AN INNOVATION OF DATA PROCESSING MODEL FOR SMART ENGINEERING AND AUTOMATIC CONTROL

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Abstract

Data processing is the collection, storage, retrieval, processing, transformation and transmission of data. Data processing is a representation of facts, concepts or methods, which may be manual or automatic devices. Data in the form can be numbers, text, graphics or sound. After interpreting the data and giving a certain sense, the information changed. The basic purpose of data processing is to extract valuable, meaningful data from a large number of people and found that the data is difficult to understand, it can be confusing. Data processing is a fundamental aspect of systems engineering and automatic control. The Data processing across all areas of social production and social life. Data processing technology greatly affects the development process of human society in its applications, development breadth and depth. In this paper an effective data processing model was proposed. The data processing software includes various programming languages and compilers, file system management data and information systems application software package handlers, as well as various data processing methods. Ensure a package of safe and reliable data, as well as data security and technology confidentiality.

Keywords:

Data Processing, Collection, Storage, Processing, Transmission, Automatic Devices

1. INTRODUCTION

Data and data processing is provided in different ways depending on the processing equipment, work, and time and location in the configuration mode. Different approaches require different hardware and software support [1]. Each approach has its own characteristics, choosing the appropriate treatment based on the problems in the actual application environment. There are four main data processing classification approaches in the device differentiation system, the treatment approach is on-line and off-line.

According to the set method, time handling and distribution of real-time processing data processing time difference [2]. According to the data processing space distinction is distributed mode, a centralized approach, and distributed processing mode. Computer central processor, job distinguishing single channel job processing mode, multi-channel job processing mode and interactive approach [3].

Analytical and processing technology process (including numerical and non-numerical) data processing. Classification Calculation, editing and other processing and manipulation, including analysis of multiple raw data. Data analysis is broader than material. With the increasing popularity of computers, computer applications in small numbers, information management through computer data processing has become an important application [4].

One page sketch management, warehouse management, accounting management, traffic management, IT management, office automation. Given the large number of natural environmental data (land, water, climate, biological and resource data), geographic data often require the processing of detailed data, including a large number of social, economic data (population, transport, agriculture and industry, etc.) [5]. Hence the need to plan, organize and deploy geographic database installation, to reduce the development of data processing software, to make full use of data management and processing information technology [6].

Data processing related to the business website: some professional data analysis of the traffic of the site, at the time of data destruction is often the target, because it is very large, related to that data, and many out there is no insignificant data [7]. Then, data related point's classification, classification segmentation such as path analysis, interest correlation rules, analysis techniques can be selected in a set, according to specific needs [8] -[9]. The method of studies, to find useful information, and through tax analysis (OLAP). The combination of customer record information, through verification, valuable market information identification, or potential market identification [10]. A computer is a device that is instructed to automatically perform a sequence of arithmetic or logical operations through computer programming. Modern computers have the ability to execute common operations called programs. These programs enable computers to perform a wide range of tasks [11].

Computers are used as control systems for a wide variety of industrial and consumer devices. These include simple special-purpose devices such as microwave ovens and remote controls, industrial devices such as industrial robots and computer-aided design, and general-purpose devices such as personal computers and mobile devices such as smartphones [12].

Early computers were only considered computing devices. Since ancient times, simple manual devices like abacus have helped people to perform calculations. At the beginning of the Industrial Revolution, some mechanical devices were built to automate long laborious tasks, such as guiding mechanisms for looms. And sophisticated electrical machines performed specialized analog calculations in the early 20th century [13].

The speed, power and versatility of computers have increased dramatically since then. Typically, a modern computer has at least one processing element, usually a central processing unit (CPU), and some form of memory. A processing unit performs arithmetic and logical operations, and sequencing and control unit changes the sequence of operations in response to stored information.

External devices include input devices, output devices and input/output devices that perform both functions [14]. Peripheral devices allow information to be received from an external source and help to store and retrieve the results of operations.

2. LITERATURE REVIEW

A device that performs numerical and logical operations using electronic circuits. Although machines have a long history of manipulating materials, the handling of information and knowledge has long been a human monopoly [1]. With the advent of computers, machines have advanced in this field and reduced the integration costs of circuits. From home appliances to hobbies like automobile control parts and microwave ovens, computers have permeated every corner of our lives. Computers are also known as electronic calculators, but their applications are not limited to mere calculations, but have long been used for large-scale data management, retrieval, and well-designed character printing, and in this sense, they simply are not [2]. Calculators. Considering this feature, it is called a "computer" in Taiwan (a computer in China) and a "coordinator" in France. With the development of science and commerce, the number of calculations that humans have to process has increased exponentially [3].

Until very recently, when computers became so widespread, it was not uncommon for scholars to claim that manual machines had been rotating for many years to clarify physical phenomena, but that computers were a powerful force in the field of scientific computing and completely eliminated the manual system [4]. In addition, the four-color problem, which had been a difficult problem for hundreds of years, was already solved by the immense power of computers to perform mathematical functions, and this is far from the traditional argument of mathematics. There is not a few ripples about what was done [5]. However, it can be said that the advent of computers has freed humans from the labor of enormous and simple calculations. However, on the other hand, it has been re-recognized that there are many problems with familiar physical phenomena that cannot be calculated even on high-speed computers that perform calculations millions of times per second [6].

The data management is considered to be one of the most important tasks for various industry organizations and various sectors to successfully carry out their operations. Companies are found to be constantly storing a lot of data through their operations. Data mining plays a leading role in converting such stored information into useful information [7].

3. PROPOSED MODEL

Data mining is the process of finding inconsistencies and redundant data within large data sets in order to identify the best data set. A wide range of techniques are used here, through which the company can use this information to increase revenue, reduce costs, improve customer relationships and reduce risks.

The main objective of data mining is to "extract information (with intelligent methods) from a data set and transform the information into an understandable structure for further use to provide relevant information for making managerial decisions". The Process to create new forms of computer collection, data recording and information technology are the different forms. Data refers to a set of numbers, symbols, letters, and many other characters. The usual mathematical processing data processing involved is very extensive. The proposed System data processing involves eight aspects shown in Fig.1.

- **Data Collection**: Gathering the required information.
- **Data Conversion**: A machine that converts information which can be formatted.
- **Pocket**: Indicates the effective group according to relevant information, coded.
- **Data System**: To organize or process data, to organize data in any way.
- **Data Computation**: Perform various mathematical and logical operations to obtain more details.
- **Data Storage**: The results of the original data are calculated to save or use them later.
- **Data Recovery**: Find useful information for user needs.
- **Sorting Data**: The data are sorted according to specific requirements.
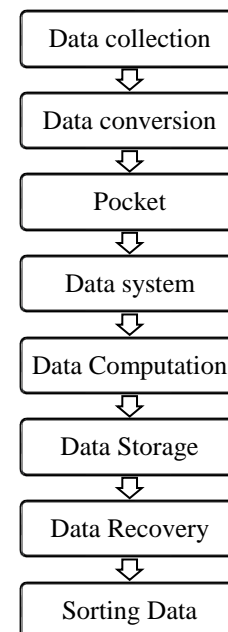

Fig.1. Proposed System Data Processing Module

Data Processing Approximately data production, processing and output are divided into three stages. During the data production phase, offline punch card information is injected into the input, tape, magnetic tape or disk. Even at this point the data is referred to as the input level. After data entry, it is necessary to process the data through a computer, and the computer program to program the user in advance, according to the computer data processing instructions and requirements to do this. The so-called processing means one or a number of combinations in all eight aspects described above. Finally, the output has text and digital formats and various statements.

Data mining is the process of capturing large amounts of data in order to identify insights and nuances in that data. Nowadays, the demand of data industry is increasing very rapidly, which has also increased the demand for data analysts and data scientists. Using this technique, we analyze data and then convert that data into meaningful information. It helps the business to take accurate and better decisions in an organization. Data mining enables smart market decision making, running accurate campaigns, forecasting and more. With the help of data mining, we can analyze customer

behaviors and their insights. This leads to great success and data-driven business. The data mining process consists of the following 6 steps.
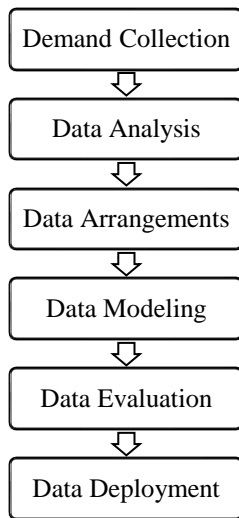
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┌─────────────────────┐
│ Demand Collection   │
└─────────────────────┘
          ⇩
┌─────────────────────┐
│ Data Analysis       │
└─────────────────────┘
          ⇩
┌─────────────────────┐
│ Data Arrangements   │
└─────────────────────┘
          ⇩
┌─────────────────────┐
│ Data Modeling       │
└─────────────────────┘
          ⇩
┌─────────────────────┐
│ Data Evaluation     │
└─────────────────────┘
          ⇩
┌─────────────────────┐
│ Data Deployment     │
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Fig.2. Data Mining Process

- **Demand Collection**: Data processing projects begin with the collection and understanding of need. Data mining analysts or users define the amount of demand with a vendor business perspective. Once the scope is defined, we move on to the next step.

- **Data Analysis**: At this stage, data mining experts collect, evaluate and explore the need or plan. Experts understand problems and challenges and turn them into metadata. At this point, data mining statistics are used to identify and modify data formats.

- **Data Arrangements**: Data mining experts translate data into meaningful information for the modeling step. They use the nucleus process - extraction, transformation and loading. They are also responsible for creating new data properties. Various tools are used here to render data in structured form without changing the meaning of the data sets.

- **Data Modeling**: Data professionals put their best tools into this process as it plays an important role in the complete processing of data. All modeling methods are used to filter the data appropriately. Modeling and evaluation are followed simultaneously to verify the relevant steps and parameters. The final result quality is proven after the final modeling is completed.

- **Data Evaluation**: This is the filtration process after successful modeling. If the result is not satisfactory, it will be redone to the sample. In the end, the demand is re-checked with the seller so no point is missed. Data mining experts ultimately determine the absolute outcome.

- **Data Deployment**: This is the final stage of the whole process. Experts provide data to vendors in the form of spreadsheets or maps.

The data processing system is widely used by various companies and educational institutions, including payroll, bills, debt and inventory management, scheduling, project management and sales analysis. It can produce analysis of performance reports, financial statements and statistical reports. Data processing technique includes module systems, data management systems, distributed data processing methods and other aspects of technology. In addition, a large number of data or information used by a variety of companies and public companies has formed an independent information processing industry of the industrial community. With data and information, human society itself has become a very valuable resource. Develop these resources in order to organize the information processing industry and promote the development of the information community.

The current computer does not write the user-executable program, but the computer schedules the user-written program in an appropriate sequence, allocates the necessary peripherals, and executes it upon each request. A group of programs known as an operating system controls the operation of such a computer. As a result, different types of processing can be implemented, such as online real-time processing, time-sharing processing, and batch processing. Also, for the integrated handling of data used in computer network software that interconnects computers and transfers data between them or naturally among different programs. The database management system is also an extension of the operating system functionality.

4. RESULTS AND DISCUSSION

The proposed innovation of data processing model (IDPM) was compared with the existing Data Processing System (DPS), Herschel data processing system (HDPS), GOCI data processing system (GDPS) and Distributed Data Processing System (DDPS)

4.1 ENTRY OF DATA

In the case of a business organization, data required at all stages of business operations must be collected and entered into an information system. Data is entered mostly through the keyboard. Data on tape or disks can be entered into the information system. Data entry is also possible through voice recording, scanning. Often the data entered is stored in the permanent storage (diskettes or CDs) of the information system. When competition is tight in a market with a high load, the answers are often within your consumer data. Telecommunications, media and technology companies can use analytical models to understand mountains of customer data, predict customer behavior, and deliver more targeted and relevant campaigns.

Table.1. Comparison of entry of different data

Data	DPS	HDPS	GDPS	DDPS	IDPM
200	67.32	67.68	66.86	65.14	84.84
400	68.81	69.65	69.28	67.34	87.26
600	70.30	71.62	71.70	69.54	89.25
800	71.79	73.59	74.12	71.74	91.53
1000	73.28	75.56	76.54	73.94	93.73
1200	74.77	77.53	78.96	76.14	95.94
1400	76.26	79.50	81.38	78.34	98.14

4.2 DATA PROCESSING

The term data processing refers to tasks such as addition and subtraction calculations, comparison, ascending/descending sorting, analysis, predicting future status based on previous data, preparing reports based on data, creating graphs and charts based on data. In short, data mining is the process of compressing data into information. With analytical knowledge, insurance companies can address issues related to fraud, compliance, risk management and customer attrition. Companies use data mining techniques to more effectively price products in commercial mines and to find new ways to deliver products to existing customer standards.

Table.2: Comparison of data processing

Data	DPS	HDPS	GDPS	DDPS	IDPM
200	71.79	73.59	74.12	71.74	86.24
400	73.28	75.56	76.54	73.94	88.23
600	74.77	77.53	78.96	76.14	90.22
800	76.26	79.50	81.38	78.34	92.21
1000	77.75	81.47	83.80	80.54	94.20
1200	79.24	83.44	86.22	82.74	96.19
1400	80.73	85.41	88.64	84.94	98.18

4.3 DISCLOSURE OF INFORMATION

Information obtained during data processing is passed on to the end user. The purpose of information systems is to provide end users with the information they need in the right format at the right time. Information output can be messages, reports, forms, or images. Output can also be in audio or video format. These can also be printed paper. With integrated, data-based perspectives on student progress, educators can predict students' performance before they set foot in the classroom - and develop intervention strategies to keep them certain. Data processing allows educators to access student data, predict achievement levels, and point out groups of students or groups of students who need extra attention.

Table.3. Comparison of disclosure of information

Data	DPS	HDPS	GDPS	DDPS	IDPM
200	69.61	70.78	69.69	68.14	83.46
400	71.91	71.91	71.29	68.81	83.94
600	74.21	73.04	72.89	69.48	84.42
800	76.51	74.17	74.49	70.15	84.90
1000	78.81	75.30	76.09	70.82	85.38
1200	81.11	76.43	77.69	71.49	85.86
1400	83.41	77.56	79.29	72.16	86.34

4.4 STORAGE OF DATA/INFORMATION

Written text is stored for words, sequences, paragraphs, and documents. Similarly, data is stored in a system called Fields, Records, Files, and Databases. Sometimes the information obtained from the data is also stored permanently. Aligning

supply plans with demand forecasts requires early detection of issues, quality assurance and investment in brand equity. Manufacturers can predict wear and tear on production assets and anticipate maintenance, which can maximize uptime and keep production lines on schedule.

Table.4. Comparison of storage of information

Data	DPS	HDPS	GDPS	DDPS	IDPM
200	76.51	74.17	74.49	70.15	94.90
400	78.81	75.30	76.09	70.82	95.38
600	81.11	76.43	77.69	71.49	95.86
800	83.41	77.56	79.29	72.16	96.34
1000	85.71	78.69	80.89	72.83	96.82
1200	88.01	79.82	82.49	73.50	97.30
1400	90.31	80.95	84.09	74.17	97.78

4.5 SYSTEM CONTROL

The information published is verified. If there is an error in them, the corresponding cause will be investigated. It could be an input error. Corresponding programs may need to be modified. Such control measures shall be taken by the administrator of the information system. Automated mechanisms help banks understand their customer base and the billions of transactions at the heart of the financial system. Data mining enables financial services firms to gain a better view of market risks, detect fraud more quickly, manage regulatory compliance obligations and achieve optimal returns on their marketing investments.

Table.5. Comparison of system control

Data	DPS	HDPS	GDPS	DDPS	IDPM
200	81.11	76.43	77.69	71.49	95.86
400	83.41	77.56	79.29	72.16	96.34
600	85.71	78.69	80.89	72.83	96.82
800	88.01	79.82	82.49	73.50	97.30
1000	90.31	80.95	84.09	74.17	97.78
1200	92.61	82.08	85.69	74.84	98.26
1400	94.91	83.21	87.29	75.51	98.74

5. CONCLUSION

The large customer databases contain hidden customer insights that can help improve relationships, optimize marketing campaigns and forecast sales. With more accurate data models, retail companies can deliver more targeted campaigns – and find the offer that has the biggest impact on the customer. It should be noted that it takes more time to get accurate information from the data. Therefore, after growing your business quickly, there is a need to make accurate and quick decisions so that you can take advantage of the opportunities available at the right time. In this technology-based world data mining is a fast-growing industry. Nowadays everyone has to use their data in the right way and in the right approach to get useful and accurate information.

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