

# Use of Intelligent Agents As Data Mining Tools In Knowledge Management

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**Abstract --In this paper we argue that data mining can make a significant contribution to knowledge management initiatives. We use two studies to show how data mining can make the difference during the knowledge management process. First, we describe how data mining was used as part of the knowledge management. Data can be viewed as an abundant, vital and necessary resource in the field of knowledge management. Second Intelligent agents can be used as data mining tool to extract the meaningful information from the raw data. Knowledge management involves the identification and analysis of available and required Knowledge assets from the acquired information. These knowledge assets, related processes and the subsequent planning can be exploited to develop both the assets and the processes so as to fulfill organizational objective.**

## I.INTRODUCTION

With the explosive growth of the information sources available on the internet, and on the business, government, and scientific databases, there is a dramatic increase in the amount of data being stored in the electric format. In order to find and extract the desired information resources from such a huge dynamic and heterogeneous database, the conventional search methods are not sufficient and it become increasingly necessary for the users to utilize automated and intelligent tools known as Intelligent Agents (IA). Analysis of these information resources can provide further knowledge about an enterprise by going beyond the data explicitly stored to derive knowledge about the business. This is where data mining, Intelligent agents and knowledge management has great benefit for an enterprise.

## II.INTELLIGENT AGENTS

Agents are defined as software or hardware entities that can perform some set of task on behalf of user with some autonomy. An information agent allows the user to define information requests irrespective of actual storage structure and physical distribution of source data. It act as an intelligent assistant that locates, retrieves, and present the information required by the user. The user only need to tell the interface what information he wants and does not need to know where how to get it. The interface gets the information automatically and presents it to the user in the form that is required by the user.

Agents are a natural extension for complementing and evolving technologies. In the future as these other technologies evolve, so too will the corresponding capability of associated agents to deliver these technologies. Some supporting and complementing technologies include: Object-Oriented Programming, Neural Networks, Fuzzy Logic and Genetic algorithm.

## III.GOALS OF AGENTS

An agent is designed to automate frequently accessed and tedious tasks, and to determine the patterns in the requests, or in the performance in the tasks. This automation and learning should be ongoing acts of the agent in order to make it effective. By automating these tasks , an agent frees the user to accomplish other, more productive work.

An agent should provide a shift to user- centric approach .That is, instead of the user having to adapt to a given application ,the (agent-enabled)application should be able to adapt to the user.

Agent should be able to resolve ambiguity and make decision to complete their tasks. They also should be able to learn from other agents the best manner in which to complete the given task.

An agent should provide some level of abstraction.

Finally, agents are intended to reduce waste of resources. A task that can be automated can usually be done more efficiently, especially for frequently –executed, similar tasks. Not only can an agent help avoid the waste of time, but other resources such as bandwidth.

### *A. Framework for Intelligent Agents based Business Intelligence*

Combining the process, described in BI data framework and the properties of agent-based technologies, we assume three areas of intelligent agent potentials in BI. Intelligent agents based BI framework is presented in fig 1.

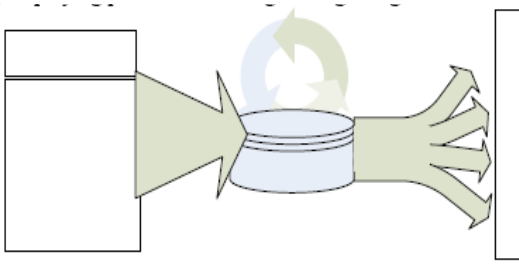


Fig 1 Model for using ABS in BI

Our assumption is that intelligent agents can be used for:

**Intelligent Acquisition:** for collecting mainly unstructured data from internal and distributed sources with use of agents recognizing information in semi-structured documents and autonomously researching possible sources of information.

**Intelligent modeling:** for creating environment simulation models for predicting future states of models, using ABS, handling on data, events and intelligent rules.

**Intelligent delivery:** for proactive delivery of selected information to appropriate users over the right communicating channel. This can be done using the brokerage agents, capable of identifying importance and correlation of information and autonomously deciding on used means for information delivery. Further more intelligent agents can be used to facilitate intelligent collaboration.

In general there are several issues in creating a customer credit ranking evaluation: Gathering quality customer data with intelligent acquisition, building successful, intelligent models, simulating future customer states and, at last, timely delivery of any relevant information concerning customer credit ranking changes.

**Intelligent Acquisition:** Customer financial data, held in relational databases, normally accessed by classification models, contains delayed consequences of customer actions, performed in the past. If proactive reaction is expected; data about customer actions must be acquired from its origins, usually from distributed sources, at the time of its creation.

**Intelligent Modeling:** Research was being done in using artificial intelligence tools such as Neuron networks for creating successful models with high correlation with actual credit scoring. Their usage was though never widely accepted. Two possible reasons could be suggested: models that do not reflect the whole complexity of the real world were proposed, combined with the lack of explanatory means of the provided results. It is hard to decide on a suggestion, which can not be properly explained. Important and often neglected characteristic of social models is a fact that customers are connected in a network of formal and informal relations. Therefore change in one player can affect a whole group of customers, carrying different consequences. The challenge is to create a model, capable of handling regulated, structured data, enhanced with unstructured data, derived from various sources such as news, investment records, customer plans and realizations etc. We argue that such a simulation can only be handled

with use of agent-based systems, where customers are simulated by intelligent agents, actively responding to changes in their environment. Up to now solutions of simulating complex systems still haven't reached the stage of development enabling their wide usage and can therefore be used primarily for research purposes.

**Intelligent Delivery:** Usually credit ranking commissions meet on a regular basis where full credit reports are discussed and decisions are taken. This approach has two back drafts: it is time consuming for several senior and middle management, on the other hand very important issues, requesting immediate response, are often put in a queue and consequently not getting the response time, they ought to. Information delivery should combine: carrying the right information, using the right channel to the right user, last, but not least in the right time. This is why really good assistant is so highly valued. Using intelligent agents with ability to proactively respond to exceptional events, to decide which information is to be delivered first, to be able to answer to user requests for additional information could upgrade the process of customer decision taking on a new level.

#### IV. AGENT DESIGN MODEL

The agent design model represents the building block which makes up an agent. The block are inter connected. Some of these are Skills, Knowledge, Interface, and Language.

*Skills* represent the capabilities of an agent: that is, what the agent can do. Intelligence fall into this category, with a bit of overlap into knowledge. *Knowledge* represents the manner in which the agent stores and understands the user's preferences. It can be as simple as asset of rules, or as complex as references.

The *interface* aspect of the model has two parts: user and application interfaces. User interfaces represent how the agent determines the user's desires and preferences. It could be as simple as a set of rules, or moiré sophisticated, such as learn by example system. The *application interface* is the ability of an agent to connect and manipulate a non-agent-enabled application or resource.

The *language* aspect of the model is still in need of standardization .It refers to how the agents represent knowledge and communicate with each other Inter-agent Communication has three layers. The highest level is the speech act category, for which knowledge query and manipulation language(KQML)is high level protocol language. At this level ,it communicates the *performative*, which is the intent or tone of the message.

The next layer of inter-agent communication is *message content language*. KMQL allows the use of an arbitrary content language by specifying the name of the content language. The "native" content language or KQML is the Knowledge Interchange Format.

The third layer is *ontology*, which is the vocabulary which grounds the abstract grammar of the content language in the real world.

## V. DATA MINING AND KNOWLEDGE MANAGEMENT

No modern business or government agency can thrive without knowledge. Amid mountains of data, relevant information must be identified, structured, and directed toward work processes to effectively facilitate or enable the achievement of goals and end-products. *Knowledge management* structures, maintains, and provides access to knowledge within information systems. *Data mining* extracts relevant tacit knowledge from information system assets through data correlation.

The Knowledge Management Applications group of the Technical Computing organization has extensive capabilities in many facets of knowledge management, including highly secure data warehousing, expert system information-of-value determination, advanced document and content indexing and access systems, and knowledge engineering. Data mining can be performed in highly automated fashion on single documents or archives of related documents, using both expert systems and conceptual clustering. The information in knowledgebase

A general, usable system that provides associative access to all this data must meet certain criteria: It must offer a single point of contact that provides uniform access to all the information available on a particular network or on a web. It must have a reasonable performance in processing user queries. It must address scalability issues in terms of network communications by efficiently and selectively accessing the large and rapidly growing number of information servers. Finally, it must help the user to locate relevant information. In order to do this, the system should provide recommendations for refining user queries and help the user manage and understand the complexity of information space.

## VI. CONCLUSION

The goal of an agent is capable of integrating in the basic logic language and the interaction with data mining algorithms.

At the higher level, Data mining techniques provide tools and methods for the analysis of large amount of data on the basis of extraction of implicit information in the form of patterns or interesting rules, potentially useful for the user.

At the lower level, Logic languages for databases provide adequate linguistic support for the use of data mining techniques and their integration with relational databases.

The Declarative nature of the technology is such that the combined use of inductive technology and deductive technology allows one to model complex analysis,

from heterogeneous databases. So the goal is to be able to turn agents loose to find the necessary information or pattern needed to gain knowledge about environment or about some specific condition.

Figure 2: represents the agent structure for the acquisition of knowledge from wherever it may be located. Data exist in many forms, so the agent is required to find the desired data and transform in the required format.

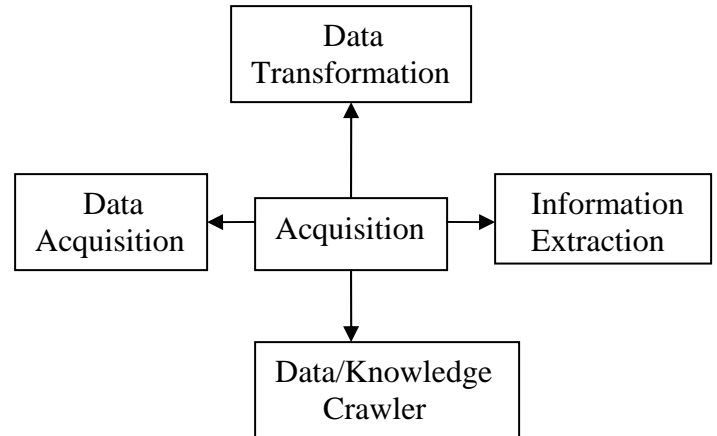


Fig 2 Knowledge Acquisition Structure

necessary to extract and refine Knowledge that is not directly available via basic data mining tools.

## VII. REFERENCES:

1. J.P. Bigus, Data mining with neural networks-Solving Business Problems-from Application Development to Decision Support, McGraw-Hill, 1996 .
2. J.P. Bigus Bigus , Constructing Intelligent Agent with java -a Programmers guide to smarter Applications, John Wiley & sons Inc. , 2003.
3. Dhar, V. Stein, R. Seven Methods for Transforming Corporate Data into Business Intelligence. Upper Saddle River, NJ: Prentice Hall, 1997 (ISBN: 0-13-282006-4)
4. R. Murch, T. Johnson, Intelligent software agents, Prentice-Hall 1999 .
5. C.C. Hayes, "Agent in a Nutshell-A Very brief Introduction", IEEE Transactions on Knowledge and Data Engineering, vol. 11, no. 1, pp. 127-132.
6. IEEE Intelligent Systems <http://computer.org/Intelligent>