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# DATABASES FOR ARTIFICIAL INTELLIGENCE

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*Abstract- The basic motto behind implementing artificial intelligence is to create expert systems and to implement human intelligence in machines. An intelligent robot is a machine able to extract information from its environment. One can study this to know more about themselves and how data are stored and which system is used here.*

*Keywords: - AI (Artificial intelligence), RDMS (Relational database management system), DBMS (Database management system), IDMS (Intelligent database management system), HIPM (Human information processing model), DPM (Data processing model).*

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## I. INTRODUCTION

Artificial intelligence is a branch of science or rather advanced science which deals with how intelligence can be implemented. But after implementing next important aspect that should be made confront is how data which is generated will be stored and for that we need databases. Database is basically a pool of data which stores data in both sequential and non-sequential format.

## II. THEORETICAL BACKGROUND

Data is collection of bits and bytes of information and a database is an organised collection of data. On the broader side a Database management system (DBMS) is a computer software application that interacts with the user, other applications, and the database itself to capture and analyse data. DBMS permits applications to define, access, and update data through a Data definition language (DDL) and Data manipulation language (DML) combined into a declarative query language such as the relational query language (SQL). SQL is an ANSI standard for accessing and manipulating the information stored in relational databases. The relational database stores the data in the form of tables and records and often that data are called as structured data and on the contrary non-relational databases stores data in the form of documents and is often termed as non-structured or semi-structured data.

### III. LITERATURE REVIEW

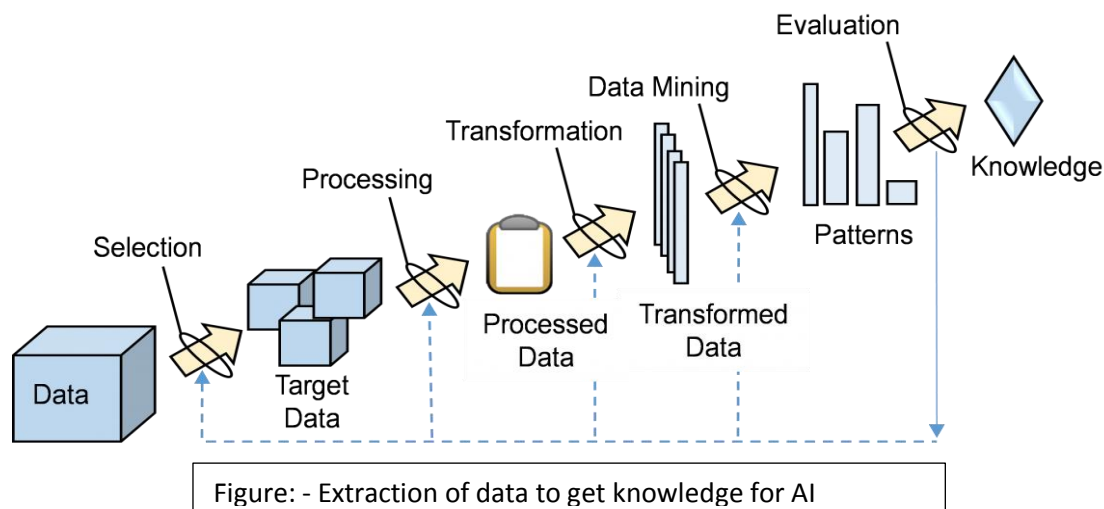
Artificial intelligence technique is a manner to organize and use the knowledge very efficiently and it also elevates the speed of execution of complex program. Artificial intelligence is growing at a big pace and incorporates various technical terms such as blue brain which is especially used to process the data and gives expected result. Then the role of intelligent databases comes into picture where two vital concerns to be looked upon are:

- a) Intelligent information processing in databases.
- b) Intelligent aspects of databases.

Artificial intelligence (AI) has astounding potential to accelerate scientific discovery in biology and medicine, and to transform health care. It basically deals with knowledge. The philosophy of a program for intelligent database research may revolve among two basic concepts of database knowledge:

(1) *Introspective knowledge*: - Introspective knowledge entails studies of what the database should know about itself: its structure, its content, its frequency of update, the nature of the queries, volume of data in its segments, the relationships among its parts, the nature of the content the security and privacy considerations in its usage and volume of usage patterns across time and users.

(2) *Extrospective knowledge*: -Extrospective knowledge entails the development of representational protocols that can be exchanged among hosts (clusters) giving a view of its environment and setting the rules for acceptable cooperation. Modern research on networks, and their practical implementation, led to a substantive approximation among local and foreign clusters where by the first are part of the extended family while the second only allow and promise very limited (and highly controlled) cooperation.



### IV. INTELLIGENT DATABASE SYSTEM(IDMS)

- A.) The term intelligent databases are being used in storing data generated by intelligent robots using artificial intelligence. This concept of ID postulated three levels of intelligence for such systems:
  1. High level tools: It manages data quality and automatically discovers relevant patterns in the data with a process called data mining and often relies on the use of artificial intelligence techniques.
  2. User interface: It uses hypermedia in a form that uniformly manages text, images and numeric data.
  3. Database Engine: It supports other two layers that are high level tools and user interfaces, often merging relational database techniques with object orientation.
- B.) The intelligent databases drawn from the human information processing model to try to tackle data retention problems that are arising. The concept of intelligent databases does not imply a data structural model but a family of solutions impounding intelligence in the different elements of the process as well as making its main elements interact in a functional and stochastic manner. There is little reason to believe the human information processing model (HIPM) to be the ultimate in intelligence and storage. However, there is no question that it is superior in

multiple features to the data processing model (DPM). The base on which intelligent database model as build upon include the five information technologies:

1. Databases
2. Object-Oriented Programming
3. Expert systems
4. Hypermedia
5. Text Management

This approach is useful in the construction of axioms for intelligent databases but rather restricted in the ability to postulate a program for research in databases.

## V. DATABASES FOR ARTIFICIAL INTELLIGENCE(AI)

An intelligent data system entail a network of data processing cluster sharing information on their internal content and structure and dynamically and automatically updating this knowledge acting upon this knowledge. Artificial intelligence uses intelligent databases (IDB) systems which integrate the resources of both RDBMS's and KB's to offer a natural way to deal with information, making it easy to store, access and apply.

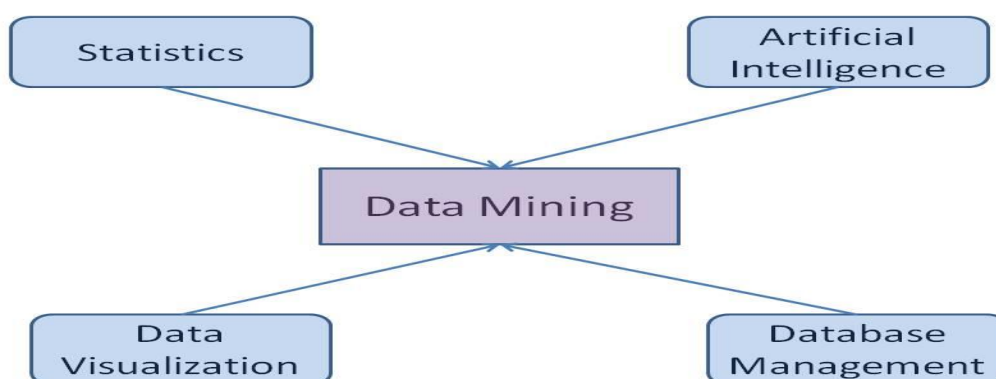


Figure: - Data mining of databases for artificial intelligence

## VI. ADVANTAGES OF RELATIONAL DATABASES OVER NON-RELATIONAL DATABASES

Relational databases are also called as SQL databases. It usually works with structured data. Structured data is easy to fetch from the database as queries can be executed very fast with less time complexity. The reasons for the dominance of relational databases are simplicity, robustness, flexibility, performance, scalability and compatibility in managing generic data.

## VII. CASE STUDY ON NON-RELATIONAL DATABASES

The next point to focus about is whether we can make use of non-relational databases with artificial intelligence or not?

Firstly something to rethink about databases used for artificial intelligence are a NoSQL database provides a mechanism for storage and retrieval of data that is modelled in means other than the tabular relations as used in relational databases. The reason of motivation to use this approach include following salient features of non-relational databases:

1. *Simplicity of design*: - Designing a NoSQL database is very simple as compared to relational databases.
2. *Better horizontal scaling*: - Scaling can be achieved here to scale the database to a new level.

3. *Finer control over availability*: - Here the servers can be added or removed without application downtime. As NoSQL databases support perfectly for data replication, storing multiple copies of data across data centre's to ensure high data availability and disaster recovery.
4. *Easily capture all kinds of data "Big Data"*: - It includes storing unstructured and semi-structured data thus allowing for a flexible database that can easily and quickly accommodate any sort of new data. This is because document databases (Non-relational database) are schema-less, allowing you to freely add fields to JSON documents.
5. *Speed*: - As in non-relational databases we need not have to worry about joining tables hence speed increases.
6. *Cost*: - To design a software it is mandatory to have these conditions fulfilled that is software should be made in "Stipulated Time and Simulated Cost" similarly NoSQL databases usually use clusters of cheap commodity servers and are open source and therefore free

## VIII. CONCLUSION

Hence from above mentioned all points in this paper conclusion comes to a single point that in today's era where there is so drastic increase in data commonly termed as "Big Data", it seems very inefficient to use traditional system that is nothing but relational databases but since now data has been increased we should try to implement non-relational databases as it provides more salient features.

Databases should be designed so that the perceptions and recognition made using artificial intelligence seems so true that is becomes more difficult to distinguish between artificial intelligence and natural intelligence.

Secondly, it seems that the comparison of the DPM and HIPM lead to some insight on the development of intelligent databases.

The understanding of the HIPM is still very incipient and the linkage between the human neurophysiological level, the logical thinking processes, the control of physical motion and human emotions is close to nil.

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