Data and BI / Analytics

DSC340
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Organizations are drowning in data…

... but lacking in information / knowledge

Our ability to collect and store data seems to have surpassed our ability to make sense of it!

Important trends:
- Storage capacity continues to rise rapidly
- Cost of storage continues to drop

What is Business Intelligence?

A Simple Definition: The applications and technologies transforming Business Data into Action

Fact-based decision making typically involves a subset of the following skills/tools…
- Data querying / SQL
- Database design / data warehousing
- Data mining
- Decision support systems / simulations
- Data visualization / Dashboards

BI / analytics in all industries

A few examples
- Pro Sports
  - Oakland A’s, New England Patriots – recruiting players
  - Dallas Cowboys – merchandising
- Gambling
  - Harrah’s → Caesar’s

Quote from Intel manager;
“..."In God we trust, all others bring data" - Demming

Managers value analytics (survey)

3 in 4
business leaders say more predictive information would drive better decisions

2 in 3
business leaders see the opportunity to leverage information and are just beginning to act

1 in 5
business leaders haven’t thought about how to use information for new advantages

Data / information / knowledge

- **Data** – a collection of raw value elements or facts used for calculating, reasoning, or measuring.

- **Information** – the result of collecting and organizing data in a way that establishes relationship between data items, which thereby provides context and meaning.

- **Knowledge** – the concept of understanding information based on recognized patterns in a way that provides insight to information.

Famous “Beer and Diapers” BI example

- Consider the following convenience-store transactional data (register sales receipts):

<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>SKU_1</th>
<th>Units Sold_1</th>
<th>SKU_2</th>
<th>Units Sold_2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/3/10</td>
<td>Wed</td>
<td>101</td>
<td>202</td>
<td>301</td>
<td>402</td>
</tr>
<tr>
<td>1/3/10</td>
<td>Thu</td>
<td>90</td>
<td>180</td>
<td>360</td>
<td>720</td>
</tr>
<tr>
<td>1/3/10</td>
<td>Fri</td>
<td>180</td>
<td>360</td>
<td>540</td>
<td>1080</td>
</tr>
<tr>
<td>1/3/10</td>
<td>Sat</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>1/3/10</td>
<td>Sun</td>
<td>50</td>
<td>100</td>
<td>150</td>
<td>300</td>
</tr>
<tr>
<td>1/3/10</td>
<td>Mon</td>
<td>70</td>
<td>140</td>
<td>280</td>
<td>560</td>
</tr>
<tr>
<td>1/3/10</td>
<td>Tue</td>
<td>30</td>
<td>60</td>
<td>90</td>
<td>180</td>
</tr>
<tr>
<td>1/3/10</td>
<td>Wed</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td>600</td>
</tr>
<tr>
<td>1/3/10</td>
<td>Thu</td>
<td>75</td>
<td>150</td>
<td>225</td>
<td>450</td>
</tr>
<tr>
<td>1/3/10</td>
<td>Fri</td>
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<td>350</td>
<td>525</td>
<td>1050</td>
</tr>
<tr>
<td>1/3/10</td>
<td>Sat</td>
<td>150</td>
<td>300</td>
<td>450</td>
<td>900</td>
</tr>
<tr>
<td>1/3/10</td>
<td>Sun</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td>600</td>
</tr>
</tbody>
</table>

- What did managers learn? That beer & diapers are often bought by men on Thursday and Saturdays. Why?

- **Data → Information → Knowledge (Insight)**

Goal: Convert Data to (Actionable) Knowledge

Increasing Value

**Knowledge**

Hard to do in practice – requires commitment/effort.
Consider the 4 posted analytics articles

- Company examples:
  - Target
  - Harrah’s
  - Match.com
  - Dallas Cowboys

- What do these companies have in common?
- What does this mean to your career?

**Compare these examples**

<table>
<thead>
<tr>
<th>Company</th>
<th>Where is their data coming from?</th>
<th>How is it changing what they do?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dallas Cowboys</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Match.com</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Target</td>
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<td>Harrah’s</td>
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