3%) and time for employees to increase customer (patient) satisfaction (27.3%) (see Figure 2). This bodes well for meeting meaningful use and accountable care requirements and maximizing reimbursements influenced by Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores. Strategies for improving HCAHPS scores include timely communication with patients about their care in ways that they can understand. Patients become frustrated when information provided by clinicians treating them seems to be contradictory. Information mobility helps to put patients and their caregivers on the same page. Multiple modes of communication will facilitate sharing of and emphasizing important information with patients who may have different abilities to process information about their care plans as they are being discharged from the hospital. Educating patients during transitions in care is especially important for improving patient outcomes and helping to improve the patient experience, which can lead to better HCAHPS scores.

Real-time communication and collaboration — driven by accountable care and meaningful use — demands information mobility.

FIGURE 2

Impact of Information Mobility is Positive for Hospitals

28.3%	27.3%	27.3%	25.3%	24.2%	22.2%	19.2%	19.2%	18.2%
Work Quality	Information flow within departments	Time for employees to increase customer satisfaction	Employee mobility on a day-to-day basis	Information flow between departments	Employee productivity when traveling for business	Increased employee satisfaction or retention	Collaboration	Time for employees to pursue innovation

Source: IDC Health Insights, 2016

The Challenges and Barriers to Information Mobility

The IDC Health Insights survey found that 47.5% of employees need to access more than six data repositories for information. Yet only 16.2% of hospitals surveyed enable search across all data sources.

Healthcare IT by its very nature is complex. A number of challenges exist that could prevent private and public sector healthcare organizations from achieving their information mobility goals. Namely, workflow inefficiencies, fragmented information due to departmental silos, and lack of access to mobile and cloud applications.

Complexities of IT, Consolidation, and Compliance

The IT portfolio is a heterogeneous combination of administrative, clinical, and operational applications running on different platforms and technologies as a result of best-of-breed technology-buying decisions and mergers and acquisitions (M&As) of other healthcare organizations. Even after rationalizing multiple EHRs to a single (or relatively few) vendor solution(s), the next M&A event adds to the complexity of the enterprise's IT portfolio. In some instances, it makes sense to reuse what the healthcare organization already has in place to leverage existing investments, and in other cases, rationalizing applications again is warranted.

Managing these siloed systems is expensive and requires IT resources with diverse skill sets to support the wide variety of technologies that can be in place. Developing interfaces between these systems is costly and time and resource intensive. Unfortunately, most healthcare organizations do not have the IT or financial resources they need to address these issues. The subsequent downward cost pressures are inhibiting innovation.

Since more than half of Veterans and active duty service members receive care from civilian providers, as well as Veterans Affairs hospitals, information mobility across organizational boundaries between federal agencies and the private sector is essential for ensuring continuity of care.

EHR Deployment and Clinical Workflow Inefficiencies

Healthcare organizations across the globe are similarly challenged to balance the widespread deployment of EHRs to meet the objectives of their healthcare organization and clinician usability. In the United States, the push to qualify for meaningful use certification (vendors) and incentive payments (providers) has accelerated the development and implementation cycles of electronic health records. Vendors and healthcare organizations alike have rushed to deploy their EHR solution to meet the next stage of meaningful use, often to the detriment of clinical workflows because EHRs were initially designed to collect data for billing -- not care coordination. So while EHR adoption has increased, workflow improvements are still rare, and EHR dissatisfaction is rampant.

Information is Scattered Across Systems, Departments and Staff

The IDC Health Insights survey found that 47.5% of employees need to access more than six data repositories for information. Yet only 16.2% of hospitals surveyed enable search across all data sources. Furthermore, information is not only scattered across multiple healthcare IT systems, but also across departments and even staff. In hospitals, approximately 34% of information and institutional knowledge is stored in filing cabinets (20.2%) and employees' heads (13.8%). And people themselves are scattered, working from multiple locations, including home when on call. Half of hospital staff spends 50% or more of their time working from non-traditional locations.

Patients can move between health systems, further adding to data fragmentation and the challenges or accessing data to create a 360 degree view of the patient. Nowhere is this more complex than when providing care to U.S. military personnel. Since more than half of Veterans and active duty service members receive care from civilian providers, as well as Veterans Affairs hospitals, information mobility across organizational boundaries between federal agencies and the private sector is essential for ensuring continuity of care.

Limited Access to Mobile and Cloud Applications

While hospitals are migrating their clinical and financial systems to the cloud and have embraced mobile technology, there are still many systems that are on premise. Older legacy systems that should have been unseated long ago still persist, and some of these systems are only accessible by dumb terminals. Such antiquated systems that are not accessible via the web or mobile devices create obstacles to information mobility.

Hospital Information Mobility Maturity

Significant Opportunity to Improve

Historically, hospitals have invested less in technology than other industries with much of that investment occurring for administrative back-end functions. Investment in clinical systems has increased in the past five years as a result of ARRA and the mandate to deploy EHRs, resulting in greater access to digital information across the enterprise than ever before. However, there is much work to be done to integrate data from multiple information systems, much of it stored as unstructured data, along with document-based information.

Hospitals lag other industries when it comes to investing in information mobility technology. To characterize the gaps in information mobility, IDC categorized the level of information mobility maturity in hospitals. (see Figure 3) Only 9% of the hospitals in our study were classified as Champions, the level with the highest degree of information mobility. Hospital Champions are large healthcare organizations with 30,000 or more employees. The remaining 91% are at risk of falling further behind, particularly as the industry makes the shift to the 3rd platform technologies of cloud, mobile, Big Data analytics, and social business. This shift impacts the way IT can bring value to these organizations. The four levels of information mobility maturity range from Candidates, those with the lowest use of tools such as information search, social networking and intelligent capture, and the lowest levels of senior management support for such initiatives, to Champions, who have the broadest use of tools and greatest levels of management support.

FIGURE 3

Hospital Information Mobility Maturity

| 9% | 32% | 30% | 28% |
| Champions | Contenders | Beginners | Candidates |
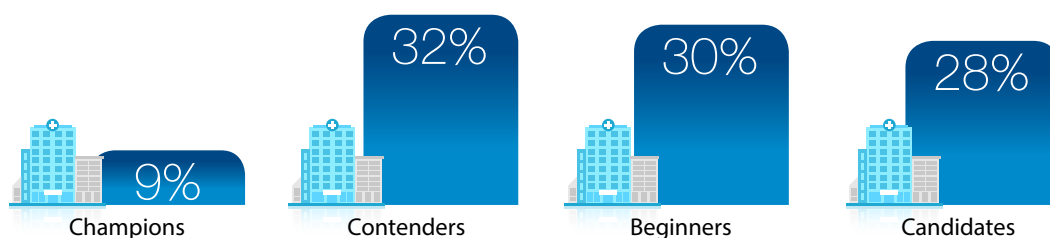
Note: Numbers do not add up to 100 because of rounding.
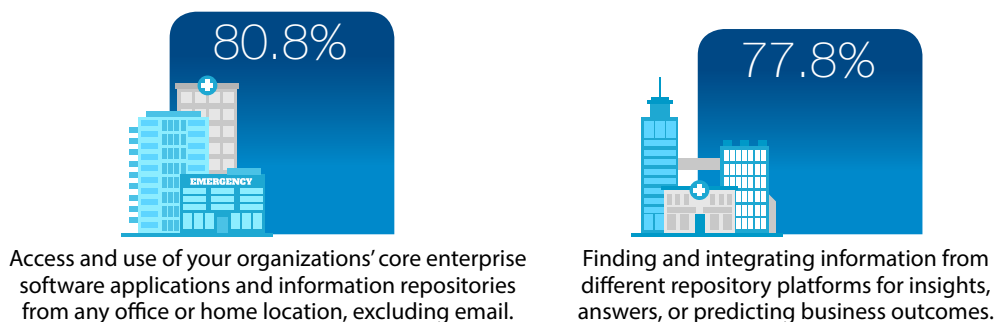*Source: IDC Health Insights, 2015*

Integrating business/clinical process workflows across departments represents a significant opportunity for hospitals, especially those participating in an accountable care organization or other forms of risk management contracts (e.g., population health management) as care collaboration and coordination will require integrated workflows and better access to information.

Information silos in healthcare are equally prevalent in other industries, but access and collaboration tools are less adequate. Hospitals have invested less in enterprise search, intelligent capture, collaboration software, and enterprise social networks. In contrast to other industries, hospitals were more likely to use self-service web portals for external customers than other industries. No doubt driven by the meaningful use requirement to offer patient portals and that a certain percentage of unique patients (or their authorized representatives) access the portal to view, transmit, or download their data.

Remote access to clinical applications and integrating information across different platforms to support the delivery and coordination of care is essential in healthcare. These information requirements were confirmed by the IDC Health Insights study in which respondents were asked to rate a series of capabilities on a 1 to 4 scale, with 4 being the highest and 1 the lowest (see Figure 4).

FIGURE 4

Hospitals Have High Need for Remote Access to Applications and for Finding/Integrating Information from Different Platforms

80.8%

Access and use of your organizations' core enterprise software applications and information repositories from any office or home location, excluding email.

77.8%

Finding and integrating information from different repository platforms for insights, answers, or predicting business outcomes.
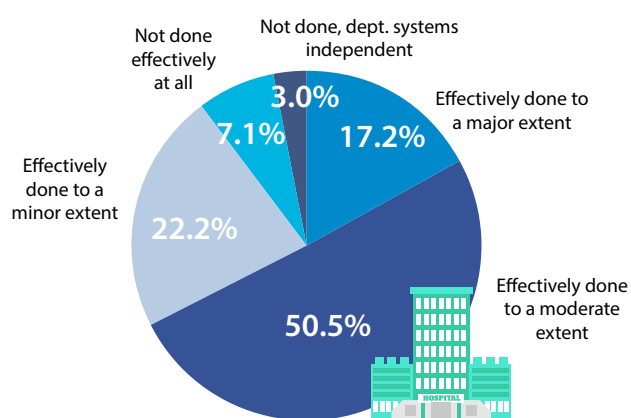
Source: IDC Health Insights, 2015

- 80.8% of healthcare respondents reported that access and use of hospital's core enterprise applications and information repositories from any office or home location was most important, and,

- 77.8 % of healthcare respondents reported finding and integrating information from different repository platforms for insights, answers, or predicting business outcomes was second most important.

Hospitals were more likely than other industries to have departments with unmet needs for optimizing document workflows; 84.7% of healthcare respondents reported unmet needs across the various departments within the organization compared with 74.6% of respondents representing other industries. Integrating business/clinical process workflows across departments represents

a significant opportunity for hospitals, especially those participating in an accountable care organization or other forms of risk management contracts (e.g., population health management), as care collaboration and coordination will require integrated workflows and better access to information. Figure 5 depicts the extent to which business processess are seamlessly integrated across departments for an automated and effective workflow across the healthcare organization.

FIGURE 5

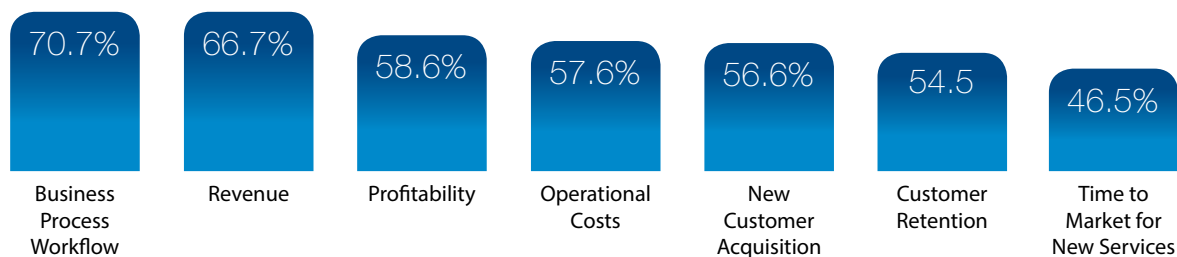## Hospitals are Not Effectively Integrating Business Process Workflows across Departments

Source: IDC Health Insights, 2015

Hospitals Achieve Workflow Efficiency and Revenue Gains from Information Mobility

Better clinical information flow leads to improved outcomes. While healthcare organizations have a harder time quantifying process improvements in terms of revenue gains, this will need to change under the new value-based business models. Hospital executives are recognizing the benefits that accrue from embracing information mobility solutions: most notably improving business process workflows (70.7%), revenue (66.7%), and profitability (58.6%) (see Figure 6)

FIGURE 6

Hospitals Achieve Workflow Efficiency and Revenue Gains from Information Mobility

70.7%	66.7%	58.6%	57.6%	56.6%	54.5	46.5%
Business Process Workflow	Revenue	Profitability	Operational Costs	New Customer Acquisition	Customer Retention	Time to Market for New Services

Source: IDC Health Insights, 2015

By way of example, consider the processes related to discharging a patient from the hospital. Careful discharge planning plays a critical role in coordinating care after the patient has been discharged, ensuring patient compliance with care treatment plans, and avoiding preventable readmissions. Multiple clinicians need to sign off that the patient is ready to go home or should receive care in a step down facility, such as a rehabilitation hospital or skilled nursing facility. If the patient is going home, the patient's nurse must provide clear discharge instructions for how the patient will be cared for, including whether visiting nurses and therapists will be involved in the post-discharge care. Porters and housekeeping need to be called to transport the patient and clean the room for the next patient. If information handoffs are inadequate and not timely, the patient's departure will be delayed, leading to patient dissatisfaction (resulting in potential poor HCAHPS scores) and the inability to turn over the bed to receive another patient. Both situations impact revenue. Hospitals that have streamlined the discharge process have achieved shorter lengths of stay and more efficient bed turnover, which helps to avoid ER diversion and the subsequent loss in revenue when patients are sent to competing hospitals.

The importance of managing patient data in a patient-centric manner and maintaining a 360-degree data set capturing all of the patient's interactions with the health system is critical in today's value-based delivery model.
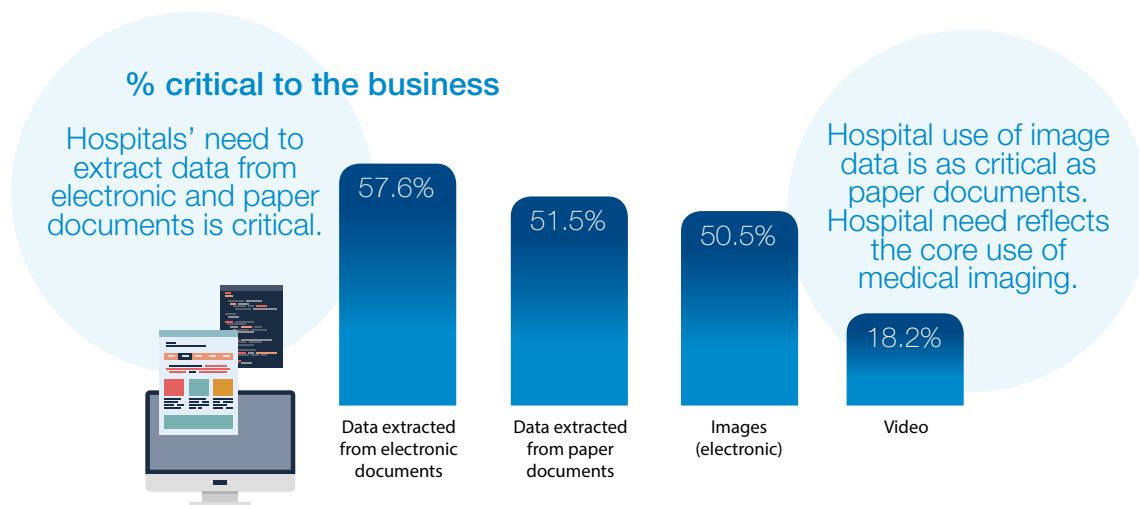
Hospitals' Need for Image Data Is as Critical as Paper Documents

The importance of managing patient data in a patient-centric manner and maintaining a 360-degree data set capturing all of the patient's interactions with the health system is critical in today's value-based delivery model. Healthcare organizations face considerable challenges when it comes to managing the explosive growth of exponentially increasing volumes of patient data, including electronic documents and medical images. This comprehensive data set will be vital to ensuring the goals of accountable care are met. The demand for access to medical images is growing and nearly

on par with being able to extract data from paper documents see figure 7). The ability to access images recently taken may help to avoid redundant imaging procedures. In turn, the patient will be exposed to less radiation and imaging costs will be reduced.

FIGURE 7

Hospitals Need to Capture Data from Imaging Sources

% critical to the business

Hospitals' need to extract data from electronic and paper documents is critical.

Hospital use of image data is as critical as paper documents. Hospital need reflects the core use of medical imaging.

57.6%	51.5%	50.5%	18.2%
Data extracted from electronic documents	Data extracted from paper documents	Images (electronic)	Video

Source: IDC Health Insights, 2016

Enhancing Information Mobility with Device Mobility

Most hospitals are in the early stages of deploying mobile technology, with most use cases around consuming information in read-only mode. Healthcare IT is wary of personal devices introducing viruses and malware, and the pendulum is swinging back to deploying company-owned devices. BYOD access to enterprise applications is very limited. Nearly half of hospital employees (47.5%) believed that BYOD access to enterprise application is about the same as when they used a company-owned device.

Hospitals recognize the need to enable document capture using cameras on smartphones and tablets; 79.8% of respondents reported their organizations need to enable this capability. Only 10.1% reported that it was fully enabled. In comparison, 19% of respondents representing other industries reported their organizations were fully enabled and could use their mobile devices for document capture.

Similarly, hospital employees are very unlikely to be able to print most or all core applications or information from their smartphones or tablets. This is because core legacy healthcare applications are only just becoming mobile-enabled. Many of these applications have not made the transition from 2nd platform client service architecture to 3rd platform technology architecture which leverages cloud, mobile, big data and analytics technologies. One out of five (19.2%) of the healthcare survey respondents reported that they could print from most or all applications from smartphones and tablets used for work. Consequently, hospital employees' satisfaction with phone/tablet access to applications and print/scan enablement is lacking; only 68.7% of hospital employees reported high satisfaction rates for these capabilities.

Optimizing Workflows and Collaboration Across Departments Through Information Mobility

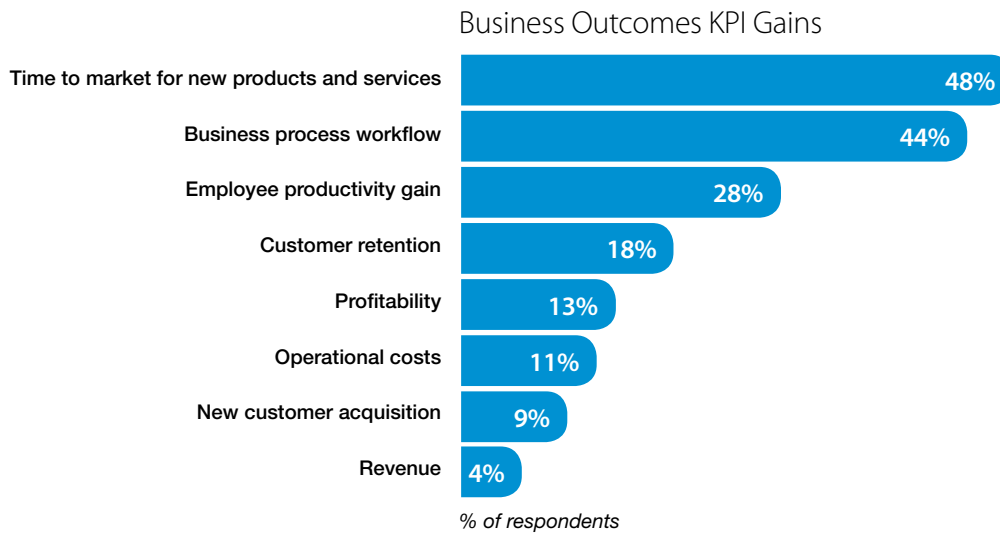## New Outcome-focused Business Models Require Hospitals to Improve Care Coordination

Driven by meaningful use and accountable care initiatives, new outcome-focused business models require hospitals to improve care coordination and clinical processes across departments. Bundled payments are a prime example where the hospital is paid a set fee for a hip replacement starting with the initial orthopedic consult, the surgery, and follow up care provided either in a rehabilitation facility or at home with visiting nurses and physical therapists. Information about the patient's care must follow the patient and be accessible to other clinicians as the patient moves from a pre-surgical consult provided in the orthopedic surgeon's office, inpatient admission the day of the surgery, and then discharge several days later to either a rehabilitation hospital or home with follow up care provided by visiting nurses and physical therapists.

This is not without its challenges given the combination of manual and automated processes to hand off patients from one care setting to another. The situation is further exacerbated when different EHR systems are used by the inpatient units and ambulatory clinics, for example. Even providers that have fully implemented the same EHR system across the enterprise, often still work with paper when communicating with patients (e.g., admissions forms, discharge summaries, billing, and test results) and with other provider institutions that are not part of their network. Home healthcare providers are even less automated than inpatient and ambulatory care settings. Consequently, paper documents persist for doctors' orders, prescriptions (especially for narcotics), lab results, medical records, claims, discharge instructions, and care plans for convalescence at home.

Driven by meaningful use and accountable care initiatives, new outcome-focused business models require hospitals to improve care coordination and clinical processes across departments.

Supplementing the quantitative survey, IDC conducted Business Value analysis using in-depth interviews with executives from organizations with high information mobility levels, and found striking results further supporting the benefits seen in the survey. The Business Value analysis found significant improvements in business outcomes can be achieved with Information Mobility (Figure 8). While the greatest gains are found in time to market for new products and services as well as business process workflows, there were appreciable gains across the board including revenue (4% gain), profitability (13% gain), and employee productivity (28% gain).
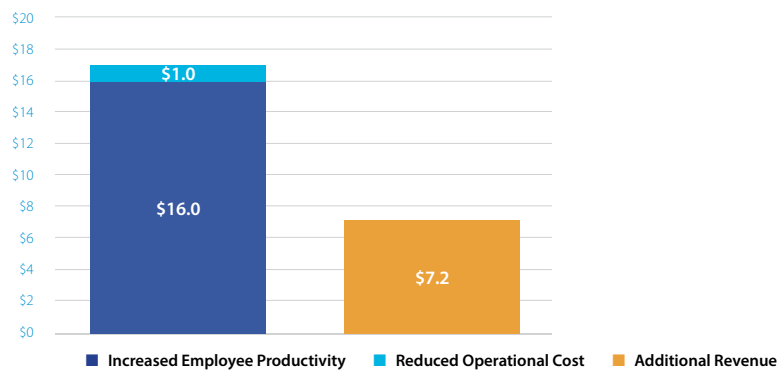
Figure 8

Business Outcome KPI Gains from Information Mobility

Business Outcomes KPI Gains

Category	%
Time to market for new products and services	48%
Business process workflow	44%
Employee productivity gain	28%
Customer retention	18%
Profitability	13%
Operational costs	11%
New customer acquisition	9%
Revenue	4%

% of respondents

Source: Information Mobility Business Value Research Study, IDC, 2015

This study also quantified the economic benefits the most information mobile mature organizations are realizing by category (Figure 9). Combining $17.0K in cost reductions from increased productivity and reduced operational costs with $7.2K in revenue gains, these organizations are seeing almost $25K in annual benefit per employee.

Figure 9

Annual Gains from Improved Business Outcomes

	Value
Reduced Operational Cost	$1.0
Increased Employee Productivity	$16.0
Additional Revenue	$7.2

Legend: ■ Increased Employee Productivity ■ Reduced Operational Cost ■ Additional Revenue

Source: Information Mobility Business Value Research Study, IDC, 2015

Achieving Information Mobility

Achieving information mobility requires technologies that enable collaboration and workflows within and across departments. These include:

- **Web conferencing access for employees.** Informal consultations, or "curbside" consults, are common practice between clinicians and are often used to seek advice from a specialist about appropriate diagnostic tests, treatment plans, or advice about whether or not a more formal consultation is required. The ability to initiate a web conference easily to discuss a patient's case can often resolve issues related to a patient's care more quickly than other modes of asynchronous communication.

- **Automated/optimized document workflows within and across departments.** Medical records input, patient admissions, and patient billing are the leading workflows. Under accountable care initiatives, there are opportunities for improvement in care coordination, transition management, and patient discharge.

- **Search across core information repositories.** As noted previously, clinicians and hospital staff access multiple systems throughout the course of their day. Hospitals have historically relied on integration engines and health information exchange technology to access information found across the enterprise. However, these solutions only query digital information. According to IDC research findings, 38% of documents used in healthcare today are paper-based and content from 31% of those documents are re-keyed into a computer. And paper is not going away as quickly as expected; 62% of healthcare workers say that paper volume either increased or remained flat year over year.

- **Intelligent capture and scanning.** Intelligent capture and scanning are important tools for converting from paper to electronic health records. Larger hospitals have invested early in tools to digitize patient records.

- **Phone/tablet access to applications and printing.** Clinicians are increasingly using mobile devices, either personal or corporate, while caring for their patients. The ability to access core applications and print from mobile devices improves clinical workflows and employee efficiency, and thus improves employee satisfaction.

- **Cloud application use and cloud printing.** Hospitals are in the early stages of adopting cloud technology compared to other industries, and prefer private and hybrid clouds over public clouds. Use of cloud-based solutions should be as easy as on premise solutions. One note of caution: the increased use of cloud file sharing/storage (CFS) among more mature information mobility users could create security vulnerabilities for their institutions, unless those CFS solutions are HIPAA compliant. Among the information mobility Champions, 44.4% of employees use whatever CFS service they want (e.g., Box, Dropbox, Microsoft OneDrive, and Google Drive).

> Hospitals have historically relied on integration engines and health information exchange technology to access information found across the enterprise.

Essential Guidance

Now more than ever, HCOs need information mobility to empower clinicians and care teams to innovate together to uncover new ways to drive out the waste, waits, delays, missed handoffs, ineffective care, and operational inefficiencies to consistently deliver quality care.

Other industries have addressed communication and collaboration challenges and have made the requisite investment in content, communication, collaboration, and social platforms. Now more than ever, HCOs need information mobility to empower clinicians and care teams to innovate together to uncover new ways to drive out the waste, waits, delays, missed handoffs, ineffective care, and operational inefficiencies to consistently deliver quality care. It is time for healthcare to make similar investments to leverage information mobility solutions to meet the demands of the new healthcare models in a post reform world.

To achieve information mobility, healthcare organizations should:

- **Assess and map their current workflows.** Begin by mapping the major processes surrounding a patient being admitted to the hospital, diagnosed and treated, and then discharged to home or another care facility. Map related clinical processes and then the administrative processes related to billing for services rendered. Focus on processes that are known to be highly inefficient because information is not readily available to staff to do their jobs effectively.

- **Identify where there are gaps in the flow of information.** As workflows are being mapped, note what information is required, when, and where it is stored (e.g., which system, digital or paper, or even in someone's head).

- **Identify where technology can address these gaps.** Next, how will that information be surfaced during the workflow to improve that process? What information mobility technologies can address clinical decision making or the question: "What do I need to do next?"

- **Engage physician and nurse champions for clinical collaboration processes.** Identify clinical leaders who are well respected among their peers, not only for their clinical expertise but also for their thought leadership on matters where IT intersects with medicine. These clinical leaders will be instrumental in identifying clinical collaboration processes that would benefit from applying information mobility technologies and encouraging their peers to adopt new strategies to entrenched, but broken, processes.

- **Educate the user community about how information mobility can positively impact communications, collaboration, and innovation.** An informed user community will often use technology to solve its own challenges in ways that may surprise the "experts" but which can be very effective. Identify case studies highlighting innovative information mobility applications at other provider organizations. Once the various information mobility components are in place, end-user teams can often devise their own collaboration and communication processes and, through viral internal marketing of the solution, encourage other colleagues to adopt the solution for their own purposes.

- **Make information securely available anytime, anywhere to those authorized to access it.** Use of cloud-based solutions makes it easier to provide anywhere, anytime access to health information provided the requisite security measures are in place to mitigate privacy and security breaches. Other considerations include whether staff have the appropriate IT credentials to access this information while at work or on call.

- **Look to early adopters both inside and outside of the healthcare industry for lessons learned and best practices.** Early adopters of information mobility in healthcare are discovering, and deploying, innovative collaboration and communication solutions that validate the benefits of information mobility when it comes to driving meaningful use and accountable care.

Parting Thoughts

The fast-paced, communication-intensive environment of healthcare, combined with a highly mobile clinical workforce, lends itself to using information mobility solutions to collaborate with colleagues and care teams. Information mobility enables a wealth of administrative, operational, and clinical workflows that can cross devices and platforms. Healthcare professionals can access information using their preferred channel and device, regardless of where they may be — in the hospital or ambulatory care setting, at home, or on the go. These benefits derived from information mobility dovetail well with the shift to value-based reimbursement and health reform initiatives. The effective of use of information mobility solutions will drive many process improvements in healthcare, most notably, improving patient safety and patient outcomes while reducing costs through productivity and efficiency gains.

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