INFORMATION TECHNOLOGY IMPACT ON DECISION PROCESS

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Abstract:
Underlying trends in the information-management firms are several assumptions, mainly technical and economic, which facilitates understanding highlighting multiple mutations occurring in contemporary firms. This paper pursues an interdisciplinary approach, focusing on the impact of information technology on decision-making.

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JEL classification*: C88, M15*

1 Interdisciplinary scientific approach

The decision, generally, is finding the process through which a choice, a choice between two or more alternative courses of action available, in order to achieve a goal or more. The process of obtaining this conclusion or option is known as "decision-making process." According to the concept known American specialist and professor in management, Herbert Simon, developing managerial decision is synonymous with the entire management process.

You must remember that one of the essential functions of management is planning. Thus, planning involves a series of decisions: "What should be done? When? How? Where and by whom? "

Therefore, content planning is basically a series of decisions. But other functions of management is a ***lot of chains*** and independent ***decisions***.

One of the main assumptions of management science is that the development decision, regardless of the situation involved, can be considered as a general process, systematic, consisting of the following steps:

1. problem definition;
2. search and discovery of alternative action;
3. evaluation of alternatives;
4. selecting an alternative.

Can see a lot of confusion regarding the two concepts, "developing decision" and "problem solving". A common way to distinguish between the two concepts is to consider the whole process (steps 1 - 4) as "problem solving" and the specific stage of "an alternative selection (4th round) as" developing decision "or the proposed solution to the problem.

Another view considers that the four stages of decision-making component, which is completed in one option, while solving the problem would include the implementation option.

There is a similarity between the decision making process in general management and scientific analysis. Scientific approach (or method) is a formalized process of causality, which consists of the following steps:

I. Defining the issues involved and determine the conditions observed, ie analysis and problem definition;
II. Making observations in different conditions, to determine the reaction system containing the problem;
III. Based on observations, devising a hypothesis to describe how actors interact, or who is the best solution to the problem;
IV. Hypothesis testing, design an experiment;
V. Conducting the experiment and the measurement results and their registration.
VI. Analysis and accept or reject the hypothesis.

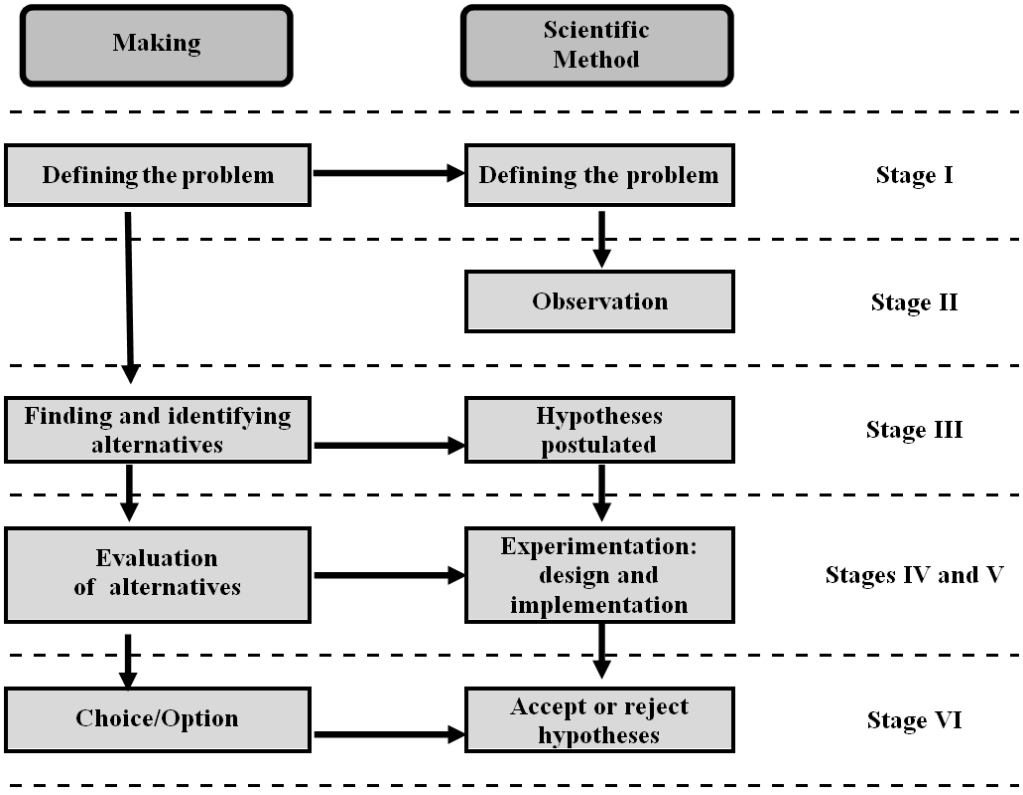

Figure 1: Relations between scientific approach and decision-making

All six stages of the scientific method can be applied in decision making. General relations of the scientific approach to decision making are shown in Figure 1. Management Science uses the scientific approach to solving the problem.

For each of the steps outlined in Figure 1.1, some methodologies of management science and decision theory have been designed, developed. These methodologies of management science - decision theory are interested mainly concentrated around the idea that organizational problems and the organization itself are considered as systems.

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2 Systems Theory

A system is a lot of people, concepts and procedures for executing a function interact to serve an identifiable purpose. A clear definition of the function or purpose is most important..

Concept level (hierarchy) system shows that all systems and subsystems are actually here all can be included in a larger system. For example, a bank will include it as sub:

- Commercial loan department;
- Department of public officers;
- Department of economy;
- Operations department, etc.

but the bank itself may be a bank branch which is in turn the General part of the banking system of a country or international etc.

a) Structure of the system

Systems generally consist of three distinct parts: inputs, processes, outputs. They are surrounded by an environment and are commonly linked by a feedback mechanism, ie a reaction mechanism based on the results.

• *entries* include those elements into the system, eg raw materials for a manufacturing company or a university students.

• *processes* are necessary elements to change entries results in output. For example, a university, the processes may include the procedure for teaching, learning methods, testing technology and using educational facilities, laboratories and libraries.

• *outputs (results)* describe the consequences of the existence of finished products or systems. For example, university graduates and licensees are the result.

- *feed-back* - the flow of information for decision makers¬ concerned, the outcome or output size of the system. Based on this information, decision-maker may change either inputs or processes, or both.
- *environment* - there are some items outside that are neither inputs nor processes or outputs (results). However, they have an impact on system performance and, accordingly, the system achieve the goals or objectives. These elements are collectively environment. One way to identify environmental elements is to answer two questions, namely:
  1. It is possible to manipulate, the controlled item?
  2. Element that creates problems on purpose or objectives of the scheme?

If and only if the answer to the first question is "No" (negative) and the second "yes" (positive), the item will be considered part of the environment. Environmental elements may be social, political, legal, physical, economic and others. For example, a university, neighbors, community and regional society are environmental factors.

b) Graniţa mediului

A system is separate, enclosed environment of a border. The system is inside the border, and environment outside. *Boundaries can be physical* (eg, department of computer science "is in body building, B, ground floor) or can be *non physical borders* (as if the organization boundaries delimit a time to make a analysis).

When systems are studied, is necessary to define boundaries in order to perform the analysis, because the borders are inextricably linked to concepts of open or closed system.

Closed or open systems. Because each system can be considered as a subsystem of another application of systems analysis is endless. Hence the need to address practical problems of limitation, the containment analysis defined borders, leading to the concept of "closed system".

Closed system is one of the two ends of a continuum, while the system is open to the other end. Continuity will reflect the degree of independence of the system. Closed systems are completely independent, while open systems are very dependent. A closed system is considered to be isolated from environmental influences. The system accepts inputs from the environment and can provide, delivering outputs / results to it, but without any interaction and feedback type information during transformation processes.

A special type of closed system and while it is now well known folk, "black box". In a "black box" inputs and outputs are well defined, but the process itself is not specified. Managers often treat management science models and computational systems such as systems, "black box", since they do not care how the models work, but are interested and focus only on inputs or outcomes. They also considered the systems computer or TV, or use them without interest mode of action.

Open systems. They exchange information, matter and energy with the environment and living systems are the best examples of open systems. Organisations are also open systems that continually adapt and change according to changes in their environment.

Management Science recognizes that a decision in one department, part of the organization, may have significant effect not only on the department concerned, but also on other operating departments, other organizational parts. So whenever possible, should be considered an organizational point of view fully. Such an approach is called *systemic approach*.

c) Efficacy and effectiveness of systems

Effectiveness is defined as the level or share the objectives have been achieved. She is so concerned with the results or output system. Hence I conclude that the *effectiveness is synonymous with performance*.

Effectiveness is often confused with efficiency. Effectiveness measures the extent, the obtaining / objective or objectives, while efficiency measures how well resources were used. Effectiveness not necessarily imply efficiency.

A system can be effective but may be ineffective if it aims to achieve very high costs. Furthermore, a system can be effective, making best use of resources, but ineffective, failing to achieve / achieved its objectives.

Management Science is interested in improving managerial decision in order to reach decisions that will produce the highest yield - a situation called *optimality*.

But in many management systems, particularly those involving the delivery of human services (such as education, health, tourism, etc.), measuring the effectiveness and efficiency is a difficult problem. Because of these difficulties is the existence of several objectives, often unidentifiable and indirect costs and benefits involved.

In recent decades, several methodologies were developed to measure efficiency and effectiveness of these actions less tangible. Some *methodologies* have been developed under the name: *cost effectiveness*, *cost-benefit analysis*, *systems analysis*, etc.

3 Interdisciplinary approach

Most problems have a variety of managerial economic, engineering, sociology, mathematics, biological, psychological and physical. It is made up of a *multidisciplinary team* approaches and progressive, even revolutionary to old problems. Thinking or perspective each discipline seeks to define and draw the essence, "content problem" and its structural relationship compared with similar problems, considered a priori, the traditional view, only a domain specific or characteristic or areas of knowledge.

By identifying, shaping and defining analogues, the researcher can then determine if the problem under study is right, comparable to traditional success in the field. When we are dealing with teams of researchers from several fields or disciplines, it is possible a multitude of diverse approaches, which also broadens unidisciplinară approach, but most importantly it provides ways to solve the problem, sometimes completely different, discovering new aspects of the problem and contribute to a high level of managerial creativity.

4 Models

Using models, especially mathematical models, the backbone of management science or decision theory. *A model* is a simplified and abstract representation of reality. It is usually a simplification, because reality is too complex to copy it exactly and also very much and because of this complexity of reality is irrelevant for a given specific problem. Meanwhile, in practice it is difficult to obtain simultaneously simplified and representative features of reality.

Such a model can be simple, but without being representative of reality. Representation systems or problems with models can be done at different levels of abstraction. Models can be classified according to level of abstraction in three main categories:

• *Iconic* (*scale*). An iconic model (least abstract) is a natural response of a system, usually at a scale different from the original. This response can be achieved in *three dimensional space*, eg an airplane, a car, a bridge, etc. made to scale. Photographs, plans or drawings to computer icons are all types of scale models, but a *two-dimensional space*.

• *Analog*. An analogue model does not show as the real system, but also behaves's. Such models are two-dimensional maps and diagrams, which represent individuals, but their content differs from that of systems. In this sense we can see an example of flowcharts which organizaţio-tional structure, authority and accountability relationships, with a map in different colors representing landforms, or graphics market structures, etc. As can be inferred, analog models are more abstract than iconic.

• *Mathematics*. Complexity of relationships in some systems can not be represented physically or physical representation can be cumbersome, bulky and require a long construction or manipulation. Hence the need for a more abstract model to be built and manipulated using mathematics. This model can describe various situations and can be more easily handled for testing and forecasting. Recently, modeling has become more common due to the simulation, decision support systems and expert systems.

There are several reasons to use the theory based decision model in general and mathematical models, in particular:

a) the models are able to achieve time compression. Operations or activities conducted by the organization over the years can be simulated in minutes or seconds on the

computer.

b) holding pattern is easier than handling the whole system, so experimentation is easier.
c) the cost of committing an error or more in experimentation, especially in the trial and error is much smaller when the model experiment is performed.
d) contemporary environment involves considerable uncertainty. Using modeling allows a manager to calculate the assessed risks in decision making;
e) cost modeling analysis is lower than if a similar experiment was conducted as a real model.
f) models emphasize and reinforce learning and education management.
g) use of mathematical models is capable of rapid identification and analysis of a very large number of possible solutions.

5 Use of IT techniques. Conclusions

Many management issues are complex, involving numerous interdependent variables. Finding and evaluating alternatives, especially for sophisticated models can be transformed into a megaproiect calculations. In this manual approach is impractical or impossible due to excessive time complained of calculations, which necessarily requires the use of computers.

In addition, computers, besides solving the required calculations models, provides collection, storage, retrieval, restoration and analysis datelelor and also validate the models. Computers are used to assist and help implement, especially using sensitivity analysis capacity model with the question "What if?" And graphical presentation, which may make implementation easier, so that managers can understand and use the model results

Using computers has become closely associated with quantitative analysis and operational research, decision theory and management science. Computers have the great advantage of relatively cheap computing tools, precise and flexible experimentation deemed essential in resolving managerial decision models.

Computer can be equipped with instruments to address those issues that require more time to be quantified and are conceptually too complex or time consuming to be resolved manually. Without computers, while decisions were issued, the information on which they relied was outdated and often resulting consequences were too weak or diminished. Time computer performance has increased, while procurement costs were reduced data and calculations. As a result, the use of computers in management science has become a normal fact, even mandatory.

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