Application Wise Innovation on Intelligent Database Technique

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Abstract

Databases are systems, which are used for storing data. With the increase in information at rapid pace, extraction of relevant information becomes time-consuming using traditional databases. Thus, the need of intelligent or smart databases arises. Intelligent database is a system in which automation is applied on conventional database in order to enhance its functionality and efficiency. Intelligent databases help us in making decisions and can respond or act to situations by learning. It has applications in wide areas such as healthcare, automobile, education, information security, business etc. This paper represents various intelligent database techniques, which are further used for implementation of applications of this domain.  

Keywords: Intelligent Database, Data Marts, Data Analysis Systems, Database with Artificial Intelligence

I. INTRODUCTION

Intelligent Database is made of two words “Intelligent” and “Database”. The word intelligent means Artificial Intelligence- Artificial Intelligence is counterfeiting of human intelligence in computers. Computers are made to act like humans in certain situation through learning. Computers are trained by feeding data into them and are evaluated by giving similar to real life test situations. Database- Database is storehouse of data. It may contain either heterogeneous or homogenous data and includes both text and graphics. Information is retrieved using queries or simply searching. Thus, intelligent database is smart database which provides user oriented result.

A. Applications of Intelligent Database

Smart Backward Dictionary: Reverse dictionary is opposite to forward or traditional dictionary. In this phrases are given as input and words are received as output. For example: if one writes “someone who is too afraid to do what is right or expected”, the output will be coward, funk, sissy etc. Reverse or backward dictionary uses forward dictionary by looking up the phrase in it and then returns matching word.

Egyptian Tourism Based Data-Warehouse

This is data warehouse for tourism in Egyptian sector. The main objective of this application is to provide tourism details at one place so as to enhance decision making capability in this sector. The methodology used in this system can also help in building data warehouses for other nations for similar purpose.

C. Smart Searching Using Keywords

This is an intelligent way of searching using the same basic XML and Relational Databases. In this application object semantics, relationships and attributes are explored. Further, Object Relationship graph for XML and Object Relationship Mixed Graph for relational databases are used in this approach.

D. Smart Web Crawler

Web Mining includes data collection and for this web crawler is required. But due to constant updates in data structures and databases, smart web crawler is required. Intelligent dynamic web crawler stores extraction rules in Xpath, loads the rules dynamically and for relevance calculation uses TF-IDF method. Further, intelligent dynamic crawler is used for threat awareness of public vulnerabilities with the help of data collection and analysis of vulnerability community and the network node search engine.

E. Attack Detection

This application uses MinHash based detection system which works by analyzing aggregated process creation events. It used MinHash algorithm and weighted square matched similarity score for attack detection.
F. Intelligent Database in Telecommunication

This application proposes the use of CDR files which are used in calling records but here importance is given in analyzing information. This information is further used for drawing customer habits and thus helps in enhancing this business.

G. Smart Flaw Detection System in Hospitals

Databases plays vital in health care units. This application is focused on preventing malfunctions by detecting them and providing early decisions for solving problems. It uses mathematical tools for checking severity of the problem.

II. Literature survey

It is based on diverse applications of intelligent database implemented using various approaches. It tells us how intelligent database is evolving in various areas of life with the time.

JIA Wenchao, ZHEN G Guojun et al. in [5] designed and implemented intelligent and dynamic web crawler which stores Xpath rules, loads them dynamically and uses TF-IDF method to check relevance. Apart from this there is also implementation of threat awareness of public vulnerabilities. It successfully overcomes all the problems faced by traditional web crawler due to change in data at higher pace.

Soumya Rajan, Kumary R Soumya in [7] proposed a technique called reverse dictionary where phrases can be matched to words i.e. corresponding to a given phrase there will a word. For e.g. if user enters a phrase ‘a strong feeling of sadness’ heartache will come as result. Reverse dictionary is opposite to forward dictionary. Reverse dictionary is helpful for certain users like scientist, researchers, students, professional writers, teachers, marketing professionals and many more.

Alin Tisan, Stefan Oniga et al. in [1] represented a health status monitoring system using inertial sensors which can be placed on human body. These sensors collect information about anything abrupt in human body and further information can be displayed on cell phones. The use of database for storing information is also proposed. These sensors are low powered. There is an app for displaying data on cell phone.

Wesal M Abu-Alam, Tamer A. Abdulaziz, Ibrahim F. Moawad, in [9] proposed a data warehouse for Egyptian tourism. This clubs all the information regarding Egyptian tourism at one place and thus helps people in this sector in making decision. The technique used is OLAP- Online Analytical Processing. In the similar way data warehouse for other tourism can also be designed using the methodology presented in this paper.

Kehinde O. Adetiloye in [6] proposed intelligent database using SMS- Short Messaging Service. Further SMS service is used for poll opinion. The use of triggers and stored procedures is mentioned. Thus, it makes opinion poll system automatic by reacting according to situations. Here triggers response according to question that is if situation A is there trigger X will get activated, situation B trigger Y and so on. There is use of secured RDBMS- Relational Database Management System.

Thuy Ngoc Le, and Zhong Zeng, Tok Wang Ling et al. in [10] proposed intelligent keyword search by enhancing XML and Relational Databases. For achieving this purpose Object Relationship (OR) data graph for XML and Object Relationship Mixed (ORM) for Relational Database is used. Further aggregate functions are used and there is provision for explicit searching using relation, attributes and tag names in their search queries.

Himanshu Chandola, Jack W. Stokes et al. in [3] proposed Min Hash based targeted attack detection system. Min Hash algorithm can detect millions of attacks in a single day. MART is distributed analysis tool which helps in finding malicious activities in a large computer network using event logging on each host. The system is designed to find another attacks using information from current ones. The use of weighted squared matched similarity score provides robustness to mimicry and NOOP attacks.

O.Jukie in [8] proposed the use of CDR files for dimensioning database which further can be used to analyze customer habits. CDR files contain records being made at each call. For analyzing customer, database is mandatory and here model star database is used. In telecommunication sector customers play significant role and to serve them better there is need to know about different customer requirement in depth.

Cesar Quintas, Paulo Silva et al. in [2] proposed fault prevention mechanism in healthcare sector. It monitors the database continuously and alerts when there is chance of fault occurrence. It uses mathematical techniques and methods for this operation. This mechanism is highly useful in healthcare as risk of fault cannot be taken.

Itorobong A. Inam, Ambrose A. Azeta et al. in [4] proposed a framework for enhancement of voice based system for examination in open and distant learning (ODL). This mechanism is proposed for visually impaired students. For achieving the objective proposed-system design, algorithm, server side scripting, data management, rule based reasoning, voice-based system development is explained in the paper. Further, its usability is tested.

III. Comparative Analysis of Methodologies used in Different Applications of Intelligent Database

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<thead>
<tr>
<th>Parameters</th>
<th>Application</th>
<th>Methodology/ Components</th>
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<tbody>
<tr>
<td>Reliable</td>
<td>Voice based e-examination system for visually challenged students in open and distant learning</td>
<td>VUI Framework, Fisher yates shuffling algorithm</td>
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<tr>
<td>Accuracy</td>
<td>Intelligent Systems based in Hospital malfunction scenario</td>
<td>MEWS-</td>
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### IV. CONCLUSION

The comparative analysis of Intelligent Database represents that there are different techniques or methodologies of intelligent database which can be classified on certain parameters and there are different applications implemented using these techniques. The conclusion drawn out of this comparative analysis is that intelligent database has different applications in diverse areas, implemented using varied techniques/approaches but all of them lead to efficient and improved results. One of the application Data warehouse for Egyptian Tourism uses OLAP – Online Analytical Processing Tool and similarly there is another application Business Intelligence solutions for personal use which is also implemented using OLAP. In the same manner both smart reverse dictionary and application of Examination of gene drug in relation to diabetic gene both are implemented using stemming. Intelligent Web crawler and Enhanced query processing both uses Xpath for their implementation. Intelligent billboard and Smart flaw detection in hospitals both are based on IOT. Thus, there are different applications of Intelligent Database which are implemented using similar techniques for their desired results. Implementation of similar techniques in different applications varies but all produces optimal solutions.

### REFERENCES