CHAPTER

Business Intelligence

1. Managers and Decision Making
2. What Is Business Intelligence?
3. Business Intelligence Applications for Data Analysis
4. Business Intelligence Applications for Presenting Results

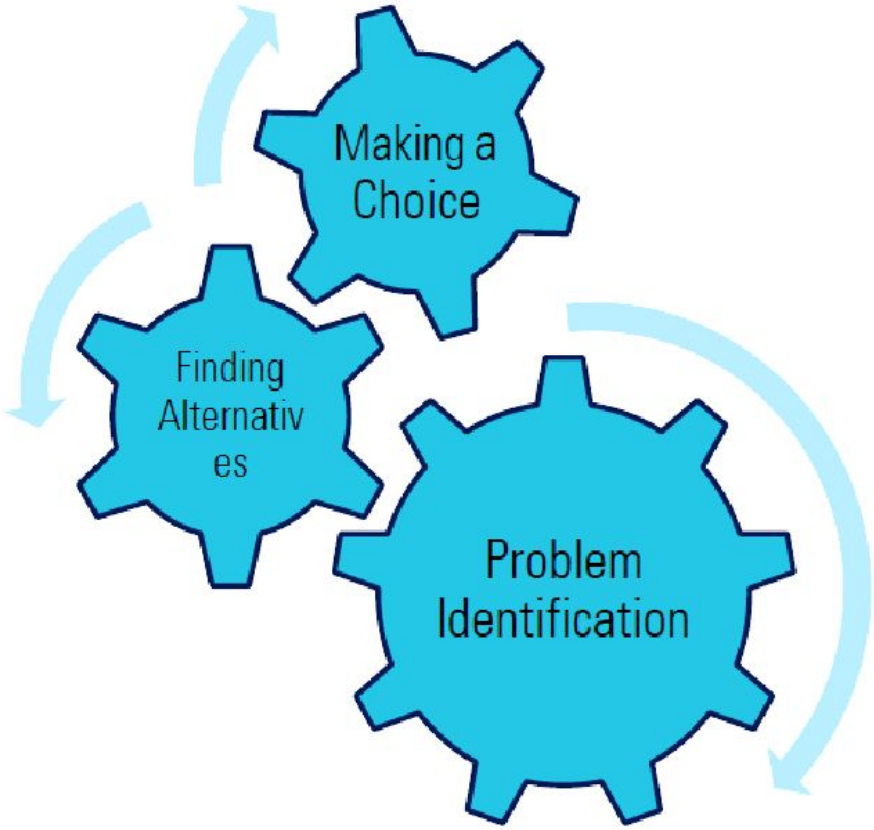
The Manager's Job and Decision Making

- **Management:** a process by which an organization achieves its goals through the use of resources (people, money, materials, and information).

- **Three Basic Roles of Managers (Mintzberg, 1973):**

1. ***Interpersonal roles*:** figurehead, leader, liaison
2. ***Informational roles*:** monitor, disseminator, spokesperson, analyzer
3. ***Decisional roles*:** entrepreneur, disturbance handler, resource allocator, negotiator

Decision Making Basics



"Information and knowledge form the backbone of the decision making process"

Who Makes Decisions?

Decision making at different levels:

– Operational

- Related to daily activities with short-term effect
- Structured decisions taken by lower management

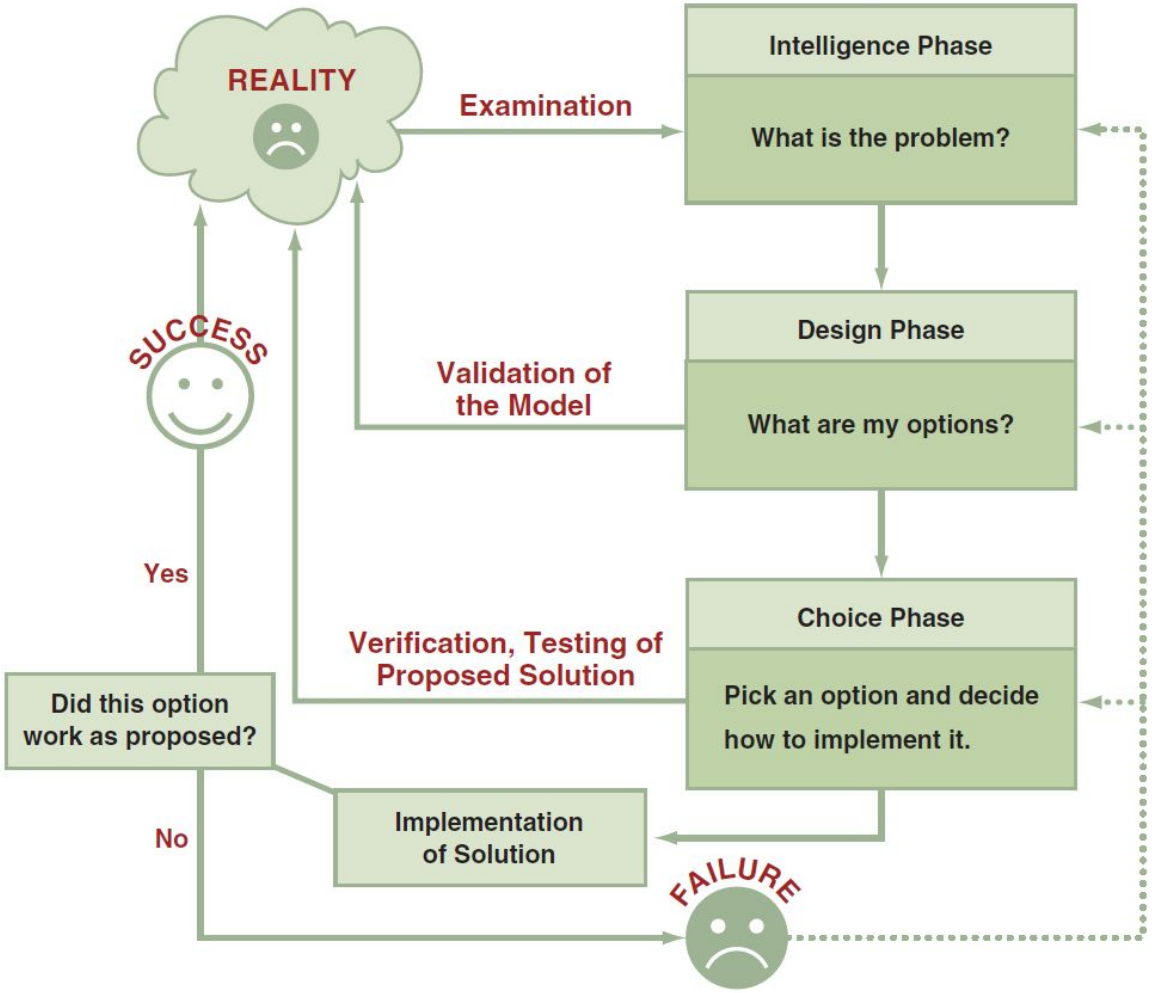
– Tactical

- Semi-structured decisions taken by middle management

– Strategic

- Long-term effect
- Unstructured decisions taken by top management

The Process and Phases in Decision Making



The Process and Phases in Decision Making

Decision makers follow a process to address a situation:
Model Construction: They create a model by simplifying reality through assumptions and defining relationships among relevant factors.
Validation: To check if the model works, they test it with real data.
Criteria Setting: Decision makers establish criteria to evaluate proposed solutions to the problem.

- **Decision:** a choice among two or more alternatives that individuals and groups make. Decisions are diverse and are made continuously.
- **Phases of the Decision Making Process:**
- **Intelligence Phase:** managers examine a situation and then identify and defi ne the problem or opportunity.
- **Design Phase:** decision makers construct a model for addressing the situation. They perform this task by making assumptions that simplify reality and by expressing the relationships among all of the relevant variables. Managers then validate the model by using test data. Finally, decision makers set criteria for evaluating all of the potential solutions that are proposed.
- **Choice Phase:** involves selecting a solution or course of action that seems best suited to resolve the problem. Th is solution (the decision) is then implemented.
- **Implementation Phase:** is successful if the proposed solution solves the problem or seizes the opportunity. If the solution fails, then the process returns to the previous phases. Computer-based decision support assists managers in the decision-making process.

Why Managers Need IT Support?

- The number of alternatives is constantly increasing
- Most decisions are made under time constraints
- Uncertainty in the decision environment
- Group decision making required

What IT are Available to Support Managers

- **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.
- BI applications enable decision makers to quickly ascertain (find out) the status of a business enterprise by examining key information.

A Framework for Computerized Decision Analysis

This framework helps us understand how decisions are made by looking at two things:
Problem Structure: Some decisions are easy to figure out because they're well-structured, like following a recipe. Others are much more complex and unclear, like trying to solve a big, messy problem.
Nature of Decisions: There are three main types of decisions managers make:
Operational Control: Deciding how to do specific tasks efficiently.
Management Control: Figuring out how to use resources wisely to achieve goals.
Strategic Planning: Setting long-term goals and plans for a company's growth.
So, this framework helps us see where decisions fall on the structured-to-unstructured scale and what kind of decision they are. This can help when using computer tools to analyze and make decisions.

Problem Structure: where decision-making processes fall along a range from highly structured to highly unstructured.

Nature of Decisions:

- All managerial decisions fall into one of three broad categories:
  - **Operational Control:** executing specific tasks efficiently and effectively.
  - **Management Control:** acquiring and using resources efficiently in accomplishing organizational goals.
  - **Strategic Planning:** the long-range goals and policies for growth and resource allocation.

Decision Support Framework

	Operational Control	Management Control	Strategic Planning	IS Support
Structured	Accounts receivable, order entry 1	Budget analysis, short-term forecasting, personnel reports, make-or-buy analysis 2	3	MIS, statistical models (management science, financial, etc.)
Semistructured	Production scheduling, inventory control 4	Credit evaluation, budget preparation, plant layout, project scheduling, reward systems design 5	Building a new plant, mergers and acquisitions, planning (product, quality assurance, compensation, etc.) 6	Decision support systems, business intelligence
Unstructured	7	Negotiating, recruiting an executive, buying hardware, lobbying 8	New technology development, product R&D, social responsibility planning 9	Decision support systems, expert systems, enterprise resource planning, neural networks, business intelligence, big data

What is Business Intelligence

Technology that Allows:

- Gathering, storing, accessing & analyzing data to help business users make better decisions

Set of Applications that Allow:

- Decision support systems
- Query and reporting
- online analytical processing (OLAP)
- Statistical analysis, forecasting, and data mining

Help in analyzing business performance through data-driven insight:

- Understand the past & predict the future

The Scope of Business Intelligence

- The Development of One or a Few Related BI Applications
- The Development of Infrastructure to Support Enterprisewide BI
- Support for the Organizational Transformation

’S ABOUT BUSINESS 5.1

- **Predicting Airplane Arrivals More Accurately**
  1. Do you think that satellite-based navigation will meet resistance among air traffic controllers? Why or why not?
  2. Do you think that pilots will object to having “smart assistants” help them make decisions? Why or why not?
  3. Do you think the overall response of the airlines to satellite-based navigation and smart assistants for pilots will be positive or negative? Support your answer.
  4. What is the relationship between analytics and smart assistants for pilots?

’S ABOUT BUSINESS 5.2


© Juanmonino / iStockphoto

- **Cardlytics Analyzes Customer Buying Behaviors**
  1. Discuss the advantages and disadvantages of Cardlytics’s data analyses for the customer. Use specific examples in your answers.
  2. Discuss the advantages and disadvantages of Cardlytics’s data analyses for the merchants. Use specific examples in your answers.

Business Intelligence Applications for Data Analysis

- Multidimensional Analysis or Online Analytical Processing
- Data Mining
- Decision Support Systems

Multidimensional Analysis or Online Analytical Processing

- **Online Analytical Processing** (OLAP - also referred to as **multidimensional analysis)** capabilities. OLAP involves "slicing and dicing" data stored in a dimensional format, drilling down in the data to greater detail, and aggregating the data.

Data Mining

- **Data Mining:** the process of searching for valuable business information in a large database, data warehouse, or data mart.
- **Data Mining Can Perform Two Basic Operations:**
- (1) predicting trends and behaviors
- (2) identifying previously unknown patterns.

Decision Support Systems (DSS)

- Decision support systems (DSS) are interactive software-based systems that help managers in decision-making by accessing large volumes of information generated from various related information systems
- DSS uses the summary information, exceptions, patterns, and trends using the analytical models.
- A decision support system helps in decision-making but does not necessarily give a decision itself.
- The decision makers compile useful information from raw data, documents, personal knowledge, and/or business models to identify and solve problems and make decisions.

DSS Capabilities

- **Sensitivity Analysis:** Sensitivity analysis is the study of the impact that changes in one or more parts of a decision-making model have on other parts.
- **What–If Analysis:** This analysis attempts t predict impact of assumptions (input data) on the proposed solution. The results depend on the accuracy of these assumptions, which can be highly subjective.
- **Goal-Seeking Analysis:** represents a "backward" solution approach. It attempts to calculate the value of the inputs necessary to achieve a desired level of output.

Business Intelligence Applications for Presenting Results

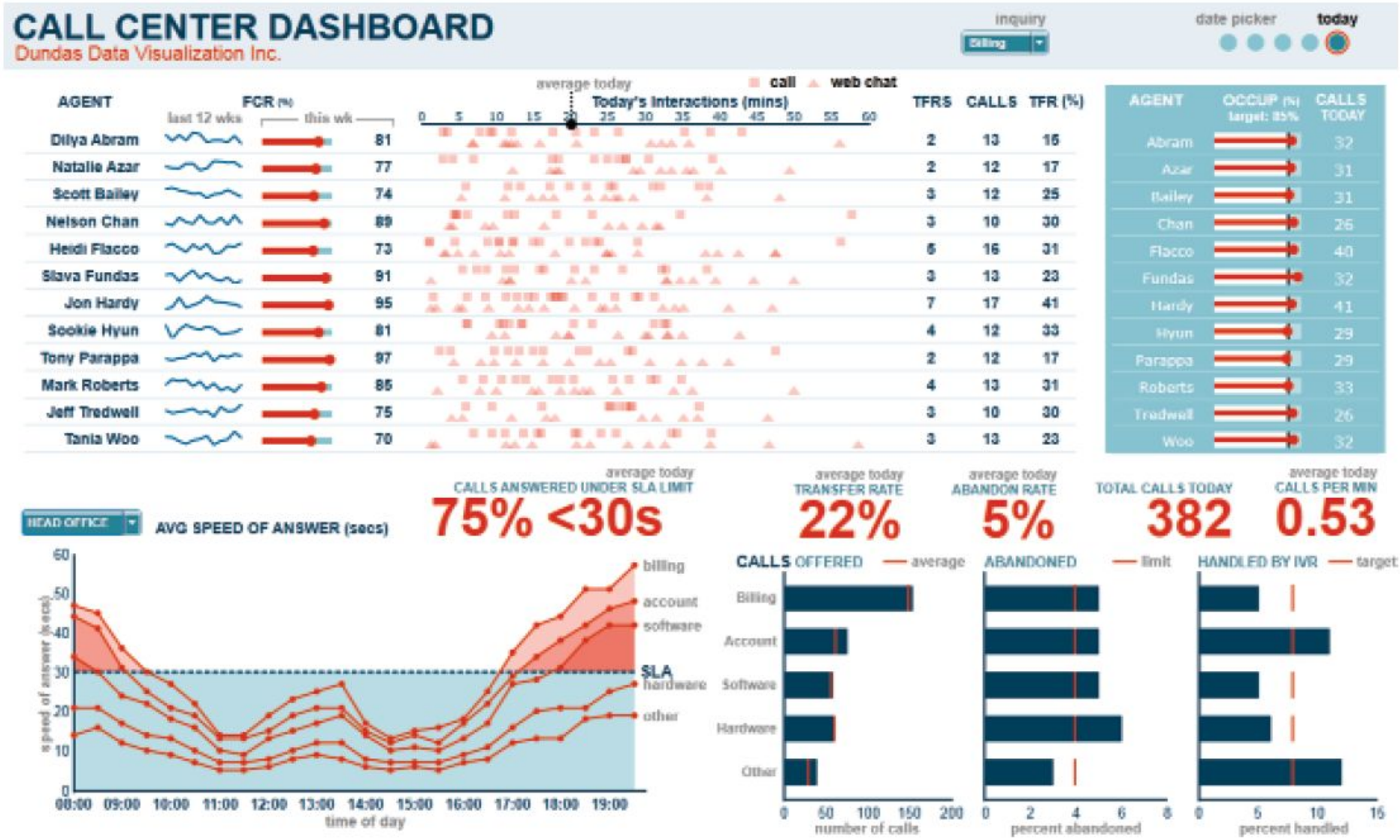
refer techneo too

- **Dashboard:** provides easy access to timely information and direct access to management reports. They evolved from executive information systems, which were information systems designed specifically for the information needs of top executives
- **Data Visualization:** data presented to users in visual formats such as text, graphics, and tables following data processing. Data Visualization makes IT applications more attractive and understandable to users.
- **Real-Time Business Intelligence:** includes the use of real time data for analysis as it is created rather than using historical data for analysis.

The Capabilities of Dashboards

Capability	Description
Drill down	The ability to go to details, at several levels; it can be done by a series of menus or by clicking on a drillable portion of the screen.
Critical success factors (CSFs)	The factors most critical for the success of business. These can be organizational, industry, departmental, or for individual workers.
Key performance indicators	The specific measures of CSFs.
Status access	The latest data available on KPI or some other metric, often in real time.
Trend analysis	Short-, medium-, and long-term trend of KPIs or metrics, which are projected using forecasting methods.
Exception reporting	Reports that highlight deviations larger than certain thresholds. Reports may include only deviations.

Sample Performance Dashboard



Data Visualization Technologies

- **Geographic Information System (GIS):** a computer-based system for capturing, integrating, manipulating, and displaying data using digitized maps. Its most distinguishing characteristic is that every record or digital object has an identified geographical location.
- **Reality Mining:** Graphical Information Systems (GIS) and Geographic Positioning Systems (GPS) together to produce an interesting new type of technology which allows analysts to extract information from the usage patterns of mobile phones and other wireless devices.

Support Center Operations Dashboard