Chapter 4
Getting Started with Business Intelligence
## Learning Objectives and Learning Outcomes

<table>
<thead>
<tr>
<th>Learning Objectives</th>
<th>Learning Outcomes</th>
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<tbody>
<tr>
<td><strong>Getting started on Business Intelligence</strong></td>
<td>(a) To understand why BI is important</td>
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<tr>
<td>1. Understanding Business Intelligence</td>
<td>(b) To understand the need for a Data warehouse</td>
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<td>2. The Acronym “BI”</td>
<td>(c) To understand the need for BI at all levels</td>
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<td>3. What are the other terms for “BI”?</td>
<td>(d) To understand the difference between BI and ERP</td>
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<td>4. The meaning of “BI”, BI defined?</td>
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<td>5. What relationship then DSS, EIS, MIS, etc. have with BI?</td>
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<td>6. Is the term “Data-warehouse” synonymous with “BI”?</td>
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<td>7. Difference between ERP (Enterprise Resource Planning) and BI</td>
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<td>8. Need for Business Intelligence at virtually all levels</td>
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<td>9. BI for Past, Present and Future</td>
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Session Plan

Lecture time : 90 minutes approx.

Q/A : 15 minutes
Agenda

• What is BI?
• Business Intelligence by Other Names
• BI Defined
• BI is…
• BI and decision making
• Why BI?
• Need for BI at virtually all levels
• How BI?
• Case studies
• ERP vs. BI
• Introduction to Business Analytics
• Differences between Business Intelligence and Business Analytics
What is BI?

Business Intelligence (BI) is about getting the right information, to the right decision makers, at the right time.

BI is an enterprise-wide platform that supports reporting, analysis and decision making.

BI leads to:
- fact-based decision making
- “single version of the truth”

BI includes reporting and analytics.
Business Intelligence by Other Names

- Reporting
- Decision Support System
- Competitive Intelligence
- Business Investment
- Business Analytics
- Business Insight

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RN Prasad and Seema Acharya
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Howard Dresner, of the Gartner Group, in 1989 coined the term BI. He defined BI as

“a set of concepts and methodologies to improve decision making in business through use of facts and fact-based systems”.

- The goal of BI is improved decision making. Yes, decisions were made earlier too (without BI). The use of BI should lead to improved decision making.

- BI is more than just technologies. It is a group of concepts and methodologies.

- It is fact based. Decisions are no longer made on gut feeling or purely on hunch. It has to be backed by facts.
Can you explain why “Businesses choose to leverage analytics for decision making”?
BI Defined

```
Raw Data

Meaningful Information

Knowledge Discovery

Beneficial Insights

Impactful Decisions

Business Benefits
```

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BI is...

- Fact-based decision making
- Single version of truth
- 360 degrees perspective on your business
- Virtual team members on the same page
- Visibility into enterprise performance
Answer a Few Quick Questions

• What problems can an enterprise encounter, if the single version of truth is compromised?

• Cite a few examples from everyday life of fact-based decision making.

• What is your understanding of 360 degrees perspective and why do you think it is important?

• You are a Project Manager. You lead a 10 member team. Your team members are in three geographically different locations. What measures will you take to ensure that all your team members are on the same page?
BI and Decision Making

Types of Decisions

- Strategic
- Tactical
- Operational

Impact
- High
- Low

Frequency
- Low
- High

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Explain “Strategic, Tactical and Operational Decisions” by providing appropriate examples.
Do you think “BI only deals with analysis of past data”?
Why BI?

What happened?
Why did it happen?
What is happening?
Why is it happening?
What will happen?

Know the past
Analyze the Present
Predict the Future

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Need for BI at Virtually All Levels

• There is too much data, but too little insight!

• Business Intelligence has been there in the boardroom for long. There is a need to expand business intelligence from the boardroom to the front lines!

• Structured and unstructured data need to converge!
How BI?

IT Department

Source Systems

- ORDERS
- INVOICES
- SHIPPING
- Web Clicks
- External Data

Business Users

BI Tools

Data Warehouse

- Extract
- Transform
- Load

Relational Tables

- Report
- Query
- Analyze
- Alert

Analytic Applications

(Product Profitability, Workforce Planning, CRM)

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Challenges in Retail Industry

- Cost to Serve?
- Promotional Offers?
- Attract Customers?
- Manage Inventory?

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Retail Industry Leveraging BI

Reporting Tools | Analytics Tools | Best Practices | Optimization Techniques

- Optimized Costs
- New Promotions
- Identifying Customer Needs
- Optimized Inventory and Allocation

Data Warehouse

Customer, Demographics or products/price details

Daily Sales Transactions

Optimized Costs

30% Off

50% Discount

Online Shopping

Customer, Demographics or products/price details

Optimization Techniques

Best Practices

Optimized Inventory and Allocation

Daily Sales Transactions

Customers

Transactions

Products

Data Warehouse
Explain how BI is being leveraged in the insurance/healthcare/banking sector, etc.
Data Mining in Retail

The Diapers-Beer Example

• A (hypothetical) pattern learned from transaction data: “On Friday evenings, shoppers who buy diapers also buy beer.”

• Highlights new, surprising correlations that can be acted on by the store.
  – To promote more users to display this behavior, consider dynamic store layout decisions that might alter locations of products based on co-purchase
  – Consider couponing strategies that can be used to cross promote related products in some cases.
Data Mining in Credit Card Fraud

- Credit card fraud costs the industry billions of dollars each year and pattern discovery tools and machine learning models such as neural networks are routinely used to analyze fraud databases to identify triggers.

- “A self-service transaction at a gas station followed by an expensive purchase” is indicative of fraud.

  - An example pattern learned from credit card fraud data
  - Pattern is then used in real-time to flag transactions that might be fraudulent. For instance, if you fill gas in your car with a credit card and then make an expensive purchase then the merchant may be instructed (by the point of sale system) to check the user’s ID.
Data Mining in UI Optimization

“A simple example had to do with discovering that on the Yahoo Front Page, centering the search box on the page (as opposed to having it be left-justified) would increase consumer usage. This led to better user engagement and there was no cost to Yahoo! to make the change. This was discovered by discovering the hidden pattern that showed that Netscape users tended to use search more than IE users, and by discovering that the only visible difference was the subtle position of the box! It was centered on Netscape browsers but left justified on IE browsers. A very unnoticeable difference, yet an important one. Who would figure that out???”
Online Product Recommendations
• Amazon.com pioneered the use of collaborative filtering based approaches to recommend products to users online.
## ERP vs. BI

<table>
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<tr>
<th>ERP</th>
<th>BI as an enterprise application</th>
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<tr>
<td>ERP is for data input</td>
<td>BI is for data retrieval</td>
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<tr>
<td>Essentially an operational /transactional/ OLTP system</td>
<td>Essentially OLAP</td>
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<td>Supports the capture, storage and flow of data across multiple units of an organization</td>
<td>Supports the integration of data from varied data sources, transforms the data as per business requirements and stores it in the business data warehouse</td>
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<tr>
<td>Has support for a few prebuilt reports which usually help to meet the transactional needs of the organization</td>
<td>Supports advanced form of reporting (boardroom quality) and visualization. Has support for dynamic reports, drill down reports, drill across reports, etc.</td>
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<tr>
<td>Has little or no support for analytical needs of the organization</td>
<td>Supports the analytical needs of the organization</td>
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Business analytics is heavily dependent on data.

For its successful implementation, business analytics requires a high volume of high quality data.

The challenges faced by business analytics are: storage, integration, reconciliation of data from multiple disparate sources across several business functions and the continuous updates to the data warehouse.
### Differences between Business Intelligence and Business Analytics

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<th>Business Analytics</th>
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| **Answers the questions:** | • What happened?  
  • When did it happen?  
  • Who is accountable for what happened?  
  • How many?  
  • How often?  
  • Where did it happen? | • Why did it happen?  
  • Will it happen again?  
  • What will happen if we change x?  
  • What else does the data tell us that we never thought to ask?  
  • What is the best that can happen? |
| **Makes use of:**         | • Reporting (KPIs, metrics)  
  • Automated Monitoring/Alerting (thresholds)  
  • Dashboards /Scorecards  
  • OLAP (Cubes, Slice & Dice, Drilling)  
  • Ad hoc query | • Statistical/Quantitative Analysis  
  • Data Mining  
  • Predictive Modeling  
  • Design of experiments to extract learning out of business data  
  • Multivariate Testing |
Summarizing

- BI is a $15 Billion market today and is growing at 15 to 20%
- BI leads to:
  - fact-based decision making
  - “single version of the truth”
- BI focuses:
  - To find value in gigantic amounts of data collected in modern enterprises
  - On enhancing the quality of the decision-making process
  - To improve the rate at which the enterprises are able to make decisions
  - Gartner Says Worldwide Business Intelligence, Analytics and Performance Management Software Market Grew 4 Percent in 2009
Summary please...

Ask a few participants of the learning program to summarize the lecture.