Data Warehousing for Business Intelligence
Course 4: Business Intelligence Concepts, Tools, and Applications

Module 1 Bonus Materials

Lesson 2: Conceptual Foundations of Decision Making

We've arranged for students in this MOOC to purchase at a very low cost digital versions of chapters 1, 2, and 4 of the authoritative textbook *Business Intelligence and Analytics: Systems for Decision Support*, 10th edition, 2015 by Sharda, R., Delen, D., and Turban, E. See the optional text book link under course overview to purchase (US$4 for one chapter, US$10 for all three; the regular price for students is $15 per digital chapter).

Excerpts from SHARDA, RAMESH; DELEN, DURSUN; TURBAN, EFRAIM, BUSINESS INTELLIGENCE AND ANALYTICS: SYSTEMS FOR DECISION SUPPORT, 10th Edition, © 2015. Used by permission of Pearson Education, Inc., New York, NY. All Rights Reserved.

According to the source above, Decision making style is the manner by which decision makers think and react to problems. It includes (1) perceive a problem, (2) cognitive response, and (3) values and beliefs. When making decisions, people (1) follow different steps/sequence, (2) give different emphasis, time allotment, and priority to each step. It is important to consider it because different decision styles require different types of support.

- Perceptive Style (1) Perceptive individuals use concepts to filter data, (2) They focus on relationships between items and look for deviations from or conformities with their expectations, (3) Precepts act as cues for both gathering and cataloging data.
- Receptive thinkers (1) are more sensitive to stimuli, (2) Tend to suspend judgment and avoid preconceptions, (3) They focus on detail rather than relationships and try to derive attributes from direct examination of the information they receive, instead of trying fit new data to their precepts.
- Researchers have also identified
    - heuristic and analytic styles. One can also distinguish between autocratic versus democratic styles.
    - Negotiated decisions, Unilateral decisions.
    - Another style is consultative (with individuals or groups).
    - Of course, there are many combinations and variations of styles. For example, a person can be analytic and autocratic, or consultative (with individuals) and heuristic.

According to Sauter, V. L. (1999) Intuitive Decision-Making, Communications of the ACM, 42(6), June 1999, page 109-115, *the left-brain style* stresses analytical and quantitative techniques and employs rational and logical methods of reasoning. Decision-makers decompose problems, approaching each sub-problem sequentially using logic and data. Quantitative analyses of database-stored information lend themselves to this style of decision making.

> "Left-brain style works best when all relevant variables can be controlled or predicted, measured, quantified, and when complete information is available. These conditions often are not met, and hence the exclusive use of analytic methods is inappropriate. An alternate decision-making style is the *right brain approach.* This style uses intuitive techniques, often placing more importance on feelings than facts. Right-brained decision-makers use an unstructured and spontaneous procedure of considering the whole rather than its parts, even when information is inadequate. Brainstorming and emergent trends projection are characteristic examples of appropriate use of this style. Intuitive thought avoids committing to a particular strategy. The problem-solver acts without specifying premises or procedures, experiments with unknowns to get a feel for what is require, and considers many alternatives and options concurrently, while keeping the total problem in mind. …"

Decision making process

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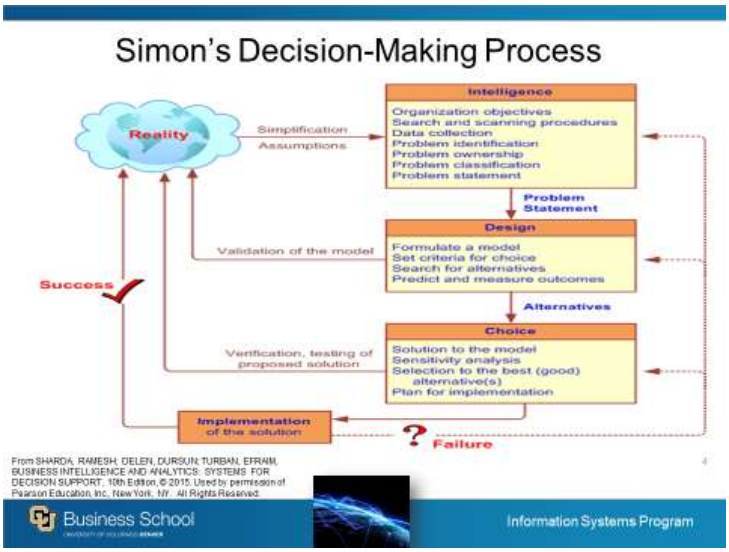
Intelligence consists of gathering information by examining reality, then identifying and defining the problem. In this phase problem ownership should also be established. Intelligence in decision making involves scanning the environment, either intermittently or continuously. It includes several activities aimed at identifying problem situations or opportunities. The existence of a problem can be determined by monitoring and analyzing the organization's productivity level. The measurement of productivity and the construction of a model are based on real data. The collection of data and the estimation of future data are among the most difficult steps in the analysis. When the preliminary investigation is completed, it is possible to determine whether a problem really exists, where it is located, and how significant it is.

The *choice* phase consists of selecting a tentative solution and testing its validity. The choice phase of decision making uses one or more principles of choice, chosen during this decision phase or prior to it, to select an alternative in a specific situation. Selecting a principle of choice is not part of the choice phase but involves how a person establishes decision-making objective(s) and incorporates the objective(s) into the model(s).



Implementation of the decision consists of putting the selected solution into effect. The implementation phase involves putting a recommended solution to work, not necessarily implementing a computer system. Many generic implementation issues, such as resistance to change, degree of support of top management, and user training, are important in dealing with information system supported decision making.

- *Optimization* refers to the "best." Select the course of action with the highest payoff/ utility. To do so you need to consider cost/ benefit of all alternatives. It is therefore costly to perform and can't adequately measure utility
- Satisfying: select the course of action "good enough" to meet minimal set of requirements. Therefore all alternatives not considered because of limited time, effort, money to make decision alternatives considered sequentially.
- Elimination-by-aspects. It is a narrowing process, eliminating alternatives that fail with respect to one aspect. It may eliminate one that is "overall" superior to others in all but a single aspect.

- Incrementalism is "muddling through" or "putting out fires". It is a successive comparison of alternatives to current course, to find ways of removing shortcomings of present approach.
- Mixed scanning is scanning: search, collection, processing, evaluating, and weighing of information. The degree varies with importance of decision. Decision maker list the alternatives & reject those with "crippling objection" and then continue until one alternative remains.

See more information about

(1) cognitive styles and decision styles: https://www.birkman.com/
(2) Keirsey Temperament Sorter and Keirsey Temperament Theory-II, http://keirsey.com/
(3) Decision-making tools for the Kepner-Tregoe method available at kepner-tregoe.com,
(4) Decision Explorer, an interesting software tool for cognitive mapping from Banxia Software try the demo,
(5) A compound DSS product offered by WolframAlpha,
(6) http://dssbibook.com/,
(7) Thinking Outside the Data Box: Is There Room for Intuition in Today's Data-Driven Decision-Making?