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Usability of Data Warehousing and Data Mining for Interactive Decision Making in Textile Sector

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Abstract

Data warehouse is one of the most rapidly growing areas in management information system. With this approach, data for Executive Information System (EIS) and Decision Support System (DSS) applications are separated from operational data and stored in a separate database. This process is called data warehousing. The major advantages of this approach are: improved in performance, better data quality, and the ability to consolidate and summarize data from heterogeneous systems. A data warehouse is part of a larger infrastructure that includes legacy data sources, external data sources, a repository, data acquisition software, and user interface and related analytical tools. The aim of this research work is to elaborate that how the textile industry can manage and improve their production capacity and resources at optimum level to produce a good quality result using data warehousing and data mining techniques. This research work is conduction in Masood Textile Mills Limited, Faisalabad, Pakistan (MTML). The results may hopefully opened-up an era of research and methodology that could further benefit the Industry to support in decision support system.

Index terms— Executive Information System, Decision Support System, data warehouse, data mining, production capacity, heterogeneous systems.

1 I. INTRODUCTION

storing summarized integrated business information in a central repository used by analytical application with different user perspective. It is a process of merging data in a centralized location. The data warehouses" databases usually store the complete organizational business history from start to end. The frequently used procedure for fetching decision making information from data warehouses is based on executing queries and tools which perform online analytical processing (OLAP) [1]. Data mining is a rising methodology used for identifying, extracting and evaluating variables to find useful information [2]. Data Mining is a process of extracting previously stored, valid, potential by useful and hidden patterns from large data sets as data volume is increasing rapidly day by day [3]. It allow the users to analyze data from different dimensions categorize and summarize the relationships, identified during the mining process [4]. Different data mining Author ? : Dept of Computer Science, University of Agriculture, Faisalabad, 38000, Pakistan. E-mail : shakeelfaridi@gmail.com Author ? : Dept of Computer Science, University of Agriculture, Faisalabad, 38000, Pakistan. E-mail : tasleem_mustafa@uaf.edu.pk techniques are used in various organizations and institutions like pharmaceutical, telecommunication, engineering, education, banking, marketing, sale, etc [5]. It is very difficult to normalize data without using any sort of technique. To get required benefits and useful information from such large amount of stored data, you must use some data mining techniques like Classical Techniques: Statistics, Neighborhoods and Clustering and Next Generation Techniques: Trees, Networks and Rules [4]. These sorts of techniques facilitate the user to get useful and accurate information on time for interactive decision.

The objective of this study is to elaborate that how the textile industries can manage and improve their production capacity and resources at optimum level to produce good quality results comparing from the historic information using data warehousing and data mining techniques.

2 II.

3 THE USABILITY CONCEPT

The definition of usability or usability engineering by international standardization organization (ISO) and usability-experts also defined it as "the effectiveness, efficiency and satisfaction with which specified user can achieve the specified goals in particular environment" [10,11,12,13,14,15]. The basic purpose of usability is to make sure that the work is smoothly going done by the end user by using his average ability without any frustration [16, ??7]. It not only discusses but also applies to the design of software system, applications and product but also includes users" interface, supporting documents to run the software efficiently ??18,19]. There is surety for unsuccessfulness of a fully functional software or application, if it has poor usability. As functionality and

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Usability is defined as the capability in human functional terms that to be used easily, effectively and satisfactorily by specific users, performing specific responsibilities, in specific environments [23]. It can be measured analytically through the use of inspection method ??7; 8]. The analytical approach to measuring usability attempts to identify actual usability issues that are practically faced by the end users ??7; 9]. Usability inspection is regarded as a cost-effective approach (to measuring usability) which relies on the review of usability experts [7]. Inspection techniques differ from empirical techniques by identifying potential usability issues, as opposed to actual usability issues. usability both are tasks and user related terms [20]. Functions need to match task requirements while the users need to understand the exact functionality of the system to meet their requirements ??21]. "Grouping related commands into menus, other examples of good interface design and documentation help overcome the conflict between power and ease of use to enhance both usability and functionality [22]." Evaluator"s experience, available resources like time, budget, and labor are the multiple methods to evaluate the usability. It also depends on the stage of development tools.

5 III. COMMON USABILITY EVALUATION PRINCIPLES

There are some common usability evaluations principles are used to evaluate the requirements. These evaluation principles are; ease of use, usefulness, customization, task support, flexibility, navigation, guidance, memorability, system reliability, user interface, output presentation, learn ability, system responsiveness, accuracy and completeness [6,24,25].

The usability evaluation principles like usefulness, guidance, customization, accuracy and completeness are showing the amazing results in my work.

IV.

6 HOW TO IMPROVE DECISION MAKING BY USING DATA MINING

Hence, data mining uses predictive techniques to expose patterns in the data. These patterns of a data playing a vital role in the process of decision making since they expose the areas where improvements is required in the whole process. Organizations can use data mining in such a way as to improve profitableness and effectiveness of their interactions with their customers, improve the management of risk, and detect fraud. In other words, these patterns that are expose by using data mining techniques to assist business organizations and stakeholders of the organizations to make timely, accurately and better decisions [26].

7 Prediction

Forecasting, like estimation, is everywhere in business. Accurate prediction can reduce the cost, optimize your sales and better utilization of available resources. If you can predict the future, you will definitely boost your business and bring more profits ??17].

8 ii. Estimation

This process is useful in just about every surface of business. From finance to marketing to sales, the better you can estimate your expenses, product mix optimization, or potential customer value, the better off you will be. This and the next use are fairly self-evident if you have ever spent a day at a business ??17].

iii. Regression This is the most widely known and the oldest statistical technique that is utilized by the data mining community. Essentially, regression makes use of a dataset to develop a mathematical formula which fits the data. So whenever you want to use the results for predicting future behavioral patterns, all you need to do

is just take the new data, and apply it to the model that has been developed, and you will get your prediction. But if you need to work with data that is categorical, where there is no significant order, such as gender, name, or color, it is better to use a different technique.

[26] iv. Classification If you need to work with categorical data, or a combination of categorical data and continuous numeric, classification analysis will meet your requirements. This technique has the capability to process a more extensive variety of data compared to regression and is therefore increasingly popular. The complex mathematical formula that the regression technique provides, in this you will be provided a decision tree which requires a sequence of binary decisions. MTM have their complete and fully in-house developed ERP system. It contains all important applications that provide the absolute solutions for its operations and management as well. This well designed ERP system makes MTM competitive advantages over the others in this region.

9 VII. CONCLUSION

The value of data warehousing and data mining can be seen in effective decision making based on concrete evidence from the old data. The purpose of this research was basically to highlight the core area of business issues. These core areas, where top management needs to be focused to make the organization more profitable by using latest technologies. In order to continue aggressive data mining techniques must be used to save money, achieve better operational performance and mitigate risk. Cost saving will be achieved by maintaining or improving production performance. It would be difficult to achieve more profitability by ignoring these loop holes. The present study was focused only one area of the business by using data mining for decision analysis. In future the author will try to discuss the other core area of business that can directly affect the organization"s objectives. [1] [2]

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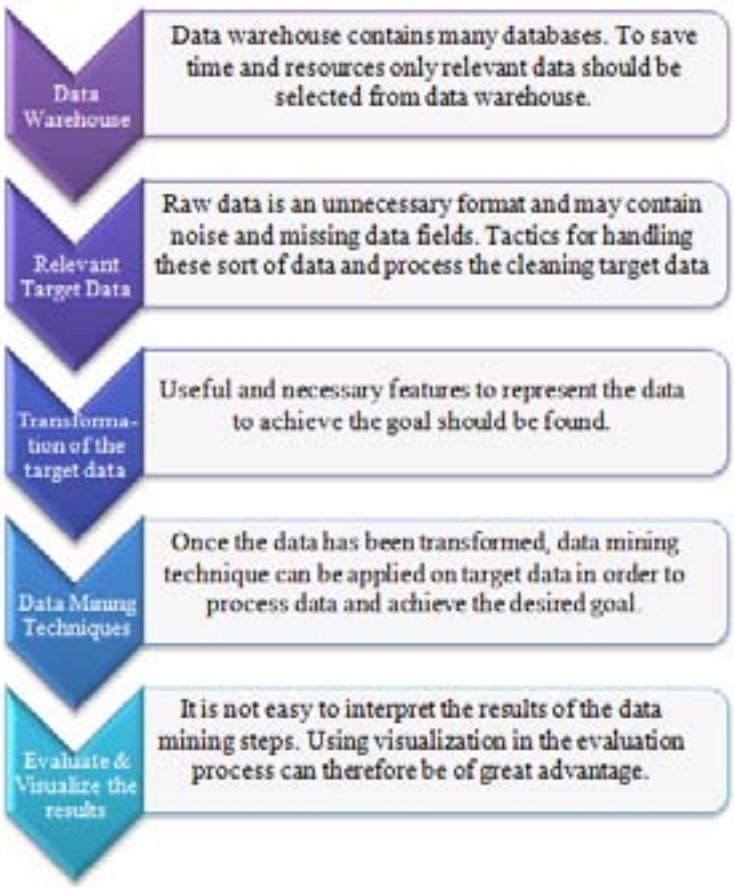

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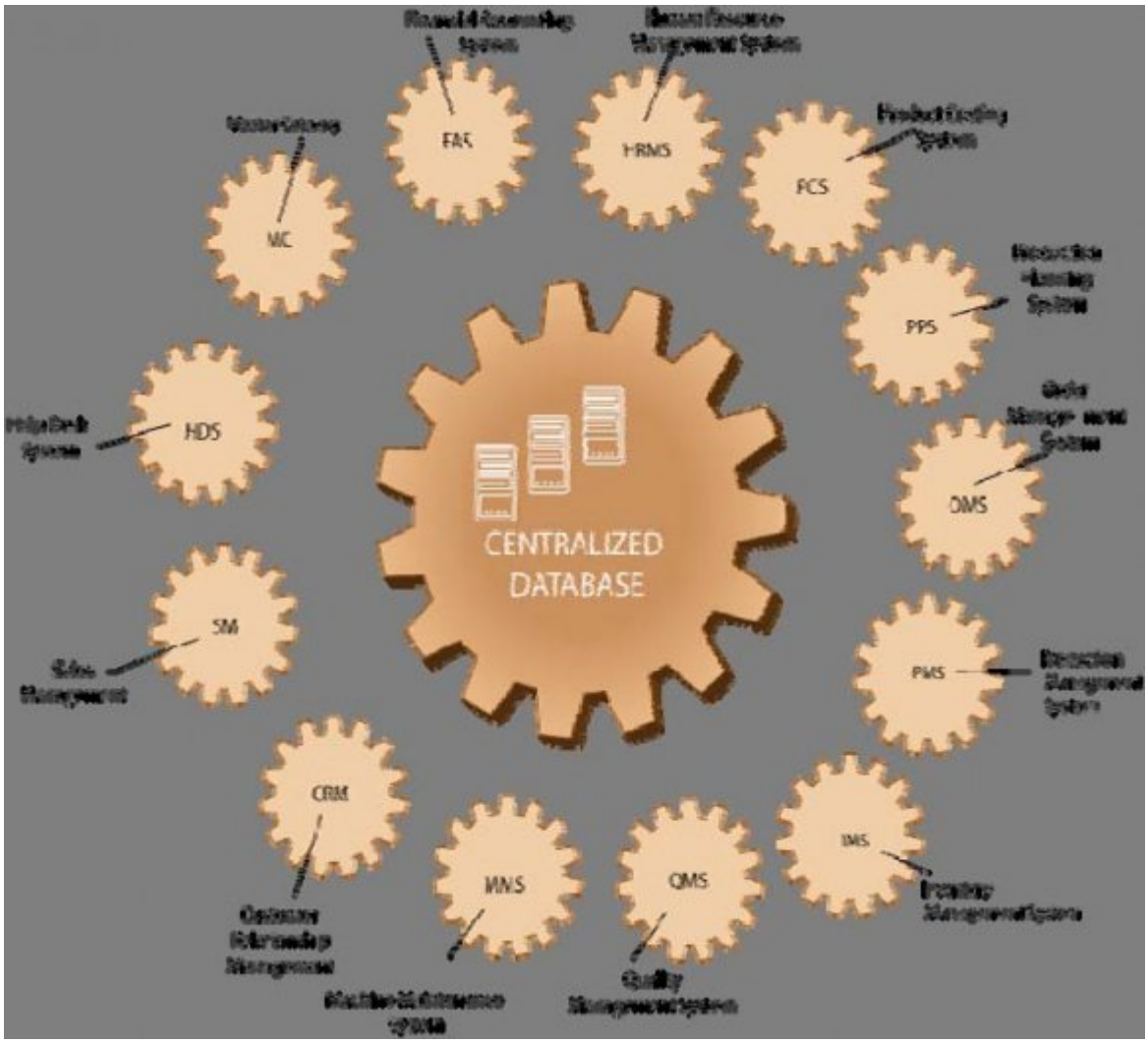
Figure 2: Figure . 1 :


FAS
HRMS
FCS
MC
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DATABASE
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QMS
IMS

Figure 3:

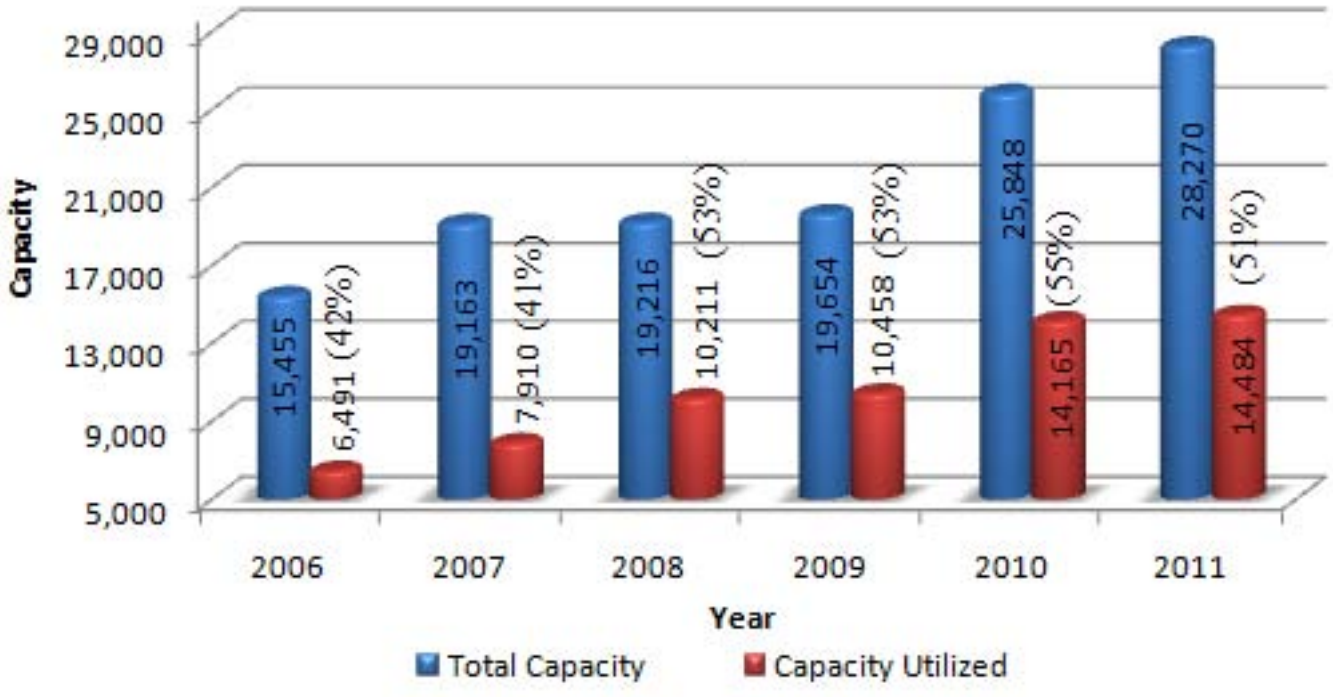

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Figure 4: Figure 2 :

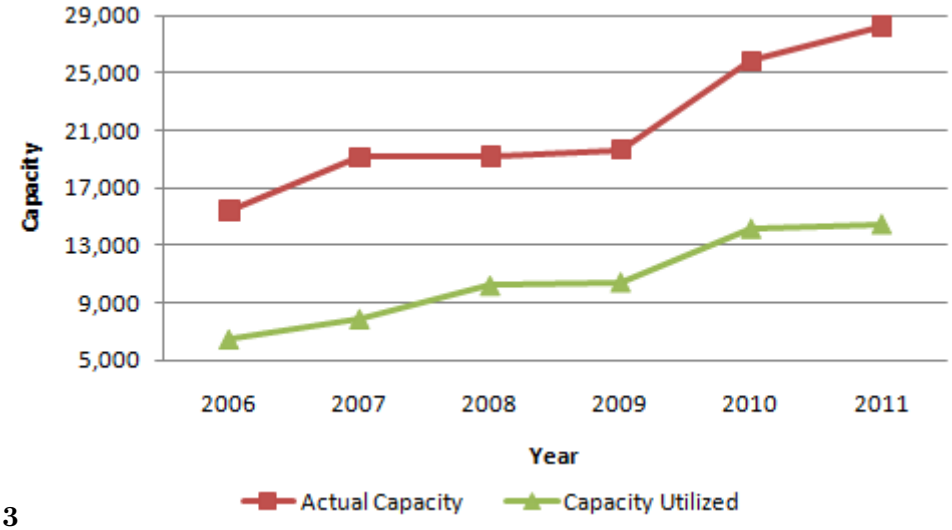

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Figure 5: Figure 3 :

Year	Actual Capacity	Capacity Utilized	% age Utilized
2006	15,455	6,491	42
2007	19,163	7,910	41
2008	19,216	10,211	53
2009	19,654	10,458	53
2010	25,848	14,165	55
2011	28,270	14,484	51

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Figure 6: Figure 3 and

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Figure 7: Table 1 April

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[Note: knitting Production Capacity & Utilization]

Figure 8: Table 1 :

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