

Relevance of Data Warehousing in the Third Party Logistic Industry

¹ARABINDA NANDA
KRUPAJAL ENGINEERING COLLEGE
EMAIL: aru.nanda@rediffmail.com

²OMKAR PATTNAIK
S.I.E.T ,DHENKANAL
EMAIL: omkar29in@gmail.com

Abstract:-

The rapid pace of today's business environment has made Business Intelligence (BI) systems indispensable to an organization's success. BI systems turn a company's raw data into useable information that can help management identify important trends, analyze customer behavior, and make intelligent business decisions quickly. Over the past few years, business intelligence systems have been used to understand and address back office needs such as efficiency and productivity. Now organizations are increasingly using BI to analyze customer behavior, understand market trends, and search for new opportunities. Over the last few decades the role of logistics management has undergone a prototype change. It is widely recognized as an extremely important aspect of the overall business strategy. At the same time, a number of factors have increased the complexity of logistics management. This has led many companies to outsource their logistics activities to Third Party Logistics (3PL) providers. Today, 3PLs play a critical role in the supply chains of their customers. They are increasingly viewed as strategic partners who can play a key role in optimizing the supply chain and thereby providing sustained competitive advantage. To effectively manage the supply chains of their customers, 3PLs need to constantly analyze data collected from various sources and convert it into actionable information. Business Intelligence (BI) tools like data warehousing and OLAP can significantly help 3PLs in achieving this objective. By providing a unified view of the entire supply chain, these tools can help improve the functioning of basic 3PL services like transportation management, warehousing, and inventory management. 3PLs can leverage BI tools to provide their clients with information specific to their supply chain, thereby increasing their market responsiveness. BI tools can also help 3PLs improve their own internal organizational functions like human resources and financial management.

Introduction:-

Logistics came to be recognized as a distinct function with the rise of mass production systems. Production and distribution were viewed as a sequential chain of extremely specialized activities; the role of logistics was to ensure availability of all the requisite materials before each step in this chain. Obviously inventory of raw materials, semi-finished and finished goods was a must across this chain to ensure its smooth functioning. Business environment was relatively stable and the mass production system ensured huge economies of scale for the manufacturers. So far so good.

Enter the Japanese. The whole paradigm of mass production system came crumbling down! Suddenly companies scrambled to adopt Japanese philosophy in manufacturing and distribution – Lean manufacturing, Just-in-Time, Kaizen, and Quality Circles became the key techniques. Simultaneously the role of logistics underwent a paradigm shift. It became the cornerstone of business strategy – a key enabler for the new techniques. Lean manufacturing called for drastic reduction in inventory costs across the supply chain. This required on-time delivery of raw materials, semi-finished and finished goods at different points in the chain; often the window of on-time delivery was as low as 10 minutes. Hence logistics became an extremely complicated process and firms hired experts to do this job. Logistics management has, if anything, grown much more complex ever since. Product lifecycles have shortened, customer behavior has become very fickle and business environment as a whole is extremely volatile. Manufacturers can no longer push their products down the supply chain; it is the consumer who pulls the products she desires. And the products should be there right in front of her, as and when she wants them. Price and quality are no longer sufficient to thrive in this market; speed to market and flexibility of the supply chain are also of paramount importance. To achieve this flexibility, information has to freely flow throughout the supply chain – information not just about where the products are but also how the supply chain as a whole has been functioning. The performance of the supply chain needs to be constantly analyzed and improved to ensure its survival.

Rise of Third Party Logistics (3PL) Providers

Increased impetus on core competence and growing complexity of the logistics function has led many companies to outsource logistics activities like transportation and inventory management to Third Party Logistics (3PL) providers. In addition to this, by outsourcing to 3PLs, companies avoid locking capital in warehouses, trucks, containers, etc.

Another factor influencing the adoption of 3PL services is globalization. As firms expand their markets beyond national boundaries, the need for more sophisticated services like multi-modal transport and international trade rules compliance increases. Smart 3PLs have developed these competencies and can effectively ship products to multiple countries, using multi-modal transport, and meeting all the international trade requirements.

The emergence of Internet has given rise to a new breed of e-Logistics companies, which provide a spectrum of solutions. These web based logistics portals seek to bring together shippers, 3PLs and other interested parties to provide more effective collaboration. Often these portals are perceived to be in competition with conventional 3PLs. In fact they provide complementary services and together they can cover the worldwide supply chain needs for their customers. In conjunction with e-Logistics companies, 3PLs can provide services like crossborder transport, customs clearance and international trade settlement by effectively coordinating with concerned agencies. But there are still many companies which believe that logistics is too critical a function for them to relinquish control to third parties. To win over these customers, 3PLs need to establish themselves as key business partners involved in the entire supply chain – right from logistics strategy formulation to

its implementation. And they need to effectively share information and knowledge with the customers.

Business Intelligence and the 3PL Industry

The 3PL industry is extremely varied in the types of services it provides. At one end are conventional freight movers involved in transportation of shipments from one location to another. Generally these services are restricted within a geographical area and use limited modes of transportation. At the other end are 3PLs who can execute complex end to end supply chain projects involving multiple countries and multiple modes of transport. 3PLs may or may not own carriers and warehouses. Accordingly they are classified as asset based and non-asset based 3PLs. Currently the 3PL industry is in a state of transition. Players are adding more and more services to their portfolio as customers demand more integrated solutions. 3PLs are viewed as strategic partners who can optimize the supply chain, reduce the cycle time, and provide unprecedented customer responsiveness. The key to effectively provide these services is Information Technology. More sophisticated 3PLs have quickly embraced IT to enable better coordination of activities by providing tracing and tracking facility to its customers. But this is hardly enough to ensure sustained competitive advantage. To squeeze out the last drop of inefficiency from the supply chain, eliminate bottlenecks, and continuously seek process improvement, the ability to analyze all the activities in the logistics process is vital.

Business Intelligence can help the 3PLs in three ways:

1. **Service Improvement:** Traditionally 3PLs have been providing services transportation management; warehouse and inventory management; and value added services like light assembly, kitting, etc. Business Intelligence can improve the effectiveness of these services by in-depth analysis and reports on various functions involved in these services.
2. **Provide Information Technology Based Services:** With the help of BI, 3PLs can provide their clients with analysis and reports specific to their supply chain. These can significantly help the customers increase their responsiveness and time to market.
3. **Improve Organizational Support Functions:** BI can significantly improve organizational support functions like HR and financial management by providing an integrated view of these functions and supporting their specific decision making requirements.

BIDW Overview

- *Analyze* internal business activities to improve processes, increase efficiency, and reduce costs
- *Track* external market trends to understand customer behavior, improve relationships, identify opportunities, and increase competitiveness

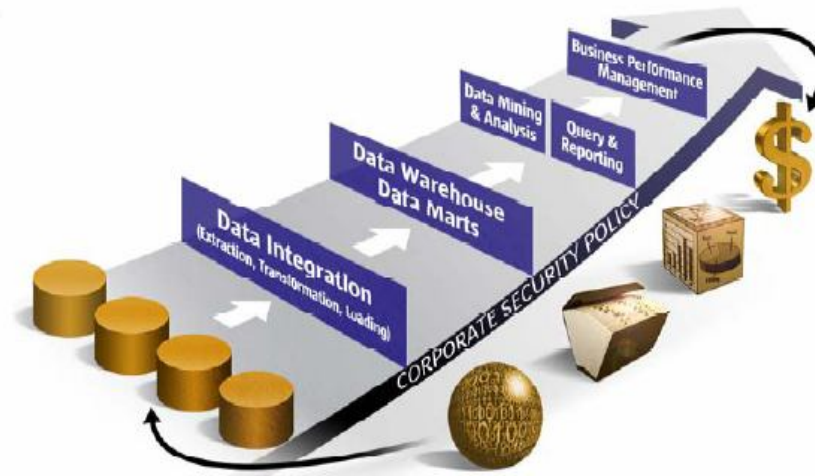


Figure 1. BIDW Overview

Figure 1 illustrates the major components of a BI system and the process of generating business results from raw data (the operational data that is used to run the business). A brief overview of the general functions involved in the process follows.

The BIDW process can be broken down into the following steps:

- Raw data is stored

Raw data is typically stored, retrieved, and updated by an organization's on-line transaction processing (OLTP) system. Additional data that feeds into the data warehouse may include external and legacy data that is useful to analyze the business.

- Information is cleansed and optimized

The information is then cleansed (for example, all duplicate items are removed) and optimized for decision support applications (i.e. structured for queries and analysis vs. structured for transactions). It is usually "read only" (meaning no updates allowed) and stored on separate systems to lessen the impact on the operational systems.

- Data mining, query and analytical tools generate intelligence

Various data mining, query and analytical tools generate the intelligence that enables companies to spot trends, enhance business relationships, and create new opportunities.

- Organizations use intelligence to make strategic business decisions

With this intelligence, organizations can make effective decisions, and create strategies and programs for competitive advantage.

- The system is regulated by an overall corporate security policy

Information in a data warehouse is typically confidential and critical to a company's business operations. Consequently, access to all functions and contents of a data warehouse environment must be secure from both external as well as internal threats and should be regulated by an overall, corporate security policy.

- Business performance management applications track results

A well-run BIDW operation also includes Business Performance Management (BPM) applications, which help track the results of the decisions made and the performance of the programs created.

Business Intelligence and its Core Technology

BI (Business Intelligence) is the process of business information collection, management and analysis, the purpose is to make corporate decision-makers at all levels acquire knowledge or insight, to help them make better decisions for their enterprises. The main principle of its work is carried out by the data extraction, cleansing, clustering, and mining of dialysis treatment to produce the various display data [1]. These data can directly show some management attribute or the laws of the market sought by the analyzer. Enterprises can fully exploit the existing data resources, capture and analyze information to help enterprise managers to make better business decisions. This can not only be found from witch laws of the market, prediction of the future trend of development, forecasting and monitoring of risks, but also can assist decision-makers to discover new profit growth, and optimize enterprise resources, which will help enterprises to achieve more robust operation and management objectives. Business Intelligence mainly includes the following four core technologies.

1. Data warehouse Technology (DW) Data Warehouse is a data set which is subject-oriented, integrated, stable, and containing historical data, establishment Data Warehouse which used in supporting management and decision-making is the data base of achieving business intelligence, and which is the accurate summary of the data of long-term corporate affairs. Set up a Data Warehouse is the base of handling massive data. Data Warehouse is the core architecture of Business Intelligence System, which works on the data collection, integration, storage, management, business intelligence deals with the data that has been processed, and making business intelligence can be more deeply focusing on the extraction of information and discovering knowledge. Data Warehouse captures or loads in massive original information for Business intelligence, merges various data sources of data to support enterprise management and commercial decision-making.

2. On-Line Analytical Processing Technology (OLAP) Online analytical processing provides a technical basis for the precise definition of multi-dimensional model and manipulate multidimensional cube. Using the technology can do online analytical processing to data based on multi-dimensional business data in Data Warehouse, generate new business information, and also monitor the effectiveness of business operations in real-time, which makes managers can freely interconnect the business data.

3. **Data Mining Technology (DM)** Data mining is a process of mining knowledge that feed the public interest from massive data stored in the Data Warehouse, Data Warehouse or other information Data Warehouse. Use the highest level characteristic of business intelligence of the technology to find previously unknown, understandable information in the massive data and documents to predict future business behaviors.

4. **Enterprise Information Portal Technology (EIP)** Enterprise Information Portal technology provides an interface between commercial information and the application software for users and enterprises. Enterprise business information, not only stored in a Data Warehouse, but also distributed in different systems and applications software. Business Intelligence systems collect, organize and integrate enterprise-wide business information through the enterprise information entrance, and offer different users with different access right to information.

Warehouse Management

This is another core service provided by many 3PLs. Again, 3PLs themselves may or may not have their own warehousing facilities. The various functions in this service include inventory management, cross-docking, metering, picking etc.

- **Inventory Analysis:** A host of analyses can be done on inventory in the warehouses. This includes inventory by supplier, inventory by material class, etc. for a time period or at a point in time. Key inventory performance indicators like inventory accuracy and inventory turnover can also be tracked over a period of time.

- **Warehouse Performance Analysis:** Compare the performance of various warehouses along key performance indicators like picking accuracy, shipping (from warehouse) accuracy, lines per hour (LPH), percentage over-time hours and percentage on-time shipments. This analysis can be used to compare the performance of warehouse operators/ managers.

- **Assigning Warehouse Costs:** Warehousing costs depend on product dimensions and handling requirements. Based on past data, warehousing costs can be assigned to combinations of dimensions and handling requirements (on appropriate scale) and this data can be used for pricing of the warehousing service.

- **Picking Analysis:** It involves analysis of products on the basis of number of picks required. It also includes analysis of products which tend to be picked together for grouping of products during picking. Picking analysis can signify cantly improve warehouse efficiency and help in the layout design.

- **Warehouse Space Utilization Analysis:** Analyze how effectively the warehouse space has been utilized and the cost per unit of space over a period of time.

Conclusion

The third party logistics industry is in a state of flux. Internet, supply chain management and globalization has made sweeping changes in the existing business models of the 3PLs. To compete in this market, a 3PL has to continuously improve the existing services, add new services based on technology and make its internal organizational

functions more effective. BI tools like data warehousing can significantly help a 3PL achieve these objectives.

Recognizing the need for an effective business intelligence solution is just the first step. The real challenge is to make it an integral part of the decision making process. It is vitally important to set clear business objectives for the business intelligence solution with total top management support.

References

Poirier, Charles and Reiter, Stephen, Supply Chain Optimization: Building the strongest total business network, Berrett-Koehler Publishers, San Francisco, 1999.

Martin, Andre, Distribution Resource Planning: The gateway to true quick response and continual replenishment, John Wiley & Sons, 1995.

Quillin, Timothy and Duncan, Matt, Logistics and Fulfillment: Industry Report, Stephens Inc, August 2000.

Dyche, Jill, e-Data: Turning data into information with data warehousing, Addison Wesley, February 2000.

Greis, Noel and Kasarda, John, Enterprise Logistics in the Information Era, California Management Review, Spring 1997.

Business Intelligence & Retailing, Business Intelligence and Data Warehousing White Paper, Wipro Technologies, Bangalore, 2001.

Langley, John; Newton, Brian; and Allen, Gary, Third Party Logistic Services: Views from the customers – results and findings of the 2000 fifth annual survey, Cap Gemini Ernst and Young, Univ. of Tennessee, and Excel.