Technology Set to Drive Next-Gen Care Management

Abstract

In recent times, care management has gained renewed focus, mainly owing to the need to improve patient satisfaction and healthcare outcomes and reduce costs. To top it off, a new era of business reinvention - at the convergence of data, technology, regulation, and social aspects - is now challenging the existing paradigm in the healthcare industry. It has made us rethink every aspect of care and medical management including utilization management, case management, pre-authorizations, pre-certifications, medication therapy management, disease management, preventive care, and health and wellness coaching services.

New-age care management is backed by the digital technologies including cloud, automation, Artificial Intelligence (AI), blockchain, Internet of Things (IoT), and 5G. While these technologies are becoming more pervasive on their own, their combined impact in reshaping next-gen business models and care standards is undeniable.

At its core, care management is shaping up to be a digital enabler framework that supports digital services, AI devices such as Alexa and Google Home, voice-guided interactions, sensor-assisted care, digital patient communication, gamification for improved patient engagement and Augmented Reality (AR)/Mixed Reality (MR) solutions. This framework is a transformational, patient-centric digital platform-based approach focused on improving care experiences and outcomes, by leveraging the combined power of a digital care services marketplace, machine-based care, digital patient engagement, and targeting of analytics-driven outcomes. The platform creates a digital ecosystem driven by data and analytics, machine-first sensors, a care-services-marketplace-as-a-service aggregator, and digital patient engagement using conversational experiences.

What is New-Age Care Management?

The care management framework lays the foundation for a futuristic business platform.

Platform Attributes

New-age care management is an agile and intelligent digital innovation framework based on rapidly evolving powerful technologies including cloud and robotic process automation (see Figure 1).

Figure 1: New Age Care Management Platform

This framework leverages game-changing technologies such as digital tools for people with disabilities, digital authorizations and referrals, digital patient communication and episodic care models, to mention a few.

Digital Care Services Marketplace	Clinical Data Hub—Analytics & Insights-based Targeting & Outcomes
▪ Digital case management ▪ Digital disease management & preventive services ▪ On-demand health advisory services ▪ Digital medication therapy management ▪ Drug interaction alerts to patients & providers ▪ Digital pre-authorizations services ▪ Digital tools for people with disabilities ▪ Behavioral services	▪ Targeted population ▪ Outcome improvement ▪ Genomics/big-data-based personalized care plan ▪ Longitudinal data sets for episodic care analytics
Machine-Based Care	**Digital Patient Engagement**
▪ Alexa/Google Home interface ▪ IoT sensor-based care ▪ MR- and AR-enabled field coaching ▪ Personal medical devices integration ▪ Personal health records	▪ Campaign for targeted populations ▪ Digital communications ▪ Gamified engagement ▪ Digitized incentives and rewards for wellness

Data Holds the Key

Some of the design-thinking principles that can ensure the success of this care management framework include:

- Agile enterprises to fail fast, learn, and build
- Transforming into a data-driven cognitive enterprise
- Building data trust using blockchain
- Preparing the enterprise for rapid technology churning
- Orchestrating the workflow and AI towards business drivers
- Adopting machine-first delivery model for automation and self-aware operations
- Understanding the impact of evolving technologies such as 5G

The need for real-time data from multiple disparate systems has become increasingly critical for coordinating care so that providers can intervene and prevent adverse health events. The digitization of EHR and clinical data, wearable technologies, mobile, and IoT together are offering a wealth of information. This is reflected in the continued growth of telemedicine monitoring and clinical data capturing on a near or absolute real-time basis as health systems look for ways to increase patient engagement. With the ability to capture clinical, quality, and financial data from EMRs/EHRs along with claims, the total costs of care can also be calculated based on complex algorithms that can thereafter score and predict high-risk populations to target.

While EMRs have increased access to patient information, interoperability challenges still exist in sharing data across multiple EMR platforms. Using a health information exchange (HIE) along with continuity care documents (CCDs) will provide all listed providers access to patient data, which can help them make informed decisions to improve care coordination. We need to build clinical pathways within the EHR to take advantage of tools in a provider's typical workflow, with the added benefit of an evidence-guided care delivery paradigm. As the care team documents details on a patient chart, the information entered into the EHR such as diagnoses, assessments, and lab values determines what evidence-based clinical pathway can be recommended to the physician for the patient. Once the physician is presented with the recommendation, quick links are provided through a recommended order set or a best practice alert.

Despite these advancements, one of the problems that still loom around healthcare data is security as it hinders the ability of EHR/EMRs to accept and process confidential data. Blockchain can be the answer to these issues in healthcare.

Blockchain transactions are logged publicly and in a chronological order such that the database shows an ever-expanding list of ordered "blocks," each time-stamped and connected to the block. Most importantly, none of the blocks can be changed, deleted or otherwise modified. This makes it an indelible record of the transaction. Moreover, the open and decentralized nature of blockchain technology could lend itself well to managing health records and proving identity. The software used to build a chain ensures that all participants on the network can view, validate, and confirm each proposed next block of data in the chain, which accounts for the integrity and availability of data.

Digital Patient Engagement

Care management of the future will offer patients a platform to engage in ensuring their own wellbeing and reap rewards in the process. Engagement with the patients could be in the form of portals providing them guidance on medication and health improvement or chatbots as clinical nurses to periodically discuss any health issues. Patients can be offered incentives and rewarded for working to maintain good health and achieving their goals. In addition, offerings like digital care services marketplace, machine-assisted care, and clinical data hubs are set to offer innovative ways of care management and patient engagement.

These can be offered using the XaaS model or can be privately hosted. The consumer can subscribe to any one or multiple services. In case of a change, the framework will raise an event and the consumer can listen to the update, eventually pulling or pushing the information from the framework.

Digital Care Services Marketplace

Going forward, a digital care services marketplace (see Figure 2) will function as a services hub for members, clinical staff, providers, and employers. It can potentially be propped by any technology-enabled approach, such as tablet-based field coaching, virtual nurses delivering on-demand health services

over video chats, and instant drug interaction alerts, to name a few. These offerings can be built using an API and a micro-services backbone and can be integrated using intuitive user interfaces, touchpads, joysticks, mobile apps, and smartwatches, etc. The service hub of the future will be built on the agility principle, where the capability and services are built independently. Based on the usage and demand, these can then be expanded to offer additional features. A micro-services- and API-based architecture will help in quicker integration of payer and provider system and deliver the precise information needed.

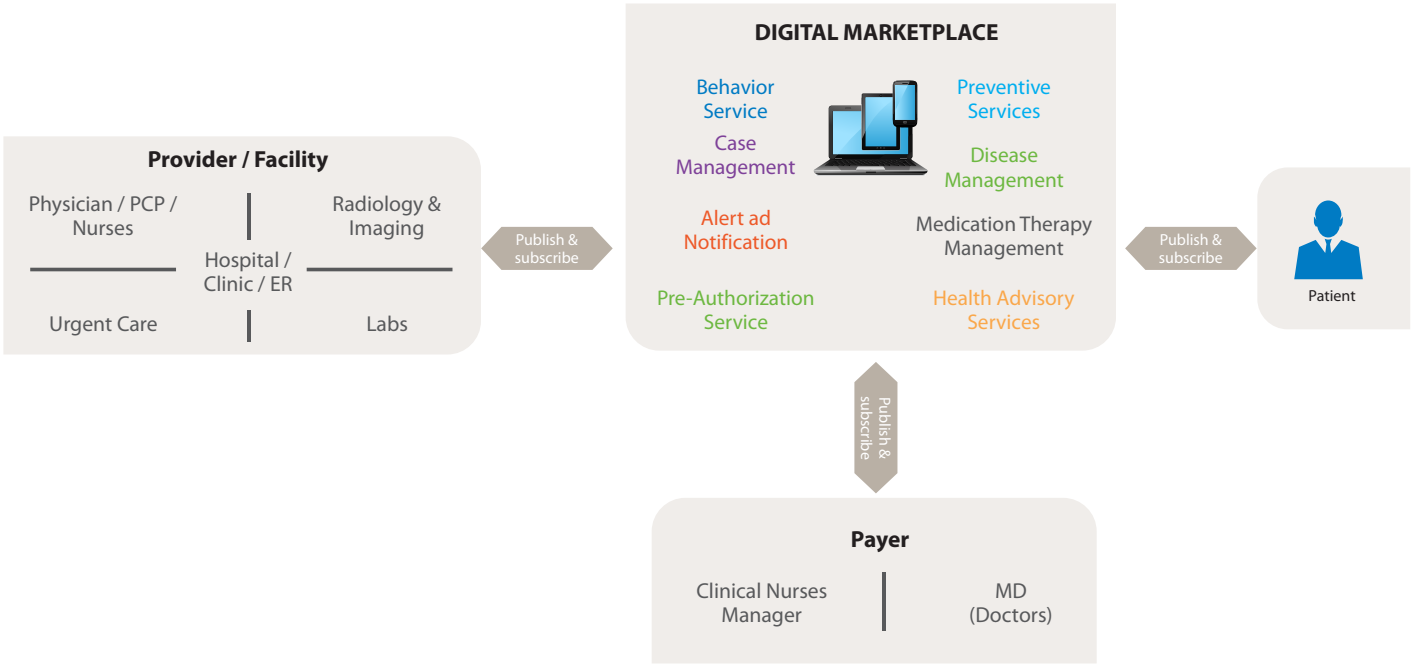

Figure 2: Digital Care Services Marketplace

Machine-Assisted Care

Machine-assisted care (see Figure 3) is driven by the design thinking of a machine-first model, where we can automate the processes to offer machine-assisted care for individuals in times when it is difficult for them to reach out to health providers. This can be achieved by leveraging IoT sensor-based patient monitoring applications, real-time virtual emergency assistance, Alexa/Google-assisted interactions, natural language processing, and voice analytics. Personal medical devices such as digital thermometers, pulse-oxymeters, Fitbits,

Garmin, digital blood glucose meters, blood pressure monitoring, etc., can be integrated and the system can dial emergency contacts using sensor-detected anomalies for the elderly.

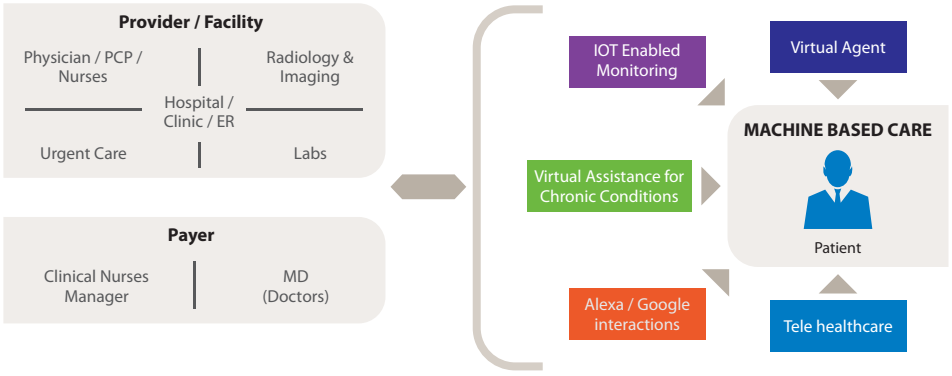

Figure 3: Machine-Assisted Care

Clinical Data Hub

The clinical data hub (see Figure 4) is the data engine used for data collection, analytics, and dissemination. This engine works on the design principle of data-driven cognitive learning and analytics. It will comprise an operational clinical hub for care delivery and an insight hub for transformative analytics and population health.

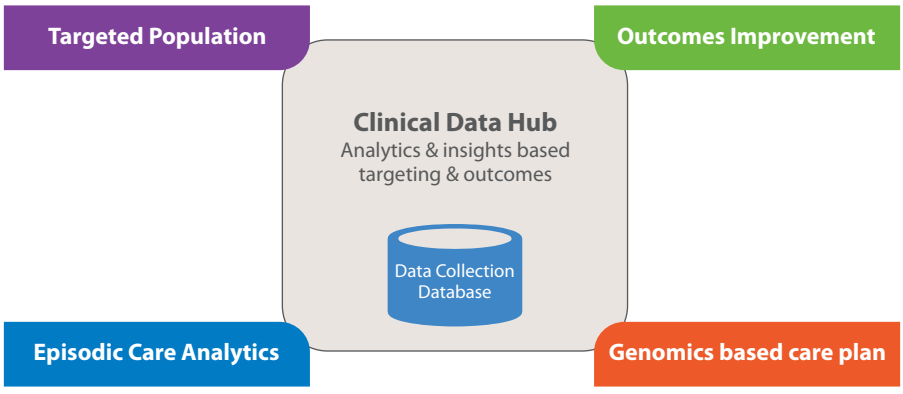

Figure 4: Clinical Data Hub

Conclusion

Formulated on the principles of Business 4.0, the incremental innovation in healthcare management can potentially prove to be a game-changer in digital care delivery. This new-age care management setup is poised to benefit all the stakeholders in the healthcare continuum given its focus on patients, employers, payers, as well as providers.

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