

INFORMATION SYSTEMS FOR INTERNATIONAL BUSINESS MANAGEMENT

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Abstract: *International business has been growing constantly lately and the number of enterprises that are classified in some sense as international is now very large. International managers must deal with the added risks of expropriation, discrimination, and foreign exchange rate fluctuations. Computer models have been developed to aid in exchange rate forecasting, but unfortunately none is a perfect forecaster. I think a good manager invests in IT to increase productivity. Besides reducing costs, computers can increase the quality of products and services provided to consumers. The company's real challenge is to optimize its strategy. This paper presents several advantages and disadvantages of information systems used in international business management.*

Keywords: Decision Support System (DSS), expert systems, genetic algorithms.

1. Introduction

The management process is often described as consisting of planning, organizing, directing and controlling. This management process takes place in both the international company and in the domestic one. There are some additional dimensions to consider in the international firm, such as human resources. Economic situations have become large-scale and complex, and the demand and the requirements of the market suffer many changes. Along with a change to diversify small-quantity production, there has been a change to diversify small-scale services. In case that the problems to be handled are very complicated or large-scale, we limit it an amount that we can process and focus our goals there. Information and data that are not very important are cut out. The general processing here depends upon human intellectual capacity and time. Using information systems we can increase the quality and the services provided to the consumer.

2. Information system

A good information system provides information that is understandable and usable. While information systems are an important part of any company's control system, they are critical for the international company. Because of the physical and cultural separation between units of the organization, clear information is vital to the maintenance of control throughout the organization. Of course, this separation also

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makes the design of an effective system a major challenge. An international company system may have to be understandable to and usable by people who work in different countries, speak different languages, have different literacy levels, and view their information needs differently (Punnett & David Ricks, 1997). However, to design an effective system, an organization should consider the following:

- The precise information needed at the various levels in the organization must be identified and systems put into place to accumulate the data required providing it.
- Responsibility must be assigned for data collection and the needed authority delegated to an area or person to ensure that the data can be collected.
- People need to receive only information that relates to the decisions that they have to make or to which they contribute. Only relevant information should be supplied to appropriate people. The determination of who are the appropriate people to receive specific information may vary from manager to manager, depending on the style of management and the location.
- Raw data often must be transformed into more meaningful information. Responsibility and authority for this task need to be defined and allocated. Data must be converted to information that supports decision making. User input is particularly important in deciding on the format for presenting information so that it is in a form that the receiver can use and understand.
- Information is useful only if it is available in a timely manner. Identifying and reducing the time lag between an event and the availability of information describing it therefore are very important.

2.1. Information systems for organizational and managerial assistance

The main factor of success management for the company lies in the implementation of an efficient information systems that optimize the information flow. The companies have to face the challenge of identification, assessment and control of the various types of risk. This issue is even more complicated for international companies, for which the risk management connected to investment projects in different countries include a range of new aspects. It requires to find the way to assist efficiently the decision-makers by implementing an information system for management who fits the business needs. Just like for every information system, following issues have to be defined and specified: the information requests, the information sources, the necessary processing steps to obtain the output from the input, including the methods (algorithms) of computing as well as the totality of equipments and resources involved which represents mainly the information system with its applications and modules.

2.1.1. Expert Systems

Expert systems are intelligent programs that use knowledge, facts and reasoning techniques to solve problems that require expert human knowledge. An expert system consists of the following basic modules:

- A base of knowledge,
- An engine that allows the system to simulate the process of solving the problem as a human expert,
- An user interface,
- And interface with expert human

Expert systems should allow the elimination of rules and adding new ones. To describe how expert systems work, it is necessary for human knowledge to be modeled and represented in a form that a computer can understand. Human knowledge model used by expert systems is called Knowledge Base (KB). KB contains a collection of relevant knowledge about a specific domain and is composed of rules and facts. Facts are used to represent the state of objects at a time and rules refer to operations that can perform on objects in the database. In the following figure are shown the components of an expert system:

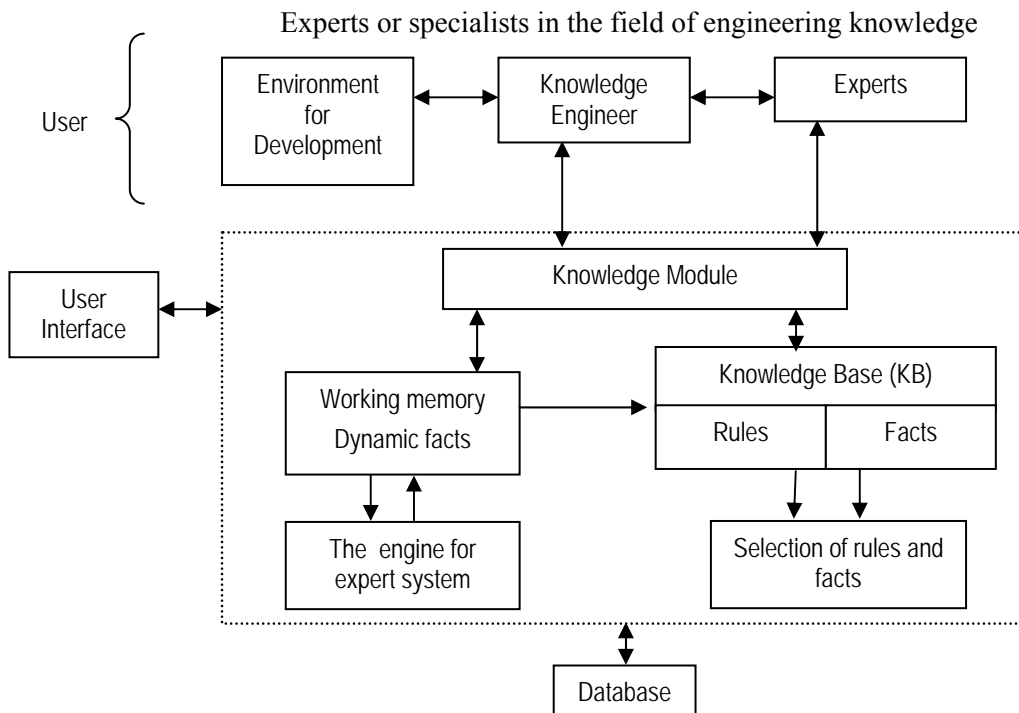


Figure 1. Architecture of an expert system

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Knowledge can be represented in structured programming using If-Then form. „If” represents the problem and „Then” is the answer (Ball & McCulloch, 1996).

Example:

IF INCOME > 200\$ (condition)

THEN PRINT NAME, PROFESSION AND AGE (action)

The expert systems use a large number of rules (between 200 and 1000). These systems can be effective if used in areas of knowledge very restrictive, for example, to grant credit.

2.1.2. Genetic Algorithms

Genetic algorithms are the most developed branch of evolutionary algorithms. They are used to solve complex problems of nonlinear optimization. The idea of such intelligent systems is the evolutionist theory principles. By combining genetic, each new population acquires the ancestors and is forced to evolve in a competitive environment. Genetic algorithms are related to a variety of techniques to solve problems, after the model of living organisms to adapt to the environment they live in. Application of genetic algorithms is done in several stages. At first, user generates randomly a population made up of rows of binary digits. Each row corresponds to a variable of the problem. The user applies a test to combine pairs of rows and to classify binary strings of digits according to the desired level of possible solution. Once the initial population is evaluated to form combinations that best suit, algorithm will produce the next generation of rows of digits. This generation consists of rows which have survived the previous test of compatibility, plus new rows of digits. The process continues until the best solution is found.

In the following figure is presented the structure of a genetic algorithm.

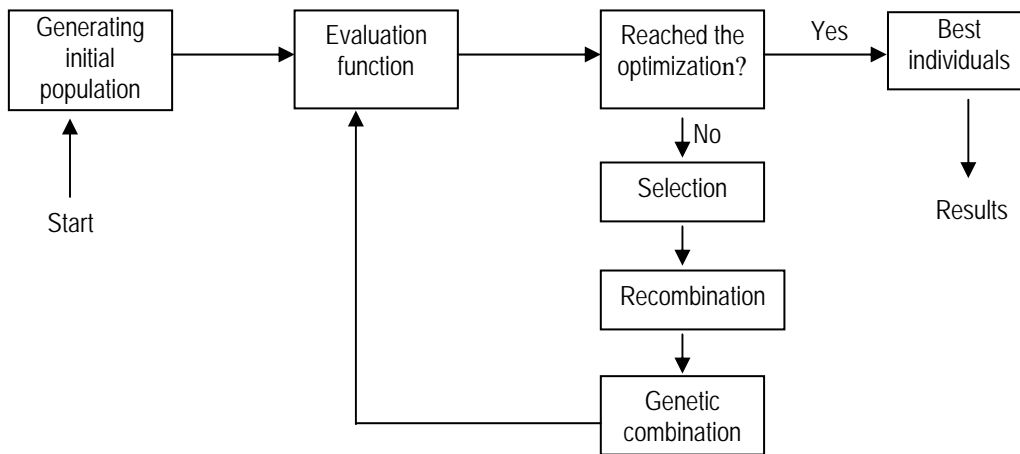


Figure 2. Structure of a genetic algorithm (Militaru, 2004)

Genetic algorithm is a search mechanism based on population genetics and natural selection of individuals. These algorithms operate with a population of words that are encrypted using a finite alphabet. Genetic algorithms are used to provide solutions to certain classes of problems of optimization, product design and industrial monitoring systems. Many business problems require specific optimizations to minimize costs and maximize profits or to identify the best use of available resources. If these situations are very complex and dynamic, then to solve them can be used genetic algorithms.

2.1.3. Decision Support System (DDS)

A Decision Support System (DSS) is an anthropocentric, adaptive, and evolving information system meant to implement some of the functions of a possible "human support system". DSS integrate several general – purpose and specific IT tools. To better understand these systems is necessary to introduce a classification of types of decisions that appear frequently in business management.

Classification is done by four criteria (a, b, c, d). According to the first classification (a), decisions can be scheduled and unscheduled. Examples of scheduled decisions are: purchasing an item, the choice of routes and means of transportation for distribution, professional skills and knowledge necessary to get a well paid job. Unscheduled decisions are: merging with another company, organization restructuring, closing a factory that is no longer profitable.

Table 1

Classification of the decisions types

Function	Types of decisions
Planning	What are the objectives of the organization? What strategies address these objectives? How difficult must be individual tasks?
Organization	How contingent should report directly to a leader? How should tasks be designed? When you need to change the organization?
Leading	How to work with people less motivated? Which style is most effective in a certain situation?
Control	What activities should be controlled? How the control is done? What type of information system should choose the manager?

There are a few advantages and some disadvantages of group decisions. Some advantages are: discussion stimulates creativity, allow assessment of a larger number of facts and issues are analyzed from different points of view. Disadvantages of groupthink: take a long time, nobody is responsible and may create conflicts.

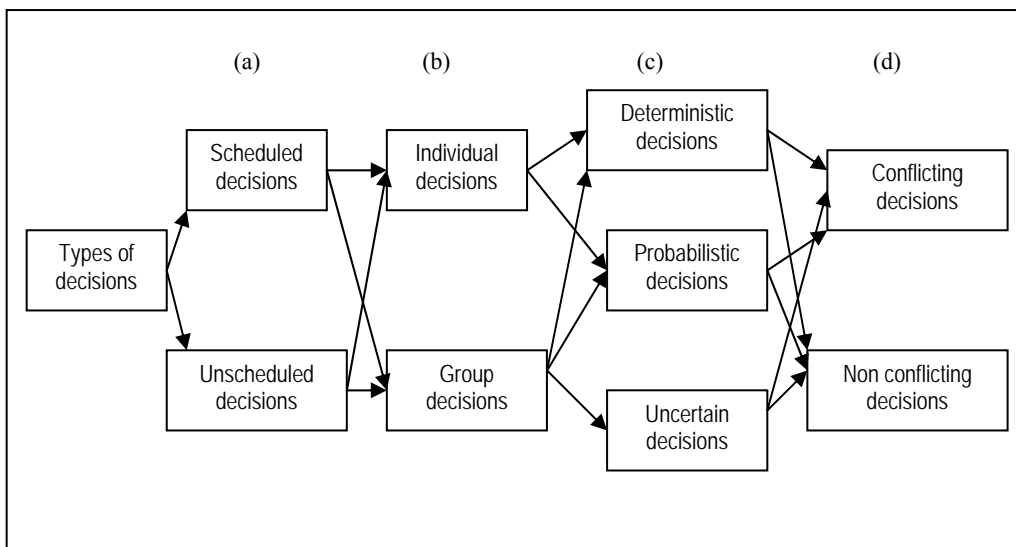


Figure 3. Types of decisions (Rob and Coronel, 2007)

According to the classification of step (c) decisions fall in deterministic decisions, probabilistic decisions and uncertain decisions.

If S_j ($j \in [1, n]$) are the solutions of the problem, then p_j is the probability for S_j to happen:

- Deterministic decisions, $p_j=1$;
- Probabilistic decisions, $0 \leq p_j \leq 100$;
- Uncertain decisions, value of p_j is unknown.

So a DSS, is an interactive computerized system that gathers and presents data from a wide range of sources, typically for business purposes. DSS applications are systems and subsystems that help people make decisions based on data that is culled from a wide range of sources. For example: a national on-line book seller wants to begin selling its products internationally but first needs to determine if that will be a wise business decision. The vendor can use a DSS to gather information from its own resources to determine if the company has the ability or potential ability to expand its business and also from external resources, such as industry data, to determine if there is indeed a demand to meet. The DSS will collect and analyze the data and then present it in a way that can be interpreted by humans. Some decision support systems come very close to acting as **artificial intelligence** agents. DSS applications are not single information resources, such as a database or a program that graphically represents sales figures, but the combination of integrated resources working together.

3. Conclusions

International business takes place in a dynamic environment, because the world is ever changing. Managers of international companies often face different challenge when making operational decisions. In my opinion information systems play an essential role in creating competitive companies, for managing international business. These systems have been developed with the emergence of Internet and other communications networks. They provide the necessary IT infrastructure for new business models. International companies combine the unified and fragmented approaches in a variety of ways. Effective international managers want to be constantly aware of the changes occurring around the world in order to understand and assess their potential of business.

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