

DECISION-MAKING FACTORS IN THE PROCESS OF MODELING ONLINE BUSINESS

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ABSTRACT

Models are “abstract structures that help us understand the real world when the situations we are in are too complicated, too dangerous or take up too much time or money to be examined directly. Models simplify things, leaving aside unessential or minor elements.”⁴

In order to assign the term model to classes that are as precise as necessary, we need to leave out all irrelevant information, in order to simplify it as much as possible.

Keywords: modeling, business, Internet, decision

1. INTRODUCTION

In the opinion of the English economist John Hicks, “a model can be defined as a design in which certain elements of the situation that we wish to examine are selected so that the interactions of these elements can be deduced rationally, in the hope that our general understanding of the situation can be enhanced through the understanding of that aspect of it that is presented by these particular elements.”

J. Hicks’ conviction on the model allows the extrapolation of the scope of the notion to any design that logically and coherently simplifies reality and offers the researcher extra knowledge. A model should be in conformity with reality; mathematical formalization can be useful and necessary or not.

Increasingly more often, there is the tendency to grant the economic model the significance of a mathematical formalized model. According to the definition given by the French economist A. Vincent, an economic model is “the simplified, but complex representation of the economic evolution of a society throughout a given period of time, from the point of view of figures. From a technical perspective, the model describes the functioning of an economic system through a series of simultaneous equations that express the relationship

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⁴ Onete, B., Modeling in the Science of Commodities – An Approach from the Consumer’s Perspective (Modelarea în ȋtiința mărfurilor- O abordare din perspectiva consumatorului), Bucharest, ASE Publishing House, 2010, page. 55

existing between measurable economic parameters which are considered significant for the functioning of the system”.

2. DIRECTIONS OF MODEL USAGE IN DECISION-MAKING

- the forecast of performances for the system that is to be modeled;
- simulation is reversible; the experiments can be made more easily, costs and risks are lower than in the case of the real system;
- the understanding of the business environment;
- helping the decision-maker to evaluate potential alternatives;
- increasing system performance through the use of What-if.

The process of doing business is in continuous transformation, and the directions are given by the social-economic environment. Thus, the transformation occurs in the way competition takes place on the market, in the organization of companies and in information-processing technologies. Hence, intensified pressure is created on decision-makers in the field of business, and new requirements appear in the manner in which decisions are elaborated and made.

The decision is made by someone who pursues certain objectives and consists in choosing a variant out of many, and in engaging on a particular direction of action through the use of various material, financial and human resources, and of accumulated knowledge. This process does not necessarily lead to the fulfilment of the desired objective.

Decision-making can be influenced by factors that are not always controlled by the decision-maker.

The decision made as a result of market research and mathematical calculations is not always the best solution. Sometimes intuition can lead to better results irrespective of the quality of the decision. That is why the quality of a decision should not be judged only from the perspective of the result that is obtained, but from the angle of the available information, of the number of identified decision variants and of the reasonings that are used at the time of decision-making. In making a decision, besides the data that represents the outcome of simulation and modeling, a documentation on the spot must be performed in order to have a bird's eye view on the matter.

The analysis of decisions through modeling and simulation helps the decision-maker to better understand the matters, which increases his/her chances to get to the desired result or to be more prepared to face unexpected developments that are independent of his/her will.

In business, decision-making is vital for its good functioning. That is why establishing the frontiers of the system on which action is intended is necessary. This system can be any business in which all actions are interdependent, forming a whole that is organized in view of reaching a common goal.

3. EXTERNAL FACTORS THAT INFLUENCE DECISION-MAKING

Most of the time, the business is influenced by external factors that cannot be controlled by the decision-makers.

These external factors are in fact a real system to which the business relates, regardless of the environment in which it activates.

In Romanian ecotourist businesses, the real system is used by the decision-maker to experiment certain decision variants, based on a schedule, often taken as a result of no preliminary analysis of the system, but based on intuition.

In some situations, modeling may take up fairly significant material resources, or resources that are impossible to produce physically. Thus, the design of a model that simplifies reality is necessary, but the model should be rigorous enough to be useful. Besides the decrease in complexity, the model brings to the analyzed system the improvement of communication, time compression, less material resources necessary for the analyzed business and the evaluation of various decision variants, as well as the avoidance of unpleasant situations that may emerge in the case of experiments in the real world.

A model⁵ is considered as representative for its implementation in reality if it can be built starting from a simple model, with the increase of complexity as the modeling process unfolds. It can be obtained by defining the frontiers of the system, as one takes into account only the necessary characteristics in relation with the desired objective and then, in order to fulfil the requirements for model validation, the relaxation of limits or the use of simplifying hypotheses.⁶

Models are separated into three categories: *physical* models (models of planes, machines, buildings etc.), *symbolical* models and *analogical* models (diagrams, graphics, maps, speedometers etc.).

Symbolical models are the most abstract ones. Within them all concepts are presented through quantitatively-defined variables and all relations are mathematically represented. That is why they are also called *mathematical models* or *quantitative models*.

Analogical models are the most common because they emerge under the form of diagrams or graphics, as these are the easiest to use, being the most representative.

A model entails a series of elements (see the next chart):

- a) decision variables, which are controllable (these variables characterize decision variants);

⁵Oakshott, L., *Business Modelling and Simulation*, Pitman Publishing, 1997

⁶Onete, B., *Modeling in the Science of Commodities – An Approach from the Consumer's Perspective (Modelarea în ȋtiința mărfurilor- O abordare din perspectiva consumatorului)*, Bucharest, ASE Publishing House, 2010

- b) parameters and/or uncontrollable variables, which can contribute to the fulfilment of the desired objective and which influence the previously-established performance criterion, and dependent variables which reflect the effectiveness of the application of one decision variant and which help the understanding and interpretation of results.

According to the type of data that is being used, models can be *deterministic*, *probabilistic* and *stochastic*.

Deterministic models are those models that employ data that is known for sure.

The design of these models is an iterative process. We start from a simple model and its complexity is increased as the understanding of the system behavior evolves. The design of a model has to follow certain steps:⁷

1. formulating the matter
2. defining the system environment
3. actual design of the model
4. model validation
5. model usage

The first stage in a modeling cycle is the definition of the frontiers of the system, and the purpose of its analysis, as these will influence the collected data and will give the model complexity.

In the second stage the data that needs to be collected gets established, as well as the manner of its collection.

The third stage consists in the analysis of the collected data. This analysis will highlight aspects that lead to the necessity of collecting new data or to the preservation of the initially-collected data.

In the fourth stage we have the actual design of the model, which depends on the type of model; it is very important for the initial model to be as simple as possible.

⁷ Onete, B., Modeling in the Science of Commodities – An Approach from the Consumer’s Perspective (Modelarea în ȋtiința mărfurilor- O abordare din perspectiva consumatorului), Bucharest, ASE Publishing House, 2010

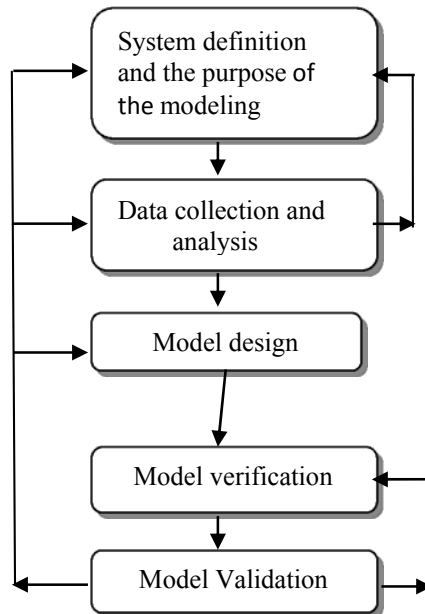


Chart 1.1: The cycle of a system in the modeling process

Source: Oakshott, L., *Business Modelling and Simulation*. Pitman Publishing, 1997

After the design of the model, its correctness needs to be checked. The verification process depends on the type of the model, but generally it entails the confirmation that the model corresponds to the requirements for which it has been designed and that it is in conformity with reality. This verification can be made using the Microsoft Excel programme, a very efficient data processor. One can use functions such as optimization, scenarios, the solver, the “what if” analysis, as well as other statistical functions for the calculation of amortization, interest, rates and functions of profit maximization.

The last stage is model validation, which is different from the verification stage, as it establishes whether the model produces results whose values correspond to those that can be observed in the real system. If the real system does not exist, similar systems can be used or we can resort to experts to analyze the results. The verified and validated model can then be used to perform “what if” analyses.

To design a model, we must take as a reference the real system and then establish the relations between variables. Most of the time, the graphic representation is the most efficient, and it helps the decision-maker to establish the variables. To this end, the data method must be used, with the help of which the model equations are established, as in chart 1.1, as well as the model variables, graphically represented in chart 1.2.

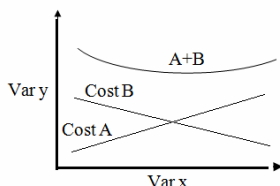


Chart 1.2: Establishing model variables

Source: Moore, J.H., Weatherford, L.R., *Decision Modeling with Microsoft Excel*, 6th ed., Prentice-Hall, Inc., Upper Saddle River, NJ, 2001

The decisions made with the help of the modeling and simulation process are reached through the analysis and processing of information, as well as through the decision-maker’s intuition, imagination and creativity. Most of the time, decision-makers are managers and the ones to design and adopt the solutions.

Also, Moore and Weatherford consider that the manager’s major involvement in the modeling process is very important for the success of the application of a model in the decision-making process.

The superior area of Chart 1.3 refers to the modeling process. Through this modeling process we may obtain a recommendation for a course of action that adds value to the manager’s intuition and experience. This indirect path presupposes the abstractization of the managerial situation through a model that represents the essence of that situation. The solution will be interpreted in relation to the real system, taking into account the elements that have been eliminated as a result of the abstractization. If the solution is viable, it can complete the knowledge based on the manager’s intuition and experience; thus, the modeling process will contribute to both the elaboration of a better decision and to the understanding of the matter, consequently enriching the manager’s knowledge.

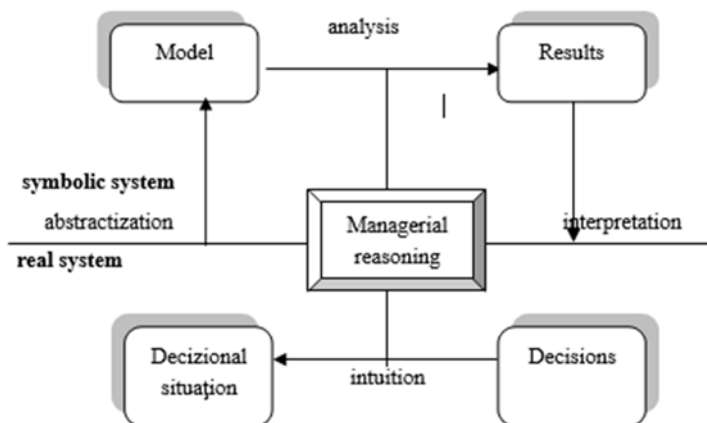


Chart 1.3: The role of the manager’s reasoning in the modeling process

Source: Moore, J.H., Weatherford, L.R., *Decision Modeling with Microsoft Excel*, 6th ed., Prentice-Hall, Inc., Upper Saddle River, NJ, 2001

In the inferior area of Chart 1.3, we notice that the modeling process may allow the relaxation of limits, or the existence of certain hypotheses that help us obtain a representative model for the reference system.

A model can be improved through the redefinition of limits or through the relaxation of the hypotheses, so that the model should adequately represent the analyzed system, thus making up a modeling cycle.

4. THE UTILITY OF BUSINESS MODELS

The utility of business models⁸ is expressed by a series of characteristics in public services: user necessity, service reliability, the possibility to use them with utmost efficiency. This paper analyzes online business models and their benefits for society, and, implicitly, for business people.

The use of computers is permanently more widespread, especially in the urban areas, and Romanian ecotourism is increasingly relying on online promotion. Computer networks have expanded, thus allowing the creation of websites on which every pension owner can be present without having his/her own website, but simply by registering on a database as a website that allows the consumer a clear view of the market supply in the shortest time, without having to navigate on the Internet too long. Therefore, once the interest in online services has increased, the computer has started playing a particularly important role in trade, services and in the life of every individual.

Computers have become an important part in the lives of a lot of people. Those who use the Internet do that both as part of their professional life and for personal matters. According to a study made by The Financial newspaper in January 2012, on 200000 people aged between 15 and 40, an individual spends an average of 5 hours a day in front of the computer. Hence, we may conclude that the Internet has become a necessity, be it for communication via e-mails and instant messenger, for the payment of bills and the administration of personal finances, or for hobbies, entertainment and socialization; computers have become an essential instrument.

Indeed, the variety of tasks that computers can perform nowadays would have been difficult to foresee two decades ago.

For every business model there are factors that influence the business, according to its nature. In order to understand the nature of the ecotourism online business model, it is essential to place the business in a general business context. An online business model is nothing but a method to generate material resources. Every online business model has its specificity, which differentiates it from other models and which creates and adds to its value.

⁸ Rappa M.A. - The utility business model and the future of computing services, IBM Sistem Journal, vol. 43, no1, 2004

In any industry, be it tourism or some other, the methods to do business can be extremely varied, the limits being imposed by technological factors, by allocated budgets, by competition, and, most importantly, by consumer demands (expectations, preferences etc.).

Throughout the years, a few attempts to classify business models in usage have been made, especially as far as the Internet is concerned.

Globally, during the nineties, online purchasing drew great attention to business models. In the case of Romania the situation is different; Romanians started using the Internet massively after 2000, and trust in online purchasing came later, and has increased exponentially every year.

Hence, the Internet has opened a door to new opportunities for online businesses, but a lot of business people did not consider that profit can be made from these; they thought that the Internet was just an instrument for brand promotion, that it would make them known on the market. These business people continued to focus on traditional business.

Nevertheless, during the past two years Romanians have adapted rapidly to the age of the Internet, and nowadays one cannot discuss business models without taking it into consideration.

In order to understand the nature of the business model in Romanian ecotourism, it is useful to place it in the general context of business first.

An approach regarding the classification of online models, or e-business models, as they are also known, is a comprehensive taxonomy concerning customer relations. Although it is not the only approach, it turns out to be a useful framework, as it relies upon common language that is already used in the description of business models. In practice, there is a great diversification of business models, which makes their analysis quite laborious.

E-business⁹ can have the following classification:

- business-business (B2B)
- business-consumer (B2C)
- business-administration (B2A)
- consumer-administration (C2A)
- consumer-consumer (C2C)

⁹ Rappa, M.A.- The utility business model and the future of computing services, IBM Sistem Journal, vol. 43, no1, 2004

To put things in perspective, as far as business based on online business models is concerned, a new outlook is emerging. Demand is continuously increasing, from the part of both users and business people.

Users have come to depend on web services, for the payment of their bills, shopping, vacation planning, socialization and for various information. These services save time and money spent on material resources.

E-business is based on electronic resources that a company uses to manage business efficiently, in comparison with *e-commerce*, which defines the models through which the company website offers the possibility to sell products online. *E-purchasing* presupposes the acquisition of goods, services and information through electronic media. By moving their acquisitions online, companies have saved millions of euro. *E-marketing* describes the process through which companies inform their customers, through which they promote and sell their products and services with the help of the Internet. The terms that begin with “e” are many: e-finance, e-learning, e-service etc. One can notice that this “e” will be given up when most businesses will be done in an electronic environment.¹⁰

The informatic solutions for e-business allow the integration of the internal and external processes of the company. Electronic business can be administered using technologies such as: the world wide web, the Internet, the intranet, the extranet or combinations of these.

The applications that are used for e-business can be divided into three categories:

1. Internal systems: ERP (Enterprise Resource Planning), CRM (Customer Relationship Management), HRM (Human Resources Management), DMS (Document Systems Management);
2. Communication and collaboration within enterprises: VoIP systems (Virtual Telephony Systems), CMS (Content Management System), e-mail, voice inboxes, online conference systems, teleshopping, catalogues available on DVD;
3. Electronic commerce of the types B2C and B2B: they are socialization websites, online shops that advertise for their products and services, the management of supply chains or online marketing.

5. CONCLUSIONS

Throughout the years, a lot of attempts to classify business models used in practice have been made, especially regarding the Internet.

Globally, throughout the nineties, online purchasing drew a lot of attention on business models. In the case of Romania, the situation is different; Romanians have begun to massively use the Internet after the year 2000, and trust in online purchasing has come even later, increasing exponentially every year.

¹⁰ Crescitelli, E., Figueiredo J.B.- *Brand equity evolution: a system dynamics model*, BAR. Brazilian Administration Review, vol. 6, no 2, 2009

Thus, the Internet has opened a door for new online business opportunities, but a lot of business people did not believe that they can obtain profit from online business, but that the Internet is just a brand promotion instrument that makes them known on the market; these business people have continued to rely on traditional business.

Nevertheless, in the past two years Romanians have adapted rapidly to the age of the Internet and it is impossible to speak about business models without taking the Internet into consideration.

In order to understand the nature of the business model in Romanian ecotourism, it is useful to assign it to the context of business in general.

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