A Prescription for Better Patient Outcomes and a More Profitable Business

A CIO and CIMO Guide to Elevating Healthcare Delivery

DIAGNOSING THE CHALLENGES OF HEALTHCARE

Of all market segments, healthcare receives the most scrutiny and faces the biggest challenges in the first half of the 21st century.

Costs of healthcare—technology and delivery—are outpacing other industrial areas, while shortages of qualified caregivers ("talent") are predicted to exacerbate further in coming years.

At the same time, technological advancements present healthcare organizations with both challenges and opportunities. Patients place many of the same consumerization expectations they have on businesses outside of the healthcare realm on their healthcare providers. For healthcare businesses, the walls likely seem they are "caving in" from all sides.

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CONTROLLING COST

Healthcare costs continue on an upward spiral. Recent reports predict nearly $1 in every $5 spent in the United States by 2024 will be on healthcare[1]. A four percent annual growth rate since 2008 will be eclipsed with a projected 5.8 percent annual rate over the next decade, pushing healthcare spending as a share of GDP from 17.4 percent today to almost 20 percent in 2024[2].

Primary factors behind this dramatic growth are the evolution and development of medical technologies and pharmaceuticals coupled with higher healthcare delivery prices.

Finding ways to control costs and improve operational efficiencies is a top priority for many healthcare leaders.

FACILITATING SYSTEM INTEROPERABILITY

Despite $28 billion being spent on implementing health information technologies such as Electronic Health Record (EHR) systems, a huge void still exists when it comes to interoperability[3]. Most medical centers have 20 to 30 different programs used to deliver patient care[4].

"**Yet, these systems reside in silos, often failing to communicate and exchange information with each other[5].**"

As a result, patients are forced to repeat the same information over and over again, and caregivers are forced to ask the same questions over and over again.

On the plus side, adoption by the U.S. hospital community is nearly complete. Yet, interoperability is still a mixed bag. Access to information doesn't always mean more informed or efficient patient care[6]. A different approach is still needed.

Utilization of big data insights could reduce healthcare spending by as much as

17%

ANALYZING BIG DATA

Each day, 2.5 quintillion terabytes of healthcare data are created and stored[7], which is growing at a 40 percent annual rate[8]. The problem with all of this data is that it's scattered across different types of applications, silos, and storage systems. Reaching intelligent insights from its analysis is virtually difficult.

Even if the information can be made useful, making it readable and relevant to physicians and patients is an immense challenge.

Beyond better patient care and outcomes, McKinsey estimates better utilization of big data could deliver up to $450 billion in annual cost savings, or nearly 20 percent, in the U.S. alone[9].

ENCOUNTERING THE COMPLEXITY OF SYSTEMS, APPS, AND UIs

Caregivers are inundated with applications, emails, patients, and other tasks that detract from patient care. Doctors, for example, see an average of 40 patients daily while sifting through 200-plus emails daily. Once seen as a productivity enabler, mobile applications simply create more silos. Caregivers and patients must sort through some 165,000 health-related apps today to determine which ones are relevant[10]. No wonder 36 of them garner more than 50 percent of total downloads[11].

SCALING FINITE HUMAN RESOURCES

While there are interesting possibilities to leverage alternative options for patient care, humans in the form of doctors, nurses, and other caregivers are a critical linchpin when it comes to healthcare. Their empathy and understanding is the primary differentiator for patients between good and bad care experiences.

Yet, the percentage of the U.S. population 65 and older will grow to 16 percent by 2020 (from 13 percent in 2010). This is exacerbated by the aging caregiver population: 55 percent of registered nurses are 50 years or older, with 62 percent of those 54 and older considering retirement today[12].

PATIENT CONSUMERIZATION

Research shows patient engagement is crucial when it comes to improving health outcomes and lowering costs[13]. Part of this process includes empowering them with self-service capabilities and giving them access to their health-related records.

Those who assume patient expectations for their healthcare providers are different than non-healthcare companies with which they do business are wrong. McKinsey finds that they're virtually the same in a recent study. **Patient expectations are being set by non-healthcare industries, and meeting those expectations is likely to be a critical issue for healthcare companies**[14].

> **"Patients of virtually all age groups want self-service when it comes to certain aspects of managing their healthcare.**
>
> **These activities range from scheduling appointments, to checking health status, to dietary and exercise planning and monitoring."**

PRESCRIBING THE DIGITAL IMPERATIVES

The current path taken by healthcare providers and patients leads them up a dead-end street. The rows of silos are simply too numerous to break down. The proliferation of applications—mobile and web-based—makes the problem even worse. And assessing, let alone learning how to use, the myriad of healthcare-related applications—and the user interfaces for each one—that are now available is impossible.

Beyond all of these challenges, development cycles for new applications take months, with user interface programming consuming more than half of the time required to develop an app.

The digital strategy for healthcare is comprised of a number of different factors. Getting this digital "amalgam" mixed in the right way will enable healthcare organizations put empower both their caregivers and patients.

This enables caregivers to deliver great patient experiences and most importantly care outcomes, while providing patients to become much better informed and more active participants in monitoring and managing their health.

1 NAVIGATING MULTI-CHANNEL INTEGRATION

Caregivers and patients want to use multiple channels regardless of application, device, and location. Seamless experiences between devices and applications is particularly important. Without streamlined interoperability, this is impossible.

This is where bots (chat bots) come into the equation. Bots use Natural Language Processing (NLP)—regardless if the user is accessing via a computer, tablet, or mobile phone—to tap a rich repository of data via text or auditory languages. This now transforms the human-to-computer interaction requirement, and eliminates sophisticated code needing to be written to bridge the gap between humans and the different computer repositories.

Doctors simply tell the bot what she wants in terms of information, and the bot connects her with the data store or application that meets her question. The same type of capability is afforded to patients, who simply speak what they need or cite their question, and the bot connects them with a data set that corresponds to their question.

Sophisticated, time-consuming, and resource-intensive interoperability integration with various back-end systems and data pools is eliminated with this approach.

2 BENEFITING FROM A DEVICE- AND APPLICATION-AGNOSTIC USER INTERFACE

The graphical user interface (GUI) has inherit limitations. Today, it is used by virtually every application—web based and mobile. But as developers add more features, it becomes increasingly cluttered and difficult to use.

When everything is boiled down to a hierarchy of needs, healthcare providers choose: **efficiency, security/ privacy, and integration/ interoperability**.

Patients seek: **simplicity, health outcomes, and engagement**.

Bots change these dynamics. No longer must humans speak computer language to elicit the responses they want.

Rather NLP facilitates a conversation in human speak. Drawing upon artificial intelligence (AI) and machine learning, bots understand context and built anthropomorphic connections with caregivers and patients, intelligently routing them to the applications and data stores needed to answer their questions[15].

3 PROVIDING PERSONALIZED CARE

Caregivers and patients want two-way conversations when using their healthcare-related applications. Contextually aware bots seek to understand the questions and requests of caregivers and patients and help them find the answers and information they need, regardless of application or data silo.

Bots also proactively supply information and suggestions used to make decisions that enable better health outcomes while minimizing costs.

4 COUNTING ON SECURITY, PRIVACY, AND COMPLIANCE

Of all the different constituents involved in the health-related activities, primary care providers rank at the top of the list when it comes to the entity patients trust most with their healthcare data. At the same time, there are real concerns about the lack of security standards and compliance protocols in the ever-expanding, "wild west" of new health-related applications[16]

Bots bring a sense of control and vetting to this process, prompting providers and patients to determine which apps to connect and which to leave unconnected. These decisions can be based on security and compliance validation.

FINDING A CURE WITH CONVERSATIONAL HEALTHCARE

Conversational healthcare that uses bots holds much potential. Unlike prior GUI-based applications that enable one-way human-to-computer conversations, conversational healthcare creates bi-directional interactions spoken in the language of caregiver or patient.

Text- and voice-based bots stand at the center of this conversational exchange, breaking down application and information silos while enabling healthcare providers and patients to connect with applications that answer their questions and provide the information needed, securely and in full compliance with health-related standards and regulations. And because bots employ heuristic learning and AI, they are contextually aware and form emotional connections with their human counterpart. In addition to helping control and shrink costs while delivering better health outcomes, bots allow healthcare providers to provide a better patient experience.

PATIENT Outcomes via Bots

OUTCOME	CAPABILITIES
Patient Experience	Alert care teams of urgent patient changes Schedule prescription refills and appointments Get answers to FAQs for health self-service quickly Engage post discharge to follow up and track patients for reduced readmissions Provide differentiated services for temporary and long-term care
Caregiver Mobility	Send and receive referral information Facilitate patient consultation requests Admission, discharge, and transfer requests Support peer-to-peer collaboration Automatically alert response teams during emergencies (e.g., endemic)
Caregiver Agility	Update system of record with patient history Signal hospital staff if patient needs assistance Provide instant notifications of emergency room priority cases

PROVIDER Outcomes via Bots

OUTCOME	CAPABILITIES
Regulatory Compliance	Create real-time out-of-tolerance alerts Systematize HIPAA compliance challenges compared to human decision-making Ease audits through auto-reoccurring reports and follow-up actions Send regulatory event updates
Interoperability	Automate data entry in disparate applications to avoid double entry Transfer data from legacy to new databases to create a single system of record Send relevant training materials to the right people automatically Enable health data exchange from any system within the healthcare digital network and community (e.g., EHR, pharmacy systems, etc.)
Readmissions	Automatically sort and route calls by priority Answer patient inquiries Resolve common issues within the channel of choice Automatically enter caller, question, and resolution data to appropriate system of record

JOIN THE BOT CONVERSATION

Conversational healthcare gives healthcare providers the means to transform how health-related services are delivered to patients. It also puts self-service capabilities in the hands of patients. The integration and centralization of applications and data repositories allows caregivers to make faster and better health-related decisions, while putting self-service capabilities within the easy reaches of patients. To learn more about how Kore.ai is simplifying and transforming how organizations connect with their customers and patients, visit www.kore.ai.

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[16] Padmanabhan, "5 Healthcare Technology Predictions."

Kore.ai specializes in AI-rich conversational solutions designed specifically for enterprises that aim to make digital customer interactions faster and more human, and employee work simpler and more efficient. Regardless of function or industry, chatbots built on the Kore.ai Bots Platform – the only enterprise grade cloud or on-prem PaaS of its kind – make data actionable for users and meet the highest business standards of performance, security, and scalability.