Decision–Making Systems

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INTRODUCTION

Decision-making is one of the steps that humans take in every moment in their lives. When they open their eyes from the early morning, they start making decisions to snooze the alarm or get up. All long the day, decisions make a big part of human life.

After a simultaneous interaction between multiple functional systems differently, decisions are taken; each has its pros and cons. Individuals in organizations use the information collected and processed to make good decisions. These decisions may influence and change the course of the organization and the lives of other employees in this organization. In the business dictionary (Gibson, 2009), decision-making is the thought process of selecting a rational or logical choice from a set of available options. Decision-making theory was first introduced by Simon (Mintrom, 2015). The decision-making process consists of two parts: the actual decision-making process and the implementation process.

In (Scott & Bruce, 1995), the authors proposed four different types of decision-making models: Rational decision-making style, in which thorough research for alternative logical evaluation is done

- Intuitive decision-making style, in which reliance on hunches is the main characteristic
- Dependent decision-making style, which depends directly on advice and direction from others
- Avoidant decision-making style, in which we try to avoid making decisions

The decision-making theory is a multidisciplinary field where philosophers, economists, psychologists, computer scientists, and statisticians are expertise. Generally, two types of decision theory can be distinguished: normative and descriptive decision theory. These theories are studied separately.

- Normative decision theory, which looks for yield instructions about what decision-makers are rationally required or must
- Descriptive decision theories that describe and predict how people make decisions; it is a practical discipline, which was first introduced and experimented with within psychology.

Furthermore, decisions are classified into three categories based on the level at which they happen:

- Strategic decisions adjust the journey of an organization.
- Tactical decisions are the decisions about how things will happen.

●   Operational decisions refer to the decisions taken daily by employees.

Table 1 shows examples of decisions level within an organization.

Table 1. Examples of decision levels, decision cases, and decision makers

Decision Level	Example	Decision Maker
Strategic Decision	● Merge with another organization to increase profit and globalization. ● Create a new product line to ensure business continuity. ● Downsize the organization to maintain the continuity of the business.	● Director ● CEO
Tactical Decision	● Which employees should be let go during downsizing the organization. ● Which employees should be let go during downsizing the organization. ● Which employees should be let go during downsizing the organization.	● Manager
Operational Decision	● In addition to face-to-face class, various ● Which employees should be let go during downsizing the organization.	● Employee

The main objective of this chapter is to present some existing techniques used in decision-making systems. A background for decision-making technique is represented. Afterward, the decision-making process and existing approaches are introduced. This chapter will conclude with the different models and methods used in decision-making theory.

BACKGROUND

Decision-Making Process

Decision-making is one of the essential activities in different fields: education, health, organization, management, and others. Usually, a decision involves the presence of alternatives and values (Eisenfuhr, 2011). However, the decision-making process requires problem structuring and evaluation of the result. In Scott and Bruce (Scott & Bruce, 1995), four different decision-making models have been proposed: Rational, intuitive dependent, and avoidance decision-making. In this section, the process of rational decision-making is presented. Also, a review of other models is shown.

Decision-making is the process of choosing an action or value from among alternative courses of action, each conduct to different environments or outcomes. Some outcomes are preferable to others, based on the equitable of the decision-maker. This process is presented in Figure 1 (Whitworth, Van de Walle, & Turoff, 2000).

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