THE ENHANCEMENT OF BIG DATA STORAGE BY USING RAPID EXPANSION FREEDOM ACCESS APPROACH

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Abstract

Big Data storage management is a technical concept that deals with managing large amounts of data, both structured and unstructured, which are currently handled by large business, technology, science and government departments. Big data, it's not really the amount of important data, but the data what companies do. In this aspect, free software (SL) and open source (CA) contributed a lot to this technology, as many advanced applications have been implemented in this development format. In this paper a smart approach was proposed to enhance the storage in big data. It's a development model, its philosophy, is based on the development of technologies, mainly software products, which can be used, modified and distributed for free. That open source is an important component in the development of free software because it focuses on the practical benefits of this development dynamically rather than the ethics of product freedom and citizens. Therefore, when SL/CA contribute to the mechanisms for advancing Big Data, where it is not only benefits from the rapid expansion of technological development, but also implicitly completes them for the freedom of access to the information that Big Data brings.

Keywords:

Big Data Storage, Data, Structured, Unstructured, Free Software, Open Source, Rapid Expansion, Freedom Access

1. INTRODUCTION

Big Data, its technology, was born with the intention of covering the entire spectrum of data analysis, that is, with current and different technologies, including those that can be solved, as well as those that cannot be solved by existing technologies, such as large-scale data storage and management [1]. Big Data, the technology associated with it, can analyze them to get ideas that lead to better decision making, movements and strategies [2]. Big Data makes it such a useful technology for companies (private and public, business, government and community) The fact that it provides valuable information that often serves as an accurate and reliable replacement for unanswered questions about certain situations or issues [3]. That is, its usefulness is often found in features that usually arise from the same information that is collected and managed.

Processing large amounts of information makes it easier to format or test processed data in the most appropriate way or specifies that it is deemed appropriate by its administrator [4]. This allows companies that use Big Data to identify issues in an understandable way. Its subsequent analysis allows it to be more effective and efficient at collecting large amounts of data and looking for trends in them, by moving them very quickly, smoothly and in a timely manner [5]. In addition, it allows complex areas to be cleared up before problems can be overcome, thus losing their benefits, reputation or support [6-8]. Many companies consider it possible to create backups of your files and software on a storage device, or on a cloud hosting service, which automatically backs up this information [9]. The truth is, it's not like that, so it's important to know some things about data storage that are beyond storage [10].

Computer data storage, often referred to as storage or memory, is a technology consisting of computer components and recording media used to retain digital data [11]. It is the main function and basic component of computers. A computer's central processing unit (CPU) handles data by performing calculations [12]. Practically all computers use a storage array, which keeps fast but expensive and small storage options closer to the CPU and slower but larger and cheaper options farther away [13]. Faster transient technologies (which lose data when power is turned off) are commonly referred to as "memory" and slower continuous technologies are referred to as "storage" [14]. In electronic digital systems such as computers, data communications and various control devices, information such as data and procedures required to process information are stored without error and can be retrieved and used when needed. Devices are collectively referred to as storage devices or memories. It is a storage device that represents the system with electronic circuits from other systems, and determines the capabilities and functions of the system, and its importance and progress are significant [14].

A storage device is considered to be an electronic device that senses human memory and recording capabilities electronically, but there are many differences in structure and function. Most storage devices use a simple way to write and read information from a storage location (called an address by assigning a serial number). There are numerous functions for humans to memorize content and chronology, but the storage device is highly advanced in terms of accuracy and speed, which is being actively used. In particular, the operating speed determines the upper limit of system performance, so speed is always required, and some speeds can be used up to 100 million times per second (access time is about 10 Ns) or more. A storage device is made up of a combination of storage components and recording components (collectively referred to as storage components) and their control/support components. However, in many registration areas, its main purpose is to store a large amount of information economically, and the address selection function is separated from other mechanical means to achieve a comprehensive economy. In this case, the registration is done. This is called a (recording) medium. An example table of the approximate storage capacity and size of the main storage components/media is shown. Books are an excellent storage medium, but their interaction with electronic functions is weak and the information storage density is not as high as the latest storage components. The memory of the first computer, ENIAC, was a set of flip-flop circuits using dual triodes.

Among the fast-advancing electronic technologies, the speed of advancement of memory technology with semiconductor

technology is very fast. The average memory in 1983 is about 10 tos 0.1 ors or less than 2 digits at access time, compared to ENIAC about 40 years ago, and from 6W to 6W several μW or bit less power requirement. As mentioned above, a bit size of 10 digits or more can be upgraded from 0.3L to 10^{-8} cm^3 or less, and storage capacity can be upgraded to over 12 digits. Typically, this is unstable memory, and requires a dedicated offline device to write and erase. Auxiliary memory/content-address memory/content-address memory is also abbreviated as CAM. A typical storage device reads stored information according to the storage location address, but is a storage device that encodes and reads the stored information by specifying the content of the information. Use the reference field instead of the address and read it by matching the reference information. The reference field can also be changed independently with the direct field. It is perceived by a simple logical function, which is different from the human sub-function and ability. Keep in mind that creating an entire storage device accessory is expensive, so it is common to apply this idea to certain areas [15]. Wire Memory Magnetic wire memory is also known as magnetic wire storage device. A form of magnetic thin film storage device in which a magnetic wire is attached to the surface of a non-magnetic wire with a disparate anisotropic magnetic thin film in the circumferential direction, about 0.1 mm in diameter by electroplating word line

2. RELATED WORKS

Identifying the value of big data does not just mean analyzing it (which is already an advantage). It is a complete discovery process that requires analysts, business users and administrators to ask the right questions, identify patterns, make informed decisions, and predict behaviors [1]. This distribution moves to the top right with the advancement of technology and times and Faster speed, smaller capacity. This relationship is the same not only for the operating principle, but also for those who use the same object and policy. Due to the inevitability of conflicting speeds and large capacity, it is not practical and economical to cover all the memory required by the system with the same operating principle and object memory [2]. The information used in the short term in a particular processing process is often a group of information that is not much related to each other. Utilizing this property, it uses the required portion of information to transfer high-capacity memory at low speeds to high-capacity small-capacity memory in a timely manner and to improve overall performance. This is called hierarchical configuration of storage devices or multiple storage configurations [3]. The five layers in the image can be omitted depending on the size of the system. The files below the offline files are generally rarely used, and they often contain manual functions. Ultra-Mass Storage System (MSS for short) is an attempt to automate this manual function and bring it online [4]. The main storage device is a memory that exchanges information directly (in some cases, via a buffer storage device) by specifying an arithmetic/control device or an address, and is also called an internal storage device [5]. Typically, magnetic core memory has been widely used as a core storage device for a long time, but nowadays semiconductor storage devices are the mainstream, creating storage cells with semiconductor integrated circuits. Memory other than the main storage device is called an accessory storage device or external storage device, and is also called a file storage device when the main task is to store large amounts of information at low cost. It can also be used as an input/output device or communication medium [7]. The external (auxiliary) storage device communicates with the main storage device without being directly connected to the arithmetic/control device. Magnetic tape devices, magnetic disk devices, floppy disk devices, etc. are commonly used [9].

The device price configuration of a typical large computer system. The memory system occupies the majority. In small and medium-sized systems, the number of input/output devices increases relatively and the channel/communication system shrinks, but the storage system remains an important part. The importance of storage devices has been decisive since the proposal of the storage programming system, but it shows in detail how much the development of storage devices has contributed to the development of computers and electronic systems [11]. The number is five. The prices of computer utility bills and storage devices have each dropped by a few thousand in a quarter of a century, but it is clear from the price mixing ratio that the improvement and development of memory play a decisive role [12]. As storage devices become more sophisticated and inexpensive, they are widely used in fields other than computers. i.e. standard/conversion/band compression of TV images, ultra-high quality storage and voice conversion, storage/ communication information and digital signal processing, application and document creation and editing for various measuring instruments. Changes also occur in computer systems. In other words, while memory devices were expensive and had poor characteristics, information processing systems were limited by memory, and the system was designed with the focus on improving the performance of memory usage [14]. Recently, however, rising software development and maintenance costs and lower memory prices have accumulated, and the burden of software has changed despite the increase in the amount of memory used [15].

3. PROPOSED MODEL

The technology opens the door to a new approach to understanding and decision-making, which is used to describe large amounts of data (structured, unconfigured and semi-structured) that are relevant for database analysis that can be time consuming and costly to load. Auction data usually handles quantities of data defined by the following characteristics shown in Fig.1:

- **Volume**: The amount of data from multiple sources.
- **Speed**: The speed at which data comes in and is managed from multiple sources.
- **Type**: The format of data analyzed from multiple sources.

Data volumes consisting of generally configured, semi-structured, and unstructured data, and often handled in large quantities, often described with large prefixes, such as: tera, beta, or exo. And from all kinds of sources such as the Internet (social networks, digital media, websites and databases), hardware (such as mobile phones, multimedia players, positioning systems, civil and industrial digital sensors) and organizations (private and public, business, government and community).

Big data helps companies better manage their data, which identifies new positive or productive opportunities for their

members (customers or citizens). This, in turn, leads to better and more efficient actions, saving hours/labor and money, which often translate to happiness for everyone involved. When large data is used, value is usually added to operations performed in the following ways shown in Fig.2:

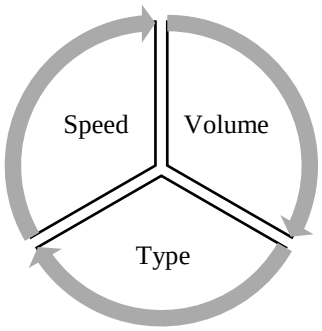

Fig.1. Quantities of Data

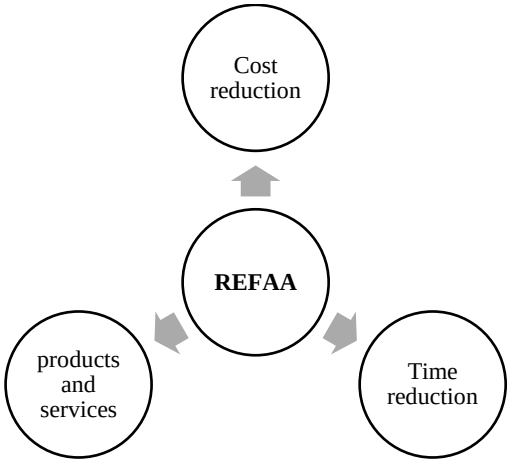

Fig.2. Proposed model operations

- **Cost reduction**: In storing and managing large amounts of data.
- **Time reduction**: greater efficiency and effectiveness in decision making.
- **New products and services**: With the ability to measure and anticipate the needs and problems of users (customers and/or citizens), their satisfaction increases.

Not all data are the same, and as a result, experts point out that it is important to understand the business value of data with the aim of defining the best storage strategy. Configuration of data retention policies is essential for those responsible for managing data locally and for legal compliance. Keep in mind that some data may have to be stored for many years, while others will only be needed for a few days. By creating processes, the company can identify the most important data, which then allows it to prioritize resources for adequate storage management shown in Fig.3.

- Data adjustment period should be short in case of loss
- The company needs access to information quickly
- It should only take a short time to address the data
- Make sure the storage is safe
- Regulatory requirements must be met

Storage information can be set by writing the default. A PROM such as fuse type that cannot be erased or rewritten while writing information, joint fracture type, FAMOS type that can be erased and rewritten by ultraviolet radiation, type 2-layer gate type, MNOS type that can rewrite electricity, type 2-type gate. Non-volatile memory Non-volatile memory is a storage device that can retain stored information without consuming energy, even when the power is turned off. It is also known as endurance storage. Examples are magnetic core storage devices, magnetic disks, and magnetic tape storage devices. Memory Push down Memory Typically, a storage device performs a storage function using an address as an intermediary, but this is a storage format that only mediates the time-order sequence of the storage. Also known as push-down stack, push-down store, lost-in, first-out memory, zero-address memory, etc., it is used for branching and return to subroutines.

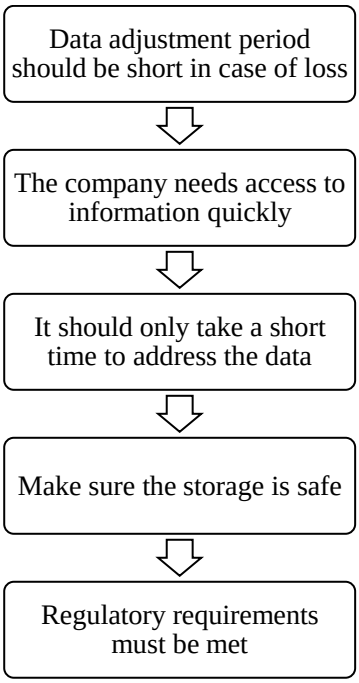

Fig.3. Resources for adequate storage management

Normal memory is often used for pointer function. Random-Access Memory Random-access memory is also abbreviated as RAM or Fixed-Speed Call Storage Device, a storage device in which access time is virtually unchanged regardless of storage location or call order. Semiconductor storage devices and sensitive memory are common to mainstream storage devices. In auxiliary storage device, the magnetic disk device is called a random-access file as opposed to a magnetic tape device. When using abbreviation for ROM, it is used in contrast to ROM. ROM is usually a fixed speed call (RAM).

On the other hand, memories such as magnetic drums, magnetic tapes, and CCDs store stored information and storage media by transmitting them electronically or mechanically, so the access mechanism can be shared by a large number of bits, so they are inexpensive to configure. This can be done, but access time is not long and stable. This type of memory is called a circular call storage device or circular memory. Read-only memory Read-only memory/fixed memory/permanent memory is also called ROM for short. Memory with equivalent reading and writing functions

and movements and free memory is called a living memory. At the expense of writing properties, read-only memories, fixed storage devices and dead memories are aimed at information retaining properties, high-speed readability and economy. Many types of stored information have been created and used that are difficult to transfer, both manual and commanding. It is used to accommodate programs that need to be prevented from being erased and to accommodate information with a limited number of modifications.

4. RESULTS AND DISCUSSIONS

Well used big data is often capable of determining the root causes of failures, problems and shortcomings almost in real time. However, it should be taken into account that Big Data technology is not a panic. The proposed rapid expansion freedom access approach (REFAA) was compared with the existing Dynamic remote data auditing (DRDA), Intelligent cryptography approach (ICA), Secure big data storage and sharing scheme (SBSS) and Privacy-preserving cipher text multi-sharing control (PPCMS)

4.1 ARCHIVE BIG DATA MEMORY

A storage device that aims to store large amounts of information such as official documents and historical data over a long period of time. The long-term storage consistency of the information and the performance of the storage are followed, and there is generally no need to overwrite the information. Research is being conducted on metal thin films with small holes made by those using electron beams and photographic technology, but the rigid ones have not yet been developed and the requirement has not necessarily been implemented. Access Time Access time Converting a storage device or storage component readable and writable by a functional command issued from a program is called proximity, call, or access, and is called the time it takes for information to return from receiving the operational command.

Table.1. Active big data memory management

No. of data	DRDA	ICA	SBSS	PPCMS	REFAA
100	81.31	64.58	78.66	75.47	87.22
200	81.64	66.08	79.25	77.34	88.23
300	81.97	67.58	79.84	79.21	89.24
400	82.30	69.08	80.43	81.08	90.25
500	82.63	70.58	81.02	82.95	91.26
600	82.96	72.08	81.61	84.82	92.27
700	83.29	73.58	82.20	86.69	93.28

4.2 ACCESS TIME

This is an important characteristic value that indicates the speed of the storage device/components. Analog Memory Analog memory is where an analog signal can be stored for a long time and the stored value can be read without destruction. There is a point memory that stores a sample point, a waveform memory that stores a one-dimensional signal, and a surface memory that stores a two-dimensional signal. Conventional recording with magnetic tape is a type of waveform memory.

Table.2. Access time management

No. of data	DRDA	ICA	SBSS	PPCMS	REFAA
100	82.98	67.19	80.23	78.17	88.39
200	84.12	67.57	81.44	79.08	89.35
300	85.26	67.95	82.65	79.99	90.31
400	86.40	68.33	83.86	80.90	91.27
500	87.54	68.71	85.07	81.81	92.23
600	88.68	69.09	86.28	82.72	93.19
700	89.82	69.47	87.49	83.63	94.15

A rotating type storage device similar to the magnetic bubble operating time is several tens of PS, power consumption, 10^{-19}j is a bit of a very promising bit array, but it is not yet practical use.

4.3 DYNAMIC MEMORY

It does not have the capacity to hold information, and the state associated with the information and its occurrence decomposing element over time are used as storage cells, but the person holding the information from time to time is called dynamic storage or dynamic memory. An example is the 3-transistor type or 1-transistor type semiconductor memory, which has the advantage of facilitating cell structure and greater integration and economy. Memory that has the ability to hold information in a static state is called static memory or static memory.

Table.3. Dynamic memory management

No. of data	DRDA	ICA	SBSS	PPCMS	REFAA
100	85.17	68.58	82.58	80.00	88.92
200	85.88	69.51	83.69	81.33	90.12
300	87.18	70.51	84.39	82.41	90.28
400	88.09	71.46	85.36	83.66	91.13
500	89.09	72.43	86.27	84.86	91.81
600	90.10	73.39	87.17	86.07	92.49
700	91.10	74.36	88.08	87.27	93.17

4.4 BUFFER MEMORY

It is a device that temporarily stores information to adjust the operating speed, data width, data format, time, etc., and is also called a buffer storage device. In particular, a cache memory or a scratchpad memory runs at very high speeds within an arithmetic unit and acts as an alternative ego to the main storage device. Indestructible Reading Reads information stored without changing the state of the storage cell. When new information is written, the retained information is restored, so it does not need to be erased, but some memories use the principle that the stored information is erased by the read process. This form immediately overwrites the same information.

Table.4. Buffer memory management

No. of data	DRDA	ICA	SBSS	PPCMS	REFAA
100	79.01	62.28	82.06	78.21	86.31

200	79.34	63.78	82.65	80.08	87.35
300	79.67	65.28	83.24	81.95	88.39
400	80.00	66.78	83.83	83.82	89.43
500	80.33	68.28	84.42	85.69	90.47
600	80.66	69.78	85.01	87.56	91.51
700	80.99	71.28	85.60	89.43	92.55

4.5 DIGITAL MEMORY

This has become so widespread that it is inevitable that noise and distortion will increase due to repeated storage and playback. Recently, with the DA change AD. Modified, digitally stored and reproduced. Evaporative memory is also known as volatile memory intolerance storage device, which loses stored information when the power is turned off. A semiconductor storage device that uses a flip-flop circuit and a dynamic storage device (dynamic memory) to store the parasite capacitor with or without an electric charge. Magnetic bubble memory the magnetic field is stored in the presence or absence of fixed cylindrical bubble-shaped magnetic fields (bubbles) of about 1mm in diameter, and the bubbles are a rotating magnetic field driven by a transmission path formed by a thin film of permethrolysis. This creates a circular memory. Although it has the advantage of unstable living memory, its operating speed is in the middle range between semiconductor storage memory and magnetic storage-based memory, and it is used as an external storage device.

Table.5. Digital memory management

No. of data	DRDA	ICA	SBSS	PPCMS	REFAA
100	80.68	64.89	83.63	80.91	87.48
200	81.82	65.27	84.84	81.82	88.44
300	82.96	65.65	86.05	82.73	89.40
400	84.10	66.03	87.26	83.64	90.36
500	85.24	66.41	88.47	84.55	91.32
600	86.38	66.79	89.68	85.46	92.28
700	87.52	67.17	90.89	86.37	93.24

4.6 CCD MEMORY CHARGING

A type of semiconductor memory element that combines device memory. The charges associated with the stored information are stored in the energy generated under the transfer electrode, and the voltage applied to the transfer electrode is moved to create a shift record type memory. It can also be used as an analog memory as the amount of charge to be converted can be set independently. It is smaller and cheaper than the RAM of MOS type elements, but it is only a rotation type memory.

Table.6. CCD memory management

No. of data	DRDA	ICA	SBSS	PPCMS	REFAA
100	82.87	66.28	85.98	82.74	88.01
200	83.58	67.21	87.09	84.07	89.25
300	84.88	68.21	87.79	84.94	89.36
400	85.79	69.16	88.76	86.12	90.22
500	86.79	70.13	89.67	87.22	90.90
600	87.80	71.09	90.57	88.32	91.57
700	88.80	72.06	91.48	89.42	92.25

When external memory is used as an input/output database for a system that requires a large storage capacity or information recording media, it is difficult to install economically and functionally only with the main storage device. Therefore, accessory/output devices (external) storage devices such as magnetic disks, ultra-large storage devices (mass storage systems), magnetic tapes, magnetic cards, magnetic bubbles, floppy disks and channel devices or digital cassette tapes used by data buses Sometimes referred to as external storage devices.

4.7 MAGNETIC CORE MEMORY

This is a storage device that uses both directions of residual magnetization of the ferrite magnetic core with square hysteresis characteristics. This is also called a core memory. Typically, a matrix is made up of a small toroidal magnetic core about 0.5 mm in diameter and the braided wire, and the braided wire is formed. Write the information through the current matching type selection. The operating speed is defined by the magnetic reversal rate of the magnetic core, but the multi-step knitting core is a drawback, with a bit size of $10^{-3}cm^3$, a random-access type and unstable memory, performance stable and optimal storage device.

Table.7. Magnetic core memory management

No. of data	DRDA	ICA	SBSS	PPCMS	REFAA
100	82.06	83.29	76.14	83.24	88.00
200	80.43	81.55	74.56	81.82	86.71
300	79.95	79.21	72.36	80.56	85.70
400	78.66	78.40	70.73	78.57	84.81
500	76.55	76.11	69.59	76.10	84.44
600	75.06	74.18	67.39	74.66	83.40
700	73.25	72.45	66.24	72.94	82.63

Recently it was replaced by semiconductor memory for special applications only. Magnetic thin film memory various technologies have been developed to improve the drawbacks of magnetic core storage devices, but to some extent magnetic thin film memory has been successful. Because an anisotropic magnetic thin film is used instead of the toroidal magnetic center, it operates at high speeds, can read without destruction, has no knitting process and is highly productive, but it is difficult to accept a closed magnetic circuit structure, the reading voltage is low, and it is susceptible to noise.

5. CONCLUSION

The present time is more or less immersive or immersive in data that can be said as a whole, rather than individually. Therefore, the use of Big Data technology in the present and immediate future will enable society and the whole of humanity to discover countless things (events or discoveries) that may take many years to discover themselves. Such large data and its tools

provide sufficient analytical speed Analyze the result obtained quickly and rework as many times as necessary in a short period of time to find the actual or approximate value you are trying to achieve are arranged in large numbers in a matrix. A drive current is passed through the word for each magnetic wire and wire, and the magnetization is written upside down at the intersection. The storage cell becomes a closed magnetic field and can be connected to a magnetic wire, which also acts as a sensor wire, so it is resistant to noise.

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