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& ASSOCIATES

The Movement towards Information Integration

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A GreenPaper™ Customer Benefit Study

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Abstract

A sound information infrastructure is critical for companies to be successful in today's market. In this paper Hurwitz & Associates looks at IBM's approach to Information Integration and how some of its key customers have benefited from this approach. The paper is divided into three sections:

- An overview of the state of information integration
- IBM's approach to solving integration problems
- The results of discussions we had with ten IBM customers who have benefited from implementing IBM's WebSphere Information Integration platform.

Companies noted very tangible technical and business benefits using IBM's technology. These included significant increases in productivity, improved decision making, and an increased ability to respond to opportunities and threats.

Introduction

There is an increasing sense of urgency among CIOs to get control over their vast array of information across the enterprise. CIOs are, for the first time, ready and able to transform their information infrastructure because of innovations in information integration and data management. While the state of data has long been a topic of discussion within corporations, there is something new happening. An historical example helps clarify this point. More than twenty years ago a forward thinking financial services organization recognized that their customer data was a potential financial gold mine. If the corporation could find a way to consistently look at and leverage customer information across all of its product offerings, it could more easily up-sell and cross-sell everything from annuities to term life insurance. What this CIO really wanted to do was to be able to bring together all the silos of data across the company in a consistent and reliable way. However, because of the state of technology at that time, the cost and time required to achieve this goal was out of reach. The company had to abandon the strategic initiative.

As an information integration industry, we have reached the tipping point.

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Technology for information integration has matured enough so that CIOs are able for the first time to have a strategic platform to make information a strategic corporate asset for growth. The urgency has never been greater. The mantra from the C-level is clear: companies need to be able to integrate information from disparate applications, processes and other data sources across and beyond the enterprise in order to make the right decisions and remain competitive. This information must be trustworthy meaning it needs to be accessible, accurate, consistent, timely and complete. And, the information architecture needs to be flexible enough to make this happen. Since the days when the financial services company was trying to simply bring data together, things have become increasingly complex. Companies have established a web of relationships with partners, suppliers, customers, and employees. They have grown larger and more complex through acquisitions and mergers. In order to ensure that all the stakeholders in the expanded business ecosystem share a common understanding of business information and rules, many CIOs are establishing a common metadata structure for their companies. The development of a metadata structure lays the foundation for one of the core goals of today's CIO – to bring all the components of a business together in a systematic and orderly way through a service oriented architecture (SOA). Even companies with significant experience recognize that the movement towards information integration is not a one-step process; it is a journey involving a combination of corporate planning and technical innovation.

Addressing the Urgency

What is the problem we face as we move to strategic information integration? We have moved beyond the fundamental objective of simply allowing two data sources to link to one another. Rather, we must be able to look at information integration as a continuum that will lead us to be able to move to a situation where information is architected as a set of services that can be reused in a variety of unanticipated ways to support business change. Getting to this architecture may take time for some businesses. In order to achieve business benefit, it is important to understand the state of information silos and the challenges these silos present. Silos of data were a natural extension of how business applications have been designed for decades. Each department has its own applications – general ledger, human resources, supply chain and the

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like. Each of these applications produces a myriad of data. Likewise, partners have their own set of data about the products they sell and the customers they serve. Each time a company makes an acquisition, it must contend with an overlapping set of systems and related data. If one were starting with a clean slate, the approach to information management would be designed from a modular, architected plan. However, there are few companies that have this luxury of starting fresh. Companies must be able to start from the messy reality of their information silos and make sense of it in a way that increases the value and quality while keeping costs under control.

The State of Information Integration: Beyond Information Silos

Innovative IT managers have begun to move their organizations away from traditional data integration to a new way of leveraging valuable corporate information assets in an effort to build flexible, responsive software. These managers are finding a direct correlation between the way organizations integrate information and how prepared they are to respond to their partners and customers.

Software environments have evolved over the years so that critical information such as business rules and customer information are embedded in databases, packaged applications, and electronic mail messages. Likewise, data sources are themselves physically scattered throughout the organization. In today's highly distributed organizations, it is almost impossible to define where one application begins and the next ends. It is equally difficult to differentiate between a database that incorporates important business rules and an application that creates specialized data.

There is no one right solution for how customers will access their information sources. Customers must be able to select between consolidation and federation. It is often valuable to maintain centralized control of information while choosing an appropriate balance of physically integrated (via consolidation) and virtually integrated (via federation) information. For example, the finance department must insure the quality and integrity of financial data for both corporate governance and regulatory compliance. However, information from these financial systems must be appropriately

shared with other departments such as human resources. There are instances when key data elements might also be shared in a secure way with business partners. There are times when the information systems must be integrated such as when two companies merge. Without consistent definitions of information across these systems the speed of the merger might be slowed or the resulting merged information sources might be inconsistent or inaccurate. There are also situations where two companies may be planning a joint venture. In order to achieve a successful partnership, these companies might create a data mart that includes information about both companies' products and services to present a seamless view of the joint venture to the customer. In the end, silos of information can be effectively managed and integrated with a broad range of situation-specific information integration solutions.

The Movement to Information Services

As companies realize that they have many different needs for how they are going to manage their information resources, they are finding that they require a platform approach to be successful. Hurwitz & Associates predicts that this platform will form the basis of the movement to a service oriented approach to information integration. What does this mean? In essence, for companies to truly leverage their information assets they need to be available as services so they can be easily used whenever they are needed without the expense and time required to reprogram or recode complex processes. If this information is available within the context of a platform that supports a metadata infrastructure, organizations will be able to innovate quickly when an opportunity or a threat to the business presents itself. Innovative managers are discovering that the movement to this type of standards based infrastructure is worth the investment because it will offer them substantial flexibility. This approach also frees the time of key developers to work on projects that bring revenue to the bottom line rather than focusing on maintaining old programs that do not add value to the company.

Hurwitz & Associates has observed that there are seven top drivers for IT management involving the evolution of their information management strategy. These include:

- **Accessing all information a company needs.** IT management is aware that they need to reach beyond departmental and geographical bounds to achieve an overall corporate view of mission critical information.

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- **Increasing the quality and precision of information.** As companies rely on their data sources to make business decisions, they are aware that the data must be accurate and of high quality in order to make confident decisions and to minimize the risk associated with meeting compliance requirements.

- **Simplifying a company's information infrastructure.** Simplification results in a reduction in data redundancy across information sources.

- **Controlling costs.** IT management needs to be able to leverage development resources more effectively and increase the operational effectiveness so the organization can focus on innovation rather than **maintenance.**

- **Utilizing metadata and standards to put the information in the right business context.** Consistent investment in metadata is emerging as a top priority. IT management has found metadata management to be complex to deal with in the past. With recent innovations in this area, management is beginning to move ahead aggressively.

- **Meeting regulatory requirements.** Management is focused on streamlining the ability to comply with regulatory requirements based on the ability to verify the accuracy of high quality, secured, and accurate information.

- **Delivering information as a service.** Management is focused on the long-term benefits of evolving and codifying information so that it can be delivered on demand as a service.

IBM's Approach to Information Integration

Over the past several years, IBM has made a huge investment in its common platform for information integration. This platform is broad enough to deliver various solutions to solve various information integration needs including everything from federating data sources to ensuring that information throughout an organization is correct and verifiable. IBM's approach to information integration is to provide a broad range of interoperable integration services that plug directly into service oriented architectures so that organizations can move at their own pace to create flexible information services

that will be available across partners, suppliers, customers, and employees. IBM is also focused on working with a broad ecosystem of partners to extend their platform value to a multitude of specialized solutions.

IBM has divided its approach to information integration into five capabilities:

1. **Connect.** This focuses on the customer need to access and connect data elements no matter where they reside. This may require consolidation of sources, synchronization between information resources, or distribution of data across disparate databases. Each product in the IBM WebSphere Information Integration portfolio contains direct native access to relevant data sources. Certain products are specialized for the connect capability, such as those that handle data replication, event publishing and changed data capture.

2. **Understand.** This focuses on understanding the meaning, structure, and lineage of data, and the relationships between data in context with the business use. IBM WebSphere Information Analyzer and the integrated metadata management within the portfolio are designed to meet this requirement.

3. **Cleanse.** This focuses on ensuring that information conforms to an organization's quality requirements. IBM WebSphere QualityStage supports the associated objective of ensuring the standardization, quality, and consistency of an organization's information.

4. **Transform.** This capability supports the predictable and highly scalable movement of data. IBM WebSphere DataStage and IBM WebSphere DataStage TX ensure the proper flow of enriched and tailored information from structured and semi-structured data sources.

5. **Federate.** Federation supports rationalizing data and content resources as if from a single resource while maintaining source integrity, enabling access to integrated information to people, processes, and applications. This capability is a key aspect of providing information as a service, an increasingly important area of focus for organizations. Products that support federation include IBM WebSphere Information Integrator Standard Edition, IBM WebSphere Information Integrator Classic Federation for z/OS, and IBM WebSphere Information Integrator Content Edition.

IBM Customers – Information Integration

Paths for Success on the Journey to Improved Information

In order to verify the significance of the information integration issues for customers, Hurwitz & Associates engaged in a detailed interview process with ten of IBM's customers. The purpose of the interviews was to understand the information challenges these companies face and how their experience with information integration has improved decision making at their organization. Discussion focused on the technical and business benefits they have achieved from implementing the IBM WebSphere Information Integration platform. Customers represented a cross-section of industries including financial services, healthcare, manufacturing, transportation, and retail. All the enterprises included in our analysis were global organizations with most headquartered in the U.S. and several headquartered elsewhere including China and in Australia.

The results of the study confirmed that, in fact, the top information priorities for the customers included accessing all the data their company needs, simplifying a highly complex information infrastructure, improving the quality and precision of their data, and utilizing metadata to improve the understanding of their information. For most companies, the drive to implement change in their information infrastructure was driven by a specific event or series of events, such as a revenue crisis precipitated by competitive pressures or a series of acquisitions that led to an inadequate understanding of customer information. The overall organizational structure of the company and their historical approach to collecting and disseminating information throughout the company had an impact on the information challenges they face today and their approach to solving their problems.

The customers in our study had implemented a range of the IBM WebSphere Information Integration products. Products used included IBM WebSphere Information Integrator, IBM WebSphere DataStage, IBM WebSphere DataStageTX, IBM WebSphere QualityStage, and IBM WebSphere ProfileStage (the predecessor to IBM WebSphere Information Analyzer). Overall, we determined that customers were getting significant technical and business benefit from the use of these products. In fact, customers cited benefits in productivity, improvements in decision making capabilities, and the ability to respond more quickly to opportunities and threats.

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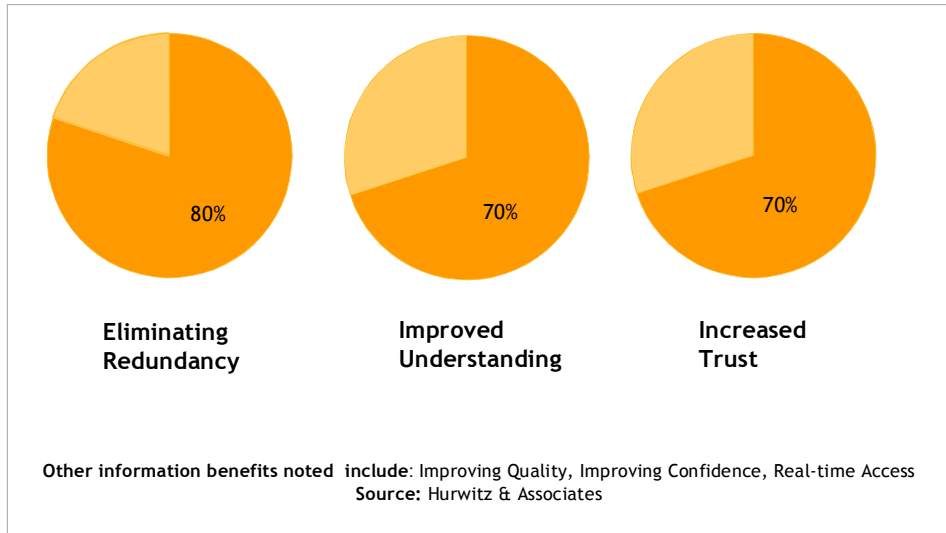## *Technical Benefits from IBM Websphere Information Integration Platform*

Customers were asked to consider how their IT organization has benefited across four categories of technical benefits: simplifying information infrastructure, improving accessibility and quality of information, improving productivity in terms of development, and improving productivity in terms of scalability, distribution, or access. Respondents were very positive across the board about how their information has improved. The most significant improvements to information reported by the customers in our study included eliminating redundancy, improving understanding of the information, and improving trust of data. Figure 1 illustrates these benefits. Additionally, ninety percent of the customers reported productivity benefits, specifically in the areas of hand coding, improved efficiency, and reuse of assets. Other important benefits included improving the quality and precision of data and improving confidence in the data.

Companies see themselves on a journey to improved information. Some technical benefits resulting from implementing IBM WebSphere Information Integration solutions, such as a reduction in the amount of hand coding required were recognized very early while it is expected that other benefits have and will continue to accrue over time. It is expected that the improvement from an infrastructure requiring a great deal of hand coding with limited opportunities for reuse of code and applications to a simplified infrastructure with modularity and SOA is an evolutionary process. Many of the companies in the study are planning now to deepen their involvement in the area of metadata as they move to a service oriented infrastructure.

There is a great deal of interest and excitement around the benefits of metadata, although only a handful of the companies we spoke with have currently made much headway in this area. One Manager of Information Integration at a pharmaceutical company said that while they originally purchased WebSphere DataStage and WebSphere QualityStage as part of a data warehouse initiative, they are now in the process of moving beyond more traditional uses of data integration. A current project involves taking all of their financial information so they will be able to offer reconciled transactional information as services on an as needed basis throughout the organization.

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Figure 1. Information Benefits

80% **Eliminating Redundancy**

70% **Improved Understanding**

70% **Increased Trust**

Other information benefits noted include: Improving Quality, Improving Confidence, Real-time Access
Source: Hurwitz & Associates

- **Eliminating Redundancy**
 Eighty percent of the companies we spoke with said that their use of IBM technology had helped to reduce redundant data. On average, data redundancy was decreased by approximately 20-25%. In some cases, however, companies experienced an even greater decrease. An IT Manager for a global package delivery services business found their business plagued by a complex mess of redundant customer data after close to 200 small regional businesses were acquired by the parent company in a relatively short period of time. The series of acquisitions resulted in data silos containing duplicate customer, product, and pricing data that needed to be integrated. According to the company, "data redundancy was a huge problem." After implementing WebSphere QualityStage and WebSphere DataStage, the IT Manager estimated that his company experienced a significant reduction in data redundancy ranging from 80%-100%.

- **Improving Understanding of the Information**
Seventy percent of the companies we interviewed said that they felt that the IBM information integration products had helped them understand their information sources better. For example, a large corporate food chain we spoke with has many franchises that operate globally. They needed to move highly visible information such as supply chain data, customer satisfaction

measurements, and restaurant data to and from these franchises. Additionally, they needed a standard set of definitions in order to meet regulatory requirements for their financial reporting. Before they implemented IBM technology the company was using C programs and, in the company's words, "it was ugly." They implemented WebSphere DataStage TX to move the data and WebSphere DataStage to provide ETL functionality for their data warehouse environment. Now, they are confident that their definitions are coming from one source. This company said that they could have done this themselves, but it would have cost too much and taken much too long. Most significantly, the business users now have confidence in their data.

In addition, 90% of the respondents said that they had reduced the time necessary to profile their systems because of the IBM technology. For example, one respondent said that prior to using the IBM solution, they were profiling using statistical tools and eyeballing the data. This was leading to less reliable information. The team was totally dependent on the availability of human resources. Now, process and technology can be reused leading to approximately 20-25% reduction of the time spent profiling or understanding sources. This company's use of the WebSphere ProfileStage has made the profiling process more comprehensive.

• **Improving Trust of Data**
Seventy percent of the respondents said that the use of IBM information integration technology had increased their trust in their information. Many of the IT managers we spoke with have experienced the detrimental business impact of inconsistent data. When business managers have access to consistent and high quality data that they know they can trust, everyone in the organization is able to make better business decisions. We spoke with a group responsible for a data warehouse effort for a large financial institution. Within the institution this group is responsible for strategic information management for business banking services. Their focus is to support analysis. According to the company, prior to building their data warehouse they had "at least 50 different data schemas and everything was siloed…The same elements were scattered in different schemas." The group knew that their architecture was not sustainable; they couldn't get a good integrated view of customers, couldn't report in a reasonable time frame, had no single version of the truth, and data quality was questionable. The company implemented WebSphere ProfileStage and WebSphere DataStage. Now, according to the company, they

know with complete confidence that what is in their data warehouse matches the source data and they can walk the data back to the source. Whereas before implementing the IBM technology the company felt it was losing control of its information, it now feels in control. The technology is helping with Sarbanes-Oxley compliance as well as helping them make better decisions.

- **Improving Efficiency**

A Vice President and Manager of the Data Warehouse practice for a global financial services organization described how his internal consulting department has retained the same number of developers over the past five years, while the workload has increased dramatically. Some of this increase in operational efficiency can be attributed to their use of IBM WebSphere Information Integrator. He noted that in the past developers would have to know the idiosyncrasies of 50 different schemas, so developers actually got grouped by the systems they dealt with because they knew these schemas. Now, without having to worry about all of these different schemas (because of their data warehouse) they can be much more effective and efficient. A similar experience was echoed by the majority of customers included in the study. Eighty-nine percent of the respondents reported an increase in operational efficiency as a result of the implementation, three-quarters of whom categorized their improvements as significant for their organizations.

- **Improving Reuse of Data, Applications and Code**

A manufacturer of motorized vehicles determined they were losing sales because they couldn't process and ship orders fast enough. In the past, orders submitted by a dealer would be processed overnight. Now, after an implementation which included use of IBM WebSphere Information Integrator Classic Federation, orders can be shipped in 15 minutes. The increase in the accessibility and reuse of data played an important role in the dramatic improvement the company experienced in the order processing process. This company has seen their responsiveness to dealers improve dramatically putting them in a much stronger position competitively.

The customers in our study who were able to quantify this impact said that they are receiving, on average, 45% reuse of their assets.

- **Reducing Hand Coding**

Eighty percent of the companies said the decrease in time spent hand coding
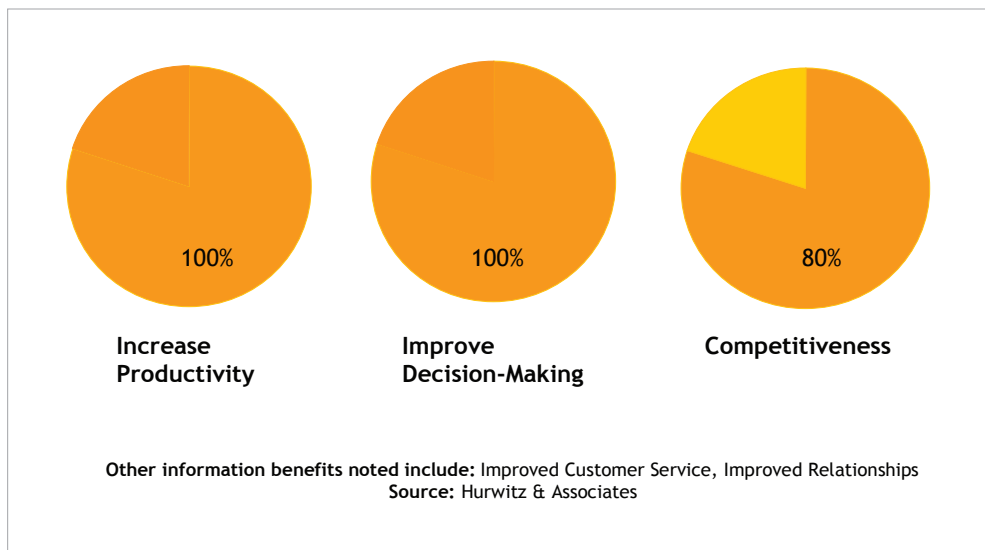
was significant – anywhere from a 30-65% decrease. For example, a healthcare company was undertaking a first of its kind project by integrating patient information across highly regulated hospitals for various uses such as cross-network collaboration and extensive – yet fully compliant – research for drug discovery. The project required them utilize a federated solution. The goal was to integrate different data sources, under a common data model, but not require institutions to change their data model. This company implemented WebSphere Information Integrator Standard Edition. According to this company, "Without Information Integrator we would not have had a solution, it would have been impossible to hand-code all of this…and much too costly." He estimates that hand coding has been reduced by more than 60%.

Business Benefits From IBM Websphere Information Integration Platform

Regardless of the initial information needs of the companies interviewed, whether industry- or initiative-specific, their information integration efforts resulted in a common set of business benefits. These benefits revolved around flexibility and responsiveness, indicating that IBM is delivering on its corporate promise to enable flexible and responsive businesses – through Information On Demand. The top business benefits are shown in Figure 2.

Figure 2. Business Benefits

| 100% | 100% | 80% |
| Increase Productivity | Improve Decision-Making | Competitiveness |

Other information benefits noted include: Improved Customer Service, Improved Relationships
Source: Hurwitz & Associates

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- **Improved Developer Productivity**

Fully 100% of the companies in the study stated that the use of the WebSphere Information Integration products had helped their developers improve their productivity; 60% felt the impact was significant. Some of the respondents were able to quantify the benefit in terms of an actual productivity increase. A few saw an increase of greater than 50% while others saw productivity increase by between 100-200%. For example, one wholesale distribution company saw a huge increase in productivity. This company was building data marts to help with various business functions such as planning. The first data mart took them one year to build. They had determined that they would need 7 data marts to help them with their business planning efforts, and certainly couldn't afford a seven-year project. Use of WebSphere Information Integrator Classic Federation enabled them to build seven data marts in the time it had taken them to build one data mart before.

- **Improved Decision Making**

Decision making capabilities improved to some degree for all ten of the IBM customers interviewed by Hurwitz & Associates. Over 50% of the companies felt that their use of IBM's WebSphere Information Integration platform had a significant impact on helping them make better business decisions. This improvement in decision making resulted from a number of factors including a higher degree of trust in the data, more timely information, and access to data that they didn't have before.

For example, one financial services company had to deal with huge transactional data stores that were housed in both a relational database and a non-relational data store. Prior to using the IBM technology, they had no good way to integrate this data and use it as a whole to make decisions. The company then utilized a federated approach to integration by implementing WebSphere Information Integrator Standard Edition. This software enabled them to create a logical view of these disparate data sources and actually use all of the information to generate more useful reports and make better business decisions. He said that the technology had, in fact, "created a new paradigm for how they work with information" and "they can now do things that weren't possible before."

- **Improved Competitiveness**

Eighty percent of the respondents believed that their ability to respond

to opportunities and threats had improved by using the IBM WebSphere Information Integration technology. Those that could quantify how much faster they could respond cited a 20% faster response time to opportunities and threats because of this technology. This was due to a number of reasons including better decision making as well as the ability to differentiate themselves. For example, a retail company was able to use WebSphere Information Integrator Classic Federation to integrate information into order fulfillment systems moving the information more quickly and letting distributors know when to expect merchandise. This has given them the opportunity to differentiate themselves. Another respondent said that the IBM technology, together with their business processes, applications, and operations centers, has enabled them to respond to issues in customer satisfaction and customer safety in a matter of days, as opposed to the weeks or even months it took before they had invested in IBM.

Conclusion:
Meeting the Challenge of Information Integration

We are entering a new business era where understanding the context of information across the enterprise is as critical to the future success of an organization as getting the data right from a division or functional perspective. Tomorrow's organization must have a comprehensive view of its customers, suppliers, and partners – in order to have the ability to make real-time decisions and take advantage of opportunities. This requires a platform approach to information integration based on the need to move from siloed data sources to information services that improve business agility. Hurwitz & Associates asserts that IBM delivers a comprehensive information integration platform, with clear customer benefits. IBM's overall SOA strategy that offers information as a service will help meet customers' future requirements.