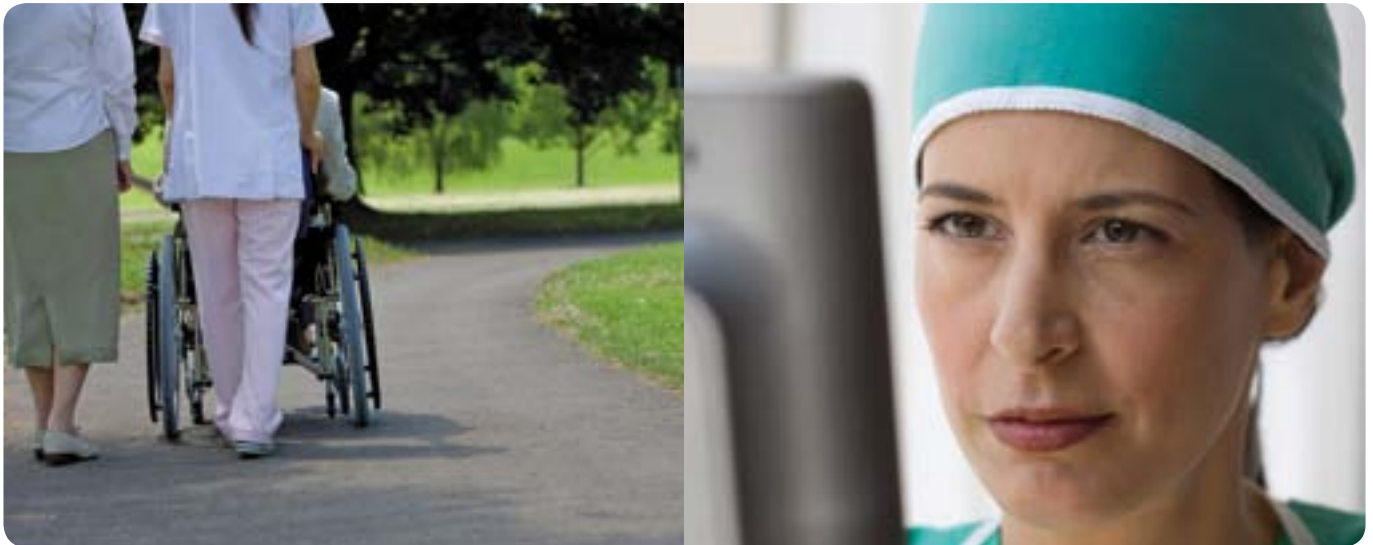


The dbMotion™ Solution

Interoperability & HIE for Connected Healthcare



dbMotion helps healthcare providers realize the vision of connected healthcare. dbMotion's innovative solution enables providers to meet the challenges posed by growing amounts of data, from increasing numbers of disparate information systems, by efficiently leveraging and using this information for improved clinical outcomes and quality care.

dbMotion provides the foundation for interoperability and secure health information exchange throughout the continuum of care. Innovative and powerful information-driven applications and physician tools empower care providers with a harmonized patient-centric medical record and actionable data to facilitate coordinated care and population management.

The robust, standards-based dbMotion platform enables agile use of information technology through its service oriented architecture (SOA), leveraging existing systems, reducing costs and enabling organizations to flexibly grow and meet the needs of today and tomorrow.



Realizing the vision of connected healthcare

Increasingly advanced systems, data complexity and unprecedented patient mobility have decentralized clinical data across the continuum of care and created a multitude of formats, posing insurmountable challenges to caregivers for real-time access to truly integrated medical records.

dbMotion provides a secure, real-time integrated virtual patient record, available on-demand at the point-of-care, that facilitates improved clinical and business outcomes for quality, efficient and effective healthcare. It harmonizes the data empowering caregivers with use of the data's true meaning and bridges care settings between acute and community care environments.



Coordinated Care

Empowering outcomes with coordinated care

dbMotion promotes enterprise-wide collaboration of caregivers and care settings for improved clinical outcomes, quality patient care and health system effectiveness. The system provides patient-centric information while meeting physician-centric needs and organizational requirements. With dbMotion, physician workflow is streamlined and accelerated, helping ensure that physician tasks are focused on patient benefit. It also improves business outcomes by reducing redundant and unnecessary testing, greater ease in meeting quality measures and reimbursement guidelines and increasing physician and patient satisfaction.

The system promotes unprecedented coordinated care by:

- Delivering integrated, consolidated patient records from across the care continuum—both acute and community based
- Organizing, aggregating and presenting patient information from disparate systems in an actionable, normalized, meaningful format
- Delivering physician-focused, patient-centric information with easy-to-use web-based portal and clinical viewer
- Providing an HIE that is deeply embedded in the EMR workflow
- Supporting key physician functions, such as referrals and basic orders
- Preparing worklists for caregiver follow-up
- Applying a semantic framework for data uniformity and normalization



Population Management

Clinical effectiveness with population management

dbMotion enables proactive patient population monitoring and care. A comprehensive dbMotion virtual patient record supports disease management and public health initiatives, facilitates quality measurement and tracking, reduces disparities and enables care management and outreach. With dbMotion, physicians can monitor patient compliance and put prevention initiatives in place.

dbMotion promotes effective population management by:

- Leveraging the “mountain” of healthcare data and converting it into meaningful clinical information
- Performing health surveillance in real-time
- Targeting dynamic patient populations that require ongoing monitoring and management
- Providing automatic alerts and notifications of patient status
- Generating patient lists categorized by specific condition

“Enabling the ever increasing amounts of information stored in diverse systems to be securely accessed and viewed in a single, integrated fashion gives our caregivers a real advantage.”

Francis Cammaerts, Chief Information Officer, IRIS, Belgium

Delivering the promise of connected healthcare – better, improved care at a lower cost

dbMotion’s healthcare interoperability approach establishes a clear direction for the future. It empowers positive financial outcomes by lowering costs, reducing redundant or unnecessary care, and boosting quality. Its proven technology and HIE experience enables healthcare organizations to position themselves for government-sponsored financial incentives, leverage current IT investments and avoid costly ‘rip-and-replace’ strategies.

dbMotion fosters relationships by building the foundation for broad health community connectivity and affiliation. Empowering caregivers through coordinated care, streamlined transitions and powerful workflow tools; dbMotion’s collaborative approach strengthens referral management, transfer of care, and safety. Engaging patients, families and support staff in the care process with the help of innovative applications improves patient satisfaction and client retention.

dbMotion’s SOA-based interoperability platform

The standards-based approach of service oriented architecture (SOA) to software design enables the reuse and composition of independent applications and systems through various services. The dbMotion Platform supports multiple use cases and enables the development of custom applications based on its services. These capabilities provide flexibility, efficiency and modularity—all of which are key factors that enable organizations to successfully address current and future challenges to the business of healthcare: regulatory compliance, quality measures and disease management, to name just a few.

“dbMotion’s advanced, healthcare focused platform, allows us to deliver critical medical information to the point-of-care regardless of where the care is delivered.”

George Brenckle, Senior Vice President and Chief Information Officer, UMass Memorial Health Care, Worcester, Massachusetts

When seconds count, interoperability saves lives

A patient that was admitted to the ED complaining of abdominal pain was referred for a standard workup. A nurse consulted dbMotion and discovered that the patient had a history of an aortic aneurysm. The patient was immediately sent for a CT scan which revealed an acute dissection with the likelihood of rupture. The operating team was mobilized. Prior to transfer to a tertiary care center the nurse also noted, via dbMotion, that the patient was taking a blood thinner and appropriate therapy was initiated during transfer thus preventing further delay of surgery and most certainly saving the patient’s life.



Agility in Information Technology

Leveraging existing investments through agile use of information technology

The power of dbMotion lies in creating truly interoperable, portable and secure health records. dbMotion leverages and extends the life of existing IT infrastructure investments, enabling enterprises to strategically and financially plan system replacements. The system enables organizations to customize applications based on specific needs and emerging requirements. The agility of dbMotion delivers an aggregated on-ramp to an untethered Patient Health Record as well as new applications and services through its software development kit (SDK)

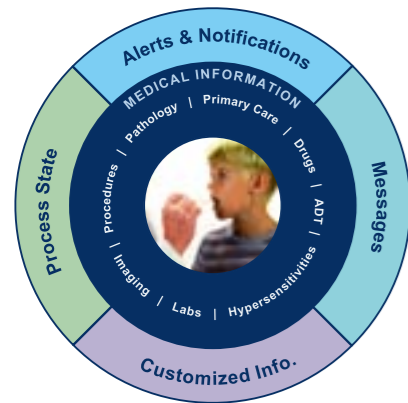
dbMotion positions healthcare enterprises for the long-term by:

- Collecting and aggregating health information from system “silos” into a single virtual patient record
- Offering a robust, modular out-of-the-box platform
- Supporting rapid integration, ease of implementation and scalability
- Providing a SDK for customization and application development
- Applying a multi-dimensional security infrastructure
- Making existing electronic medical records more robust by enriching them with harmonized, cross-enterprise information

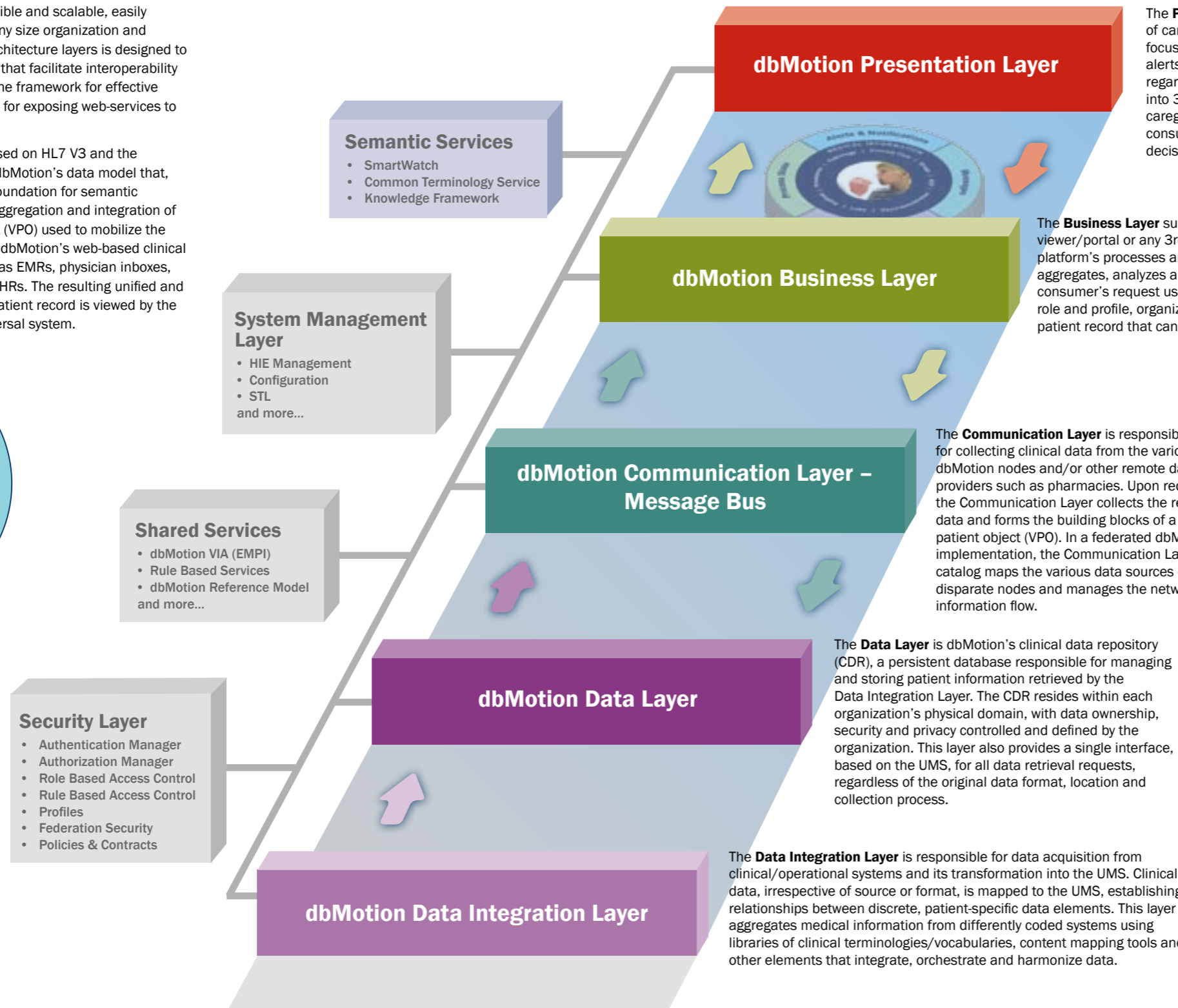
Technology Overview

dbMotion's multi-tier architecture is flexible and scalable, easily adapting to the changing demands of any size organization and diverse IT environments. Each of the architecture layers is designed to optimally perform a variety of functions that facilitate interoperability and health information exchange. It is the framework for effective and efficient communication, as well as for exposing web-services to external consumers.

The Unified Medical Schema (UMS), based on HL7 V3 and the Reference Information Model (RIM), is dbMotion's data model that, with its vocabulary domain, forms the foundation for semantic interoperability. The UMS enables the aggregation and integration of clinical data into a virtual patient object (VPO) used to mobilize the integrated data to 'consumers' such as dbMotion's web-based clinical viewer and 3rd party applications such as EMRs, physician inboxes, clinical decision support systems and PHRs. The resulting unified and comprehensive patient-centric virtual patient record is viewed by the caregiver as if created by a single, universal system.



Complete Virtual Patient Object (VPO)



The **Presentation Layer** presents integrated medical information at the point of care via dbMotion's web-based clinical viewer or CareBoard, a physician-focused application that hosts functionalities such as a patient-oriented inbox, alerts, creation of care notes, monitoring of admitted patients, creation of tasks regarding medical events and clinical reminders. Its framework can be integrated into 3rd party applications (EMRs, portals, etc.) ensuring data is delivered within caregivers' preferred environments and workflows. It also enables data to be consumed by research or analytical applications such as dbMotion SmartWatch, decision support systems and business intelligence applications.

The **Business Layer** supplies medical data to its consumer— either a clinical viewer/portal or any 3rd-party application or service. The brain behind the platform's processes and a key enabler of its SOA capabilities; this layer aggregates, analyzes and integrates medical information according to the consumer's request using embedded business rules related to data, user role and profile, organization and more. This results in an integrated virtual patient record that can be delivered in various formats.

The **Communication Layer** is responsible for collecting clinical data from the various dbMotion nodes and/or other remote data providers such as pharmacies. Upon request, the Communication Layer collects the relevant data and forms the building blocks of a virtual patient object (VPO). In a federated dbMotion implementation, the Communication Layer's catalog maps the various data sources of disparate nodes and manages the network's information flow.

The **Data Layer** is dbMotion's clinical data repository (CDR), a persistent database responsible for managing and storing patient information retrieved by the Data Integration Layer. The CDR resides within each organization's physical domain, with data ownership, security and privacy controlled and defined by the organization. This layer also provides a single interface, based on the UMS, for all data retrieval requests, regardless of the original data format, location and collection process.

The **Data Integration Layer** is responsible for data acquisition from clinical/operational systems and its transformation into the UMS. Clinical data, irrespective of source or format, is mapped to the UMS, establishing relationships between discrete, patient-specific data elements. This layer aggregates medical information from differently coded systems using libraries of clinical terminologies/vocabularies, content mapping tools and other elements that integrate, orchestrate and harmonize data.

Platform Services

Semantic Services
The semantic services are created by the Semantic Framework and enable the generation of new cross-system applications and utilities that are feasible only by leveraging the true meaning of information.

System Management
The System Management Layer incorporates applications and tools for managing dbMotion subsystems, modules and services; handling configuration, testing and monitoring. Examples include the Event Viewer, a tool for monitoring and configuring system logs and the Security Management Application, a web-based application used to define users, roles, permissions, profiles and more.

Patient Identification
dbMotion combines an Enterprise Master Patient Index (EMPI) system with additional technologies to locate and link a patient's identifiers across multiple systems - a critical prerequisite for interoperability and health information exchange. This overcomes duplicate and fragmented records, multiple identifications, transpositions, misspellings and more.

Security
The Security Layer defines the aggregate of technical and administrative safeguards that prevent prohibited access to electronically Protected Health Information (ePHI) by unauthorized parties inside or outside the organization. Its comprehensive approach to security management includes authorization, authentication, patient consent and secure data transfer, and sophisticated business processes can be applied defining information access. Its services are used throughout the system's layers, with safeguards implemented through sub-systems, each dealing with a different aspect of information security enabling adherence to a broad array of security standards including HIPAA.



dbMotion Applications and Tools

dbMotion™ Clinical Views™

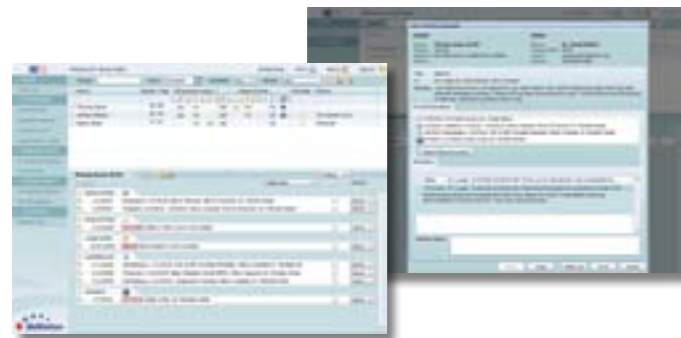
Clinical Views offers a user friendly, intuitive, customizable web-based viewer/portal that displays integrated patient records at the point of care. The system structures views based on user profiles, personal preferences, and advanced sorting and filtering functions and offers a wide range of viewing formats for facilitating care, such as aggregate views, (summary pages, annual reviews, etc.) and detailed drill-down views into each medical domain (allergies, medications, etc.).

Enabling caregivers to assess the patient's prescribed and administered medications to optimize treatment planning, the medications reconciliation tool displays the patient's complete medication list and creates a medication reconciliation report. Drawing data from all source systems, it consolidates diverse medication codes and formats, harmonizes the information and displays each medication's current status (discontinued, new, continued), as well as warnings when contraindications exist between current medications.



dbMotion™ CareBoard™

CareBoard is the powerful physician desktop application for streamlined daily clinical workflows that facilitates coordinated care and clinical collaboration. It helps clinic- and hospital-based physicians manage patients, review patient status, plan patient care and communicate and share patient's medical events. Caregivers have a unified, integrated view of patient-related updates, SmartWatch alerts and can directly initiate actions; such as issuing basic orders, requesting and managing referrals, consultations and collaboration with other care providers—serving as a foundation for coordinated care teams. Its patient population management and worklist features facilitate chronic disease management, proactive care and patient follow-up.



CareBoard facilitates effective and efficient physician workflows

Through CareBoard, Dr. Medici begins a busy day with a review of his patient list and their recent medical events. He easily sees that T. Jones was recently discharged after a five-day hospitalization. Clicking on this event, he notices in the encounter detail that besides the cardiac event, the patient also had hospital-acquired pneumonia. He also notes a reminder event for HbA1c testing to be done in 2 weeks.

With this information at his fingertips Dr. Medici calls the patient and upon hearing that he still has a fever and a cough, creates a new task for his office manager to immediately order a HbA1c test and schedule a follow-up visit. CareBoard then enables Dr. Medici to create a new order for a follow-up chest X-ray and a referral to a pulmonologist that includes the vital information of the patient's latest discharge summary and CBC results. Secure in the knowledge that the pulmonologist will be able to electronically reply to his referral through CareBoard, Dr. Medici is able to focus on his next patient.

Better healthcare through connectivity

dbMotion™ SmartWatch™

SmartWatch is a data analysis and monitoring solution for tracking populations of patients over time and across the continuum of care to promote quality care and optimize clinical outcomes. SmartWatch capitalizes on dbMotion's holistic, integrated patient record for developing decision support applications for 24/7 patient monitoring, alerting based upon predefined conditions and recommending actions using knowledge from clinical experts.



SmartWatch empowers caregivers to be one step ahead of their patient's needs

SmartWatch triggers an alert when a child lacking routine immunizations is seen in three different emergency departments over a six-week period with injuries indicative of domestic violence. The result: proactive child abuse interventions.

SmartWatch enables providers to immediately notify government agencies when they encounter an otherwise healthy patient younger than 50 who died from the H1N1 virus or a college student who presents with tuberculosis. The result: comprehensive public health monitoring and research support.

SmartWatch equips providers with real-time notifications to monitor and intervene at all stages of patient wellness – for example, prompting a provider to initiate an alternative treatment with a patient who is not on an ACE inhibitor, but has a contraindication to this class of medication. The result: effective population management.

Semantic Framework brings order, meaning and utility to data

Semantically coherent and actionable data

Helps receiving systems consume, understand and act upon data collected from heterogeneous systems.

Enhanced user experience

Together with harmonized data, drives function-rich dbMotion applications (Clinical Views, CareBoard, future user-facing applications).

Trending labs across independent batteries and tests

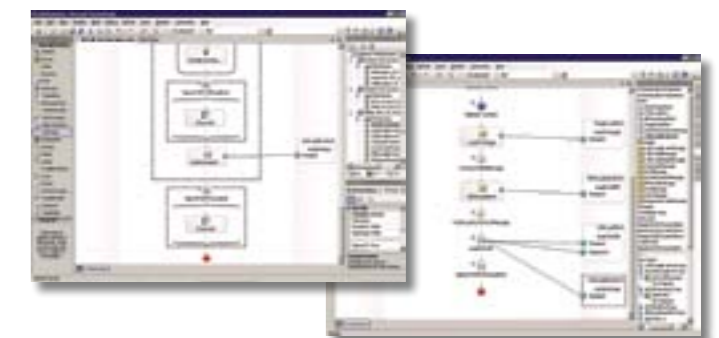
Semantically reconciles lab analyses recorded across the healthcare continuum, creating an accurate picture of analyte levels over time and enabling trend analysis.

dbMotion™ Semantic Framework™

The Semantic Framework provides the technology platform, model, and infrastructure for achieving semantic interoperability. It enables the exchange of meaningful information across diverse systems so that information can be understood and used—empowering information consumers to act upon the information. Harmonized data enriches clinical workflows and provides meaningful data to clinical and analytical systems, personal health records and other applications.

dbMotion™ Software Development Kit (SDK)

dbMotion's SDK provides tools, methodologies and code samples to enable the development of applications that leverage the integrated clinical information created by the dbMotion Platform to respond to needs unique to an organization. A rich set of tools and exposed web services enable IT teams to rapidly develop or enhance applications to respond to an organization's emerging needs.



dbMotion Highlights

All-encompassing solution – Facilitates access to a comprehensive, integrated virtual patient record based on a complete product set – ranging from data integration tools to innovative workflow applications. Covers a broad set of needs and use cases, developed by and for physicians and other healthcare professionals.

Foundation for semantic interoperability – Exchanges, integrates and displays harmonized data that represents the clinical information's inherent meaning.

Integrated virtual patient records – Seamlessly connects disparate healthcare systems to create an integrated virtual patient record viewed by caregivers as if it were created by a single, universal system.

Vocabulary management – Enables harmonization and unification of medical information from disparate data sources and systems by mapping industry standards and coded systems, facilitating better medical interpretation.

Clinical viewer/portal – The patient-centered clinical viewer present essential patient information to streamline and accelerate physician and caregiver workflows.

End-to-end security – Offers features such as authorization, authentication, patient consent, as well as secure data transfer, encryption and digital signatures.

Tracking and auditing – Provides logs, tools and applications that record system and caregiver activities.

International support – dbMotion provides international support for language, date and time formats.

Robust, SOA-based platform for interoperability – Enables the utilization of existing systems and the development of new applications to address key healthcare business objectives such as quality measures, compliance, disease management and more.

Open, standards-based system for data integration – Integrates applications with no dependencies, limitations or need for modifications, whether based on standards, guidelines (e.g., IHE) or proprietary interfaces.

EMR integration – dbMotion can integrate with external EMR systems to expand their scope of clinical data. Healthcare providers can update their EMR systems with enterprise-based clinical data from dbMotion, making their medical records more complete and eliminating the need to re-access that data every time it is needed.

EMR and workflow synchronization – dbMotion supports single sign-on (SSO), enabling streamlined context synchronization. It also enables the embedding of clinical data and web components into existing applications, such as EMRs.

Improved clinical & business outcomes – Access to the comprehensive virtual patient record helps improve quality and reduce redundant and unnecessary testing. Leveraging existing systems avoids costly replacement and disruption of workflows.

Scalability – Can be deployed in any single healthcare organization and easily expands and connects to regional and national networks.

Flexible implementation approaches – Supports centralized, distributed and/or hybrid health information exchange.

About dbMotion

dbMotion is an innovative provider of health interoperability solutions for connected healthcare. It develops and markets the dbMotion™ Solution, a proven SOA-based platform that enables healthcare organizations and exchanges to meaningfully integrate and leverage their information assets, driving improvements in the quality, safety and efficiency of patient care. dbMotion transforms care through the creation of a virtual patient record that logically connects patient information in existing systems without requiring their replacement. By providing access to integrated patient information the solution connects care settings, bridging gaps that often exist between inpatient/acute care and community care, and demonstrates a compelling return on investment (ROI).