

Role of Decision Support System in building Entrepreneurship



Computer Science

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ABSTRACT

Many Polish entrepreneurial companies have completed organizational restructuring which was typically accompanied by the implementation of information technology (IT). My study explores how IT lends support to entrepreneurial activities and help the entrepreneurs in decision making.

Entrepreneurship is the structured process of establishing business organization or business opportunities by utilizing the available standard resources at hand. It is often a difficult undertaking as it demands various personal capabilities and skills, prominent among them are an enthusiastic clear vision, specific ideas, a through analysis of past present and future market trends and a positive and bold approach in decision making.

Traditionally crucial decisions where based on certain predefined set of rules and conventions manually, hence resulting in heavy monetary losses. The losses incurred due to poor decisions at critical moment further destabilizes an enterprise and discourages the entrepreneur. The paper reflects the necessity and usefulness of implementing computer aided decision making tools for enhancement of entrepreneurship. For being a successful entrepreneur proper utilization of decision support system is an added benefit in personal and organizational interest.

The paper highlights few entrepreneurial activities which, when automated gives a solid support and relief to the entrepreneur for taking profitable decisions. The real time automated decision support tools give better performance for future forecasting and risk analysis.

I. INTRODUCTION

THE DECISION-MAKING PROCESS

Decision making is a continuous process that is central to the successful management of any business. It is a process of selecting one action from two or more alternative actions. All decisions will involve some risk and uncertainty because we cannot know everything the future holds. Since we cannot know or control everything, we must base our decisions on those things that we can reasonably expect to know and to control.

While we cannot always guarantee successful outcomes, experience proves that well-thought-out decisions are more likely to yield success than are choices made haphazardly. Flipping a coin is no substitute for studying and planning. Developing and using good decision-making tools can help you to identify and plan coping strategies to deal with risk and uncertainty.

One important decision-making skill is learning to place each decision into the right perspective. When you have decisions in the right perspective, you can then determine how much time and effort to devote to each decision.

Computer Oriented Decision Support tools provide current, timely information that is accurate, relevant and complete. A specific DSS presents information in an appropriate format that is easy to understand and manipulate. The information presented by a DSS may result from analysis of transaction data or it may be the result of a decision model or it may have been gathered from external sources. DSS can present internal and external facts, informed opinions and forecasts to Entrepreneurs. Entrepreneur wants the right information, at the right time, in the right format, and at the right cost.



Figure 1 Decision Support Vs Decision Management
(Source <http://www.jtonedm.com>)

II. ENTREPRENEURSHIP

Entrepreneurship is the act and art of being an entrepreneur or one who undertakes innovations or introducing new things, finance and business acumen in an effort to transform innovations into economic goods. This may result in new organizations or may be part of revitalizing mature organizations in response to a perceived opportunity.

Role of the Entrepreneur: Decision Making Process:

The entrepreneur organizes the factors of production to create goods and services. The most suitable location, qualified workers, and the right equipment and machinery will ensure efficient production. It is therefore important for him to make the right decisions concerning the employment of the required resources for his business. He must also make decisions on systems and processes to be applied in the production process.

III. CHARACTERISTICS OF ENTREPRENEURIAL DSS

1. A DSS includes a body of knowledge that describes some aspects of the decision-maker's world, how to accomplish various tasks and what conclusions are valid in various circumstances, and so forth.
2. A DSS has an ability to acquire and maintain descriptive knowledge (i.e., record keeping) and other kinds of knowledge as well (i.e., procedure keeping, rule keeping, etc.).
3. A DSS has ability to present knowledge on an ad hoc basis in various customized ways as well as in standardized reports.
4. A DSS has an ability to select any desired subset of stored knowledge for either presentation or deriving new knowledge in the course of problem recognition and/or problem solving.
5. A DSS can interact directly with a decision maker or a participant in a decision in such a way that the user has a flexible choice and sequence of knowledge-management activities.

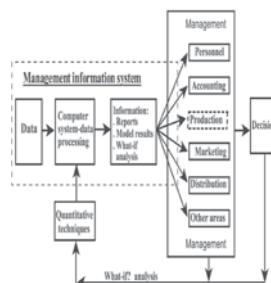


Figure 2 Role of DSS(type of MIS) in Management Processes
(Source <http://www.emeraldinsight.com>)

IV. BUSINESS INFORMATION REQUIRED FOR DECISION MAKING PROCESS

Entrepreneurs and their support staff need to consider what information and analyses are actually needed to support management and business activities. Some need both detailed transaction data and summarized data whereas most only want summaries of transactions. They usually require lots of charts and graphs; a few only want tables of numbers.

Many managers want information provided routinely or periodically and some want information available on-line and on demand. Managers want financial analyses and some managers want primarily "soft", non-financial or qualitative information. In general, business Information can provide business transaction information and it can help managers understand many business operations and performance issues. For example, a computerized system can help managers understand the status of operations, monitor business results, review customer preference data and investigate competitor actions.

Decision Support Systems provide current, timely information that is accurate, relevant and complete. A specific DSS presents information in an appropriate format that is easy to understand and manipulate. The information presented by a DSS may result from analysis of transaction data or it may be the result of a decision model or it may have been gathered from external sources.

DSS can present internal and external facts, informed opinions and forecasts to managers. Managers want the right information, at the right time, in the right format, and at the right cost.

V. AN EXPANDED DECISION SUPPORT SYSTEM FRAMEWORK

The terms frameworks, taxonomies, conceptual models and typologies are often used interchangeably. Taxonomies classify objects and typologies show how mutually exclusive types of things are related. In this section we want to categorize the large number of computerized systems that support decision-making.

I) Data-Driven DSS

These systems include file drawer and management reporting systems, data warehousing and analysis systems, Executive Information Systems (EIS) and Geographic Information Systems (GIS). Business Intelligence Systems are also examples of Data-Driven DSS.

Data-Driven DSS emphasize access to and manipulation of large databases of structured data and especially a time-series of internal company data and some times external data. Simple file systems accessed by query and retrieval tools provide the most elementary level of functionality. Data-Driven DSS with Online Analytical Processing provide the highest level of functionality and decision support that is linked to analysis of large collections of historical data.

II) Model-Driven DSS

A second category, Model-Driven DSS, includes systems that use accounting and financial models, representational models, and optimization models. Model-Driven DSS emphasize access to and manipulation of a model. Simple statistical and analytical tools provide the most elementary level of functionality. Model-Driven DSS use data and parameters provided by decision-makers to aid them in analyzing a situation, but they are not usually data intensive. Very large databases are usually not needed for Model-Driven DSS.



Figure 3 Data Driven DSS and Model Driven DSS
(Source <http://www.elml.uzh.ch>)

III) Knowledge-Driven DSS

The terminology for this category of DSS is still evolving. Currently, the best term seems to be Knowledge-Driven DSS. Sometimes it seems equally appropriate to use the term DSS or the narrower term Management Expert System. Knowledge-Driven DSS can suggest or recommend actions to managers. These DSS are person-computer systems with specialized problem-solving expertise. The "expertise" consists of knowledge about a particular domain, understanding of problems within that domain, and "skill" at solving some of these problems.

IV) Document-Driven DSS

A new type of DSS, a Document-Driven DSS or Knowledge Management System, is evolving to help managers retrieve and manage unstructured documents and Web pages. A Document-Driven DSS integrates a variety of storage and processing technologies to provide complete document retrieval and analysis. The Web provides access to large document databases including databases of hypertext documents, images, sounds and video. Examples of documents that would be accessed by a Document-Based DSS are policies and procedures, product specifications, catalogs, and corporate historical documents, including minutes of meetings, corporate records & important correspondence.

V) Communications-Driven DSS

This type of DSS includes communication, collaboration and decision support technologies that do not fit within the earlier discussed DSS types. This type emphasizes both the use of communications and decision models. It is an interactive computer-based system intended to facilitate the solution of problems by decision-makers working together as a group. Groupware supports electronic communication, scheduling, document sharing, and other group productivity and decision support enhancing activities.

VI. STEPS TO BE TAKEN BY AN ENTREPRENEUR FOR DECISION MAKING

Problem Identification

Many decisions are made by default because people do not realize that a decision needs to be made. Recognizing the need for the decision involves identifying and defining the problem. What is the decision you need to make?

Identification of the alternatives and choices to be considered

When facing a decision, you usually have more than one option to consider.

Alternatives are not always evident. You sometimes need to search for them. At times it can be helpful to do some brainstorming to find additional alternatives.

Gather and analyze facts related to each of the alternatives

As you gather facts and analyze them, consider the possible consequences or costs of each alternative. Weigh the pluses and minuses for each alternative. Be certain to separate facts from the value you place on something. Recognize that sometimes your values are more important than the facts. As you gather and analyze the facts, also think about your available resources.

Select an alternative

Recognize that the alternative you select will be the best decision you can make at the time, based on the facts you have and your less-than-perfect knowledge of the future. Write down the alternative you have selected.

VII. SOME REAL-WORLD ENTREPRENEURIAL ACTIVITIES CARRIED OUT USING SOFTWARE MODELS FOR DECISION SUPPORT

Following are few Real world examples where an entrepreneur can utilize computer based software models for decision making. In this paper we have considered the software models developed by palisade decision suit. This firm is involved in providing decision making software tools for many entrepreneurial tasks.

1) Financial Forecasting

This model demonstrates the analysis of uncertainty in a financial forecast. Imagine you are deciding whether to launch a new product line. Since most of the elements of the model involve the prediction of future events, they all involve uncertainty. By adding @RISK distributions to your financial models, you can go beyond the simplistic "best-case/worst-case" analysis that can lead to bad business decisions.

2) New Product Profitability

When a company develops a new product, the profitability of the product is highly uncertain. Simulation is an excellent tool to estimate the average profitability and riskiness of new products. Imagine Pigo is thinking of marketing a new drug used to make hippos healthier. The model sets up the variables involved in marketing the new product, such as market size, use of the drug, whether competitors enter the market, etc. @RISK distributions are used to illustrate the uncertainty. Analyzing the results of this output will help Pigo decide whether introducing the hippo drug would be profitable or not.

3) Value at Risk (VAR)

Anybody who owns a portfolio of investments knows there is a great deal of uncertainty about the future worth of the portfolio. The concept of value at risk (VAR) has been used to help describe a portfolio's uncertainty. Simply stated, the value at risk of a portfolio at a future point in time is usually considered to be the fifth percentile of the loss in the portfolio's value at that point in time. In other words, there is considered to be only one chance in 20 that the portfolio's loss will exceed the VAR. To illustrate the idea, suppose a portfolio today is worth \$100. We simulate the portfolio's value one year from now and find there is a 5% chance that the portfolio's value will be \$80 or less. Then the portfolio's VAR is \$20 or 20%. @RISK can be used to measure VAR. The model also demonstrates how buying can greatly reduce the risk in a stock.

4) Asset Price Random Walks and Options Valuation

Models of the prices of assets (stocks, property, commodities) very often assume a random walk over time, in which the periodic price changes are random, and in the simplest models are independent of each other. The future price level of the asset may result in some contract or payoff becoming valuable, such as in the case of financial market options. In these cases, the value of the contract (contingent payment or option) is calculated as the average discounted value of the future payoff. This particular model compares the average simulated payoff for European Call and Put options with the Black-Scholes valuation.

5) Discounted Cash Flow (DCF)

Discounted cash flow (DCF) calculations are a frequent example of the use of @RISK. In the model, the sources of risk are the revenue growth rate and the variable costs as a percentage of sales. After taking into account the assumed investment, and applying a discount factor, the DCF is derived. Following the simulation, the average (mean) of the DCF is known as the net present value (NPV).

The decision as to whether to proceed or not with this project will therefore depend on the risk perspective or tolerance of the decision-maker. This model has also been extended to calculate the distribution of bonus payments on the assumption that a bonus is paid whenever the net DCF is larger than a fixed amount.

It also uses some of the @RISK Statistics functions RiskMean, RiskTarget, and RiskTargetD to work out the average net DCF, the probability that the net DCF is negative and the probability that a bonus is paid.

VIII. ADVANTAGES OF DSS BASED ENTREPRENEURSHIP

Every successful entrepreneur brings about benefits not only for himself/ herself but for the region or country as a whole. Few benefits that can be derived from DSS based entrepreneurial activities are as follows:

1. Income generation and increased economic growth
2. Healthy competition thus encourages higher quality products
3. Promotion of the use of modern technology in small-scale manufacturing to enhance higher productivity
4. Encouragement of more researches/ studies and development of modern machines and equipment for domestic consumption
5. Freedom from the dependency on the jobs offered by others
6. The ability to have great accomplishments
7. Emigration of talent may be stopped by a better domestic entrepreneurship climate

IX. CONCLUSION

The overall description gave us an idea about the need and usefulness of using Computer based software models for decision support in many entrepreneurial activities. This concept of implementing the decision tools will definitely change the way we think about entrepreneurship and will bring large amounts of personal and organizational uplift.

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