![dbMotion logo] **dbMotion**
CLEAR. CRITICAL. DECISIONS.

The dbMotion™ Solution
Enabling Health Information Exchange for Better Healthcare

The proven dbMotion Solution for health information exchange enables healthcare providers to break through the interoperability barrier. Its robust platform provides integrated information exchange between diverse systems, within or across organizations, that form a secure, comprehensive, real-time medical record – anytime, anywhere.

BRINGING INFORMATION TO LIFE

Increasingly advanced tools, data complexity and unprecedented patient mobility have resulted in a diversity of locations and formats of medical information that often poses insurmountable challenges to caregivers and applications for real-time access to an integrated medical record.

The dbMotion™ Solution meets industry needs with its platform for interoperability and health information exchange (HIE) that provides, on demand, secure integrated medical information for use by the caregiver and applications that facilitate quality healthcare.

Integrated Patient Records

The dbMotion Solution securely shares medical information, creating an integrated patient record by logically connecting a group of care providers and organizations regardless of the data's format and location. Medical data is then incorporated into a single entity – known as the Virtual Patient Object (VPO) - this is the data object used to mobilize the integrated data to its 'consumers' such as dbMotion's web-based viewer or third party applications such as EMRs, PHRs, Clinical Decision Support and others. The VPO is made available via web services that integrate the various elements of data in accordance with the organization's security policy and medical/business requirements.

The resulting integrated patient record is viewed by a caregiver as if it were created by a single, universal system.
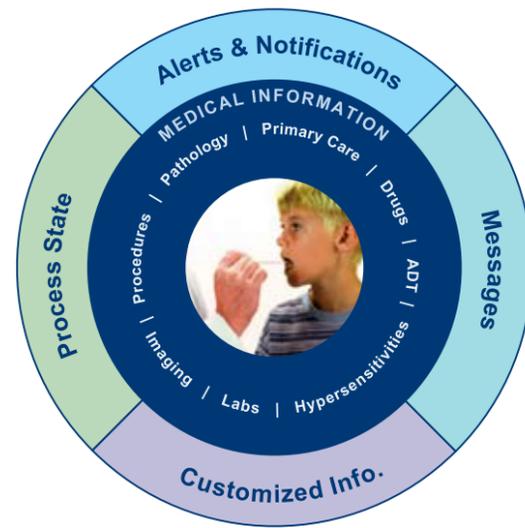
Complete Virtual Patient Object (VPO)
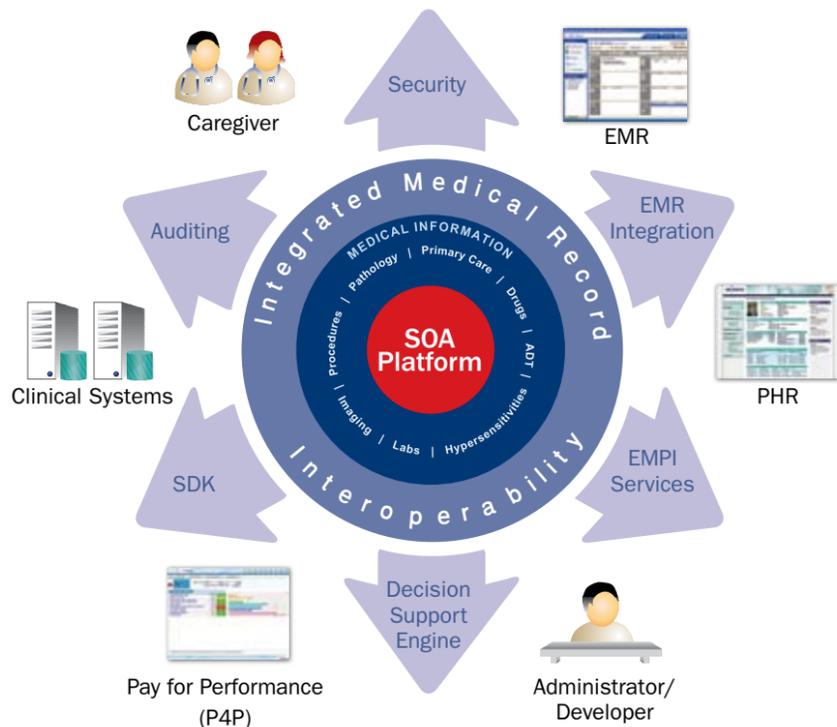
Proven SOA-based Interoperability Platform

Based on service oriented architecture (SOA), the dbMotion Platform provides a pragmatic basis for health information exchange in an interoperable manner – enabling organizations to provide advanced healthcare by leveraging existing systems and applications and setting the foundation for achieving semantic interoperability.

The standards-based approach of 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.

Service Oriented Architecture (SOA)

Implementation Approaches

dbMotion's multi-tier service oriented architecture (SOA) overcomes the challenges of scalability, information ownership, security and privacy inherent to healthcare's vast array of organizations, standards and IT systems – regardless of an organization's information-sharing approach whether it be centralized, distributed/federated or hybrid.

Centralized

A centralized system uses a singular persistent repository to store data originating from an organization's clinical systems.

This provides both *internal scalability* – acquiring data from new clinical systems and facilitating different policies for the organization's various members; as well as *outbound scalability* – easily connecting with external HIEs, networks and independent clinical systems and data providers.

Distributed/Federated

A distributed system has more than one physical location for data storage that serves the needs of multi-stakeholder organizations in which data ownership issues are a focal point.

The dbMotion Solution addresses the complex issues of data collection, application of different security policies and management of user and role definitions for each of the network's nodes.

Hybrid

The dbMotion architecture enables easy scalability of an organization's health information exchange. It can combine the characteristics of both the centralized and distributed approaches on a large scale. For example, an organization can begin with a centralized approach for its internal needs and as the need emerges to connect with independent data providers, additional autonomous nodes can be added.
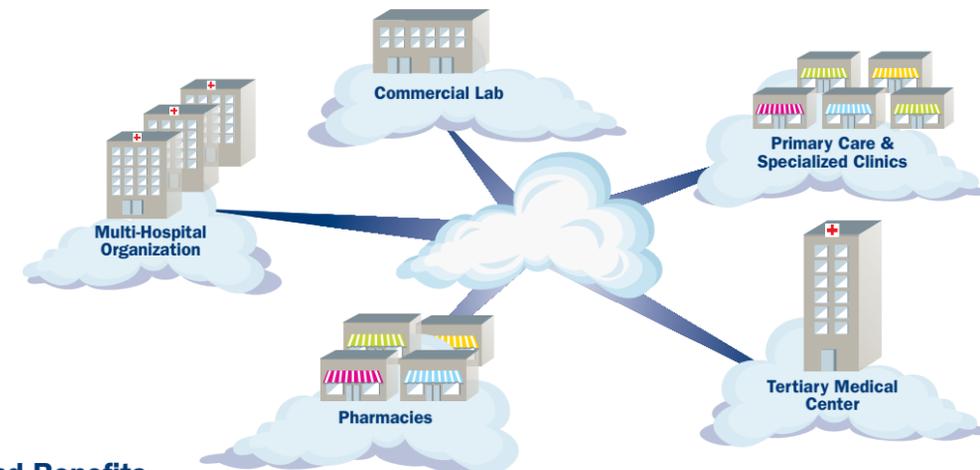
Features and Benefits

All-encompassing solution – Facilitates access to a comprehensive medical record based on a complete product set – ranging from data integration tools to a clinical viewer.

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

Robust healthcare-centric platform – Covers a broad set of needs and use cases, developed by and for healthcare professionals.

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

dbMotion™ Unified Medical Schema™ based on HL7 V3 – Enables true integration of clinical information, the creation of advanced policies, and integration with 3rd-party applications.

End-to-end security – Addresses issues 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 the system's and caregiver's activities.

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

dbMotion™ Clinical Views™ – User friendly, intuitive, customizable web-based viewer/portal displays integrated patient records at the point of care.

Foundation for semantic interoperability – Exchange, integrate and display data that represents the clinical information's 'inherent' meaning.

Vocabulary management – Enables harmonization and unification of medical information from disparate data sources and systems by mapping industry standards and coding systems.
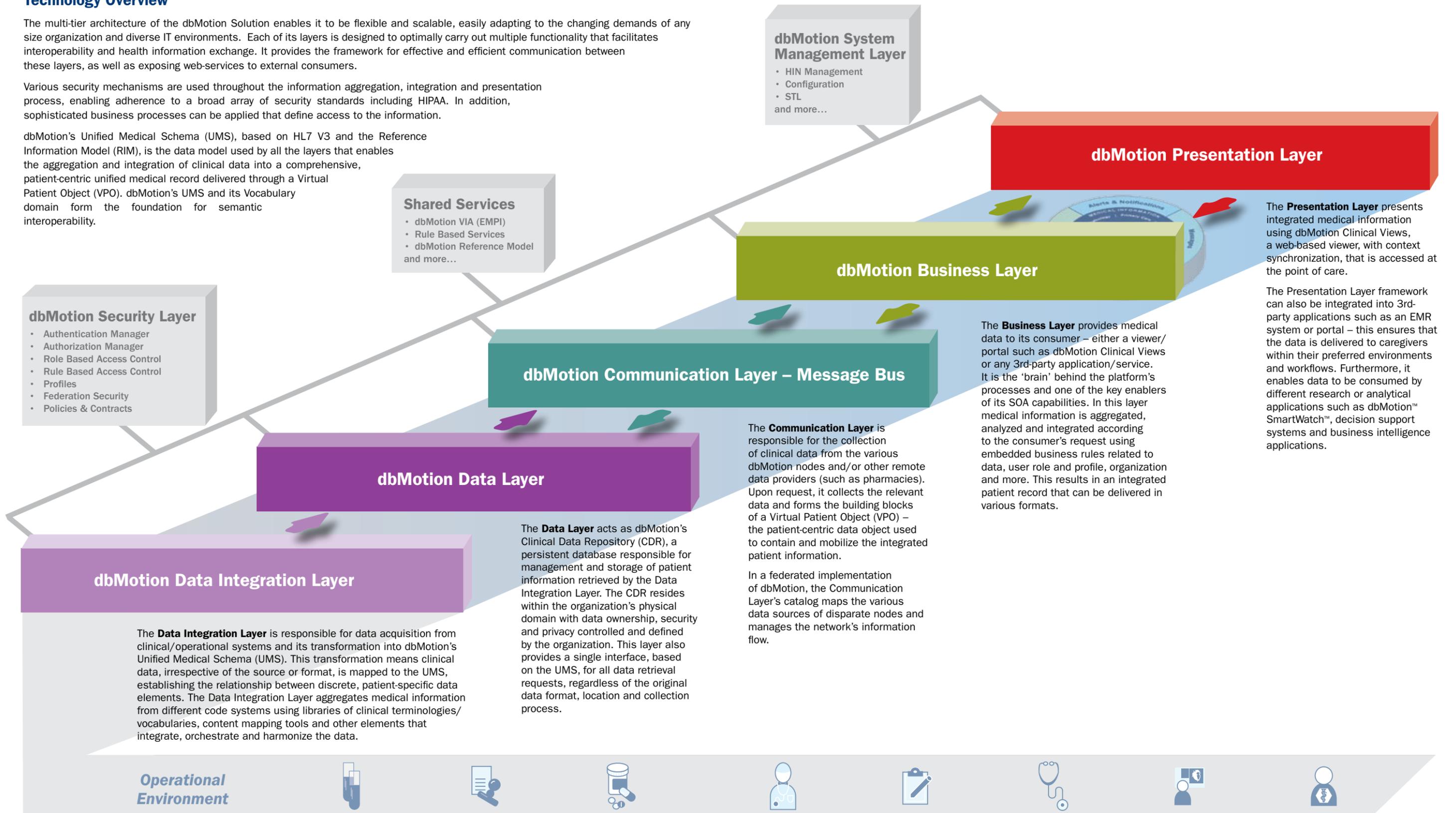
'Business Process' approach – Applies flexible and powerful rules throughout the data acquisition, storage, exchange and information viewing processes.

Technology Overview

The multi-tier architecture of the dbMotion Solution enables it to be flexible and scalable, easily adapting to the changing demands of any size organization and diverse IT environments. Each of its layers is designed to optimally carry out multiple functionality that facilitates interoperability and health information exchange. It provides the framework for effective and efficient communication between these layers, as well as exposing web-services to external consumers.

Various security mechanisms are used throughout the information aggregation, integration and presentation process, enabling adherence to a broad array of security standards including HIPAA. In addition, sophisticated business processes can be applied that define access to the information.

dbMotion's Unified Medical Schema (UMS), based on HL7 V3 and the Reference Information Model (RIM), is the data model used by all the layers that enables the aggregation and integration of clinical data into a comprehensive, patient-centric unified medical record delivered through a Virtual Patient Object (VPO). dbMotion's UMS and its Vocabulary domain form the foundation for semantic interoperability.

dbMotion System Management Layer
• HIN Management
• Configuration
• STL
and more…

Shared Services
• dbMotion VIA (EMPI)
• Rule Based Services
• dbMotion Reference Model
and more…

dbMotion Security Layer
• Authentication Manager
• Authorization Manager
• Role Based Access Control
• Rule Based Access Control
• Profiles
• Federation Security
• Policies & Contracts

dbMotion Presentation Layer

dbMotion Business Layer

dbMotion Communication Layer – Message Bus

dbMotion Data Layer

dbMotion Data Integration Layer

The **Presentation Layer** presents integrated medical information using dbMotion Clinical Views, a web-based viewer, with context synchronization, that is accessed at the point of care.

The Presentation Layer framework can also be integrated into 3rd-party applications such as an EMR system or portal – this ensures that the data is delivered to caregivers within their preferred environments and workflows. Furthermore, it enables data to be consumed by different research or analytical applications such as dbMotion™ SmartWatch™, decision support systems and business intelligence applications.

The **Business Layer** provides medical data to its consumer – either a viewer/portal such as dbMotion Clinical Views or any 3rd-party application/service. It is the 'brain' behind the platform's processes and one of the key enablers of its SOA capabilities. In this layer medical information is aggregated, analyzed and integrated 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 patient record that can be delivered in various formats.

The **Communication Layer** is responsible for the collection of clinical data from the various dbMotion nodes and/or other remote data providers (such as pharmacies). Upon request, it collects the relevant data and forms the building blocks of a Virtual Patient Object (VPO) – the patient-centric data object used to contain and mobilize the integrated patient information.

In a federated implementation of dbMotion, the Communication Layer's catalog maps the various data sources of disparate nodes and manages the network's information flow.

The **Data Layer** acts as dbMotion's Clinical Data Repository (CDR), a persistent database responsible for management and storage of patient information retrieved by the Data Integration Layer. The CDR resides within the 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 dbMotion's Unified Medical Schema (UMS). This transformation means clinical data, irrespective of the source or format, is mapped to the UMS, establishing the relationship between discrete, patient-specific data elements. The Data Integration Layer aggregates medical information from different code systems using libraries of clinical terminologies/vocabularies, content mapping tools and other elements that integrate, orchestrate and harmonize the data.

Operational Environment

Platform Services

Security

The Security Layer defines the aggregate of safeguards, both technical and administrative, that prevent prohibited access to electronically Protected Health Information (ePHI) by unauthorized parties, whether internal or from outside the organization. It delivers a comprehensive approach to security management and covers issues such as authorization, authentication, patient consent and secure data transfer. Its services are used pervasively throughout the system's layers, with safeguards implemented through sub-systems, each dealing with a different aspect of information security.

Patient Identification

In environments that lack unique patient identification, the ability to correctly recognize a patient identity in different information systems is a critical prerequisite for interoperability and health information exchange. Data sources must be searched to determine where a person has previously received care. Only after identification has been confirmed can core clinical data be retrieved.

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

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.

dbMotion Applications and Tools

dbMotion™ Clinical Views™

This web-based viewer is used at the point of care to display integrated medical information. Clinical Views enables users to view data in a variety of ways ranging from aggregate views, e.g. summary page, annual review, etc., to detailed views created by drilling down into each medical domain (Allergies, Medications, etc.). It incorporates profiles, personal preferences and advanced sorting and filtering functions.

dbMotion™ SmartWatch™

SmartWatch is a framework that capitalizes on dbMotion's ability to provide a holistic, integrated view of a patient record, enabling the development of decision support applications capable of continuous population monitoring, alerting and recommending actions based on knowledge inputs from domain experts.

EMR and Workflow Integration

The dbMotion Presentation Layer framework complies with the CCOW standard and 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 an EMR.

Software Development Kit (SDK)
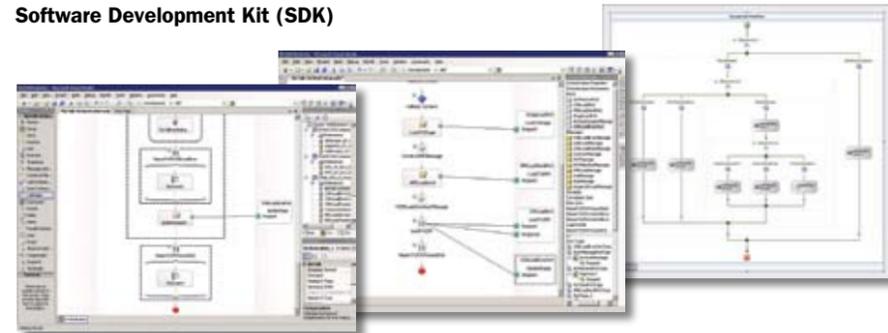
dbMotion's SDK provides tools, methodologies and code samples to enable the development of applications that leverage the integrated clinical information created by the dbMotion Platform to respond to specific needs unique to an organization or environment. A rich set of tools and exposed web services enables the development or enhancement of applications enabling development teams to rapidly respond to an organization's unique and changing needs.

Proven Experience in Delivering Integrated Healthcare Information

- Local and regional projects in North America and Europe
- Serving networks of independent care providers with millions of patients
- Integrating primary and acute care data within seconds
- Proven national-scale implementation

An Easy Start

Recognizing the long-term value of a robust and comprehensive interoperability solution is key to a successful IT strategy. Nevertheless, it is equally important to begin the voyage toward semantic interoperability with a straightforward, stepwise approach. Using dbMotion's platform to deliver a first application, such as a portal, creates rapid physician buy-in with minimal effort. dbMotion's patient-centric approach offers you the flexibility to begin reaping the benefits of integrated patient information today.

Future Proof

Healthcare IT teams are constantly seeking ways to optimize and leverage their infrastructure and services. Thinking long-term and considering the full impact of interoperability and health information exchange can enable you to do so. dbMotion's SOA-based design and robust approach towards interoperability ensure that the platform you deploy will be able to scale and respond to these challenges.

One solution that meets the multiple needs of today and tomorrow

- Integrated Patient Records
- Measurement & Management of Quality
- Adherence to Reporting Mandates
- Leveraging of IT Infrastructure
- Improving Out/In Patient Continuity of Care
- Enterprise Clinical Decision Support
- Supporting Research & Clinical Trials

"The dbMotion Solution represents the 'gold standard' for interoperability – it combines a robust technology foundation with the full spectrum of functionality required for health information exchange in the short and long term."

Dan Drawbaugh, CIO, University of Pittsburgh Medical Center, USA

"After extensive research we chose dbMotion because it offers a commercial, standards-based solution with a proven track record in complex and demanding healthcare environments."

Patrice Blemont, Director of the Regional Agency of Hospitalization for the Franche-Comté region, France

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About dbMotion

dbMotion is a premier provider of healthcare information integration software that facilitates interoperability and health information exchange (HIE) for health information networks and integrated healthcare delivery systems. The SOA-based dbMotion™ Solution gives caregivers and information systems secure access to an integrated patient record composed from the patient's medical data maintained at facilities that are otherwise unconnected or have no common technology through which to share data. Integrated real-time medical information facilitates clear critical decisions for safer and more efficient care. The solution is field-proven having been implemented in demanding environments since 2001 – serving millions of patients and integrating billions of individual records of clinical information.

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