VISUALIZING CONNECTED CARE TRANSFORMATION

A Framework for Blueprinting and Evaluating Connected Care Models

Healthcare delivery organizations need a reliable framework that can evaluate any personalized connected care model.

Amid accelerated digital transformation across the healthcare industry, digital care personalization is a standout growth engine. According to recent data, the global connected healthcare market grew from $100 billion in 2022 to $127 billion in 2023, achieving a CAGR of 27.5%. The market is expected to grow to more than $345 billion by 2027.

Patients increasingly expect a high degree of healthcare personalization alongside improved health outcomes and reduced expenses. They want to access their health data digitally (ideally with robust healthcare data visualization tools), and they also want to be confident that their digital data is being handled appropriately and securely. Advancing all of these imperatives at once is one of the core strategic challenges for health delivery organizations (HDOs).

As connected care models continue to evolve, HDOs will need to make massive investments in devices, infrastructure, technology and operations, taking into consideration the customer adoption rate and customer usage patterns to forecast long-term growth and costs. To accomplish this transformation efficiently, HDOs need a reliable framework that can evaluate any personalized connected care model and predict that blueprint model's limitations and anticipated outcome metrics, particularly with regard to overall digital maturity.

The Elements of Connected Care

Five interlocking factors impact the outcomes of any connected care model: Source and connected entities, digital care plans, care plan analytics, geo-specific regulations and patient experience. The first step to creating any blueprint for digitalized connected care transformation is to understand how each of these factors affects the viability of connected care models.to meet distant patients face to face.

1. Source and Connected Entities: The engine of any connected care model is data, and the core data will come from source entities and connected entities. Source entities are where information about clinical events originate at an early stage of the patient treatment cycle. Connected entities are where source clinical records can be utilized in the care pipeline; for example, in the context of remote monitoring systems or alternate care centers. Traditionally, this data has consisted of patient medical records comprised of a chief complaint diagnosis and a record of treatment decisions. Connected care harmonizes traditional patient records with other data collected across treatment settings: hospital inpatient, outpatient and clinics; eHealth monitoring systems; medical devices; and other ancillary connected entities like laboratory, radiology and pathology. Connected care should also embed Social Determinants of Health (SDoH) data in patient medical records. Increasingly, blockchain technology can be used to both secure patient information and enable robust consent management systems.

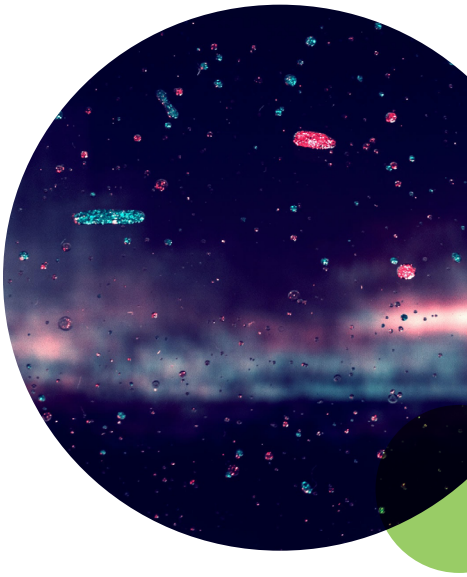
2. Digital Care Plans: A care plan, in its paper form, is drafted by caregivers and encapsulates observations, actions and guidance on the specific clinical workflow for a patient. The basic ingredients of a care plan include patient need assessment questionnaires, diagnoses, goals, interventions and outcome evaluations at periodic intervals. Digitalizing patient care plans with personalized notifications and insights, including tracking deviations, immediately improves health outcomes and decreases patient risks.

3. Care Plan Analytics: An electronic registry of care plans, rendered to centralized systems through Consolidated CDA (C-CDA) formats, allows HDOs to align the best possible care plan with each patient profile, continuously delivering and evaluating personalized digital care. HDOs can leverage datapoints such as plan deviation (predicted personalized care vs. actual care plan rendered), factors for at-risk identification, and patient decisions to not proceed with their advised personalized care plans.

Figure 1: Factors impacting digital continuity of care.

4. Geo-specific Regulations: Any connected care model that will operate across multiple geographies will need to consider geo-specific regulations. Depending on the geographic scope of the proposed care model, geo-specific regulations can add significant complexity to any blueprinting exercise.

5. Patient Experience: Patient-friendly engagement channels and portal designs are fundamental to successful connected care, enabling providers, care planners and administrators to collect a rich spectrum of details about patient experiences, quality of life, perceptions about their care and its cost effectiveness, and the patient's willingness to participate in future preventive care programs. When patients feel that care has improved their lives in a broad sense, that positive experience will be reflected in the NPS for the organization.



A Connected Care Blueprinting Framework

Any framework for blueprinting and evaluating connected care models needs to include a number of complex capabilities. In particular, such a framework needs to:

1. Connect and categorize data coming from different system of record and engagement channels to build robust layers of data fabric.

2. Provide an end-to-end analysis that can predict the affordability and effectiveness of moving to a comprehensive, data-driven connected healthcare system. (This would include solutions to better visualize how connected care will drive improved customer digital journeys and allow providers to expand their products/services by leveraging the data that already exists in different forms throughout the healthcare ecosystem.)

3. Provide visualizations of how provider specializations will be incorporated into connected care from a point-of-care perspective.

4. Evaluate whether proposed connected care models will meet the needs of an aging population.

5. Predict interoperability and data transparency outcomes while also considering the impact on adherence to geo-specific regulatory factors and compliance policies.

6. Measure the resulting digital maturity that new interventions will achieve. A Connected Care Blueprinting Framework harmonizes all of these capabilities, with the goal of estimating an organization's resulting digital maturity once the proposed connected care model is in place.

Visualizing a connected care model begins with putting the patient at the center (see Figure 2) and considering how a unified system for digital patient consent will allow data to be shared across the healthcare delivery ecosystem.

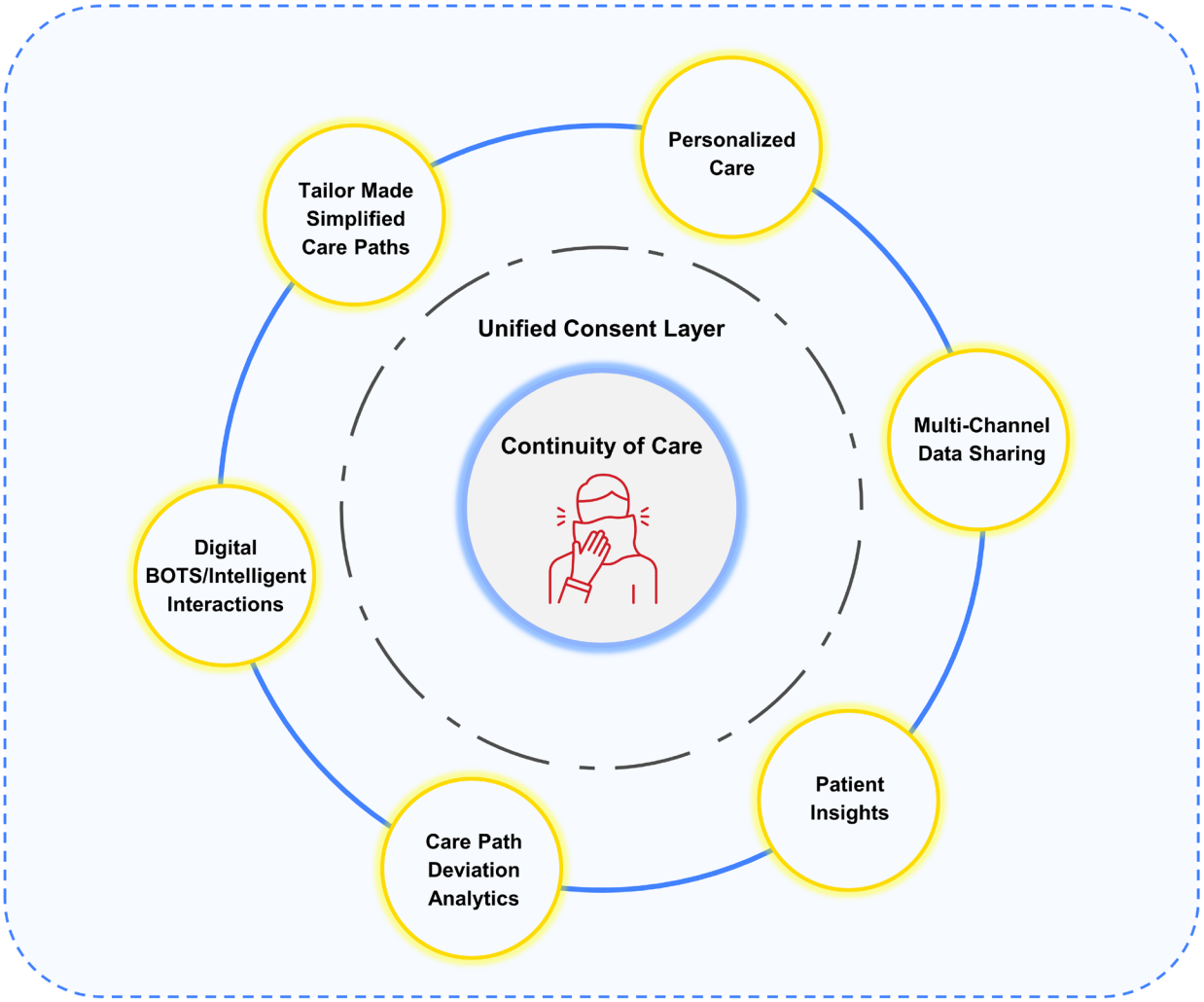


Figure 2: Blueprinting connected care.

A multitude of data sources will flow into a connected care model, including data from clinical entities like hospitals, eHealth agencies and labs. This data will include not just traditional medical records and care plans, but also Social Determinants of Health (SDoH) data and patient-reported experience measures (PREMs). This rich longitudinal data can be shared through industry standards like Fast Healthcare Interoperability Resources (FHIR) and HL7. Converted into digital records, these inputs will enable robust analytics, detailed patient profiles/personas, multi-variant care plans and care path deviation tracking.

To understand how these data elements can be synthesized into concrete patient care, HDOs can create a digital blueprint of their proposed model — essentially a digital twin of a connected care model. Through the lens of this digital twin, they can capture how a patient care record would evolve through numerous journeys of care. The digital twin can be used to ascertain the extent to which patient data could be uniquely identified, stored and secured, as well as transmitted outside the organization. The digital twin will also portray the new role of virtual health monitoring (including compliance tracking), clinical decision support and embedded population health data. The blueprint model can be examined to ensure that the proposed care model will enable a consistent customer experience and be adaptable to all types of patients and caregivers/ healthcare providers. Increasingly, building a blueprint model will not be a manual strategic exercise, but rather will leverage tools like generative AI to propose optimal end states.

Digital Maturity: A Key Metric for Connected Care Transformation

While numerous metrics can be used to evaluate the viability of a proposed connected care model, one important factor to consider is how the transformation will impact the organization's digital maturity. In order to predict this digitalization quotient, it is necessary to understand how new While numerous metrics can be used to evaluate the viability of a proposed connected care model, one important factor to consider is how the transformation will impact the organization's digital maturity. In order to predict this digitalization quotient, it is necessary to understand how new capabilities such as automation and advanced/secure digital data storage will impact the quality and cost of care. On this front, the Continuity of Care Maturity Model (CCMM) created by the member-based Healthcare Information and Management Systems Society (HIMSS) is a promising tool. The CCMM's seven stages consider how factors like telemedicine, data exchange, e-prescribing, audit trails, interoperability and local/national policy alignment will advance an HDO's digital transformation journey.

Advancing care delivery and evolving new clinical care pathways will be crucial to thriving in tomorrow's digitalized healthcare market. New approaches to visualizing and evaluating connected care delivery will play a crucial role in helping organizations chart how digitalization will improve productivity and enable strategic growth in an interoperable, connected ecosystem. By leveraging new technologies like digital twins and AI, and examining new connected care approaches through the lens of sophisticated digital-first modelling tools like CCMM, healthcare organizations can ensure that their future care models will engage patients across the entire care lifecycle — a crucial differentiator in the emerging healthcare climate.

Given the potential impacts of connected care interventions on patients, care providers and the resilience of HDOs themselves, it is imperative that HDOs carefully model their connected care interventions before putting them into practice. A problem-ridden connected care model will quickly reverse its apparent efficiencies as care providers struggle with data breakages and cumbersome systems. A mature, digitally-powered connected care model, by contrast, will empower care providers across the care journey, equipping them with the right information at the right time so that they can work with patients to make optimal healthcare decisions.

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