UNIMORE
UNIVERSITÀ DEGLI STUDI DI MODENA E REGGIO EMILIA

Dipartimento di Economia Marco Biagi

DEMB Working Paper Series

N. 253

Problem solving and decision making

Massimo Pilati[1]

March 2025

[1] University of Modena and Reggio Emilia, Department of Economics "Marco Biagi
Email: massimo.pilati@unimore.it

ISSN: 2281-440X online

PROBLEM SOLVING AND DECISION MAKING

Massimo Pilati

March 2025

Abstract

Problem solving and decision making are important processes in any organization, as well in everyday life. Not surprisingly, people do not always deal systematically with an important decision. They might overreact and plunge headlong and headstrong into it. They might also show great resourcefulness in avoiding the decision. Problem solving and decision making are often imperfect processes that require new decisions to compensate for prior decisions. The basic process includes defining the problem, generating and evaluating alternative solutions, choosing among solutions and implementing the decision. Both evaluative and creative behaviors are important in all stages. At each step, a number of errors can be made that reduce the effectiveness of a decision: people frequently define problems too narrowly, or fail to generate sufficient alternatives and premature and incomplete evaluation is also common. Because of such errors, many ideal models and techniques for better decision making have been suggested. These can help decision making significantly, but rarely produce perfect and lasting solutions.

In this paper we describe characteristics of the process of problem solving and decision making. Emphasis is given to the difficulties that arise and to methods for improving the process.

Key words: problem finding and solving, decision making models, bias, personality, myths.

This work was supported by Fondo di Ateneo per la ricerca (FAR DEMB 2024 "Soft Skill e Project Engagement")

Introduction

The identification, definition and resolution of problems are the basis of decision making processes. Their origin is mental and is linked to a gap between expectations and evidence, together with cognitive dissonances related to perceptions and the way in which they are interpreted (Simon, 1957). The definition of a problem, the evaluation of the different alternative solutions and the decision of which action to take, are subjective and depend on personality traits, attitudes, and perceptions. Nothing is a problem until someone considers it as such, since problems do not exist except in relation to a subject who must face and solve them.

Problem solving

In one Peanuts cartoon, Linus said to Charlie Brown, "No problem is so big or so complicated that it can't be run away from!" (Janis & Mann, 1977). A problem is nothing more than a personal, subjective conclusion that things are "not as they should be". It is a discrepancy between a factual situation and a desired one, both perceived, and a huge problem for someone can be not at all for someone else. It may be wise, therefore, to compare our perceptions with those of others before concluding that a problem does not exist. In particular, some studies have demonstrated the influence of personality traits on the perception of problems: an analytical person will tend to delve deeper into their causes and determinants, while a systemic person will tend to propose immediate solutions. The different orientation of divergent and convergent thinking has an impact on the ability to break down the problem and creatively analyze possible solutions (Myszkowski, Storme, Davila & Lubart, 2015).

Furthermore, problem solving activity is also selective, because it includes and excludes some aspects of reality, both in quantitative and qualitative

terms. Therefore, a fundamental phase is problem finding, that is an obvious and useless phase for some people, because they already have the solution (systemic and convergent thinking), while it is a necessary and complex phase for others, who require further information and elements to decide (analytical and systemic thinking). The different orientation and decision making style can be at the origin of tensions and conflicts, but if appropriately managed it is a resource for intercepting cognitive frames and effective decision making alternatives. It also happens that a difficulty lies in the unwillingness of the actors involved to "see" the reality, because they think that the solution would require different skills even in their own area and organizational changes are considered penalizing.

Consequently, the same problem is perceived and defined differently by actors with different personalities, styles, and preference functions. For this reason, the question "what is the problem?" allows each person involved to propose their own point of view: by comparing opinions it is therefore possible to reduce possible cognitive differentiations linked to bias, prejudices, stereotypes, ideologies, etc. As a result, the ability to define a problem broadly or narrowly is tied to each individual's knowledge and experience of that problem. The perceived complexity of a problem depends on the degree of structuring of the same and the characteristics of the objectives. A structured problem is easily definable, has clear boundaries, identifiable and small potential solution alternatives. Complexity increases in unstructured problems, characterized by multiplicity and diversity of objectives, often ambiguous and incongruent (March & Simon, 1958; Payne, 1976, Cyert & March, 1963).

Once the problem has been realized and after having defined and framed it, it is necessary to identify alternative solutions, and this research is the more

difficult the larger and less structured the problem is. Subsequently it is necessary to evaluate them, defining rules and criteria, which also constitute a very powerful regulator of the breadth of the search process for such solutions. Depending on the complexity of the problem, the most appropriate evaluation rule, such as optimization, satisfaction, random, unconscious, intuitive, etc., should be applied. Then it is possible to select the corresponding course of action and make the decision to solve the problem. Rules are different from each other and therefore underlie different decision making processes, illustrated below.

Decision Making

Etymologically, the verb "to decide" derives from the Latin *deciděre*, composed of *dē* and *caeděre*: to cut, to cut away, which involves the selection of a course of action and the exclusion of other possible ones, but of lesser impact and effectiveness. The decision can be defined as the intention to act in a certain way. The different models that allow us to analyze decision making processes can be evaluated based on their ability to link results and objectives to solve problems of different complexity.

The rational-normative model (optimizing approach).

The underlying criterion of this model is typical of classical economics, i.e., the optimization and maximization of results, with the hypothesis of absolute rationality. This model is *rational* because it assumes that decision makers apply a carefully applied set of criteria or rationale for their decisions, and is also *normative* because it is based on observation of the actual errors that decision makers tend to commit.

The decision making process begins with a judgment that a problem exists or a change is needed. Sometimes a problem is an uncomfortable or negative condition to eliminate, other times it can also exist when the decision maker has to set a goal, because a goal also represents a desire to improve on a current condition. Once a problem is recognized and defined, alternatives are sought that could eliminate the negative condition or achieve the goal. The alternatives are assumptions or predictions that certain outcomes will follow, but the relationship between alternatives and their outcomes is not a simple one; for example, several alternatives could be required to achieve a single desired outcome, and some outcomes are intended, while others are unintended side-effects.

At this stage the decision maker has to use criteria to evaluate the various alternatives and the most common are feasibility, time, cost, and personal acceptability.

This model is applicable when the problem is clear, unambiguous and the greatest amount of relevant information is available. Furthermore, the decision maker must be able to identify all the criteria, classify all the possible alternatives and the different consequences of each alternative, in terms of risks that can be assumed. It can be used when the criteria and alternatives are stable over time. in absence of constraints.

Examples of application of this approach are production scheduling, the location of a critical service in a network of users, the design and assignment of work shifts to cashiers in a supermarket, the optimization of the head path of a tool in the machining of a complex mechanical detail, the optimization model for simultaneous operation and the codification of flight problems.

Nowadays, the use of big data, artificial intelligence and algorithms has made it possible to activate decision making processes with optimizing rationality,

at least in intention. Machine learning, understood as a subset of artificial intelligence, concerns the ability of machines to solve problems, giving them the tools to independently learn the correct methodology to operate. In particular, the algorithms are created to allow a study of the data flow, their analysis and comparison, like a real neural net. A critical aspect is that the algorithms created may contain the same biases as the designers. The problem comes from the data, or rather, from how the data are collected and then fed into the algorithms and artificial intelligence software. If the data contain cultural, ethnic and gender biases, distortions in how they are themselves organized, the program will simply reflect, in its behavior and decisions, those types of biases capable of influencing decision making processes and generate systematic errors of evaluation or discriminatory and less than objective judgments (Belenguer, 2022). Discrimination can refer to minorities historically discriminated on ethnicity, gender, social class, sexual orientation, political opinions or any other condition (Zou & Schiebinger, 2018).

The administrative model (heuristic approach)

According to organizational behavior scholars, the decision making process is much less systematic than established by the rational-normative model and the particular conditions just examined are rare and limited. There are two key concepts underlying the heuristic decision making model: bounded rationality and satisficing, neologism coined by Nobel Prize winner Herbert Simon, composed of the words *satisfye* and *suffice* (Simon, 1957; March & Simon, 1958). Decisions are made with limited rationality, because decision makers are able to recognize only a limited number of alternatives and are only aware of some consequences of each of them. Furthermore, human abilities are fallible, limited and information is never perfect. Often, in response to a

problem, organizations will begin a search for "fixes" to that particular problem, with the introduction of a new "program" which focuses on the most easily identified (or accepted) cause of the problem. When these routines and programs exist, decision makers don't need to generate a large listing of alternative responses to a problem and perhaps do not even consider alternative definitions of the problem. Pressures due to cost and time may limit the number of options decision makers want to consider. Instead, as alternatives are suggested, they are compared to a set of minimally acceptable criteria, and the first alternative that meets those criteria is selected. This process is called satisficing, understood as the tendency to accept the first solution that satisfies the minimum criteria established as acceptable. Recent studies have shown how individuals search for a good choice sequentially and stop when they find an "acceptable" one, thus applying a satisficing model and producing good decisions (Caplin, Dean & Martin, 2011).

In everyday reality we tend to achieve satisfactory outcomes rather than maximize expected utility. Consciously or unconsciously, we tend to use *heuristics*, that are practical and common-sense rules to calculate certain types of numbers or to solve certain types of problems. Heuristics are rules or mental procedures useful for generating or finding what we are looking for, for example data, information, ideas for defining and solving a problem, probabilities, consolidated practices developed through our own experience or that of others.

The cybernetic model (trial and error approach)

Some decisions are made cybernetically, inducing routine and automatic behaviors, based on classical conditioning theory (Pavlov, 1927; Skinner, 1938). To decide, it is simply necessary to adopt a "trial-error" strategy and

discern between different types of possible consequences, such as pain-pleasure; acts-does not act; reward-punishment etc. A classic example is when the computer freezes: we have learned, without knowing exactly why, that in these cases turning off and restarting solves the problem. An a-evaluative technique of testing the decision making alternatives of action is therefore used. So, we apply a solution and, if it doesn't work, we continue until we find one that does. Those decisions that work for a particular problem become a repertoire of potentially actions that we apply when we are faced with identical or similar decision problems. Those that don't work are cast aside and not used. Essentially the choices of alternatives in decision making are the imitations of successful actions. For them to work, we must be able to recognize the characteristics of the situation, recognize the similarity to the earlier problem, review the possible solutions for that situation, then apply the solution. Another example of a cybernetic approach to decisions could be some sharing between firms of organizational or technological know-how: these are often approached by benchmarking and best practices imitation. Cybernetic approaches can produce significant effort savings in solving problems, but it should be obvious that they are limited to contexts in which decision making situations occur with similar characteristics over time.

The garbage can model

Many forces in organizations complicate decision making. For example, problems are redefined and decisions modified as different people become involved in the process over time. Even with normative approaches, organizational forces will have an effect.

One approach to understanding organizational decision making that considers these effects is the garbage can model, or organized anarchy (March & Olsen,

1972). This model is based on the premise that some decisions aren't made to solve a problem, but rather they are choices that have already been made and are in search of a problem to which they can be applied, when it is convenient to do so.

It is particularly suitable in those organizations, defined as organized anarchies, operating in contexts of high uncertainty, in which individual preferences are articulated and it is difficult to identify and define problems, outline decision making alternatives and to express preference judgments on the actions to be taken. An idea may be implemented without being intentionally thought of as a solution, or a problem may continue to exist without being addressed, even if ideas for solving it exist (March & Olsen, 1972).

The garbage can decision process consists of four elements: the participants with their various priorities, problems to be solved, solutions to be chosen and applied, decision opportunities. The participants in complex organizations are the many decision makers with different goals and problems. They have limited time and energy, and cannot involve themselves in all decisions. So, their involvement depends on their individual needs, goals, and availability. The participation of decision makers can be direct in that they are directly involved or responsible for resolving the problem. Alternatively, they can be indirectly related to the decision and can influence outcomes. Decision makers may also vary in the priority with which they view the problem. Consider what occurs within cross-functional teams, i.e., teams whose members come from different functions within the organization. While members may bring more ideas and perspectives to the discussion of the problem, they can also bring a different and perhaps competing set of priorities.

Timing is also an important element in this model. The organization is a fluid structure in which people, problems, and solutions flow together and apart at different times. Decisions result from a disorderly convergence of these elements, heavily determined by patterns of timing and opportunities (March & Weissinger-Baylon, 1986). The criterion of choice, in these cases, is not absolute or heuristic rationality, but random. The decision making process is a "garbage can", where elements interact with each other randomly and where a solution (the can) fortuitously attract different types of problems, choice opportunities and participants (the garbage), so that it rarely happens that solutions chase problems and that the latter are solved by unusual participants, in initially unpredictable places and times and with apparently disconnected and unexpected solutions.

Sometimes these ideas are solutions in search of a problem, rather than a problem in search of a solution. As André Gide, French writer, Nobel Prize winner for literature in 1947, stated: «There are no problems, there are only solutions. The spirit of man creates the problem later".

The unconscious-intuitive model

Some research has shown how decision making choices can be made consciously and thoughtfully, or unconsciously and instinctively, depending on the complexity of the decision. Particularly in highly complex ones, it is preferable not to think too much, but to proceed instinctively. Several experiments have demonstrated this fascinating thesis, which goes by the name of the "deliberation without attention "effect (Dijksterhuis, 2006).

How, for instance, does a surgeon, in a few seconds, decide that a patient's life is at risk and what action is necessary to reduce that risk? Or how does a Formula One race driver decide when to try to overtake cars ahead? Or how

does a firefighter decide on a high-risk action to save a life? These decisions appear to be instinctive, unconscious and made without thinking. The explanation is that in complex situations, with a great deal of information to be considered, the brain is able to maintain an overall and systemic view to quickly examine relevant aspects and to formulate the most valid choice at the moment. So, it seems that in the case of high complex decisions it is preferable not to not think too much, but proceed instinctively.

It's not about relying on chance or an unspecified sixth sense, and it's not even about impulsive or hasty decisions: it's a process dictated unconsciously by the union of past experience, knowledge and understanding of the current situation. A famous example is the case of the J. Paul Getty Museum in Los Angeles, interested in purchasing a *kouros*, considered an original statue of 530 BC.

A commission of experts began a complex and sophisticated process of evaluating the statue. After months of work, they finally certified its authenticity and the museum purchased the statue. The art critic Federico Zeri, who was one of the museum's advisors, with a look at the statue's hands, stated that it was a fake. They didn't listen to him and spent a whopping seven million dollars for a fake statue. The art critic had decided "in a blink of one eye", had opened the door to the unconscious and carried out a rapid cognition, supported by great experience, knowledge and understanding of the situation (Gladwell, 2006). Like the surgeon, the Formula One race driver and the firefighter.

Characteristics of the Decision Process

There are certain common characteristics to decision making processes that are useful to consider. Often, we incorrectly focus on the final decision made

as the result of a process, but it is just one of several decisions that were made and which had a significant impact on the success of the outcome. So, there are decisions within decisions. Many decisions we make are trivial, or seem to be so, and are made very quickly. Yet the consequences of a series of small decisions can accumulate into a serious problem. This characteristic is evident in even more common organizational situations. Picture an employee who postpones a call to a customer so as to arrive home on time. Another employee overlooks a detail on that customer's order because he has a headache. Later, a shipping clerk leaves the order off a truck rather than make an extra effort to load it. Taken together, these minor decisions can add up to the loss of a major account.

It is almost impossible to prevent errors in decision making. Most decisions, therefore, never completely solve a problem. Even if they come close, the solution often contains seeds of new problems requiring attention. Since decisions are imperfect, they are partial solutions. This means that it is necessary to follow up on important decisions and to be prepared to modify them.

Organizational politics can show up in decision making in several ways. For example, often decisions to promote one person instead of another may be based on personal factors such as how well the candidates are liked or disliked by the decision maker. Once a pool of candidates has been identified, then the person who is promoted is the one with the "right attitude," and that is defined by the decision maker, even though that person may not be the best of all others in the pool. This is the so-called "good enough theory of promotion" (Tosi & Pilati, 2011).

Personality in problem solving and decision making

The way we decide and solve problems certainly depends on our personality, that is the relatively stable organization of all a person's characteristics, an enduring pattern of attributes that define the uniqueness of a person. The Myers-Briggs approach to personality classifies people according to the ways in which they approach problems and decisions. The model is based on the Jungian concept of psychological type, understood as a system of preferences identified in relation to dichotomous dimensions, which interact in dynamic way, determining ways of thinking, acting, interests, motivations and propensities of individuals (Jung & Baynes, 1921; Myers & Briggs, 1962). Four dimensions are used to describe the personality, underlying these preferences:

-sensing-intuition:

-thinking-feeling;

-introversion-extroversion;

-perceptive-judgment.

Each dimension forms a continuum that people fall along. Sensing-oriented people like structured problems, an established routine, realism and precise and uncomplicated details. They enjoy using decision making skills already learned. Intuitive people prefer new problems, they dislike repetition, and are impatient with routine. They enjoy learning new skills, following their inspirations and jumping to conclusions.

Thinking individuals are unemotional and often, unknowingly, they can hurt people's feelings. They like to analyze problems and put things in a logical order. They seem impersonal and hard-hearted. Feeling types are more aware of other people and do prefer team decisions. They like harmony, are influenced by other people's needs, and relate well to most people.

Introverts prefer quiet concentration and think a lot before acting. They work well alone and can stay with one problem for a long time. Much thought precedes decision making, sometimes without action. Extroverts show impatience with long, slow jobs and like to work fast, uncomplicated by procedures. They prefer to face a variety of problems.

Perceptive people adapt to change and welcome new problems, but they can leave things unsolved and delay decisions without grave concern. They may start too many new projects, postpone unpleasant ones, and leave things unfinished. Judgment types prefer to plan work and follow the plan. They settle things on just the essentials and are satisfied with conclusions. They decide too quickly and dislike switching off a project in progress.

These four Myers-Briggs concepts can be used to improve decision making: people can be taught when it is best to exert their sensing, intuition, thinking, or feeling modes. They can also learn when it is best to pair with each other to improve decision making. This is referred to as the *mutual usefulness of opposites*. The sensing type needs an intuitive to generate possibilities, to supply ingenuity, to deal with complexity, and to furnish new ideas. Intuitive add a long-range perspective and spark things that seem impossible. The intuitive needs a sensing type to bring up facts to inspect, to attend to detail, to inject patience, and to notice what needs attention. The thinker needs a feeling type to persuade and conciliate feelings, to arouse enthusiasm, to sell or advertise, to teach and forecast. The feeling type needs a thinker to analyze and organize, to predict flaws in advance, to introduce facts and logic, to hold to a policy, and to stand firm against opposition.

Decision Making Style and Individual Differences

The decision models we have analyzed show how individuals approach making choices as a function of the situation, the degree of structure in the problem, the amount and quality of information, and the clarity and understanding of objectives. The way that a person usually makes these choices is also, as we have analyzed before, related to one's personality. One dimension is the person's tolerance for ambiguity, whether you prefer well-structured contexts or you can function effectively under conditions of high ambiguity. The other dimension is whether the person has a stronger orientation toward people or toward the task.

A person with a low tolerance for ambiguity and task orientation tend to use a directive approach. They make decisions relatively quickly, focusing on the short term. They are also likely to have strong need for power (McClelland, 1975). An analytical decision style is characteristic of a person with a task orientation and with higher tolerances for ambiguity. They are high in need for achievement in the form of challenges (McClelland, 1975). They seek more information and alternatives before deciding. They know how to confront a new decision context, but they may appear to be slow and deliberate because they want to achieve the most rational results possible. The conceptual decision style is typical of those who are high in need for achievement that is reflected by recognition from others. They have a high tolerance for ambiguity and a strong people, as opposed to task orientation. They often try to broaden the boundaries of the problem and seek creative solutions to the problem.

Finally, the relational decision style is one in which the decision maker seeks to build consensus of those involved in the process. This is typical of a person with a strong need for affiliation (McClelland, 1975). They have a strong

people orientation and a relatively low tolerance for ambiguity that is reduced by achieving consensus.

Bias in problem solving and decision making

Perceptual biases create distortions that are particularly crucial in problem solving and decision making processes. Understanding and awareness of these biases can help to avoid the many and frequent errors when we make a judgment about a problem, a situation, or an action. Let's analyze some of them (Zuckerman, 1979; Kahneman, 2003).

Representative bias: it occurs when our decision is based on stereotypes or similarity to other circumstances. The representative bias often appears in recruitment and selection decisions.

Availability bias: this is a heuristic that results from the ease with information that comes to mind, such as information salience, very vivid cues, or something that is particularly relevant and important to the decision maker.

Affect bias: the decision is based on the positive or negative feelings that the decision maker has toward the problem or the situation.

Anchoring bias: it occurs when a decision is based on a single factor which is used as a basis for a decision. Essentially, we start with some given factor or value, and then we adjust it to arrive at a judgment. One study examined the anchoring effect on charitable donations. When simply asked for a donation, people found it hard to determine what an acceptable amount would be. However, when some amount was suggested, if it was reasonably low, there were very substantial increases over the rate of giving than when no amount was suggested (Zhang, 2024).

Another example is the halo effect, when we make a judgment about a person's ability to perform a number of tasks based upon how well he or she

performs a single job. It happens the same when we judge a person to have the best qualifications for a position based on the fact that he or she graduated from a famous and important university.

Consistency bias: when a person behaves the same way in similar situations, we are more likely to see the behavior as internally motivated, such as when a friend is almost always late.

Consensus bias: when a person acts differently than others act in the situation, we are more likely to think of that person's behavior as internally motivated.

Privacy bias: decisions that are made in the absence of other people are more likely to be judged as internally motivated. When others are present, we might attribute the decision to social pressure. When people are alone, we attribute the decision to them.

Status bias: in general, higher-status people are seen to be more personally responsible for their decisions. They are thought to have more control over their own decisions and do things because they choose to, not because they have to.

Self-serving bias: this is the tendency to perceive oneself favorably. People credit themselves when they succeed but blame external factors when they fail. Success is usually attributed to hard work, ability, and good judgment. Failure, on the other hand, is attributed to bad luck, unfair conditions, or impossible odds.

Myths in decision making

Some characteristics of decision making processes should be demystified or in any case considered in the right perspective, looking at what happens in everyday reality in organizations. We therefore analyze some of the main

myths about the role of CEOs and managers in strategic decisions (Bazerman & Chugh, 2006; Roberto, 2005).

CEOs make strategic decisions. It is a common belief that strategic decisions that affect the organization are made at the highest levels and more often by the CEO. Actually, these major decisions take shape from processes of negotiation, bargaining and dealing with coalitions or managers in the firm. In short, the CEO may make and ratify the final decision, but it often emerges from decision making microprocesses at various levels of the organization.

A single team makes all of the big decisions. A lot of attention has been paid to the "top management team," usually thought of as the key group of advisors, including the CEO, that makes major decisions. It is more likely that instead of a single group, there are several subgroups, each made up of a different set of top managers who advise the CEO on diverse decisions.

The executive team is a body of equals. There is usually a status and power hierarchy within each top management team, giving some members more influence than others. In addition, it is likely that depending on the problem, the CEO may rely on the team member which is thought to be the most reliable.

Team members should always adopt a CEO perspective. It isn't likely that all team members can take the broad view that the CEO must take. Often a team member will be more concerned with his or her own unit or functional area of responsibility.

*Decisions are made in rational ways***.** The concept of organizational rationality is that decisions are made which will maximize firm performance and after a careful analysis of information. This is a pretty common-sense notion that implies that smart people, before deciding, think carefully, collect data, analyze the data and then decide using intuition and experience, but no

one is immune to the cognitive biases in all stages of analyzing problems and making decisions. A classic example is the "sunk-cost bias", a decision to increase time, money and resources already invested in an earlier decision. There appears to be a sort of "no-return-threshold" where it is difficult for the decision maker to recognize that the sunk-cost are greater than the gains of abandoning the earlier wrong decision social pressures also play an important role in decision making, especially for those with a strong need of affiliation or with the desire to meet expectations of others (McClelland, 1985).

Emotions also play an important role, providing energy and motivation to make choices or, in some cases, paralyzing decision making completely. Finally, political motivation may have positive or negative effects through the creation of coalitions, lobbying or other tactics.

*Managers analyze, then decide***.** The traditional problem solving technique is to (1) identify and define the problem; (2) collect data and information; (3) identify alternative solutions; (4) evaluate the various alternatives; then (5) select an action to be taken. However, it has been shown in research the process is often non-linear: activities such as evaluation of alternatives, problem definition and data collection may take place concurrently (Eisenhardt & Bourgeois, 1988).

*Managers decide first, act second***.** Decision making and the following action are not necessarily the norm, actions are not in necessary logical sequence. Take the case of a company which pursues a strategy of diversification. You might think that managers at some point take the decision to penetrate new markets and launch new products by investing in new technologies. In reality this decision is not always deliberate, but can be part of an emerging strategy and, as such, without a beginning and an end precisely. Decisions are often

more a back process of an action: a sort of sense-making process, “ex-post rationalized” (Weick, 2009).

Managers recognize the relevant factors when making decisions. Because many managerial decisions have significant implications for the success or failure of the organization, there is a tendency to think that they are made after careful considerations of the important factors involved. Some have argued, though, that when these critical decisions are made the manager may be in a state of “bounded awareness", a tendency to fail to recognize information that is readily available but ignored (Bazerman & Chugh, 2006). This can occur when you are too highly focused on a specific task. One reason is that decision makers often prefer to use information readily available that they believe is necessary for choosing, instead of identifying other information that might lead to a better decision. Bounded awareness might also occur because of the “success syndrome,” or the case when an organization has been very profitable in a particular market segment and ignores threats from external organizations or technologies in its environment. It is very clearly shown in a study by Neisser (Neisser, 1976; Neisser, 2000). The subjects were asked to watch two videos in which three actors played with a ball. In one video the players wore white shirts and in the other, dark shirts, otherwise the videos were identical. One other cue in both videos was a woman, walking in the background with an open umbrella. The viewers were asked to count the number of times the ball passed from one player to the other. Because they were focused on counting the number of passes of the ball, only 21% of them “saw” the woman, though she was clearly visible.

Conclusions

As we look at individual decision making, we can describe how people typically behave, including the errors they make. Once we understand these behaviors, we can turn to ways to improve individual decision making. Thus, while this discussion follows the steps in the rational process, it provides equally useful ideas for dealing with issues suggested by non-rational models of decision making as well. Someone else often makes us aware of a problem and this can result in us spending considerable time and resources towards resolving a problem that may, in reality, not exist or that may be a symptom of a larger problem. That is why problem selection and definition are so important. To avoid decision errors, it is useful to use a "controlled" approach to information processing as an approach in which we pause and reflect on the situation as well as the person and try to identify both the situational forces and the personal causes of behavior, before making our judgment.

Furthermore, we can improve problem definition by properly framing the situation in a way that leads to good solutions. There are several things that we can do. The first is to work toward a thorough definition. A second is to avoid the tendency to jump prematurely into solutions before the problem is completely defined. The third comes into play if you fail to do one of the first two. That is, if you have a solution in mind, ask yourself to link that solution back to some aspect of the problem.

The way in which solutions and ideas are generated makes all the difference in the effectiveness of our decisions. One important practice is to separate idea generation from idea evaluation. This suggestion is based on the idea that when you evaluate an idea, you cut off the generation of other ones. A positive evaluation is more harmful than a neutral or negative evaluation. If you are neutral toward, or dislike an alternative solution, you have an

incentive to generate another one, but if you like an alternative, you might stop your search right there. Another way can be taken to organize alternatives into different clusters before evaluating them. Suppose a manager is deciding how to reduce plant accidents. Alternatives might fall into distinct categories, such as machinery improvements, changing work hours, employee training, and so forth. These clusters may then be evaluated for easier decision making. Another often overlooked step is to establish criteria to use for evaluating alternatives, and they can then be weighted by importance before the process goes further. Criteria are not easy to establish, but doing so and making them explicit can help decision making immeasurably.

Bibliography

Bazerman M., Chugh D. (2006), "Decisions without blinders", *Harvard Business Review*, January.

Belenguer L. (2022), "AI bias: exploring discriminatory algorithmic decision-making models and the application of possible machine-centric solutions adapted from the pharmaceutical industry", *AI Ethics* 2, 771-787.

Caplin, A., Mark D., Daniel M. (2011), "Search and Satisficing." *American Economic Review* 101 (7): 2899–2922.

Cyert, R. M., March, J. G. (1963). *A behavioral theory of the firm.* Prentice Hall/Pearson Education.

Dijksterhuis A. (2006), “On making the right choice: The deliberation-without-attention effect”, *Science*, 311, pp. 1005-1007.

Eisenhardt K., Kahwajy J., Burgeois III L.J. (1997), “How management teams can have a good fight», Harvard Business Review, July-August, pp. 111-121.

Gladwell M. (2006). *Blink*. Penguin Books.

Jung C.G., Baynes H.G. (1921), *Psychological Types, or The Psychology of Individuation*, London, Kegan Paul Trench Trubner.

Kahneman, D. (2003), A perspective on judgment and choice: Mapping bounded rationality. *American Psychologist, 58*(9), 697–720.

McClelland D.A. (1985), *Human Motivation*, Glenview, Scott, Foresman.

March J.G., Simon H. (1958), *Organizations*, New York, John Wiley & Sons.

March J.G., Olsen J.P. (1972), “A garbage can model of organizational choice”, *Administrative Science Quarterly*, 17, 1-25.

March J.C, Weissinger-Baylon R., (1986), *Ambiguity and Command: Organizational Perspectives on Military Decision Making*. Publisher, Pitman

Myers I.B., Briggs K.C. (1962), *Myers-Briggs Type Indicators*, Princeton, Educational Testing Service.

Myszkowski, N., Storme, M., Davila, A. and Lubart, T. (2015), "Managerial creative problem solving and the big five personality traits", *Journal of Management Development*, Vol. 34, No. 6, pp. 674-68

Neisser U. H. (1976), *Cognition and Reality: Principles and Implications of Cognitive Psychology*, San Francisco, W.H. Freeman.

Neisser, U.H. (2000), *Ira, Memory Observed: Remembering in Natural Contexts*, New York, Worth.

Payne, J. W. (1976). "Task complexity and contingent processing in decision making: An information search and protocol analysis", *Organizational Behavior & Human Performance*, *16*(2), 366–387.

Pavlov, I. P. (1927), *Conditioned reflexes: an investigation of the physiological activity of the cerebral cortex*. Oxford Univ. Press.

Roberto M.A. (2005), *Why Great Leaders Don't Take Yes for an Answer: Managing for Conflict and Consensus*, Philadelphia, Wharton School Publisher.

Simon H.A. (1957), *Models of Man*, New York, John Wiley & Sons.

Skinner B. F. (1938), *The behavior of organisms.* Englewood Cliffs, NJ: Prentice-Hall.

Tosi H., Pilati M., (2011), *Managing Organizational Behavior – Individuals, Teams, Organization and Management*, Edward Elgar Publisher

Weick K.E. (ed.) (2009), *Making sense of the organization: The impermanent* organization, New York, John Wiley & Sons Ltd, vol. 2.

Zhang, T. Y. (2024). "The Effect of Anchoring on Charitable Donations". *Open Journal of Social Sciences*, 12, 160-167.

Zou J., Schiebinger L. (2018), "AI can be sexist and racist-it's time to make it fair", *Nature*, vol. 559(7714), 324-326.

Zuckerman, M. (1979), "Attribution of success and failure revisited: or The motivational bias is alive and well in attribution theory". *Journal of Personality, 47*(2), 245–287.