

BUSINESS-DRIVEN ENTERPRISE INFORMATION MANAGEMENT

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INTRODUCTION

Does your enterprise have the comprehensive, accurate, and timely information it needs to serve customers day-in and day-out?

Does it have the information and analytical tools to understand and even predict customer needs, preferences, and behaviors?

Does it have the capability to recognize and incorporate new information about customers, answer new questions, and respond to new needs and opportunities?

This EMC Perspective is addressed to CIOs and other IT executives who want to improve their enterprises' information management capability while accelerating the delivery and amplifying the value of information solutions for the business. It should also be of interest to technology-attuned business executives who want to actively influence how and how well their organizations use their information. We discuss:

- The opportunities and challenges of information management today
- The core competencies of Enterprise Information Management
- Technologies that are changing the landscape
- How to structure successful information-based business projects
- Case studies of successful projects

As you consider your answers, note how information management is a multi-faceted endeavor. It's not just about having predefined information available for predefined purposes. It's also about developing new information and putting information to work in new ways. It's not just about the short-term goal of putting information to productive use. It's also about the long-term goal of continuously improving the organization's capability to use information.

The direct, short-term goal of Enterprise Information Management (EIM) is to put information to work in the business—supporting operations, solving problems, improving performance, driving innovation, shaping decisions, and enabling employees to learn, understand, and perform well. The ongoing, longer-term goal is to improve the enterprise's ability to keep pace with the vast and growing amount of business information available, to simplify and drive cost out of the information management infrastructure, and to implement every business application of information with minimum effort and maximum speed.

Enterprises need to pursue both goals—acting locally, by improving specific business activities through information and analytics, and globally, by increasing their ability to capitalize on information.

You can't succeed with one without the other. On one hand, isolated business applications underachieve when they can't get good data or combine it to address cross-functional problems. On the other hand, ambitious attempts to get the information house in order take a long time, soon disconnect from business priorities, and lose momentum and funding. You either have a virtuous circle, with each initiative delivering direct business value while improving future capability, or a vicious circle, where individual initiatives consume unnecessary resources, complicate the computing environment, and indirectly add effort and expense to their future counterparts.

EIM begins with business strategy. Business ambitions and priorities must drive not only specific applications of information, but also the enterprise's approach to capitalizing on it, as manifested in its information management strategy, architecture, and guiding principles.

Despite this strategic common ground, however, short-term and longer-term EIM initiatives have traditionally taken different paths. They have different (though intertwined) value propositions, horizons, funding sources, and investment criteria, and thus entail different motivations to take action. Business users of information want quick results at low cost, even if filling the need may involve a step or two backward for the information management environment. IT people try to counterbalance by encouraging the enterprise to make regular and judicious investments in information management infrastructure and capability.

This situation isn't new. IT's challenge has long been to deliver applications (what business people are interested in), as well as to improve the underlying infrastructure that enables the applications to happen. It's easier to do both when implementing large transaction systems that carry clear infrastructure building and information management implications. It's harder to do with individual information-based projects because they are many but relatively small. So the default behavior in most enterprises is to under-invest in information management. As a result, too much of the potential business value of information—for strategy formulation, innovation, and execution—goes untapped.

This EMC Perspective discusses how to succeed, both short-term and long, by taking a disciplined and business-driven approach to EIM. We focus on both the core EIM competencies to put in place and the process for launching information-based projects with maximum chance of success. Interspersed in the discussion are case studies of successful EIM initiatives. As you read them, note four common threads:

- They are driven by specific business needs, have specific objectives, and focus on specific information.
- They incorporate fundamental improvements to the organization’s longer-term information management capability.
- They combine better organization and delivery of information with innovative methods for information analysis and use.
- They leverage partnerships with experts who guide the solutions, accelerate business results, and equip in-house staff to develop solutions in the future.

WHY EIM MATTERS

Information is the lifeblood of the modern business, and every new business initiative has new information needs. It goes without saying that companies must be both good and fast at capturing, interpreting, and applying information of many kinds in many ways. But let’s briefly explore four ways where excellence in EIM can make a difference.

- **Low-hanging fruit**—Most companies can accomplish a lot just by putting information to better use in specific everyday operations and decisions. Often the needed information is cross-functional and difficult to assemble. Sometimes it’s simply about upstream assumptions and downstream expectations within a business process.
- **Informed decisions**—Decision-making processes are inconsistent, too many business decisions are made more on gut feel than on facts, and even important decisions and the hypotheses behind them are too seldom reviewed. Information and analytics aimed at specific business decisions lend much needed discipline—everyday, high-frequency decisions are more consistent, and critical decisions are more insightful.
- **Collaborative business**—As business models and relationships grow more complex and interdependent, information integration and exchange grow more important to business performance and innovation. Every business today seeks closer collaboration with customers and relies more on outside partners, and thus needs to manage information not just in-house but in its marketplace ecosystem.
- **Analytical competition**—The ante goes up as competitors discover the power of business analytics, and advantage goes to those who use information best to optimize operations, anticipate outcomes, and turn information into insight. As the chart depicts, the tools and techniques of information management, analytics, and business simulation enable us to answer more important and forward-looking questions than ever before.

	PAST	PRESENT	FUTURE
INFORMATION	What happened? (Reporting)	What is happening now? (Alerts)	What will happen? (Extrapolation)
INSIGHT	How and why did it happen? (Modeling, Experimental Design)	What’s the next best action? (Recommendation)	What’s the best/worst that can happen? (Prediction, Optimization, Simulation)

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REVITALIZING ONLINE BANKING

A few years ago, a global financial services institution found that its online banking proposition was losing ground to competitors and needed renewal. The goals were to increase online revenue, the number of active online customers, and the number of account servicing transactions handled online. That entailed revitalizing online presence, brand, and customer experience; however, the capacity for change was constrained by backend technology.

The firm worked with EMC® Consulting to replace the legacy customer management system through three key initiatives: creating extensible application and infrastructure architectures, reengineering the online banking application, and integrating information management and systems across retail, online, and other channels. The results include dramatically increased website functionality and cross-channel customer service capability, enhanced customer experience (as evidenced by increased usage and fewer complaints), and improved ability to change the site in the future.

One of the firm's most important online constituencies is the 25 million holders of its branded credit and debit cards. At a point when only one million customers were registered for online account servicing, the firm set out to build an online solution that would build customer loyalty and become the customers' servicing option of choice. The challenge was that high-activity online customers expect much the same experience they have on the more sophisticated consumer sites.

Again working with EMC experts, the company designed and built a new and flexible front-end for customer online account servicing, together with brand guidelines for regional websites and innovative data visualization tools to communicate financial information. Customers now have simplified graphics and basic analytics to understand and manage their finances. The approach has proven appealing, as over 80 percent of established customers have now opted to receive their statements in digital format.

WHY EIM REMAINS CHALLENGING

Information management has long been challenging, especially for large and complex organizations. It's a function of how they evolve (acquisitions in particular complicate matters) and how the information they use keeps expanding (driven of late by the Internet). The technologies and methods of information management keep getting better, but organizations still lag when it comes to making even their most important information ready for effective business use. This isn't a problem to be solved all at once. It's a challenge to be addressed continuously.

What makes information management fundamentally difficult is fragmentation in three familiar forms:

- Data comes from many and disparate in-house systems and other sources, causing problems of completeness, inconsistency, redundancy, and accuracy, as well as disagreements about meaning and proper use.
- Technological incompatibilities among source systems compound the problem of bringing related data together. This difficulty is waning, however, in the face of more open Internet/cloud-based architectures and more flexible data extraction technologies.
- Organizational barriers impede both the flow of information and cooperation in managing information of common interest. The default behavior is often to hoard information, even when sharing it creates opportunity.

As businesses work to remedy today's fragmentation, the amount of data in play, its freedom of movement, and the number of applications and devices using it continue to explode. Industry research predicts that the rate of data creation is only going to accelerate. Meanwhile, compliance requirements around information privacy and business reporting are tightening. This suggests the need for extraordinary focus on what information a business really needs and wants to manage—and different approaches to dealing with the rest.

These factors make information management difficult, but they don't make it an unmanageable challenge, especially for the enterprise that has the essential EIM competencies in place and leverages the powerful technologies of information management.

INTEGRATED INFORMATION AT DENVER HEALTH

For 150 years, Denver Health and Hospital Authority has been providing compassionate, high quality care to all, regardless of a patient's ability to pay. Nearly half of those accessing care in 2008 were underinsured or uninsured, and services to the uninsured totaled \$362 million for 2009. Despite the rising number of uninsured patients seeking care, the institution continues to remain fiscally sound, serving as a model for both private facilities and other safety net institutions across the country.

As part of its ongoing strategy to leverage IT for both clinical and business performance, Denver Health has partnered with EMC Consulting for many years to build a robust infrastructure, enhance financial performance, and implement advanced clinical, data mining, and electronic health records. Recent applications include an Eligibility Re-Verification (ERV) solution that has helped put millions of dollars back into Denver Health's revenue stream; and Computerized Provider Order Entry and Medication Administration Checking, which uses barcodes on medications, employee identification badges, and patient wristbands to help reduce medication-related errors.

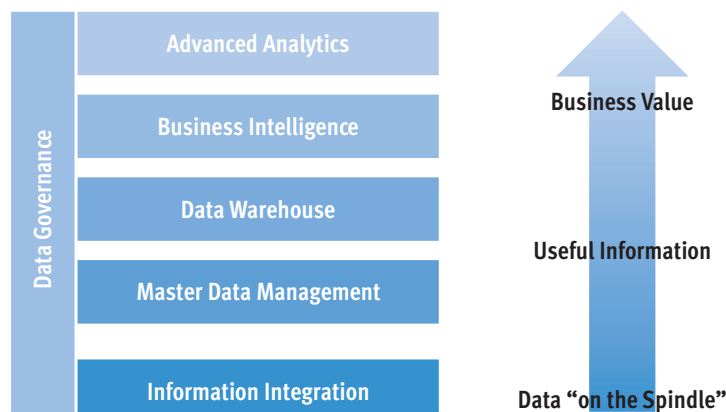
The institution's continued innovation and success depend on its information and technology management capability:

- They invest aggressively in IT where they can anticipate a variety of clinical, business, and community service results, including revenue realization, services expansion, and operational efficiency.
- Their information is integrated, flowing into a common financial and clinical data warehouse. It is readily exchanged, as doctors and nurses seamlessly, yet securely, access all of a patient's information from PCs at the point of care—from clinic exam rooms to the ER, operating rooms, and the patient floor.
- They measure rigorously, analyze the results, and turn what they learn into process improvements. Performance scorecards are posted prominently. The organization has dozens of Six Sigma "black belts," who look outside the industry for innovative best practices.
- They take a platform approach to IT, with a cost-effective and scalable infrastructure that delivers high performance and near 100 percent uptime through advanced monitoring, planning, redundancy, and virtualization.
- They follow through. Over 90 percent of IT initiatives are clear successes (compared to an industry average of about 50 percent). They collaborate effectively with technology services partners and rely on their own center of expertise in project management.

CORE COMPETENCIES OF EIM

A comprehensive and holistic approach to EIM provides the foundation both for individual information management initiatives to succeed, and for organizations to improve their information management capabilities.

The competencies for turning raw data into valuable business information begin with **information integration**, organizing data from transaction systems and other sources. The discipline of **master data management** standardizes information, ensures its quality, and makes it sharable across the enterprise. Information is modeled and made readily available for specific business needs in **data warehouses**. **Business intelligence** methods and technologies deliver the information for business inquiries and reports and management dashboards. **Advanced analytics** apply statistical and predictive methods to turn information into insight. Finally, enabling the other competencies, **data governance** organizes the people and activities of EIM and maintains the metadata that represents the business's view of its information assets.



We'll describe these six competencies in more detail and offer an EMC Consulting perspective on what it takes to succeed with each. We recommend assessing both the effectiveness of each in your enterprise, and how they work together to enable information-intensive business initiatives of all kinds.

Information Integration: processes and technologies for the storage, movement, protection, and management of both structured data and less structured content (e.g., text). This includes ETL (extract/transform/load into databases), standardized formats, and published interfaces.

Perspective—Under yesterday's technological constraints, businesses have learned to triage data movement: low-volume in real time, high-volume intermittently. Today's business demands (and today's technology enables) high-volume in real time for applications ranging from handling large streams of remote sensor data, to continuous patient monitoring in healthcare, to realtime business analytics.

Master Data Management: processes and technologies for consistently defining an organization's data assets and maintaining their quality. This includes standardization and normalization of data, as well as enforcing business rules about data composition. The goal is to maintain a "gold copy" of well-defined and non-duplicative reference data that is trustworthy and can be shared across the enterprise.

Perspective—This is more than a matter of specification, deduplication, disambiguation, and cross-referencing of data. It is fundamentally a business consensus and change management challenge. People need to understand the data they use, agree on what data is common, exercise stewardship of the data they control, and act cooperatively when data discrepancies arise.

Data Warehouse: processes and technologies for modeling data (often in multiple dimensions) in repositories that facilitate inquiry, reporting, and analysis, as well as maintaining a business-responsive warehouse architecture. This includes standing warehouses that consolidate data from multiple sources and data marts that serve specific business applications or organizations. It also includes rapid assembly of data into special-purpose warehouses, as well as scalable warehouses for analysis of massive amounts of data.

Perspective—Data warehousing was originally an efficiency move, making it easier to access data that may be "buried" in a variety of transaction systems. However, advanced search, extraction, and filtering technologies render that role less important. The real power of data warehousing comes in bringing data together and modeling it so that the interconnections can be explored. New combinations of data, both structured and unstructured, form potentially unique information assets that then guide business decisions, improve performance, and trigger innovation.

Business Intelligence (BI): processes and technologies that make data available for understanding, analyzing, and improving business performance. These include reporting solutions for specific business uses, as well as technologies and methods for finding and analyzing information.

Perspective—BI entails experimentation, exploration, and innovation. It's not just about having information readily available to answer questions, but also about discovering what questions to ask next. BI tools must enable not just operational decision-makers, but also the organization's visionaries and innovators. The BI foundation may consist largely of standard tools and common warehouses, but the toolkit must be flexible to admit new technologies for new experiments.

Advanced Analytics: processes and technologies for applying statistical and quantitative methods to guide business decisions and actions. Advanced analytics focuses on predictive and optimization models and simulations, realtime analytics for automated actions, and the visualization tools that facilitate understanding of complex information and scenarios. This includes management of reusable templates and models, and integration of analytics into operational and decision processes.

Perspective—Analytics can be as much an organizational challenge as a technological opportunity. To put analytics to work, an organization, especially its leadership, must be attentive to data, analytically oriented, committed to managing by fact, and ambitious to optimize the business and enhance its competitive position.

Data Governance: processes, frameworks, standards, and expectations for managing data as a strategic corporate asset. This includes responsibilities, policies, procedures, and measures for data stewardship, as well as the development and maintenance of metadata: information about the creation, purpose, source, standards, and meaning of data.

Perspective—Too many organizations treat governance primarily as a matter of executive endorsement, and try to get senior management involved too early. Better to develop a proposed template of roles, responsibilities, and measures, together with a business case for how data governance and other elements of EIM can reduce cost and improve business performance. Then discuss the proposal with senior executives to gain their ongoing interest and commitment.

COMET'S BUSINESS INTELLIGENCE PORTAL

Comet is a leading UK electrical retailer with over 250 stores. Its market-leading position comes through a combination of guaranteed low prices, diverse product range, and high-profile marketing. To maintain its competitive edge, Comet conducted studies that revealed a marked difference in performance from store to store. Comet embarked on project "Odyssey" to discover what managers of more successful stores were doing, and share this information across the company.

Building upon an earlier data warehousing project, EMC consultants joined the Odyssey team to develop a business intelligence portal capable of classifying and sharing sales, profit, margin, and buying pattern data across the retail network. The team selected and adapted software, then conducted user acceptance testing, a successful store pilot, and subsequent roll-out across the stores—always leveraging Comet's existing infrastructure.

Business results came in several forms:

- Able to compare and better understand their performance, store managers are motivated to adopt successful practices, and the company can offer them clearer performance incentives.
- The company gives store personnel incentives to offer customers add-on purchases or upgrades to higher value products.
- With stores polling sales data at the end of each day, ready for analysis the next morning, the company is able to respond to consumer trends faster and with greater focus.
- The company's decision-makers can understand store and manager performance, and incentivize sales growth while driving in-store and administrative process efficiencies.

The business intelligence portal represents a sophisticated addition to Comet's information management platform—what one manager calls "a quantum-leap improvement in our management information systems." With extensive operational data available in a consistent, up-to-date, and easy-to-access format, Comet continues to streamline its business processes while driving top-line growth.

GAME-CHANGING TECHNOLOGY

The entire set of information management technologies continues to advance apace—from tools for extracting, cleansing, reconciling, and structuring data, to those for simple inquiry, rapid search, and sophisticated analytics and visualization. Alongside this general advance in tools and methods, two technologies are in the process of transforming information management.

The first is **private cloud computing**, which interjects the architecture of the Internet into corporate information systems and infrastructure. Technology assets and their capabilities are well-defined, modular, and connectable. Interface methods are standardized and published. Virtualization enables physical devices to be efficiently and securely shared, and heterogeneous technologies to work together. All of these resources can be managed as an efficient and flexible pool shared across the business, its customers, and its partners. For information management, this pays off in three fundamental ways:

- It's easier to integrate data from disparate sources and technology platforms, thus dramatically reducing the time and effort needed to put information to work in analytical and other applications.
- It's easier to protect sensitive information in more complete and granular ways by establishing the identities and authorizations of data and its users.
- Cloud-based resources can also be consumed differently—as understandable business services that people can access on-demand, and often via self-service. For example, at Hawaiian Telecom “data quality” is an online service available to business applications and other information management processes.

Cloud computing enables better performance on multiple fronts simultaneously: cost, manageability, information access, new capability deployment, coordination and collaboration, business continuity and security, and business innovation and growth. There's always been a fundamental tension in IT management: we want the computing environment to be robust and secure, but we also want it to be flexible and accessible. With cloud computing, it's more possible to have it both ways.

The second game-changer is **scalable data warehouses**, pioneered by EMC's Greenplum® unit. This technology addresses the growing challenge of “big data”—the flood of potentially useful data, both structured and unstructured, coming from always-on networks, the Web, consumer content, sensor-based applications, and many other sources.

With massively parallel databases, complex inquiries and analytical algorithms can run over billions of rows of structured and unstructured data. Business people can create their own very large self-service data warehouses, and they can work with data more directly, reducing or bypassing intermediate steps of selection and filtering. Thus, the path from raw data to analytical insight becomes faster, and businesses have the opportunity to capitalize on “big data” that they simply couldn't handle before.

MCLAREN'S REALTIME ANALYTICS

McLaren Electronic Systems provides cutting-edge automotive electronics to car makers and racing teams. When the governing body of Formula One racing awarded McLaren the contract to provide the Electronic Control Unit (ECU) solution for all Formula One cars, the company faced the need for a much more robust infrastructure to capture and manage the vast amount of data generated by racing teams, and to make it available for realtime, in-race visualization and analytics.

Monitoring over 100 sensors, the ECU manages the complex engine, transmission, suspension, and other key elements of a race car, while transmitting up to 0.5 megabytes of data per second to information systems in the “garage” for continuous analysis by as many as 30 support team staff. That 1–2 gigabytes of data per car per race also needs to become part of a central database, together with data from past races, practice runs, and off-track tests and simulations.

During a race, the objective is making the right moves—for example, adjust the suspension versus change the tires—to maximize the driver’s control while pushing the limits of performance. The racing team’s ongoing objective is to understand patterns of performance and improve the operation of all facets of the car, including its electronics. In addition, the objectives of Formula One’s governing body are to control costs, provide a level playing field, and maintain safety.

McLaren Electronic Systems teamed with Microsoft and EMC Consulting to implement a four-tier information management architecture optimized for fast access to high volumes of both realtime and historical data:

- ECU on board each car captures and transmits the data.
- The ATLAS (Advanced Telemetry Linked Analysis System) server in the garage “unpacks” and distributes the data.
- ATLAS Clients provide near-realtime data display, graphics, and analytics to team members monitoring the car’s components and performance.
- The ATLAS Database stores all information in an easily searchable central repository that includes metadata about each race, test, or other ECU-data-generating event.

The solution “hits on all cylinders.” It improves in-race control and performance by delivering information in “Formula One time,” including both standard analyses of car functions and the ability to answer questions that pop up in an unpredictable sport. It also unleashes more of the value of historical data, both for efficiency, such as avoiding duplication of tests, and for analytics, such as understanding performance trends and simulating the complex operation of race cars.

AVOIDING SOME PITFALLS

Too many EIM initiatives get off on the wrong foot, get bogged down, or ultimately fail because they are overly optimistic and ambitious. Here are five of the most commonly mistaken assumptions.

The value of better information should be obvious. Better information means better business decisions and performance. Access to new information fuels business innovation. If information assets are well-organized and at-the-ready, the business is more agile and results are accelerated. All that may be clear to people at a theoretical level, and IT people may expect others in the organization to “get it.” However, business people look first and foremost for pragmatic results, and they hesitate to invest in “information for its own sake.” This disconnect leaves IT people frustrated and their business counterparts viewing EIM as an “IT project.”

We should get all our information assets in order. This has been a dream and false promise since the advent of general-purpose database technology, but the volume, complexity, and myriad uses of information continue to outpace the ability to harness even the structured data of the enterprise. Really big information organization projects tend to be prolonged and get bogged down. The enterprise needs to develop and maintain a robust architecture for information management, but trying to implement it all at once is unrealistic.

If we build it, they will come. Leading with technology doesn’t work with EIM. Easy-to-use inquiry tools and well-constructed data warehouses and data marts may gather some enthusiastic users, but overall usage is seldom high and usage isn’t the goal—business performance is. Technological capabilities have to fit business process objectives and workflow, and the people performing the work and making the decisions have to be involved in improving their information environments. The worst investment can be in tools and implementation services independent of business intent and the data in use.

We will have one version of the truth. Master Data Management focuses on maintaining a “gold standard” reference copy of information about important entities such as customers. That can go a long way toward reducing data fragmentation and inconsistency, enabling the

movement and combination and use of data, reducing business disagreements over whose information is correct, and ultimately encouraging more management by fact. However, don't expect the process to be complete. The data itself keeps changing, especially with additions from new acquisitions and external sources of all kinds. In addition, the enterprise may standardize representations and common manipulations of data, but it cannot always standardize interpretations and use. "Customer" can mean different things in different parts of a business.

Business people should own the data. It's hard to get them to see it that way if information management seems to be an IT activity. It's unrealistic to assume that responsibilities can be cut-and-dried—that business is responsible for the "what" of information, IT for "how" it's processed. It's also unrealistic to assume that responsibilities can simply be assigned. Data stewardship is an important joint responsibility, not just because the what and how of information are so intertwined, but also because of what each party brings to the table. Business people bring the direct experience of using information. By mapping and understanding the information flows of the organization, IT specialists perceive things—both from redundancies to opportunities—that the business often cannot see.

PAY FOR PERFORMANCE IN MANAGED CARE

A leading healthcare services company provides managed care administration, billing, and accounts receivable for provider groups, facilities, and payers. The company needed to be able to track and report to health maintenance organizations and other payers on the performance of physicians responsible for patients in preventative care programs. Such Pay for Performance (P4P) arrangements are a fast-growing trend in healthcare as it pursues the twin objectives of controlling cost and improving quality of care.

P4P data has been very hard to define and track because it draws from operational, clinical, and financial systems. Different data from different systems in different formats made it difficult to develop consistent performance metrics, roll-ups, and trend analyses. The company had five analysts spend more than a week each month manually collecting the data, and the delay in distributing and reviewing performance data slowed corrective management actions.

EMC consultants with expertise in healthcare information systems, data architecture, and data warehouses worked with the company to design and develop a business intelligence architecture for operational, clinical, and financial reporting. Then they built a data warehouse and worked iteratively with company executives to implement a P4P dashboard that enables both executives and physician practice partners to see and compare performance against objectives.

Along the way, EMC guided the company's migration to up-to-date information management software and methods, including a new ad hoc query toolset, and the ability to handle much larger datasets. EMC staff also transferred knowledge to the company's IT organization to enable it to build out its own business intelligence components and dashboards going forward.

Business results include:

- Integrating different types of P4P-related data from different systems to share performance metrics in a single dashboard.
- Quickly determining which individual physicians or practices are not meeting P4P goals, and accelerating corrective actions.
- Offering physician practice partners web-portal access to added-value tools for monitoring their P4P performance.
- Shifting an average of 200 analyst-hours per month from manual creation of P4P reports to higher-level work.
- The company has a new platform and staff skills to implement additional business intelligence solutions.

LAUNCHING EIM INITIATIVES

With the six EIM core competencies in place, individual information-based business initiatives can be launched with much greater confidence and chance of success. The basic steps in defining, evaluating, and launching business-focused EIM initiatives are depicted in the following diagram. This process is structured to pursue both direct business results and improvement in information management capability, and to yield projects with lower cost, less risk, and faster time to business value.

If a company's strategic business objective is to "increase same store sales by greater than five percent over the next year," then the information management initiative might focus on assembling, structuring, and analyzing data for:

- Identifying and understanding drivers of store sales from a variety of perspectives—location, time, season, product category, and customer segment.
- Coordinating cross-channel marketing.
- Minimizing customer churn.
- Optimizing price across product categories, store assortments, and customer market baskets.

EIM initiatives should begin with **business demand**. However, demand is not a given. It must be generated or captured, and then the associated expectations must be managed. To generate demand, IT should work with business people who have information-dependent challenges to meet, and take three steps:

- Find a compelling strategic issue or business challenge that relies on new combinations or uses of information, or on better accuracy, completeness, and quality of data. Then focus on the specific underlying business process and its measurable improvement objectives.
- Mobilize a communication campaign to connect the business objectives not only to the needed information itself, but also to the value of more effective data management procedures, policies, and technological infrastructure.
- Develop a business case that is anchored in the business solution and shows how information management improvements can facilitate that solution. Document both the expected business benefits and the "tax" the enterprise currently pays for sub-optimal information management.

Not many information management initiatives begin with such an explicit business demand generation step, even though it sets up the rest of the process and the likelihood of success. Skipping or shortchanging the step leads to business-IT disconnects, project scopes that are too ambitious or timid, and lower business benefits.

With demand established, it's time for detailed assessment of both the data and its business use.

- **Data**—What data is involved in the business process today? What are its sources, its completeness, accuracy, and timeliness? How is the data represented, manipulated, and managed? Who is responsible for the data, and how well are the responsibilities carried out? What can be done to improve the quality, usefulness, and management of the data itself?
- **Business Use**—What does the data mean to business people and processes? How important is it? How is it employed? For what business decisions is it used? How does the data flow serve the work flow? Is the data sufficient to the tasks at hand, and what is missing? What other data is combined with it (perhaps manually)? Who uses the data, and how attuned are these people to the data they're using? What can be done to improve the business process to capitalize on better data?

These two assessments should happen simultaneously and iteratively because of their interplay—each learns from and informs the other. As the composite picture is painted, three broader questions should come to the forefront:

- What are the specific business needs and gaps in current capability?
- How are current information management methods enabling and impeding, and how can they be improved?
- What's possible? How can better information and process changes trigger innovative ways of working and dramatic improvement in business performance? How can new technological capability change the game in terms of the types and volumes of data that can be handled, the analyses that can be performed, and how readily people can access and understand it?

WHAT SHOULD A ROADMAP INCLUDE?

- Scope, objectives, and measures
- Current state versus future state gap analysis
- Specific actions to fill the gaps in data, business use, and technology
- Change management actions, including education and training, to prepare the organization to work in new ways
- “Who’s who” in the implementation process—who needs to sponsor and support it, be directly involved, provide supplemental resources, and simply be aware of its progress; this includes technology and implementation partners, as well as customers, suppliers, and other partners in the information flow
- Implementation plans, sequences, dependencies, milestones, alternatives, and triggers of alternative action

Now it’s time to assess the **technology**. Can the installed technology meet the business need and opportunity? What additional capabilities or adjustments are needed? Evaluate the technologies and methods of data management, the user toolkit, and the overall information management architecture and infrastructure. Keep considering what’s now possible as the technological capabilities of information management continue to advance.

As the business opportunity is delineated and the assessments come together, craft the results into an implementation **roadmap** that is explicit about how to meet the direct business need and improve information management capability for the future.

It is important to remember that both solution design and roadmap must anticipate what it takes for business people to embrace the new information and analyses, as well as work and decision methods. Information and analytics should not just be available—they should be engaging to the user. Business applications incorporating extensive information and analytics should not just be useful—they should give the user the satisfaction of understanding, learning, and acting with confidence. Look for opportunities to use data visualization technologies to generate such engagement. The payoff comes with extensive and effective use—and business objectives met.

We began this EMC Perspective with three questions about customer information (though they could be about any key information category in your enterprise). To answer the questions affirmatively requires:

- High-quality and well-managed information to begin with
- The technological tools and organizational skills to put information to a variety of innovative uses
- An ongoing commitment to improving the information management capability of the enterprise

What are the means to those ends? Get the six core competencies of EIM working for your enterprise. Also make sure every information-based initiative is driven by both the short-term and long-term objectives of the business.

CALL CENTER PERFORMANCE AT HAWAIIAN TELECOM

Hawaiian Telecom is the state’s leading telecommunications products and services provider, with offerings that include local and long distance service, high-speed Internet, managed services, and wireless service. Like all providers of customer service through call centers (in their case for both ordering and repair), the company strives to optimize service quality and operating cost simultaneously.

However, reporting on basic call center performance (not to mention spotting trends and analyzing performance drivers) required pulling disparate data from several of over a dozen different systems. Information for decision making—be it for day-to-day actions, process improvements, or load forecasting—was not easily accessible. This limited visibility into agents’ performance, and there was little opportunity to spot and propagate best practices. If, for example, dropped call volume spiked, managers could eventually take note—but not quickly determine the cause or remedial action.

Hawaiian Telecom invited EMC Consulting to perform a call center assessment, and EMC recommended, as a foundation, a Business Intelligence for Call Centers service that had been co-developed by EMC and Microsoft. The service enables managers to report and analyze performance using specific measures or key performance indicators (KPIs) representing a call center’s goals. In the solution configured for Hawaiian Telecom, an automated process streams performance data on over 60 metrics into a single database. Business people can create their own KPIs for metrics they want to manage more closely, and different users can maintain different targets for the same KPI. Trend analyses display KPIs together with recent performance and simple red/yellow/green indicators. In addition, drill-down capability and “what if” analysis enable business people to instantaneously calculate any relationship among interdependent variables.

The business intelligence system also includes dashboards presenting performance, sales, marketing, and work management metrics for four different constituencies: executives (by line of business), call center managers (by center), supervisors (for the agents in the team), and individual agents.

For Hawaiian Telecom, realtime visibility into call center performance translates into increased service levels, productivity, and revenue, while lowering costs. Center operations and management are more responsive and effective—from spotting and resolving issues to coaching agents and implementing process improvements. In addition, the company can now understand and manage the interrelationships across marketing, sales, and call centers, including the effectiveness of marketing campaigns and cross-sell and up-sell initiatives. The time spent and staff required to gather call center performance data in the past now goes to more value-adding activities. Also, as people use their dashboards and drill down to understand business drivers and correlations, they become more analytical in managing performance and anticipating customer needs.

THE EMC ADVANTAGE

Enterprise Information Management is a journey, and EMC has the expertise, experience, and technology to support every stage of it: from the provisioning of data centers and private clouds, to developing the six core competencies of EIM, to developing business applications for advanced analytics and data visualization, to shaping and managing projects and programs that deliver extraordinary business value.

Major corporations trust EMC with the secure and efficient storage of their data, as well as the virtualization and optimization of their data centers. Managing these “raw materials” uniquely positions EMC to help turn them into the “finished goods” of breakthrough business applications, more analytically productive employees, and superior information management capability. EMC can bring information to life in your enterprise.

EMC CONSULTING

As part of EMC Corporation, the world’s leading developer and provider of information infrastructure technology and solutions, EMC Consulting provides strategic guidance and technology expertise to help organizations exploit information to its maximum potential. With worldwide expertise across organizations’ businesses, applications, and infrastructures, as well as deep industry understanding, EMC Consulting guides and delivers revolutionary thinking to help clients realize their ambitions in an information economy. EMC Consulting drives execution for its clients, including more than half of the Global Fortune 500 companies, to transform information into actionable strategies and tangible business results.

CONTACT US

To learn more about how EMC products, services, and solutions help solve your business and IT challenges, contact your local representative or authorized reseller—or visit us at www.EMC.com.

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