EMERGING TECHNOLOGIES

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OBJECTIVES

1. Understand the impact that emerging technologies will have in the future.

2. Define the use of emerging technologies –
   a) Cloud Computing,
   b) Big data concept and analytics,
   c) Data Centre and virtualization,
   d) internet of things,
   e) 4G/5g Mobile technologies,
   f) optical computing,
   g) quantum computing and quantum cryptography,
   h) virtual reality and wearable computing.

4. Define the ways in which certain technologies will impact homes of the future.

5. Describe some emerging technologies and their uses that are extreme.

MODULE 3

BIG DATA CONCEPT AND ANALYTICS

Business Analytics
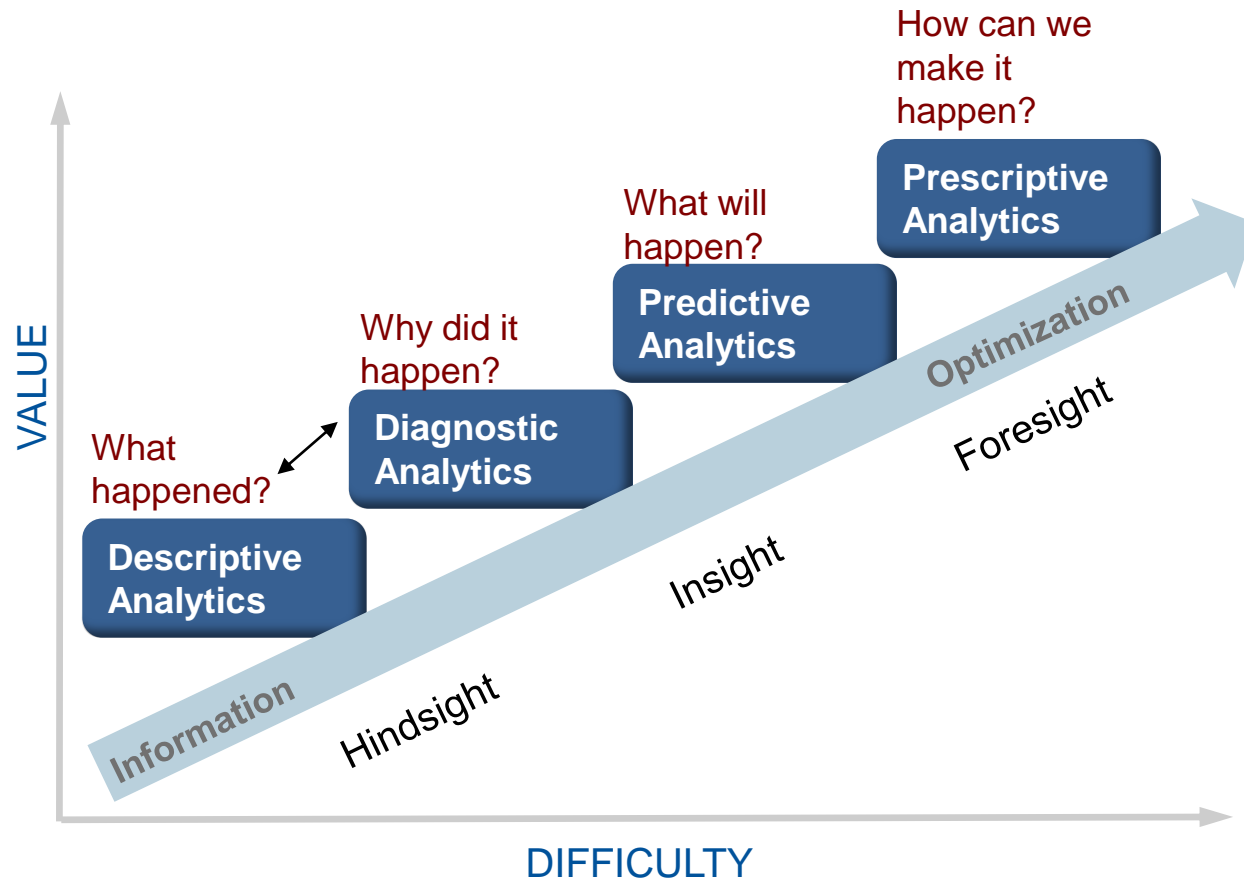
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BUSINESS ANALYTICS/BUSINESS INTELLIGENCE

- Business Analytics/Business intelligence (BI) is a broad category of applications, technologies, and processes for:

  - *gathering,*

  - *storing,*

  - *accessing, and*

  - *analyzing data*

- to help business users make better decisions.

ANALYTICS MODELS

DESCRIPTIVE ANALYTICS

- Descriptive analytics, such as reporting/OLAP, dashboards, and data visualization, have been widely used for some time.

- They are the core of traditional BI.

- Descriptive analytics, such as data visualization, is important in helping users interpret the output from predictive and predictive analytics.

PREDICTIVE ANALYTICS

- Algorithms for predictive analytics, such as regression analysis, machine learning, and neural networks, have also been around for some time.

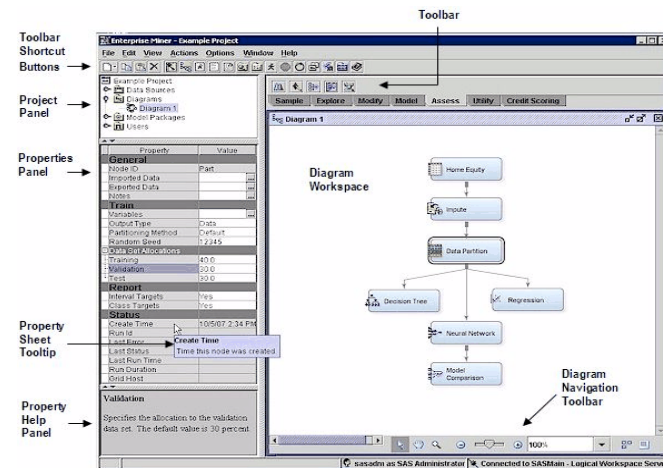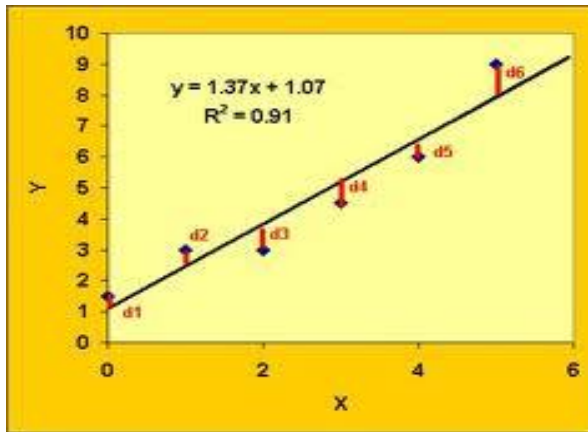- Marketing is the target for many predictive analytics applications.

- Descriptive analytics, such as data visualization, is important in helping users interpret the output from predictive and prescriptive analytics.

PRESCRIPTIVE ANALYTICS

- Prescriptive analytics are often referred to as **advanced analytics**.

- Often for the allocation of scarce resources

- Optimization
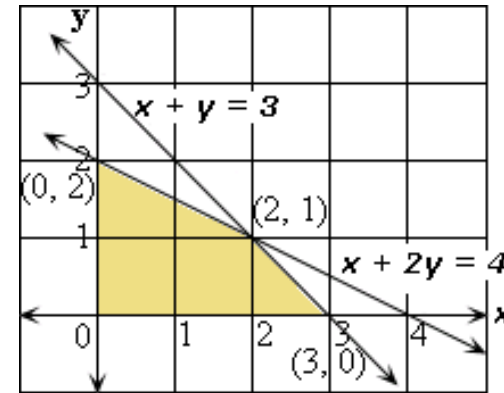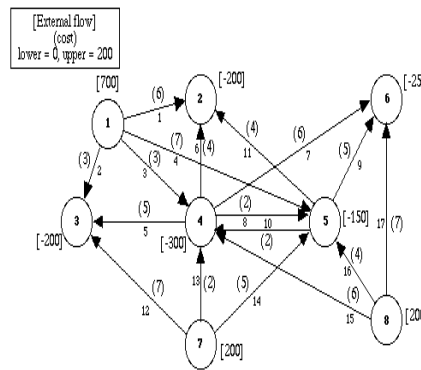
- Prescriptive analytics can benefit healthcare strategic planning by using analytics to leverage operational and usage data combined with data of external factors such as economic data, population demographic trends and population health trends, to more accurately plan for future capital investments such as new facilities and equipment utilization as well as understand the trade-offs between adding additional beds and expanding an existing facility versus building a new one.

ORGANIZATIONAL TRANSFORMATION

- Analytics are a competitive requirement

- For BI-based organizations, the use of BI/analytics is a **requirement** for successfully competing in the marketplace.
- TDWI report on Big Data Analytics found that 85% of respondents indicated that their firms would be using advanced analytics within three years

- IBM/*MIT Sloan Management Review* research study found that top performing companies in their industry are much more likely to use analytics rather than intuition across the widest range of possible decisions.

- In some industries, the use of advanced analytics has moved beyond a "nice to have" to being a requirement.

COMPLEX SYSTEMS REQUIRE ANALYTICS

- Tackle **complex problems** and provide **individualized solutions**

- **Products and services are organized** around the needs of **individual customers**

- **Dollar value** of interactions with **each customer** is **high**

- There is **high level of interaction** with **each customer**

- Examples: IBM, World Bank, etc.

VOLUME OPERATIONS REQUIRE ANALYTICS

- Serves **high-volume markets** through standardized products and services

- Each customer interaction has a **low dollar value**

- **Customer interactions are generally conducted through technology** rather than person-to-person

- Are likely to be analytics-based

- Examples: Amazon.com, eBay, etc.

KNOWLEDGE REQUIREMENTS FOR ADVANCED ANALYTICS

Business Domain
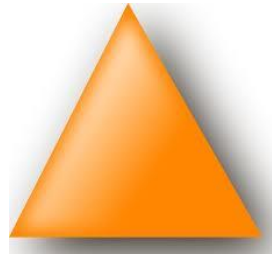
Data   Modeling

- Choosing the **right data** to include in models is important.

- Important to have some thoughts as to **what variables might be related**.

- **Domain knowledge is necessary to understand how they can be used**. Role of Business Analyst is crucial