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Business Intelligence Solutions for Gaining Competitive Advantage

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Abstract: - Business Intelligence is the process for increasing the competitive advantage of a company by intelligent use of available data in decision-making. Only a revolutionary Business Intelligence solution, like the proposed portal-based collaborative business infrastructure or data warehouse environment, can solve the complex issues faced when evaluating decision support applications and ensures the availability of any business-critical information. Modern business technologies aim at supporting the key processes that are crucial for enterprises and organizations to successfully complete within an increasingly networked and globalizing economy.

Key-Words: - business intelligence, collaborative business infrastructures, data warehouse environment, portal technology

1 Introduction

The term Business Intelligence (BI) represents the tools and systems that play a key role in the strategic planning process of the corporation. These systems allow a company to gather, store, access and analyze corporate data to aid in decision-making. Over time, these decisions can have a dramatic bottom-line impact on the business. BI gives the ability to gain insight into the business or organization by understanding the company's information assets. These assets can include customer databases, supply chain information, personnel data, manufacturing, sales and marketing activity as well as any other source of critical information.

Business intelligence software allows to integrate these disparate data sources into a single coherent framework for real-time reporting and detailed analysis by anyone in the extended enterprise – customers, partners, employees, managers, and executives. BI enables company leaders to provide knowledge workers with the data they need to make more informed business decisions. Concluding, *Business Intelligence is the art of gaining business advantage from data* (Muntean, 2006).

The decentralization of decision making is driving the need for operational and management information throughout organizations, and *portals are the delivery vehicle of choice for many business intelligence systems*. Companies are continuing to extend their application of portal technologies to an

increasing set of sophisticated challenges, and see the portal itself as the foundation for a larger IT strategy that involves assembling a variety of composite applications to solve previously intractable business problems. Each generation of portal technology adds capabilities and enriches features. Portal functionality evolves from *Basic Content Aggregation & Personalization* (Generation One) to *Portal Ubiquity* (Generation Six).

2 Collaborative Business Infrastructures (CBI)

These are technology-enabled business models that optimize the extended enterprise by connecting applications, data and people to business processes and Web services. By implementing standardized business practices and technologies, proponents of CBI model contend that organization will be able to: reduce complexity in extended enterprise operations; reduce costs by limiting replicated work; create a platform for agile businesses and supply chains; and provide an anchor for ongoing strategic business initiatives. According to Hoolahen, any CBI initiative must establish a framework for rapidly and effectively delivering integrated business solutions within and beyond the enterprise. Performant *CBIs based on portals are designed to enable timely, accurate decision making in support of strategic and tactical business initiatives* (Herrmann, 2006).

Portals, inside the CBI environment, offer a personalized, user-friendly environment for aggregation, consolidation, and collaboration of corporate assets, supporting all kind of business processes.

Gartner predicts that “through 2008, portals will be the primary enterprise environment used to expose processes across technology elements of the high-performance workplace (0.8 probability).” In addition, “Adoption of CBIs to implement business-critical processes will grow to at least 60 percent of large companies by 2008 (0.7 probability)”.

2.1 Enterprise Portal With BI Sub-Portal

Companies are continuing to extend their application of portal technologies to an increasing set of sophisticated challenges, and see the portal itself as the foundation for a larger IT strategy that involves assembling a variety of composite applications to solve previously intractable business problems.

According to Crolene, *a sub-portal paradigm* is a group-level portal that allows specific groups within an organization to administer and manage their own content and components. *A BI sub-portal, incorporated as a distinct entity inside the enterprise portal, supports all e-business processes by managing all Business Intelligence objects with the help of the portlet technology.* In the Delivery Layer, portlets are the first way to access to BI objects. Portlets, in essence, are the active visible components that end users see within their portal Web pages.

From the user's perspective, a portlet is a content channel or an application window within an overall portal view. All portal server vendors offer prebuilt portlets to expedite the user's portal implementation cycle. Since most of the servers that promote the portlet concept are Java-centric, they all offer a JavaServer Pages (JSP) portlet for portal development (Muntean, 2005). Beyond the JSP portlets there are also other commonly available and highly useful portlets. A portlet can be thought of as a “building block” of a portal. It is a user-interface for presenting data and functionality from multiple application on a single Web page. Portlets encompass the presentation layer and the business logic, but also tie into the back end data sources.

2.2 Federated Portals

Federated portals have the potential, thanks to the widespread adoption of portal standards JSR 168 and WSRP, to radically change the concept of collaborative enterprise. *A federated portal*

architecture involves separately managed portals, each portal may act as either a portlet producer (for other portals), or a consumer of portlets (from remote servers), or both.

According to the BeaWebLogic Federated Portals Guide, “federated portals are distributed (portletlets are deployed on remote systems across the enterprise), decoupled (the portal and its portlets do not depend upon one another; in most cases remote portlets can be maintained and deployed separately from federated portal), collaborative (remote portlets can communicate and share data), plug-and-play (one can easily locate and use remote portlets) and standard-based (federated portals are built upon standards, such as WSRP, SOAP, WSDL, SAML, SAML, UDDI and WS-Security)”. In a federated portal architecture portals must not only be able to run local portlets, but also to include remote portlets and share local portlets by making them available to other portals as remote portlet web services.

While local portlets can be expected to provide a large part of the base functionality for portals, the remote portlet concept allows dynamic binding of a large number of remote portlet services without any installation effort or code running locally on the portal server. Portal servers enable organizations to deploy comprehensive solutions - that enable and foster collaboration and coordination across communities of employees, customers, and partners - by providing a framework to develop performant federated portals.

A federated portal strategy based on a distributed architecture model reduces the time and consensus building required in the planning stages. With departmental control and leadership from the organizational IT group, planning and budgeting issues are more manageable, the purpose and expectations of the portal are more clearly defined, and the portal strategy is seen by department level executives as having clear, tangible benefits for their short and long term needs.

Federated portals facilitate the distribution of knowledge, improve planning and development cycles and create more functional and productive relationships within teams. This in turn increases productivity and company understanding of internal and external environments. Overall, employees will begin to have a better view of corporate information and the power to make informed decisions more effectively.

Gartner characterizes the fourth portal generation as follows: “in order to provide a single business platform for all enterprise resources, portals have to be integrated in such a way that content is location-transparent to users without users having to

remember numerous URLs and identities for access". In essence, federated portals provide federated content, identity and single-sign-on. On the other hand, *federation is not possible without standards that facilitate easy integration of business into the portals*. In a global set of portal framework evaluation criteria *JSR-168 & WSRP Compliance* must be taken into account (Akram A., 2006).

3 Data Warehouse Environment

3.1 General Considerations

Data warehouses comprise a multifaceted environment that spans the information systems spectrum from operational transaction systems to systems designed for executive and front-line decision makers. *A data warehouse environment* consists of four main elements: (1) *source systems*: they provide the raw material for the data warehouse and business intelligence systems; (2) *extraction, transformation and load systems*; (3) *data warehouse repository*: most are built on relational database management systems and advanced users combine them with OLAP systems as well; (4) *reporting tools and portals*.

The final piece of the data warehouse puzzle are the reporting tools and often the enterprise portal. Portals provide single sign-on and other infrastructure support, which eases the data warehouse developer's job. They are easily customized to provide quick access to frequently used reports, offer a convenient place to post notices, and deliver newly generated reports.

With the help of data warehouse reports, an analyst/manager may find a business problem inside the company, but these reports do not indicate *why the problem occurred*. *Portals, on the other hand, can help the manager to identify the root cause of the problem*.

A portal can house several different analytical tools (e.g., forecasting and modeling tools that use historical data from the data warehouse as the basis for projections and complement the historical look provided by ad hoc query tools) together with other tools, like enterprise search and document management systems.

3.2 Portals – Facilitating Operations: Analytic Services

Portals lend themselves to a variety of techniques for sharing information and knowledge. Data warehouses are the foundation for historical operational information; document management and

collaboration tools support knowledge management practices, and specialized analytic applications provide domain-specific functions.

Analytic services allow businesses to codify some techniques and make them available to a wider audience than can be served by individual analysts alone: (1) they support a manager in narrow elements of technical decision making; (2) modeling techniques can embody the best practices of experts for solving particular problems; (3) they are deployed in a role-based framework; (4) they have been designed by taking into account the user's feedback. Analytic services naturally complement the data-retrieval-oriented operations of the data warehouses. Concluding, *the portal framework provides the best platform for deploying suites of specialized tools to targeted users throughout the organization*.

The data warehouse repository as a long-term, historical and integrated database supports business intelligence operations. A properly deployed data warehouse will allow companies to view and analyze every important aspect of their enterprise information. It will empower users and management to make informed business decisions.

The decentralization of decision making is driving the need for operational and management information throughout organizations, and portals are the delivery vehicle of choice for many business intelligence systems. Combined with ad hoc query tools, dashboards, and visualization tools, a portal can provide the flexible access to data warehouses needed by executives and line-of-business managers throughout a organization.

Business decisions are only as good as the information on which they are based: the enterprise data warehouse must contain items/objects of importance to the business as customer, product, time, geography, sales hierarchy and market (referred to as 'dimensions' since they define the context of the business transactions). Practically the data warehouse is a database in which atomic level data from disparate sources is brought together in a structured way creating one multi-subject oriented version of the corporate truth, designed to enable timely, accurate decision making in support of strategic and tactical business initiatives.

4 Conclusion

As markets become increasingly competitive, the ability to react quickly and decisively is more critical than ever. Selecting, developing, and implementing the right BI infrastructure are complex and challenging tasks.

The presented portal-based BI solutions like *Collaborative Business Infrastructure* and *Data Warehouse Environment* ensure the availability of business-critical information.

Competitive organizations accumulate business intelligence in order to gain sustainable competitive advantage, and may regard such intelligence as a valuable core competence in some instances.

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