

The Information Agenda Guide for Communications Service Providers

Transform your business through information and analytics



Information is the key

Leaders from around the world are focused more than ever on the economic, social and environmental implications of global integration, where free trade agreements, the Internet and globalization are making the world simultaneously smaller, flatter and smarter. The systems and processes that enable goods to be developed, manufactured, bought and sold, and services that deliver everything from electricity, financial transactions and efficient healthcare systems, to name a few, are driving us to become a smarter planet.

What all of this means is that for the first time in history, almost anything can become digitally aware and interconnected. This brings major implications for the value that can be derived from such systems. With so much technology and networking abundantly available at such low cost, what wouldn't you put smart technology into? What service wouldn't you provide a customer, citizen, student or patient? What wouldn't you connect? What information wouldn't you mine for insight?

The foremost issues facing enterprises today are the waste, inaccuracy and number of missed opportunities caused by the inability to efficiently manage and apply the rapidly growing volumes of information. This information explosion is creating challenges, but forward-thinking organizations are turning it into an opportunity. They are leveraging information to identify opportunities for profitable growth, cost take-out, and proactive risk management. They are transforming their business through information and analytics to make better informed, real-time decisions as they turn their

information into a strategic driver to accelerate innovation, business optimization and sustained competitive differentiation.

When a foundation of trusted information that can be shared, re-used and applied as a strategic asset is in place, organizations can optimize every transaction, process and decision at the point of greatest impact. In doing so, they can move analysis from a back office operation limited to business analyst experts to an approach that enables everyone to optimize their decisions based on real-time, predictive analytics. It can deliver immediate and cumulative value with each step, resulting in sustainable practices and processes that create a smarter organization; one that can make better informed decisions ranging from everyday moves to major strategic bets.

Communications service providers are well aware of the opportunities inherent in an instrumented, interconnected and intelligent world. Rapid increases in broadband deployment and throughput capacity will further amplify this potential. 10,000 security cameras in London are connected to the web, feeding it video 24 hours a day. Take the 300 connected sensors on a bridge in Minnesota, add the 800 monitoring another in Hong Kong—and multiply by the millions of roads, bridges and buildings in cities around the world. Now add billions of intelligent phones, cameras, cars and appliances, and millions of miles of smart power lines and roadways. Is it any wonder that in just three years, IP traffic is expected to total more than half a zettabyte? (A zettabyte is a trillion gigabytes—or 1 followed by 21 zeroes.)

Turn information into insight

There is unprecedented change taking place in the communications industry today. Technology, globalization and economic liberalization have caused the communications industry to change more rapidly than many other industries. Gone are the days of vertical powerhouses providing one product—such as wireline phone service with a predictable revenue stream—and controlling every aspect of the creation and delivery of that product. Triple- and now quad-play business models are becoming the norm as communications delivery systems converge and consumers increasingly desire a single source for their communications needs (wired, wireless, video and Internet services). As evidenced by recent industry activities, emergence of a telemedia industry is a distinct possibility.

Time-to-market for new services and return-on-investment horizons are being significantly shortened as providers compete in geographically larger and increasingly competitive markets. Risk mitigation, from the technical, financial and regulatory perspectives, gains importance as providers collaborate with partners for content, services and technologies to gain competitive advantage or provide more compelling service offerings.

The key to managing these activities is the effective stewardship of all of the information in your enterprise. Successful communications service providers will be those that exploit customer, network and operational information as a strategic resource. Those that don't will be frustrated and overwhelmed with increasing volumes of underutilized information.

Communications providers have invested in point solutions with the goal of automating business processes to reduce cycle time and cost. Significant investments in enterprise-wide applications such as enterprise resource planning

(ERP), customer relationship management (CRM) and supply chain management (SCM) were made to address these automation requirements. For most providers, information managed by these systems is isolated, unsynchronized and often of questionable quality. Providers rarely obtain optimum value from this information.

A recent IBM report, "Telco 2015 – Five Telling Years, Four Future Scenarios,"¹ indicates that growth can be achieved through pervasive, open connectivity for any person, object and a multitude of connected devices, stimulating third-party innovation; and by leveraging customer and network insights to deliver new experiences that help to accelerate the evolving digital economy. An information agenda creates an enterprise-wide vision that will allow providers to execute on the desired scenario, manage that growth and create the desired results.

As a result, communications service providers are launching new initiatives designed to drive new intelligence, business optimization and ongoing competitive advantage – and these initiatives all depend on the exploitation of information that is created, owned or managed by the provider.

Information is at the core of the communications industry

The new, converged business model demands a better utilization of information—information that is already in a provider's control as well as the massive volumes of customer, transactional and media information that will become vital in providing a broad range of customer services and a superior customer experience. Every call, every SMS message, every pay-per-view or on-demand movie creates data that can enable a provider to gain insight regarding the customer, market segments, emerging trends and delivery channels. Considering the potential value of these data, a more effective strategy of information management is required.

Today, CIOs have an opportunity to harness and leverage the information they have captured to provide sustainable competitive advantage, rather than simply support or automate business processes. Yet, accessing and exploiting that information is not simple. For example, data is often locked up in multiple departmental silos—putting it at risk of duplication and other errors—and a communications service provider’s different business units may use different terminology or formats to describe the same information.

Overcoming these hurdles can be well worth the effort. When all of an organization’s data can be consistently utilized with processes and governance in place to assure the delivery of correct, complete and current information, that information becomes trusted information. As seen in Table 1, that trusted information can then be used as the fuel for an entirely new level of information-driven services—and sustainable competitive advantage.

Advertising	becomes	Context marketing Carefully targeted campaigns and customer interactions based upon profile, location and time for improved up-sell and cross-sell revenue
Reactive network management	becomes	Customer experience management Understand and assess the actual customer experience, anticipate and resolve network issues and notify affected clients
Churn management	becomes	Predictive Churn mitigation Predict subscriber usage and accurately identify high-value customers at risk of moving to another provider. Proactively address issues based upon understanding of customer needs to retain and increase loyalty.
Increasing average revenue per user (ARPU) via additional services	becomes	Monetizing customer segmentation Exploit customer, operational and network data to rapidly develop and deliver a wider range of services that exploit convergent technologies and are tailored to the needs of increasingly diverse customer segments.

Information Management and Business Analytics Software

Information Management software and solutions comprise a rich portfolio of technology and services that help companies establish and leverage trusted information to optimize business performance. Communications service providers can reduce operational costs, gain a far more detailed understanding of customer trends and behaviors, reduce risk and improve revenue management.

IBM Business Analytics software allows telecommunications carriers and cable operators to leverage information to create a sustainable competitive advantage. IBM analytics and performance management solutions provide a planning, consolidation and business intelligence platform that helps telcos and cable operators plan, understand and manage financial and operational performance. With core capabilities including reporting, analytics, dashboards, planning, scorecards and more, service providers can better understand performance, nurture longer-lasting and more profitable customer relationships and make more informed-decisions throughout the organization.

Information Management and Business Analytics capabilities allow a provider to better utilize the information under its control, thereby facilitating more accurate customer profiling, superior customer experience, faster product development and targeted service offerings based upon the individual profile, transaction context and device. This level of coordination and optimization can only be achieved through a common information management strategy.

Information Management and Business Analytics in action: Opportunities for Communications Industry Optimization

Reduce operational costs

- Enable faster call resolution via secure access to all relevant customer information
- Reduce customer service costs via improved self-service
- Speed time to market of new services to help drive new revenue
- Reduce cost and risk of retaining data longer than legally required

Transform infrastructure and business processes

- Improve overall IT efficiency and reduce costs by consolidating data sources, establishing enterprise platforms for business intelligence, master data management, content-centric business process management
- Establish enterprise information lifecycle standards, to use information in accord with industry or regulatory requirements
- Integrate departments, processes and systems to enable rapid and accurate provisioning
- Retire and/or consolidate legacy applications

Find new sources of revenue and profit, while improving customer experience

- Improve overall customer experience across marketing, sales and service dimensions
- Exploit extensive customer, network and operational data controlled by provider to identify new revenue opportunities, develop new products and services, cross-sell / up-sell, improve customer retention, and increase ARPU
- Proactively retain valued customers via predictive churn management

Building an information agenda

For organizations that want to get started on the path to business optimization and establish a foundation for new intelligence but do not know where to begin, an information agenda is needed. The IBM Information Agenda™ is a proven, industry-based approach that delivers an enterprise-wide strategy to align an organization's information with its strategic objectives, leveraging roadmaps, tools and best practice methodologies based upon expert industry and domain knowledge and successful client implementations. In establishing an Information Agenda for the organization, the CIO, working with line of business colleagues, puts information to work to achieve both short-term and long-term strategic changes.

An effective Information Agenda helps organizations achieve several key objectives:

- Identify data and content that are vital to the organization
- Identify how, when and where information should be made available
- Determine data management processes and governance practices
- Identify and prioritize the information projects that deliver the most return
- Align information use to match the organization's business strategy
- Create and deploy an information infrastructure that meets both immediate and future needs

The Information Agenda Guide for Communications Service Providers

IBM accelerates the process and minimizes the risk for creating an information agenda through industry-specific Information Agenda Guides. IBM's Information Agenda Guide for Communications Service Providers is a practical, proven approach for turning a client's vision and strategy into reality.



Figure 1. An effective Information Agenda provides a strategic vision and a phased plan that enables Communications Service Providers to align the use of information with the organization's business strategy.

CIOs, working with their line of business colleagues, can build a best-in-class information management vision for their organization and create a detailed roadmap to realize it. The goal is to transform the organization to unlock the business value of information for competitive advantage, enabling organizations to deliver trusted, accurate information to optimize business performance.

The Information Agenda Guide for Communications Service Providers can help direct businesses as they develop their own Information Agenda in a matter of weeks through Information Agenda workshops. The Information Agenda Guide addresses the four key components of an Information Agenda and ensures that they work in conjunction with each other. It involves key stakeholders across the organization to explore and address these four key components and ensures that they work together (see Figure 1).

- **Strategy:** The vision that guides decisions and helps the organization determine what information is needed to drive your key business priorities.
- **Roadmap:** A phased execution plan for transforming the organization, the roadmap will identify the specific projects that will return the greatest value in line with your priorities and timescales.
- **Information Infrastructure:** The technology components and capabilities needed to establish a common information framework
- **Information Governance:** The policies and practices that facilitate the management, usage, improvement and protection of your information supply chain so you can ensure that information remains trusted and protected throughout its lifecycle

As figure 1 indicates, the Information Agenda Guide for Communications Service Providers identifies crucial IT projects that establish the necessary information infrastructure and then leverage that infrastructure to help produce measurable business results identified by the business objective.

Strategy — establish end-to-end vision and business-driven value

At its highest level, the Information Agenda Guide for Communications Service Providers incorporates industry best practices to assist in identification of the primary information-centric business imperatives that drive virtually every business decision. As Figure 2 illustrates in its outermost ring, revenue management, operational and organizational efficiency, optimize IT strategy, governance, risk & compliance, and customer focus are key strategic imperatives that many communications service providers contend with under current market dynamics.

The next ring details the specific business optimization objectives that support the strategic imperatives. The business imperatives and business objectives are the foundational components used to help set the vision and strategy for an organization's information agenda. This approach helps ensure that IT objectives and overall corporate objectives are aligned and provides line-of-business and IT colleagues with a common language to communicate in regarding all projects and plans.

At the center of the Information Agenda Guide are the lines of business that have primary responsibility for developing strategies to address these business imperatives and effectively execute or respond to the business objectives.



Figure 2. The Business Optimization Map for Communications Service Providers: a proven approach for turning strategy into reality.

Roadmap – accelerate projects for short & long-term ROI

The roadmap gives information management and integration efforts direction and cohesion. It spells out the priority, order and timeframe of IT projects necessary to achieve the organization's crucial information-enabled business optimization objectives. The first step in creating the roadmap is identifying and prioritizing the underlying IT projects—usually combinations of software and services—that can help achieve each business imperative.

As Figure 3 indicates, the Information Agenda Guide for Communications Service Providers identifies crucial IT projects that establish the necessary information infrastructure for improving the customer experience, establishing new business models and improving operational efficiency—and then leverage that infrastructure to help produce measurable business results identified by the business objective.

Depending on an organization's existing information architecture and the objectives that are of most importance to the business, an organization's final information agenda roadmap can contain some or all of these projects.

Information infrastructure — create, manage and deliver trusted information

All imperatives and business initiatives depend upon a common information infrastructure that enables a communications service provider to more effectively create, capture, manage and utilize information associated with customers, services, products and market strategy. As shown in Figure 3, an effective information infrastructure allows a communications company to:

- 1. Manage information over its lifetime**—Reducing the costs associated with managing information – both structured and unstructured - while controlling access, expanding retention and increasing compliance.



Figure 3: Addressing Common Key Information Requirements

- 2. Establish an accurate, trusted view of information over time**—A flexible architecture can leverage existing IT investments to produce accurate and trusted information that is consistent across sources, facilitating better analytics and sound business decisions.
- 3. Plan, understand and optimize business performance** — Leveraging trusted information to build plans, understand how business is performing and focus on optimizing performance across the enterprise.
- 4. Provide solutions that address key business objectives** —These solutions focus on customer experience management, churn management and loyalty, fraud reduction, new product offerings, regulatory compliance and information lifecycle management, among others. These solutions can enable new business models and service innovation, improving operational efficiencies while reducing costs and differentiating the customer experience.

As the journey towards business optimization evolves, guiding principles will be applied to leverage existing assets and IT purchase decisions with these key common information requirements in mind. The journey will include looking for opportunities to use existing IT assets as common components to be utilized for other projects and will provide guidelines that help ensure that new technology investments can accommodate both short and long term objectives.

Information Governance – align people, processes and information

As a crucial component of the Information Agenda Guide, the information governance portion assists a provider in establishing standards for data quality, management processes and accountability throughout the information lifecycle. These help to improve business performance via standard definitions and processes that establish a more disciplined approach to managing data and information across the enterprise.

The Information Agenda Guide for Communications Service Providers applies best practices, based upon IBM's extensive experience in the communications industry, for creating information governance policies. It also leverages existing policies and procedures to create an environment that can more consistently and confidently manage information, thereby obtaining maximum value from these assets in support of the strategic imperatives.

IT projects for improving customer experience

As a result of the industry-wide shift in emphasis from a comparatively small number of products to an increasingly larger and complicated number of services, improving the customer experience is high on most communications organizations' lists of strategic imperatives. Providers are looking for new and better ways to identify market needs quickly, predict the buying behaviors and propensities of customer segments and provide new services that will allow

them to retain customers and acquire new ones. Since better management of the organizations' customer-related information is vital to achieving these imperatives, CEOs and other executives are increasingly looking to the CIO for answers.

Making the transition from the current state of information management to the ideal state identified by an organization's information agenda is not an easy task. Some of the factors that prevent communications service providers from delivering a superior customer experience are the numerous, isolated and inconsistent sources of customer data distributed throughout the organization; poor data quality; the difficulty in coordinating and synchronizing customer information; and the inability to establish a single, trusted source of complete, accurate and current customer information.



Figure 4: An example prescriptive roadmap of IT projects to enhance the customer experience.



Figure 5: An example prescriptive roadmap of IT projects for revenue management.

Many of the same issues arise when providing information about products, plans and services to customers, which, given the increasing complexity and variety, result in inconsistency of experience across the various channels of interaction. The Information Agenda Guide helps communications service providers remedy these problems by improving the quality and consistency of customer data regardless of its source, integrating various sources of data to create a “single view of customer” or central product catalogue that is consistent across all channels of customer interaction, and helping establish an environment for detailed analysis of customer transactions to gain insight into customer trends.

IT projects for revenue management

Revenue management has evolved from the time when a regulated environment allowed providers to focus simply on cutting costs and adding new customers. In many communications service provider organizations, costs have already been substantially reduced, while the overall pool of potential new customers is becoming more sophisticated and demanding in the use of technology, services and information sources. It takes far more effort to attract and retain customers in today’s market.

The complexity associated with revenue management (Figure 4) challenges every provider. Some of the factors that prevent communications service providers from optimizing their revenue management opportunities are the difficulties and delays in developing, planning and executing the launch of new products and services due to a lack of sufficiently reliable information, the inability to accurately identify customer needs or segments that could be addressed by the targeted services, and the difficulty of quickly implementing new services once opportunities are identified.

Determining the life-time-value of profitable customers and retaining them are equally important. The ability to rapidly analyze massive volumes of data combined with sophisticated predictive algorithms can mitigate churn and positively impact revenue. The Information Agenda Guide helps communications service providers improve revenue management by offering business intelligence and analytic capabilities to segment customers more effectively, improve new customer acquisition, identify new product and service opportunities, and bring them to market faster.

IT Projects for operational and organizational efficiency

The idea of using technology to enable greater operational efficiencies is not new. What is new, however, is the realization of the vital role of information in accomplishing this. An organization’s information agenda can now help direct the creation, collection, management and dissemination of information required for efficient utilization of operational assets, with the goals of optimizing asset usage and life as well as planning and implementing new infrastructure required to maintain market leadership. The current market now requires an extensive ecosystem of partners and suppliers in order to meet customer requirements. Efficient partner collaboration and management can have a significant effect upon a provider’s market performance.

Unfortunately, the legacy data and information applications already in place can be barriers to the implementation of an information agenda. Some of the factors that prevent communications service providers from achieving operational efficiency are the inability establish a comprehensive view of asset and infrastructure utilization due to the lack of data and process integration among legacy IT systems or applications. The Information Agenda Guide helps communications service providers apply business intelligence and analytics to gain a more accurate and detailed assessment of network and operational utilization with the goal of identifying issues or trends that may impede optimum utilization, result in unnecessary costs or delay problem resolution(Figure 6). Improved partner collaboration and management can be facilitated through well-established processes for product development and implementation cycles, timely and accurate settlements and shared insight in to the overall performance of products and services.



Figure 6: An example prescriptive roadmap of IT projects for operational efficiency

IT Projects to optimize IT strategy

Although this paper emphasizes the potential value of information under control of a provider, from an IT perspective, there are two key barriers to the effective utilization of that information. The first is the number of isolated, legacy systems and applications that most providers maintain, making it virtually impossible to integrate these sources into a “single view” that provides a current, accurate and complete of customer, product, network, asset or other entity. Many providers will admit that a large number of these could be removed without impacting operations. However, determining the appropriate ones remains a challenge.

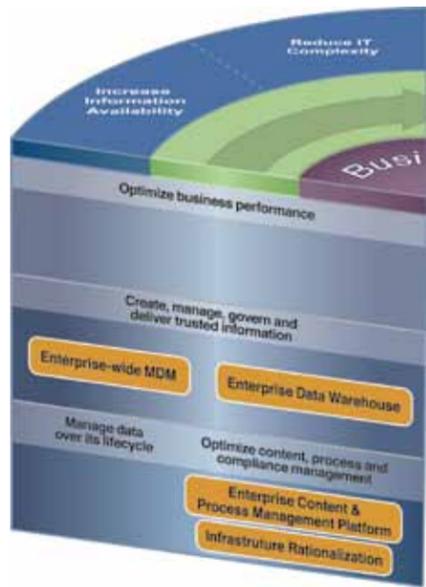


Figure 7: An example prescriptive roadmap of projects to optimize IT strategy

Data quality is the second barrier that prevents a provider from realizing the full value of data under their control. Analysis and decisions based upon questionable data provide little to no advantage to lines of business that are required to meet specific business objectives in response to rapidly changing market environments.

Further challenging the provider is the increasing volumes of data generated as a result of networks and technologies that enable an instrumented, interconnected and intelligent world.

An Information Agenda can facilitate transition to an optimized IT environment through discovery and identification of relevant data in myriad sources with the goal of reducing the number of data sources (and associated management costs) while simultaneously aggregating and integrating key data to enable easier access.

Once the relevant data sources are identified, an Information Agenda can enable a provider to establish enterprise-wide data quality practices that clearly define data and its meta-data, its usage and the transformations applied throughout its lifecycle. Data models specifically designed for the telecommunications industry and master data management capabilities further improve quality, consistency, access and use of data for analysis and insight to enable service innovation, improve operational efficiencies and differentiate the customer experience (Figure 7).

IT projects for governance, risk and compliance

With every new service, new acquisition and new partner there are new risks to assess and new compliance imperatives to establish in response to legislative and industry requirements such as data retention and privacy. Risk and compliance have a broad set of technical, financial and legal implications and demands with respect to information management. Behind all successful risk and compliance efforts is information—trusted, accurate information that can be quickly accessed and analyzed to give a true picture of the business today and for the future.

However, the volumes of data, the diversity of information and the number of isolated systems make risk management particularly challenging. Some of the factors that prevent communications service providers from effectively managing risk and compliance issues involving enterprise information include the difficulty of establishing a comprehensive enterprise retention and compliance strategy for all data; the multitude of isolated, departmental, legacy, line-of-business data and information systems that remain critical to a service provider's operations; varying regulations and data privacy laws that international operators must conform with; and the different management "domains" responsible for each

of these data sources or systems. In such an environment, establishing a consistent information lifecycle strategy to support the regulatory requirements is a daunting task.

Equally challenging is the growing sophistication of agents that perpetrate fraud. With annual losses estimated in billions of dollars worldwide, identification and prevention of fraud in all areas of a provider's operations is an unfortunate, but necessary goal.

The Information Agenda Guide provides strategies and capabilities that enable a communications service provider to systematically address the risk and compliance issues associated with data growth, data privacy, retention, discovery, test data management and application decommissioning; records retention and management; and e-mail management and archiving (Figure 8). Accurate and timely responses to government reporting requests can be facilitated through better integration of data sources and standard reports specifically tailored to lines of business. In the area of fraud, rapid processing of customer and network data via sophisticated analytics can help a provider quickly identify and address those problems.

The Information Agenda guide for Communications Services Providers accelerates roadmap creation with best practice templates for specific IT projects. They are pre-configured to accommodate industry-specific business optimization objectives and initiatives, allowing organizations to quickly organize and prioritize IT projects within the framework of their Information Agenda.



Figure 8: An example prescriptive roadmap of IT projects for governance, risk and compliance.

The Power of an Information Agenda Approach

With an Information Agenda for Communications Services Providers in place, CIOs have many of the tools needed to make the essential transition from simply supporting the business to making a measurable, sustainable contribution to the business' bottom line. The Information Agenda Guide for Communications Services Providers supplies the integrated vision needed to help achieve the business goals and objectives of a converged business model — and deliver better business outcomes. These outcomes can range from improving factory utilization, to reducing material shortages and inventory expense, to entering the market with new, high value services that increase the company's market differentiation and profitability.

The benefits — competitive advantage through business optimization

The IBM Information Agenda Guide can help communications service providers address a wide variety of business tasks, including:

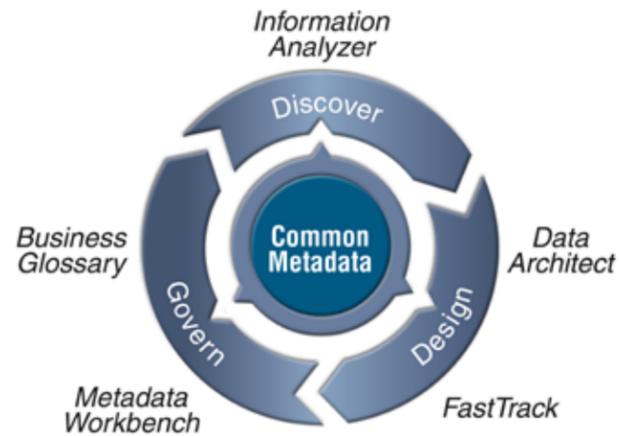
- Integrating information sources and applications gained through mergers and acquisitions
- Introducing new products quickly to targeted audiences
- Achieving a common view of the customer across all lines of business

Most important, consistently delivering trusted information to the right people at the right time gives organizations the ability to use that information—and the intelligence derived from it—in entirely new ways, providing real competitive advantage for providers whose infrastructure and services are rapidly facilitating the transition to a smarter planet.

Why IBM is the right transformation partner

IBM's unparalleled combination of pure science, deep industry knowledge and technology expertise makes it uniquely qualified to help business discover a new kind of intelligence. Only IBM offers the industry accelerators, enabling technologies and deep expertise with a proven approach necessary to do so.

The Information Agenda Guide for Communications Service Providers is a practical, accelerated and proven approach developed by IBM after years of experience of working with leading global organizations. It is a cross-IBM program composed of a proven, prescriptive methodology and mature software and technology assets delivered by IBM practitioners with deep industry expertise.



IBM Information Management and Information Infrastructure solutions offer end-to-end information infrastructure capabilities for executing your Information Agenda. Information Management and Information Infrastructure offerings have been specifically designed to address virtually every aspect of an organization's trusted information needs. Based on open standards and reflecting an investment of over US\$12 billion in the last four years, these offerings are among the industry's most comprehensive.

IBM complements its Information Agenda with additional services and capabilities from IBM's Business Analytics and Optimization organization.

IBM Business Analytics and Optimization leverages the unique capabilities of IBM Research, which, when combined with our world-class software solutions, foundational business intelligence, performance management and advanced analytics, accelerate client time-to-value. Business

Analytics and Optimization helps businesses make better decisions faster while optimizing operations, either by eliminating costs or transforming business processes. Ultimately, Business Analytics and Optimization helps predict outcomes with greater certainty and uncover opportunities that were once unknown and unattainable.

CIOs and senior IT managers ready to jump-start their organization's information agenda efforts should consider a hosted IBM Information Agenda workshop. This workshop leverages IBM's expertise to guide CIOs, senior IT managers and line of business stakeholders quickly through the process of building a cohesive Information Agenda with an actionable set of projects to execute. A hosted workshop can result in faster execution and quicker realization of return on investment.

For more information

To learn more about the Information Agenda Guide for Communications Service Providers and IBM Information Management solutions, contact your IBM sales representative or visit:

- ibm.com/new-intelligence
- ibm.com/software/data
- ibm.com/software/data/information-agenda
- ibm.com/software/data/cognos/analytics



© Copyright IBM Corporation 2010
IBM Corporation
Route 100
Somers, NY 10589
U.S.A.

Produced in the United States of America
May 2010
All Rights Reserved

IBM, the IBM logo, ibm.com, Information Agenda and Cognos are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. If these and other IBM trademarked terms are marked on their first occurrence in this information with a trademark symbol (® or ™), these symbols indicate U.S. registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at ibm.com/legal/copytrade.shtml.

Other company, product, or service names may be trademarks or service marks of others.

References in this publication to IBM products or services do not imply that IBM intends to make them available in all countries in which IBM operates.