



CLOUD COMPUTING APPLICATIONS

Analytics in the Cloud
Prof. Reza Farivar

Data Analytics

- Business Intelligence (BI)
 - Set of technologies and processes that use data to understand and analyze business performance
- *Data Analytics*: the science of examining data to draw conclusions
 - A subset of BI
- Analytics is the discovery, interpretation, and communication of meaningful patterns in data
- extensive use of data, statistical and quantitative analysis, explanatory and predictive models, and fact-based management to drive decisions and actions



Advanced Analytics

- **Business Intelligence:**

- “dark matter” of analytics—the necessary, but relatively simple, questions that will need to be answered frequently:
 - current inventory, number of customers, incoming/outgoing payments, average number of purchases per customer, etc.
- Presented in dashboards, simple data plots and reports

- **Advanced Analytics:**

- More complex statistical techniques and machine learning generate predictions and identify key performance indicators
- Models of future consumer behavior based on past data
- Fraud detection and recommender systems

```
SELECT
  store.district_name,
  product.brand,
  sum(sales_facts.sales_millions) AS "Sales Billions"
FROM
  store,
  product,
  date,
  sales_facts
WHERE
  date.month_name="January" AND
  date.year=2015 AND
  store.store_key = sales_facts.store_key AND
  product.product_key = sales_facts.product_key AND
  date.date_key = sales_facts.date_key
GROUP BY
  store.district_name,
  product.brand
```

OLTP vs OLAP

- OLTP
 - Online Transaction Processing System
 - typically involve most or all of the columns in a row for a small number of records
 - Using a database to run your business
 - RDBMS
 - Structured Data
 - SQL
 - Each query returns a small number of records
- OLAP
 - Online Analytical Processing System
 - read only a few columns for a very large number of rows
 - Using a database to understand your business
 - Data Warehouse
 - Structured Data
 - SQL
 - Each query covers many or all of the records
 - Typical query involves one column
- Different access patterns