



# PRIME DIMENSIONS

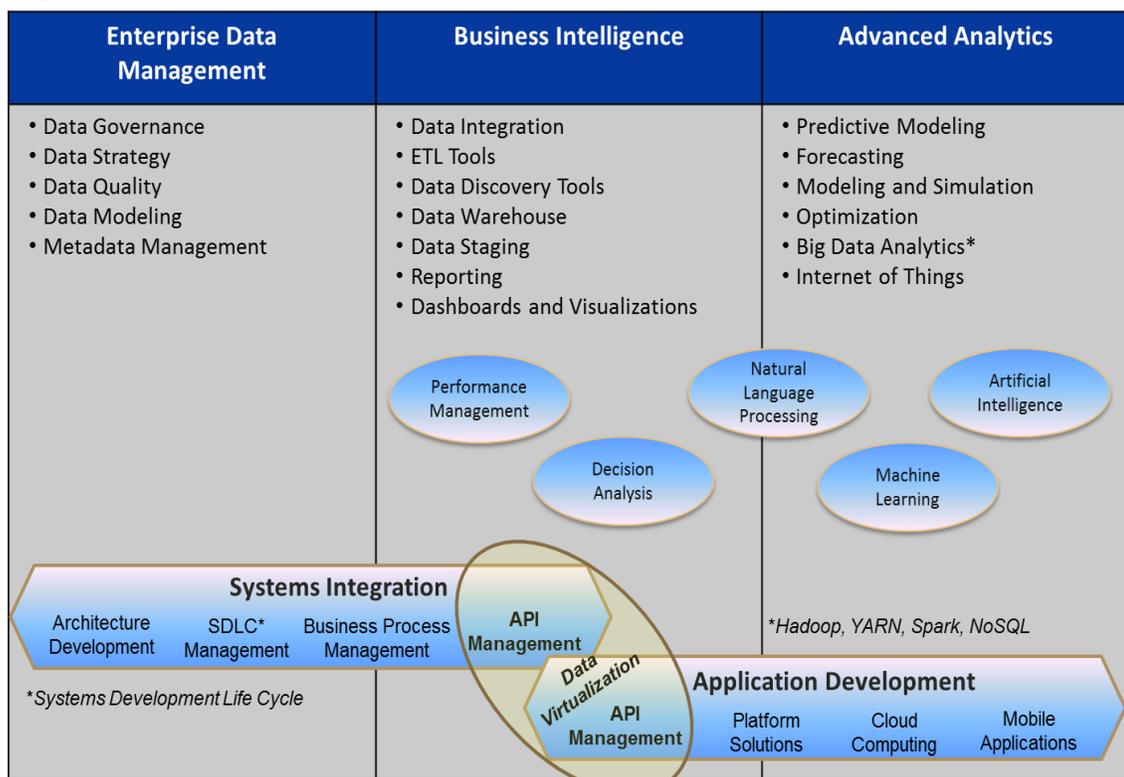
Revealing insights. Shaping the future.

## Big Data Analytics for Healthcare

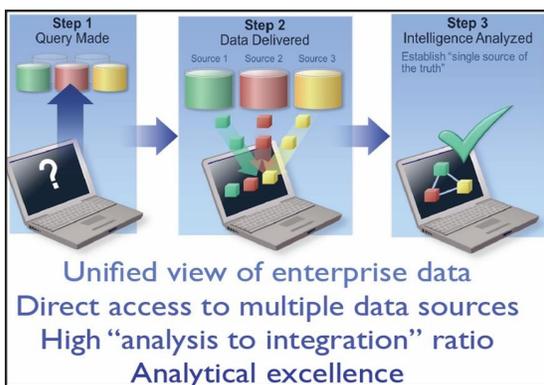
There is a massive transformation currently occurring in the healthcare industry—a transformation focused on improving quality, achieving better outcomes and lowering costs. To be successful, health care organizations must become more proficient in accessing, monitoring, and sharing health data to facilitate information exchange among all stakeholders. Given this evolving complex landscape, in which provider revenue is linked to cost savings and quality improvements, health care providers must accelerate adoption of technology solutions and analytic platforms that reveal insights to improve and extend health care delivery. The Prime Dimensions team provides a wide range of services to exceed future standards of care and ensure effective, efficient, financially sustainable health care delivery systems.

Prime Dimensions' services address the following IT challenges as organizations seek to leverage data and analytics for increasing revenue, reducing costs, improving quality, and achieving desirable outcomes:

- ▶ Ineffective Data Governance
- ▶ Fragmented Data Environment
- ▶ Limited Analytics Capabilities
- ▶ Cloud & Mobile Platforms
- ▶ Proliferation of Big Data



Prime Dimensions' Big Data Analytics Practice provides advisory and consulting services in **enterprise data management, business intelligence, and advanced analytics**, with focus on operational aspects and emphasis on **Big Data** strategy and technology. We assist health care organizations in **transforming data into actionable insights** to improve performance, make informed decisions, and achieve measurable results. Through its **systems integration** expertise, Prime Dimensions provides support through all phases of the systems development lifecycle, including architecture assessment, gap analysis, roadmap development, design specifications, acquisition strategy, and phasing plan. Our **application development** services offer an agile methodology for rapid deployment of solutions that span a broad spectrum of use cases, including **clinical decision support, population health, utilization optimization, care coordination, revenue cycle management, resource allocation, and payment reform.**



Using our results-oriented, outcomes-based delivery model, Prime Dimensions creates interdisciplinary, integrated teams of specialists to guide, build, and deploy innovative, cost-effective solutions for addressing clients' data and information challenges. Among our strengths is our ability to inform and influence clients based on **fact-based, objective recommendations**. Our team of highly skilled professionals helps organizations overcome the challenges associated with the discoverability, availability, accessibility, and reliability of enterprise data required to make well-informed decisions.

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## Specialized Expertise

Big Data requires a new generation of scalable solutions designed to extract insights from massive volumes of disparate, multi-structured data by enabling high-velocity collection, processing, discovery, and analysis. We provide integration support for the leading Big Data solutions, including **Hadoop, YARN, Spark, NoSQL and in-memory** solutions. The **Internet of Healthcare Things**—the proliferation of mobile and wearable personal devices, connected medical devices and sensors, patient-monitoring equipment, and real-time location services—will unleash an explosion of real-time data that will require new data integration services, Big Data solutions, and real-time applications to converge, connect, interact, and communicate more efficiently and at increased velocity.

Prime Dimensions's Big Data advisory services help health care organizations in deploying the proper technology and processes to improve performance by linking outcomes to predefined critical success factors and key performance indicators. We offer a framework for establishing an **Analytics Center of Excellence** within organizations to define roles and responsibilities and coordinate activities and tasks among key stakeholders. We ensure that decision makers have access to timely, accurate information that provides meaningful trends and reveals hidden patterns in the data. With emphasis on statistical analysis, forecasting, optimization, and simulation, analytics provides results that are **predictive and prescriptive**, injecting clarity and confidence into decision-making and improving performance through situational awareness at all levels of the organization.

### Fast Healthcare Interoperability Resources

Prime Dimensions' event-driven architecture supports applications based on **Fast Healthcare Interoperability Resources (FHIR)**, an emerging Health Level Seven (HL7) standard describing data formats and elements (known as "resources") and an Application Programming Interface (API) for exchanging health data. FHIR uses a modern Web-based suite of API technologies, including HTTP-based RESTful and SOAP protocols for user interface integration, and supports both JSON and XML for data representation. With FHIR, it is possible to develop applications that can access and process HL7 data in real time via RESTful and SOAP APIs. FHIR facilitates interoperability across health care systems; provides critical, actionable information to clinicians and patients; and brings context to each patient encounter in real time for improved clinical decision support. FHIR also allows third-party application developers to provide medical applications which can be easily integrated into existing systems. FHIR provides an alternative to document-centric approaches by directly exposing discrete data elements as services. For example, basic elements of health care like patients, admissions, diagnostic reports, and medications can be retrieved and manipulated via their own resource URLs.

## Value-added Services

▲ **API management** is the process of publishing, promoting and overseeing application programming interfaces (APIs) in a secure, scalable environment. APIs not only facilitate integration of new features into existing applications but also provide standard specifications for accessing and sharing data via remote Web service calls via SOAP and RESTful APIs. API management includes the creation of end user support resources that define and document the API, as well as setting attributes and parameters for publishers and subscribers. APIs are essential for establishing a **virtualized data environment** and **event-driven architecture (EDA)**. With proper API management, publishers make APIs available to subscribers, and those transactions are managed at the application level. Pushing this capability to the applications promotes higher performance, flexibility and scalability in the architecture.

▲ **Data virtualization** is an approach to data management that allows an application to retrieve and manipulate data without requiring technical details about the data, *such as location, structure, format, and storage technology*. Data virtualization provides an abstraction layer that data consumers can use to access data in a consistent manner. A data consumer can be any application retrieving or manipulating data, such as a reporting or data entry application. This abstraction layer hides all the technical aspects of data storage. Data virtualization is typically implemented on an enterprise service bus (ESB) as the abstraction layer, through which Web services (i.e., SOAP or RESTful APIs) are invoked by applications that allow access to data. The ESB can also publish APIs and allow access to data in a cloud repository. Data virtualization is also used in conjunction with in-memory databases, in which APIs facilitate processing analytics at the source and presenting the results rather than the underlying data. This provides significant performance and scalability advantages.

▲ **Event-driven Architecture** is a design pattern that builds on the fundamental aspects of Service-Oriented Architecture (SOA), in which event notifications are transmitted between decoupled software components and services to facilitate immediate information dissemination and reactive business process execution. In an EDA, information can be propagated in nearly real time throughout a highly distributed environment, enabling the organization to proactively respond to business "events." (Examples include submission of new patient admission form, payment of a claim, approval for a procedure, and physician orders.) Since EDA uses asynchronous messaging to communicate among two or more application processes, it is much more efficient than SOA. Within an EDA, business processes are modeled into discrete state transitions (compared to sequential process workflows), with event-based triggers and decoupled interactions. EDA relies on data sources sharing a common gateway or ESB.

