

A Study of Automated Decision Making Systems

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Abstract: The decision making process of many operations are dependent on analysing very large data sets, previous decisions and their results. The information generated from the large data sets are used as an input for making decisions. Since the decisions to be taken in day to day operations are expanding, the time taken for manual decision making is also expanding. In order to reduce the time, cost and to increase the efficiency and accuracy, which are the most important things for customer satisfaction, many organisations are adopting the automated decision making systems. This paper is about the technologies used for automated decision making systems and the areas in which automated decisions systems works more efficiently and accurately.

Keywords: automated decision making, decision making technologies.

I. Introduction

The ERP systems will interconnect all the departments of an organizations and provides information required for all workers in different departments for making better decisions. The ERP systems contains information only about what had already happened, it will not contain the information of the current scenario and about the future.

The ERP systems uses analytical decision management system for setting sales goals, production levels, distribution plans. The automated decision making systems are used to take decisions on management problems, which are repetitive. The operational management is a well-supported candidate for automated decision making systems since it has short term focus and repetitive.

To deal with different parameters at different business stages, the ERP systems uses different models of analytics for better decision making. The difference between Predictive, Descriptive and Decision models used in ERP systems for analysing data are given below.

Predictive models	Descriptive models	Decision models
<ul style="list-style-type: none"> • Predicts the relationship and patterns between explanatory variables and dependent variables and focus on a specific variable • Eg) Fraud Detection, Credit Worthiness 	<ul style="list-style-type: none"> • Clusters the data elements with similar characteristics. Focus is on as many variables as possible • Eg) Profitability, Product preference 	<ul style="list-style-type: none"> • Finds an exact outcome for a specific decision. Focus on specific decision • Eg) Scheduling, Resource Optimization,

The Automated decision making systems are mainly used in business analytics and informatics. The decision making systems can be automated by applying certain business rules which are generated and operated by business analytics. The decisions taken by the automated decision making systems are part of the business informatics. The ADMS are very useful in situations which requires solutions to repetitive problems using the electronically available data. The data required for the ADMS must be very clearly explained and structured. The business problems that are applied to the ADMS must be clear and well understood.

The organizations uses the ADMS to manage its interactions with its customers, employees and suppliers. Organizations uses the ADMS to improve its value, through each decision that is taken. The main aim of using ADMS has five key attributes-precision, consistency, agility and the reduced time and cost of making manual decisions. There are many number of approaches for decision making, in common they have three steps- decision identification and modelling, development of an automated system, monitoring and managing the decisions to maintain the rules and predictive analytics up to date.

II. Application of Automated Decision Making Systems.

By studying automated decision making systems in industries that include banking, insurance, travel and transportation, we can understand that automated decision applications are effectively to generate useful solutions in a number of different business areas.

Product Configuration- it is one of the earliest application of ADMS. The ADMS will select a best and most appropriate solution based on the set of variables available, which is difficult to do manually. Eg) mobile phone operators will be having many different service plans, the ADMS will find a appropriate service plan for a particular customer.

Yield optimization- the airlines uses the ADMS to fix the prize of the tickets based on the availability of seats and the day of purchase.

Routing or segmentation decisions- By designing automated filters, some companies are able to achieve significant improvement in productivity. Eg) insurance companies have established priority lanes to handle the insurance claims of regular customers with good profiles.

Corporate and regulatory compliance- Many routine policy decisions such as determining whether the person qualifies for insurance benefits.

Fraud detection- banking sectors and government agencies employs some automated screening to identify credit card frauds.

Dynamic forecasting- By automating the demand forecasting the manufacturers are able to align their customers forecast closely with their manufacturing and sales plan.

Operational control- the ADMS are also used to sense the physical and environment changes and responds rapidly based on rules and algorithms. Eg) temperature, rainfall.

III. Automated Decision Making Technologies

There are different types of Automated decision making technologies.

Rule Engines- rule engines will process a series of business rules that use conditional statements to address logical questions.

Industry specific packages- the industry specific pakage will produce automated decisions for queries faced by the organisations.

Statistical or numerical algorithms- this algorithms will process quantitative data to arrive at its target. Eg)sanction of loan amout.

Workflow Applications- the workflow applications are software programmes that enables information-intensive business processes. After making a decision the workflow system will passes the rest of the file through the required steps. Eg) loan processing.

Enterprise systems- enterprise systems are software applications that automate, connect and manage the information flows and transaction processes in the organisations. The automated decision systems in the enterprises will be used only in certain processes. Decision making is the process of taking specific action in response to the problems faced by the organisations. Good decision will results the course of actions that helps the organization to be effective, the opposite is its reverse. The growth or the failure of the organisation depends on the decisions made by its members. The decision making systems has four principal phases:

Intelligence- searching for the conditions calling for decision making.

Design- inventing, developing and analyzing possible decisions. This will makes the processes to understand the problem, to generate solutions and testing of solutions for feasibility.

Choice- selecting an alternative or decisions from those variables available.

Review- Checking the choices made previously. This model was later integrated by George Huber into an enlarged model of the entire problem-solving operation.

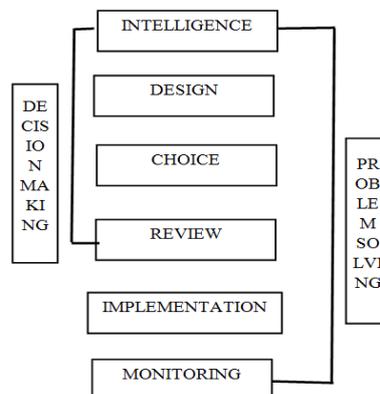


Figure 1

Expanded model of the entire problem-solving process

Although the computerized systems provides veracity, flexibility and prompt decisions for managers, there are some problems that are faced by organisations. The lack of knowledge about the specifications, restraint and variables of the systems are the biggest problem faced by the organisations. If the knowledge about the systems are not well understood by the organisations, then the systems will not provide the solutions expected by the executives. The Automated decision making system must be computed in such a way to inform the manager to handle the decision making process if it lacks the required data to make reliable decision.

The another problem faced by the organisations about the computerized decision making system is to find the skilled persons who are able to build and maintain the automated systems. Even though the Automated decision making systems are enhanced and used universally and it has more advantage over the manual decisions, it has certain constraints and many companies fail to overlook those constraints and to maintain them accordingly. Therefore, the companies must carefully oversee the systems which they are applying and they must understand the solutions that are given by the systems.

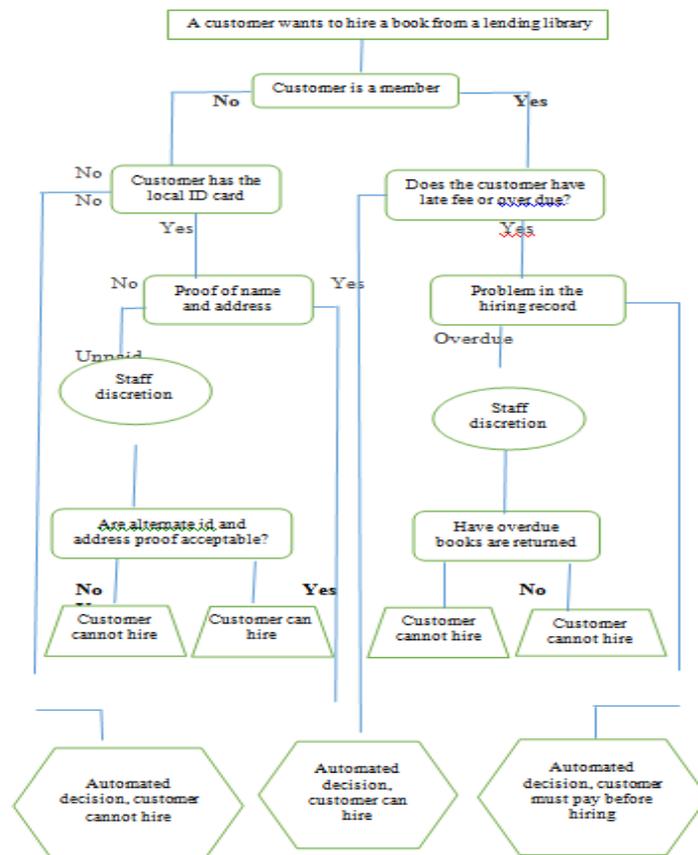
IV. Different Degrees Of Automation In Decision Making Systems

In some decision making paths, the decision making systems are only partly automated and it alerts the users where a manual decision making is required. The automated systems guides the users, using the information collected and such systems make determinations throughout the decision-making process, while avoiding the redundant pathways and in some cases, the automated systems will provide a final decision.

The automated systems may also guide the users when a manual decision is required by gathering and providing relevant information for the users to take correct decision. In some cases the system may collect and store the relevant information, and records the reasons of the outcome reached by manual decisions. Automated systems can be used in different ways in administrative decision-making system. For example;

- To make the decision.
- To recommend a decision to the manual decision maker.
- To guide a user through relevant facts, legislation and policy, closing off irrelevant paths as they go.
- Can be used as decision support systems, providing useful information for the decision maker during the decision making process.
- Can be used as a self-assessment tool, providing preliminary assessment for individuals or internal decision makers.

The decision making with partially automated system model used in lending libraries.



V. Conclusion

The more data that exist, there is more the scope for automation. The organisations can take Effective decisions only if it contains accurate, timely and relevant information. The Management information system facilitates the organizations planning, control, and operational functions to be carried out adequately by providing the exact and appropriate information needed to ease the decision-making process and MIS also helps the decision makers by providing wide range of options for making their preferred choices. This ensures that whatever the choices are taken by the decision makers, the results will be positive. Many decision makers tend to use management information system while taking tough business decisions. The decision making system focus on decision making whereas management information system focus on information. The management information system targets only on perfectly structured data but decision making system targets on structure as well as semi structured data.

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