

## SOLUTION BRIEF

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# Improving Healthcare Delivery with Intelligent Systems

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## EXECUTIVE SUMMARY

Given the pressures of rising healthcare costs and recent regulatory changes, healthcare IT is ripe for transformation. In the United States, pressure from regulation, which calls for lower readmission rates, the safeguarding of patient health records, the transition from ICD-9 to ICD-10, meaningful use of electronic records, and improved treatment outcomes, is forcing healthcare organizations to rethink and modernize healthcare IT systems. European healthcare providers are impacted by budget cuts, continue to be constrained by the costs of legacy healthcare IT systems, and are under pressure to meet efficiency targets.

The conflicting pressures of raising the quality of patient care while reducing costs create the requirement for a new generation of intelligent healthcare IT systems that enable a healthcare business delivery model that increases the level of patient care, reduces costs, and improves ROI by driving new revenue streams.

This IDC Solution Brief looks at the need for intelligent systems in the field of healthcare delivery. It provides a situational overview of the current regulatory and cost environment that healthcare organizations are operating under amid the need for transformations that are required for patient-centric healthcare delivery. Based on an interview conducted by IDC, this document also highlights how a healthcare provider has adopted intelligent systems and the benefits derived from such deployments.

## SITUATION OVERVIEW: THE NEED FOR INTELLIGENT SYSTEMS IN THE PROVISION OF PATIENT SERVICES

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### Regulation and the Cost of Healthcare

In the United States, pressure from regulations such as the Affordable Care Act, the Budget Control Act, and the Health Insurance Portability and Accountability Act (HIPAA) is forcing healthcare organizations to rethink and modernize healthcare IT systems.

#### *Reducing Readmission Rates*

Section 3025 of the Affordable Care Act added section 1886(q) to the Social Security Act, establishing the Hospital Readmissions Reduction Program. The new law requires the Centers for Medicare & Medicaid Services (CMS) to reduce payments to hospitals with excess readmissions, effective for discharges beginning on October 1, 2012. CMS

records indicate that approximately 2,127 hospitals will be fined nearly \$280 million over the course of the year by the U.S. government because a significant number of patients are readmitted soon after discharge. CMS records show that nearly 2 million Medicare-covered patients are readmitted to the hospital within 30 days of discharge, costing Medicare an additional \$17.5 billion in healthcare payments. Even though many hospitals have worked to lower readmission rates, the national average readmission rate has stood steady at around 20%. Excessive readmissions have long been considered by the U.S. government as a sign of an inefficient and expensive healthcare delivery system. Prior to the law, many hospitals did not have the financial incentive to lower readmission rates, with many profiting from higher readmissions. With the changes in regulation brought about by the Affordable Care Act, the U.S. government is using Medicare's financial muscle to pay healthcare providers based on the quality of care provided primarily based on the readmissions metric.

### ***Improving Care and Efficiencies with Electronic Medical Records***

The Health Information Technology for Economic and Clinical Health (HITECH) Act has authorized incentive payments through CMS to healthcare organizations to enable improvements in healthcare delivery through the meaningful use of electronic medical records (EMRs). The U.S. federal government will make unprecedented incentive payments to the tune of \$27 billion over 10 years, or as much as \$63,750 per clinician, to catalyze the use of EMRs. HITECH's primary goal is not just adoption but the meaningful use (MU) of EMRs to improve healthcare delivery and patient care.

In addition, the HIPAA Privacy and Security final rule released on January 17, 2013, clarifies the original "risk of harm" standard due to the breach of patient information. The new rule moves the focus of the breach assessment from whether the patient has been harmed to whether patient data has been breached. The new rule also puts the burden of proof on the hospital or healthcare provider to show that there is a low probability of a patient information compromise, barring which the hospital or healthcare provider has to treat it as a security breach.

### ***Cost Pressures Driving IT Overhaul Among Healthcare Providers in the European Union***

In Europe, healthcare CIOs are faced with a demand for patient-centric healthcare services in the face of flat IT budgets and overall healthcare financing budget cuts. Per the EU OECD report "Health at a Glance: Europe 2012," while government health spending tended to be maintained at the start of the economic crisis, cuts in spending really began to take effect in 2010 in response to budgetary pressures and the need to reduce large deficits and debts. Amid this backdrop, healthcare executives are being asked to redesign IT infrastructures, achieve efficiency targets by adopting new sourcing models, and guarantee regulation compliance.

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## **The Need for Healthcare Intelligent Systems**

IDC believes that the conflicting pressures of raising the quality of patient care while reducing costs create the requirement for a new generation of intelligent healthcare IT systems that enable a healthcare business delivery model. These systems are designed to increase the level of patient care, reduce costs, and improve ROI by

driving new revenue streams. To enable this new healthcare delivery model, these intelligent systems will need to seamlessly and autonomously connect healthcare delivery processes, medical devices, medical records, and patient services. In addition, they will need to enable real-time access to data, be capable of autonomous device-to-device communication, and enable autonomous processes such as the ability for a medical device to update patient records. Intelligent systems will also need to enable new healthcare delivery models such as telemedicine and remote monitoring to enable a healthcare delivery organization to extend its services beyond its walls.

## **ENABLING INTELLIGENT SYSTEMS IN HEALTHCARE ENVIRONMENTS**

From a technology perspective, IDC believes that enabling an intelligent system in a healthcare environment will require the following:

- Intelligent devices that enable point-of-contact information input and retrieval
- Connectivity to a range of previously unconnected medical devices
- Connectivity to remote patient monitoring and telehealth devices
- Automation of a patient's EMR interactions
- Automation of device-to-device or device-to-system communications such as medical alerts

## **Intelligent Systems Installation at Jeroen Bosch Hospital**

A few intelligent system installations in the healthcare delivery space are in existence today. IDC spoke with Peter Langenbach, CFO of Jeroen Bosch Hospital (JBH), a new 1,100+ bed hospital in the Netherlands, about the challenges, benefits, and opportunities of its newly installed Windows Embedded healthcare intelligent system. The JBH installation consists of 800+ touchscreen bedside terminals connected by an intelligent system running Microsoft Windows Embedded.

For the first iteration of the intelligent system installation, the 800+ bedside terminals provide a paper-free bedside experience for the patient and the medical practitioner by providing the patient's EMR on the bedside terminals and allowing the medical practitioner to input medical data directly into the system, removing the need for patient dossiers with the implementation of an electronic patient file. This will be possible in the near future. In addition, the system provides a range of patient services including Internet access and email and multimedia entertainment. Patients can also order meals and call nurses through the terminal.

In the near future, the system will allow JBH to easily gather and present data, given that it has done away with paper-based patient dossiers. In addition, the ability for doctors and staff to input data directly into the bedside terminals has saved time, especially with staff freed from transferring paper-based data to electronic systems, and reduced the cost associated with gathering specific indicators required for regulation-based reporting requirements. Given the backdrop of budget cuts in EU healthcare spending, reimbursements from insurance agencies are higher for hospitals that show that they can reduce cost, and JBH notes that its reimbursement rate from insurance agencies is higher than that for an older hospital with older systems.

In the next iteration of its intelligent system development, JBH plans to connect a slew of medical devices (such as vital signs monitors, intelligent medical device hubs, and cardiac output monitors) to the system so that these medical devices can chart medical data directly to a patient's EMR. The hospital envisions reducing medical errors, improving access to patient data, and providing better communication between doctors and specialists, all of which will improve patient care. In addition to interfacing the medical devices to a patient's EMR, the hospital anticipates value in the data that will be collected and organized for further analysis. Currently, JBH's data analytics effort is limited to patient services, but it could be extended to clinical analytics or other intelligence that the aggregated data can provide. The hospital does not have immediate plans for remote monitoring or telehealth offerings currently but plans to explore those opportunities as infrastructures and demand evolve to support those technologies.

JBH also notes significant business benefits from its decision to install an intelligent system based on Windows Embedded. It notes reduced time to market (50% reduction) and lower operational and maintenance costs (40% reduction). In addition, it expects to see increased revenue streams by increasing bedside patient offerings such as special entertainment programs or live events. JBH believes that it can increase its ROI on the Windows Embedded intelligent system by 50% over the next few years.

The technology implementation of JBH's intelligent system consists of bedside terminals powered by the Windows Embedded operating system, with the back-end systems running Windows Server, Microsoft SQL Server, Internet Information Server, and the Microsoft .NET framework. Patientline, JBH's technology implementation partner, notes that it chose Microsoft Windows Embedded for a number of reasons, including a familiar interface, the ease of application development (especially for service-oriented requirements), and the ability to bring the solution to market quickly. In addition, integration with older systems in the hospital was cited as a reason for choosing Windows Embedded over competing solutions such as Linux.

- ☒ A security and identity framework compliant with healthcare regulation for the new interactions and connected devices enabled by the intelligent system
- ☒ Integration with legacy healthcare IT systems
- ☒ A management framework for remote system management and the monitoring and updating of intelligent end devices
- ☒ A back-end data framework for collecting and organizing data (such as data for insurance or regulation requirements)

Building such a system, which requires the integration of a diverse set of third-party technologies, and finding a technology partner well versed in the healthcare delivery space are no simple tasks for a healthcare CIO/CFO, especially in an environment of shrinking IT budgets.

## **CHALLENGES/OPPORTUNITIES**

The deployment of intelligent systems in the healthcare delivery industry will bring with it a number of transformations, opportunities, and challenges.

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### **Opportunities**

Connected medical devices will be a key benefit of intelligent systems. The ability to interface medical devices and to automatically chart data from the device to a patient's EMR would provide benefits not just to the quality of healthcare (reduction of human entry errors, better workflow for hospitalists, and data analytics opportunities) but also in the reduction of costs by freeing medical personnel such as nurses to focus on their primary areas of care.

Paper-based dossiers near the hospital bed continue to be a mainstay of many hospitals, with electronic entry into the patient's EMR being done in batch mode at a later time. Patient terminals anchored by intelligent systems would help provide a comprehensive view of the patient, including history, recent lab results, treatments, and billing information. The ability to increase revenue streams for a healthcare delivery organization by enabling a new generation of patient services such as on-demand entertainment, videoconferencing, expanded menu selections, and other online services next to the hospital bed is an added benefit of these systems.

At a more transformational level, intelligent systems will bring with them the ability to extend patient care beyond hospital walls. IDC estimates that by the end of 2016, more than 10 million households in the United States will have a wirelessly connected personal health or medical device. In addition, more than 23 million wireless connected personal health or medical devices will have shipped in the United States by the end of 2016. Remote monitoring and telehealth services could be enabled by the system by connecting the patient's EMRs to outpatient physicians, rehabilitation facilities, and remote monitoring centers, resulting in a continuum of healthcare for the patient, reductions in readmissions, and healthcare cost savings.

## Challenges

While the adoption of an intelligent system can improve the quality of healthcare, the implementation of an intelligent system amid a backdrop of shrinking healthcare IT budgets remains a challenge. In addition, building an intelligent system on most platforms requires the integration of a number of third-party technologies, which increases the complexity and cost of the implementation. In IDC's view, intelligent systems are a transformational technology and incremental investments in such a system may not be the best road to implementation. Most hospitals do not have the luxury of reinventing themselves as Jeroen Bosch Hospital (JBH) did in 2011 during the building of a new hospital. In Europe, the IT budget for growth initiatives remains small, as exemplified by IDC's recent Western European healthcare survey results: healthcare CIOs expect that, on average, 66% of their 2013 budget will go to maintain the current installed base and a further 12% will go to regulatory compliance, which leaves less than 12% of the IT budget for growth initiatives.

## CONCLUSION

In a *New York Times* interview, Dr. Donald M. Berwick, former director of the Centers for Medicare & Medicaid Services, contended that 20–30% of healthcare spending is squandered due in part to overtreatment of patients, the failure to coordinate care, the administrative complexity of the healthcare system, CMS regulations, and fraud. Against a backdrop of budget cuts, reduced reimbursements, and consumer demand for patient-centric care, healthcare delivery organizations are under pressure to transform from a fee-based to a performance-based reimbursement model. IDC estimates that if Berwick's statements are on target or even halfway to the truth, more than \$300 billion to \$600 billion per year may be wasted due to the reasons Berwick cites. Either way, such wastage is not sustainable in any healthcare delivery system, and government and private healthcare funding organizations are already well on their way to implementing performance-based reimbursement models.

Healthcare CIOs are under tremendous pressure to increase efficiencies, comply with new regulations, increase ROI of IT systems, and enable new revenue streams with technology, all amid the pressure to cut costs. The deployment of intelligent systems by healthcare delivery organizations will be essential to creating sustainable business models in the new normal healthcare spending environment. Connected medical devices, meaningful usage of patient EMRs, remote health and telemedicine, and data analytics are key transformative healthcare IT technologies that will allow healthcare CIOs to bridge the gap between cutting costs and delivering quality patient care in this new spending, patient-centric, and reimbursement environment.

Building and maintaining an intelligent system will require the integration of a diverse set of third-party products and could be viewed as a Herculean task by most healthcare delivery organizations given the diverse design, architecture, systems planning, system, and device deployment and management needed. IDC suggests that IT decision makers explore intelligent system platforms, such as the Microsoft Windows Embedded Intelligent System suite, that offer end-to-end solutions and enable a tighter level of integration between the device, back-end servers and databases, and the cloud services layer. Using a cohesive end-to-end software

platform for the deployment of an intelligent system could reduce time to deployment and accelerate the return on such an investment.

However, in the final analysis, healthcare CIOs are faced with the tall order of cutting costs, improving efficiencies, and complying with increasing regulation while at the same time delivering on the promise of patient-centric care. And deploying an intelligent system may be the most efficient solution they have to fulfill that order.

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