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"Executive Decision Making Effectively Using Data Warehousing Technology"

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Introduction:

In the new century, onwards the decade in which organizations have started to recognize the strategic use of data, which can be refereed as a separate discipline, as that from operational use. The operational databases have been basically designed to meet mission critical requirements of the On-Line Transaction Processing and Batch Processing. The strategic data usage is basically require On-Line Query Processing or Batch-intelligence gathering for decision support. In business systems efficiency is no longer a success key factor, it has been replaced by flexibility and responsiveness. Also the emergence of communication factor is to be added to this system. Due to the massive development in communication infrastructure the transactions have been processed in real-time mode of business operations. The Organization which have come to known the power of information are getting the stronger competitive advantage over their competitors and the solution for this is Data Warehousing strategy.Due is emergence of data warehousing the information value and usage is has been newly recognized. Data warehouses works as means for the strategic data utilization. A data warehouse works as an integrated platform having the integrated data of refined quality so as to support an executive decision maker by making usage of DSS or EIS like applications. By making consolidation, conversion, transformation and integration of operational data and by provision of a consistent view a Data Warehouse has been increased the productivity of executive decision maker A senior decision maker is flavored very well by making wage of EIS applications, which allows him to "slice & dice" the data as per their working style. EIS does have he ability to report regarding unpredictable drill-down functionality provides high performance, and highly user-oriented as compared to analyst.Briefly Data Warehousing is a blend of technologies having orientation towards effective integration of operational databases in the environment that enable the usage of data for strategic purpose. This particular technology is made-up of Relational & Multidimensional Database Management Systems, Client/Server architecture, Metadata modeling and Repositories, Graphical User Interfaces etc. But the Data Warehouse are not same as Decision Support Systems.

Why there is need of Data Warehousing (DWH)?

Basically Data Warehouses are not any products. Data Warehouse is an environment. It is a blend of construction of Information Systems, which energies the user with current and past information can be used for decision making. In other words the data accessing becomes harder, which needed by Decision Maker. The Data Warehouses plays the role of cornerstone, by providing the ability to the organizations to perform information processing effectively. The informational requirement of the Knowledge Worker have been satisfied. Data Warehousing provides strategic business opportunities by allowing customers and vendors access to corporate data while maintaining necessary security measures.From the business point of view, so as to survive and succeed in today's stronger competitive global environment, the business people & users do require the answers – due to the reason:

- Decisions are required to be made quickly and correctly, by making usage of available data.
- Business experts may be Non – Cmputer people
- The Transactional data generated, which gets doubled every 18 months, which cause slow-response time, and inability to extract the required data contents.

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- Due to the competition there is an increase in information value and business intelligence.

In addition to all these things the organizations have distributed the control away from middle management. The user are more relayed on information providers of information technology systems.

Technological Reasons :

1. Data Warehouses are designed in such a way to over-come the problem of incompatibility of Informational and Operational Transactional Systems. The EDP and MIS are designed to satisfy the often, incompatible requirements of the business. But at the same time IT infrastructure is changing at a rapid speed and its capabilities are increased, as evidenced as follows :

i) The price of computer processing speed MIPS (Million Instruction Per Second) is continuously decreasing, and while the microprocessor power is getting doubled after every 2 years
ii) The prices of digital storage media is declining at a high speed.
iii) Bandwidth of network is increasing, but the price of high bandwidth is decreasing.
iv) The workplace in terms of HW & SW is alternating (heterogeneous) time to time.
v) The existing systems to and fro can be integrated with new applications.

Due to this shift in computing paradigm the Distributed Client/Server computing is emerged in organizations. As the reason more-and more critical applications were being placed (ported or developed for) on this new environment. The early-developed Client/Server solutions were found to be inadequate to solve today's business problems. This inadequacy was found incase of runtime and new development aspects of the Client-Server computing.

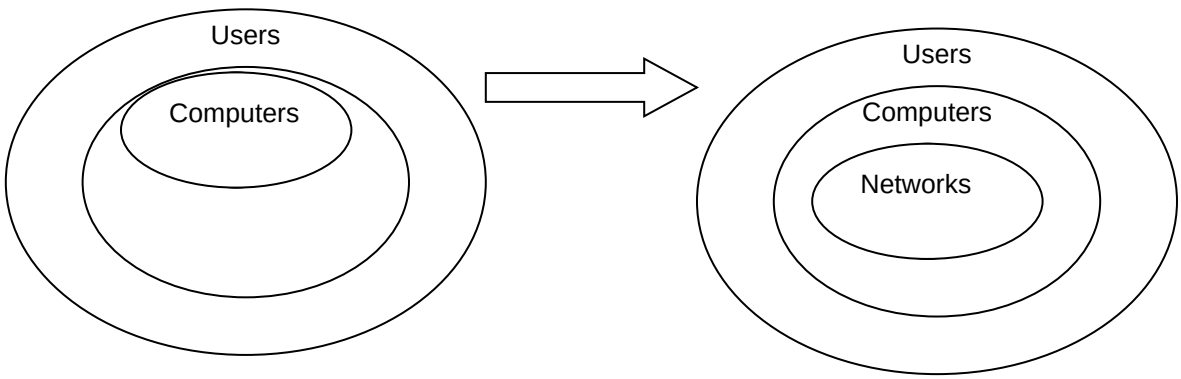
Additional New Demands on the Environment itself :

It was not making problem to the design or architecture of client-sever, but it has been additionally introduced new demands on the environment itself. As those are listed as below:

- Object Orientation: - The need for development in object oriented analysis design and programming, which was became the need of the time.
- It can be said he implicit or explicit acceptance of object-orientation by IT practitioners, which coupled with the emergence of object oriented standards, and availability of related developments and run-time tools, results, which needs to be adopted by the client/ server model. So as to handle the objects as per the practitioners.
- Middle ware: - This is the layer in client/server architecture which transforms two-tier client/server computing model into a more complex client-middle ware-server model.
- Storage and Handling of complex data: - The system ability to handle, store, manipulate a variety (complex) type of data (as user defined) for e.g. Video, images, text, special & time series data in new-object-oriented database systems, as if assuming they were traditional data types.
- High performance commercial parallel computing and very large database (VLDB) Processing :- The traditional servers were found to be in cable of handling large volume of data, a large number of users & simultaneously
-

Paradigm Shift :

The widely acceptance and popularity of data warehouse in closely linked with the phenomenon: Client/server architecture.



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Computing Paradigm Shift (by Alex Berson & Stefen Prata)

Computing paradigm: -

There is an increased shift in computing paradigm. The traditional view of computer user was a getting access to a computer via-a-communication network. The main emphasis here was to access to known computer program, which was resided on a known, or may a remote system. This concept was basically like host - based or master-slave computing.

Now a new way of computing has been came into picture. The user make use of computers to solve the problems and if any case makes requests for services. Thus there is an assumed (implied) understanding that the services requested by a user may not be available on a single system, rather those may be distributed across a network.

The users make use of their computer as a entry door (point) to have access to this distributed computing power. The global nature of this kind of business environment is roughly classified as workgroup computing and LAN/WAN environments. The main focus is laid on shared & reusable resources, the attention given to the information superhighway, and that of wide use of global networking services, such as internet and the world wide web (www). These are evidences which made the shift in computer paradigm. Thus the fundamental shift is prompted by data warehousing and its related technologies.

Due to increasing need of right sizing, the process of business processing reengineering, and the resultant of this is introduction of work group computing, and a prominent role played by decisions support systems. The users – executives and information workers, paperless office, timely supply of finished goods, and services due cause increase in customer expectations - & so on are the examples what the today's business need to remain in competion. So as to achieve these goals the technologies like client/server computing, distributed computing, object oriented technology, multimedia technology, usage of artificial intelligence and expert system, communications infrastructure are made use of extensively.

Informational data can be extracted from operational data resources (includes – few or all applications, databases, and computer systems within organization) As operational data is in fragmented form and inconsistent it cannot be used for decision support.

Designing of data warehouses is done so as to provide an architecture which will make corporate data easily accessible and can be utilized by knowledge workers and by decision makers also. Thus the Data Warehouses are significantly differ from operational systems in following respect:

1) Application wise data is organized in operational system
2) Based on daily transactions data is processed.
3) Need to update intensively.
4) Made we of present data
5) Organized in achievement of best performance.
6) On the basis of primary key direct record access
7) Do support large number of shoot transactions.
8) Supported to a large number of con-current user.

Most often the Relational Database Management System technology is used in informational as well as in operational database.

Difference between Informational Data and Operational Data :

	Operational data	**Informational data**
Data access	Predefined/structured	Ad – h & c
Access type	Read/update/delete field-by-field	Read aggregate added
Data model (Schema)	Normalized, automatic	As per user analysis needs
Data content		Summarized, archived,

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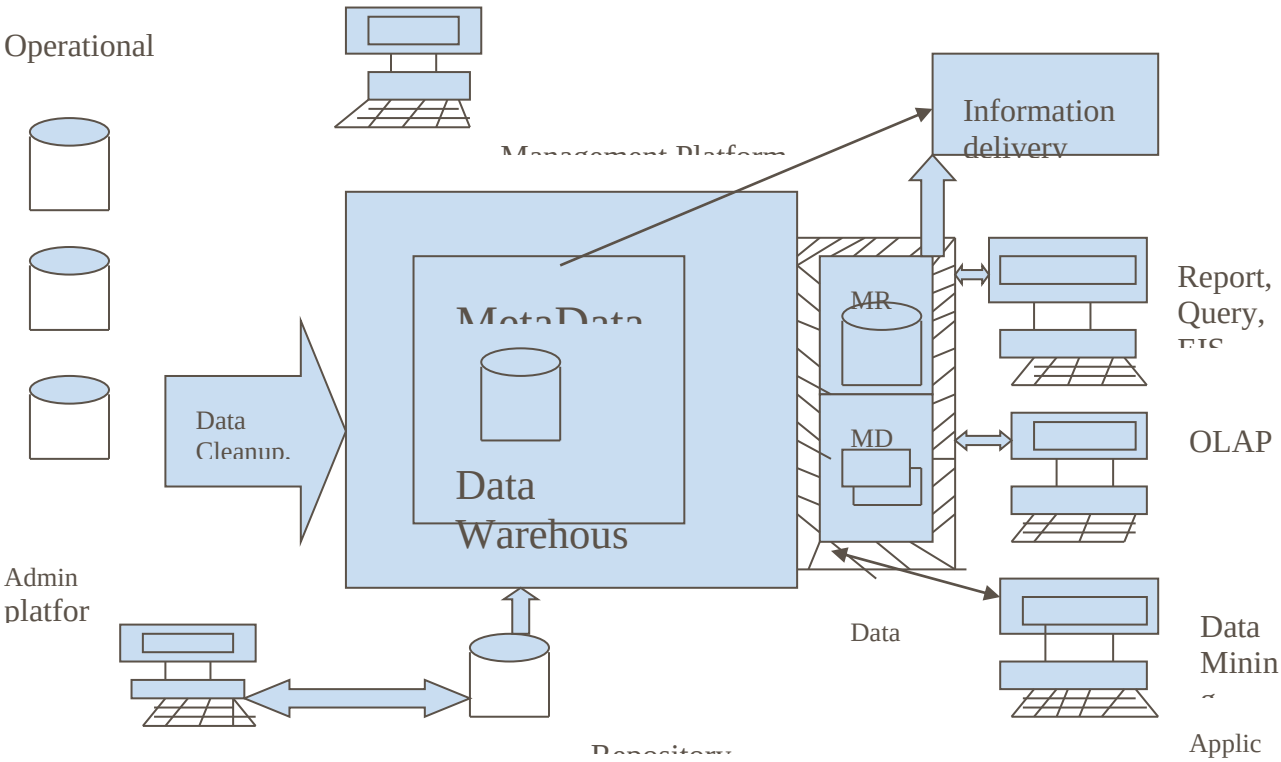
Data change Data organization Unit of work Records range accessed per transaction data stability No. Of concurrent users Transaction volume Data structures Usage Response Time Types of users Number of indexes	access, consistency isolated, durability (ACID) current values frequently changed by application concurrent update, insert and delete very few per operation dynamic thousand large volume optimized for transactions frequent / high predicable repetitive subsequent (<1's>) to 2-3s. Clerks, operational user few and simple.	derived historical Periodic, scheduled batch updates by subject data is queried Millions per operations static until refreshed Typically, hundreds Very low Optimized for Compton queries medium low Ad-hoc, unstructured Heuristic Several seconds to minutes Analytical manager Complex many

Architecture of Data Warehouse



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(Source- Data Warehousing Technology by –Alex Berson & Stephen Prata)

Conclusions: Data Warehousing Technology is meant for satisfying the Informational needs of Knowledge-Workers, in turn making effective strategies and supports executive Decision making at all the levels of Management.

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