# Business Intelligence (BI) Tools and Techniques : Indian Scenario

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**Abstract**

Information technology has aided market in planning their product strategies for decades. A slowdown in the market has lead to a renewed interest in the field of Customer Relationship Management (CRM), Data Warehousing and Business Intelligence (BI), which are offshoots of the area of marketing and customer relationships, using information technology.

Behind the scenes, IT operations for BI involve design of complex data warehouses, data mapping and messaging architectures. BI also involves the use of complex analytics and algorithms, designed to help marketers drill through the abundance of data generated during regular business processing. BI tools are also proving to be useful in dealing with suppliers.

Although, the area of BI is well-established in the West, Indian businesses—at least the mainstream businesses—are yet to capitalize on the power of such analytical technologies. Indian companies and governmental organizations have recently started computerizing on a large scale. As newer databases and application systems are designed and implemented, systems architects need to keep in mind that data analysis and mining are going to emerge as a requirement from business leaders at the top. It is important to note that the BI market in India is still at a nascent stage. Industry analysts expect the market to register high growth rates during 2006-07. The demand is likely to be fuelled by large and medium-sized enterprises and MNCs. One positive trend is that many organizations are going in for data warehousing,

data mining, OLAP on transactional data and data mart suites to address the needs of specific business units or departments.

Though the Indian BI market is headed upwards, in order to fully leverage the benefits of BI tools Indian industry still needs to undergo a significant transformation. Lack of real-time, authenticated and exhaustive information poses a strong challenge to BI vendors. Indian companies are still found to be in the adoption phase of enterprise applications such as SCM and CRM. BI applications are often regarded as high-end and a more mature application. Hence most analysts feel that BI is likely to gain quick acceptance once primary applications such as CRM or SCM have gained acceptance.

## Biographical notes

Dr. Satish R. Kolhe received his B.E. degree from the Amaravati University, Amaravati, in Computer Engineering in 1991; M.Tech. degree from the Dayalbagh Educational Institute, Dayalbagh, Agra, in Engineering Systems in 1994 and Ph.D. in Computer Engineering from North Maharashtra University, Jalgaon in 2007. He is presently Associate Professor in the Department of Computer Science, North Maharashtra University, Jalgaon where he has been involved teaching and research in the field of artificial intelligence and neural networks for over a decade. He has guided 3 M.Phil. students. Currently he is guiding 7 Ph.D. students in Computer Science and Engineering.

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## Introduction

Business Intelligence (BI) is a process for increasing the competitive advantage of a business by intelligent use of available data in decision making. Business intelligence (BI) is a broad category of applications and technologies for gathering, storing, analyzing, and providing access to data to help enterprise users make better business decisions. BI applications include the activities of decision support systems, query and reporting, online analytical processing (OLAP), statistical analysis, forecasting, and data mining.

BI applications can be:
1. Mission-critical and integral to an enterprise's operations or occasional to meet a special requirement
2. Enterprise-wide or local to one division, department, or project
3. Centrally initiated or driven by user demand

## Evolution of Business Intelligence

Around five to six years ago, due to increasing automation, companies accumulated huge amounts of data. It was felt that in order to derive benefits from the data it had to be consolidated and formatted according to specific needs. This realization gave rise to applications that enabled organizations to convert data into usable formats.

Tracing the roots of the BI market, it is seen that with each major IT development new BI applications have come online and existing products have been reworked to offer new functionality. Initially, BI tool sets could be broken down into two distinct categories: executive information systems (EIS) and DSS. They typically ran on mainframes, and were considered the exclusive property of top-level managers.

## Business Intelligence tools & Techniques

Business intelligence tools are a type of application software designed to help the business intelligence (BI) business processes. Specifically they are generally tools that aid in the analysis, and presentation of data. While some business intelligence tools include ETL functionality, ETL tools are generally not considered business intelligence tools.

## Some types of business intelligence tools

Digital Dashboards - Also known as Business Intelligence Dashboards, Enterprise Dashboards, or Executive Dashboards, these are visually-based summaries of business data that show at-a-glance understanding of business conditions through metrics and Key Performance Indicators (KPIs). A very popular BI tool that has arisen in the last few years.

Online Analytical Processing, commonly known as OLAP (including HOLAP, ROLAP and MOLAP)- a capability of some management, decision support, and executive information systems that supports interactive examination of large amounts of data from many perspectives.

Reporting software generates aggregated views of data to keep the management informed about the state of their business.

Data mining - extraction of consumer information from a database by utilizing software that can isolate and identify previously unknown patterns or trends in large amounts of data. There are a variety of data mining techniques that reveal different types of patterns. Some of the techniques that belong here are Statistical methods (particularly Business statistics) and Neural networks as very advanced means of analysing data.

## Business performance management (BPM)
### Business intelligence and Data Warehousing

Business intelligence is a term commonly associated with data warehousing. In fact, many of the tool vendors position their products as business intelligence software rather than data warehousing software. There are other occasions where the two terms are used interchangeably.

Data warehouses are often at the heart of the strategic reporting systems used to help manage and control the business. The function of the data warehouse is to consolidate and reconcile information from across disparate business units and IT systems and provide a context for reporting on and analyzing:

- Corporate performance management
- Profitability
- Consolidated financials
- Compliance

As strategic as they are, enterprise data warehousing projects are highly complex and can be risky. Projects fail almost as much as they succeed, often because of long development cycles, poor information quality and an inability to adapt quickly to changing business conditions or requirements.

The data warehousing professionals can keep the probability of success in their favor by staying abreast with the latest technology and best-practices topics, including:

- Data integration and reconciliation
- Data quality and master data management (MDM)
- Iterative delivery
- "Packaged" data warehousing applications
- Data warehouse performance
- Deployment and change management

**Business intelligence** usually refers to the information that is available for the enterprise to make decisions on. A data warehousing (or data mart) system is the backend, or the infrastructural, component for achieving business intelligence. Business intelligence also includes the insight gained from doing data mining analysis, as well as unstructured data (thus the need of content management systems).

Business Intelligence (BI) applications rely on Data Warehouses (DW) - database repositories designed to support a company's decision-making process. Data warehouses are complex and challenging to implement. The volume of data in today's typical data warehouse is enormous and continues to grow at a dramatic rate - studies indicate that data doubles every 12 to 24 months - requiring higher performance hardware and software that can integrate easily with existing systems, and can support the increased demands brought about by increased data. Additional data compliance through the recent Sarbanes-Oxley and BASIL II legislation is creating enormous implications in how data is managed for all companies.

**Business intelligence in Indian Industry**

Business Intelligence is an umbrella term for a set of tools and applications that allow corporate decision makers to gather, organize, distribute, and act on critical business information. In India, the market for BI tools is still in the development stage. Companies that have implemented applications such as ERP, supply chain management, or data warehouses, often face a situation where they have a huge amount of data and information but no helping tool or clearly defined map, which can be put to use for making strategic decisions.

The world is rapidly moving towards convergence and a new business and connection paradigm is emerging: c-commerce. C-commerce stands for Collaborative Commerce that means optimization of supply and distribution channels in order to capitalize upon the global economy and use new technology efficiently. Collaboration promotes fresh views of suppliers, competitors, and customers. The goal is for a business to move away from production and sales, shifting towards the integration of various businesses. Technology and services for enterprise knowledge management will evolve to support the extended, collaborative enterprise. This will bring in a flood of information. Surviving the information flood and effectively managing it will be a critical success factor for enterprises to survive and have a distinct competitive edge. In a c-commerce business world 'knowledge and information' will be the basis for giving an enterprise its competitive edge. And Business Intelligence provides the foundation on which C-Commerce rests.

Business intelligence solutions help a company in making business decisions faster, accurate and market-oriented. Concept of business intelligence is new in India and it is 'limited to either a traditional database analysis tool or mistaken for a concept similar to market intelligence. Business intelligence market in India was very small at the beginning of this millennium. According to Frost & Sullivan report on the Business Intelligence market in India, wherein Business Intelligence has been categorized to include query & reporting tools, data warehousing & mining technologies, and business performance management- the BI market was estimated at Rs. 26 crore ($ 6 million approx) for Jan-Dec 2001 and increased by 40-45 percent in 2002, to approximately Rs. 37.5 crore ($10 million approx.). The Business Intelligence market in India was in the range of $32-35 million in 2005. The Asia-Pacific market for BI solutions is estimated to be $1 billion by 2007, according to analyst Gartner. There has been a slow but steady growth of Business Intelligence market in India.

The use of BI by India Inc. is becoming quite sophisticated. As companies come to rely upon BI, they can choose one out of two divergent routes—go in for a dedicated BI solution from a pure-play vendor who focuses only on Business Intelligence or add BI tools to an existing ERP system. The kind of BI requirements that companies have and how available options fit into their set parameters of cost, functionality, flexibility. The decision of these companies is also based on the credibility of a vendor, the complexity of analytical reporting that is required, heterogeneity of applications, and enormity of the business.

Indian enterprises have woken up to the need of analytical reporting to make successful decisions and carry through a profitable and competitive business.

Business Intelligence (BI) solutions have tremendous potential to deliver the right value and provide the required 'intelligence' to these organizations. A variety of BI tools in the market serve this purpose. They are either available through pure-play vendors as pure components of BI or through ERP vendors who add BI tools to the existing ERP system.

The size of Business Intelligence software market in India has grown to 10.55 million US dollars with SAS leading the pack, cornering a share of 23 per cent in 2004, according to research firm IDC. IDC said the business intelligence software market was growing at compound annual growth rate of 27.09 per cent. SAS India has a strong customer base in India with over 150 installations in the country including companies like Novartis, Standard Chartered Bank, Hindustan Lever Ltd, HDFC Bank, Reserve Bank of India.

Indian Business Intelligence market was worth $47.4 million in 2005 with a growth rate of 44 percent over the previous year. Maturity of operational transactional systems such as ERP, OLTP, CRM and so on, which generate high volumes of data and regulatory compliance issues, are among the primary factors driving the BI market in India. Frost & Sullivan expects the Indian BI market to grow at a compound annual growth rate (CAGR) of 19.7 percent between 2004 and 2012. According to IDC, the banking, financial services and insurance dominate the market spends on BI software with 35 per cent of total spend in the country. The telecom sector (21 per cent), manufacturing sector (15 per cent) and services industry (10 per cent), including the ITES sector, are other key spenders on business intelligence software.

The business intelligence market in India, which was at $33 million (Rs 140 crore) in 2004, is expected to grow at a compounded aggregate growth rate of 29 per cent over the next few years.

The market is expected to reach $70 million (Rs 300 crore) in 2007. The maximum contribution to the market comes from data warehouse at 36 per cent, followed by On-line analytical processing (OLAP) & reporting tools at 34 per cent, extract transformation & load (ETL) at 18 per cent and analytics at 12 per cent. IT/telecom, along with manufacturing verticals is expected to fuel demand for BI adoption in India.

The pharmaceutical vertical is the most mature vertical for BI adoption in India and hence the contribution from this vertical is expected to decrease. All large companies in this sector already have BI solutions in place from a host of vendors. Other sectors such as transportation, hospitality, logistics, retailing etc are expected to implement BI solutions in the future and an immense opportunity exists there. Reporting & OLAP in enterprises across all verticals allows the companies to look at implementing enhanced capabilities to meet their reporting needs.

Microsoft and oracle are also the leading vendor of BI software with 18 per cent of the Indian market.

A growing number of vendors are delivering products that are more of a solution and less of a tool. Vendor software has become more closely intertwined with business processes. Recently Microsoft Corporation India launched business intelligence accelerator that would streamline its Business Intelligence solutions implementation in the banking, finance, manufacturing and retail sectors. Business

Intelligence Accelerator is a set of tools and technologies that streamline BI implementation in companies. Globally, Microsoft lead the Online Analytical Processing Servers (OLAP) vendors pack. According to product marketing , Microsoft India "By providing RDBMS (Relational Data Base Management Systems), which is a repository of data with rich OLAP functionality along with reporting services, we have the ability to take BI to the customers' fingertips". With big international players like Microsoft entering the field outlook is positive for further growth of Business Intelligence in India.

Business Intelligence is supplied by many venders some of them are:
1. Microsoft Corporation
2. Business Objects
3. CMC International
4. GeoAnalytics, Inc
5. Information Builders
6. IBM Corporation
7. Congos
8. Melissa Data Corp.
9. mySQL AB
10. Oracle
11. Routeware
12. SAP AG
13. SAS Institute

## Conclusion

Business intelligence (BI) is a broad category of applications and technologies for gathering, storing, analyzing, and providing access to data to help enterprise users make better business decisions. The business intelligence market in India, which was at $33 million (Rs 140 crore) in 2004, is expected to grow at a compounded aggregate growth rate of 29 per cent over the next few years. The market is expected to reach $70 million (Rs 300 crore) in 2007. The maximum contribution to the market comes from data warehouse at 36 per cent, followed by On-line analytical processing (OLAP) & reporting tools at 34 per cent, extract transformation & load (ETL) at 18 per cent and analytics at 12 per cent. IT/telecom, along with manufacturing verticals is expected to fuel demand for BI adoption in India. There has been a slow but steady growth of Business Intelligence market in India.

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