

Chapter 8

Data Mining Algorithms for Measuring Performance Impact of Social Development Processes: Ethical Implications

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ABSTRACT

This chapter has given focus on data mining applications and their utilizations in formulating performance measuring tools for social development initiatives upholding ethical issues. In this context, this chapter has provided justifications to include data mining algorithm to establish monitoring and evaluation tools for various social development applications. Specifically, this chapter gave in-depth analytical observations to establish knowledge centers (has been found successful in many regions as a catalyst of socio-economic growth) with various approaches and finally it put forward a few research issues and challenges to transform the contemporary human society into a knowledge society.

INTRODUCTION

All information related to a successful organization is truly its asset. Information on any entity, such as client lists, supplier lists, product details, process details, employee information, or corporate strategy, is invaluable. Without appropriate feeding of information, a business cannot operate properly (Utimaco, 2005). This is potentially

true for any sort of ventures that may vary from providing services to the scientific community or academics or civil society or individuals. However, to take an intelligent decision, the information needs to be acquired, processed and compiled. Misinformation is no information.

Data mining is a method of acquiring, processing and compiling of data and eventually assisting to take knowledgeable decision. In today's modern

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information based environment, data mining in day by day is coming at the front and beginning to attain more and more attention from all corners of the knowledge acquisition systems. Because data mining is all about acquisition, assessment and analysis, and by automatic or semiautomatic means huge or small, all quantities of data can assist to uncover meaningful patterns, relationships and rules. These patterns and schemes help enterprises improve their marketing, sales and customer support operations to better understand their end users. Over the years, corporate houses have accumulated very large databases (recently known as, Big Data) from applications such as Enterprise Resource Planning (ERP), Client Relationship Management (CRM), or other operational systems. People believe that there are untapped values hidden inside these data, and data mining techniques can help to find an intriguing pattern out of a huge volume of big data¹.

With the emergence of the Internet technologies and its various applications, including the recently developed social networks, blogs, forums, dashboards, browser cookies and many other forms of communication networks, data are being collected and accumulated across a wide variety of fields at an exaggerated pace (knowingly or unknowingly of whom the data are being accumulated). However, if accumulated and synthesized appropriately, data may lead to high benefit to the society, community, country, or an enterprise. Furthermore, data are no more a rigid matter for an entrepreneurship, or an organization, but has become an intrinsic part of any management process and most dynamic in nature. For these reasons, data mining algorithms are imperative to researches in the aspect of making intelligent decisions through data mining. To cope up with this new arena of research, there is an urgent need for a new generation of computational theories and tools to assist humans in extracting useful (and meaningful) information (leading to knowledge acquisition) from the fast growing volumes of digital data (Rahman, 2008).

At the same time, data mining and knowledge discovery in databases has attracted a significant amount of research, industry and media attention (Fayyad, Piatetsky-Shapiro, & Smyth, 1996; Bramer, 1999; Kargupta & Chen, 2001; Miller & Han, 2001; Freitas, 2002; Kloesgen & Zythkow, 2002; Boulicaut, Esposito, Giannotti, & Pedreschi, 2004; Larose, 2004), and as this chapter focuses, ethical, legal, and privacy aspects are also of essentially important characteristic of data mining research (Magkos, Maragoudakis, Chrissikopoulos, & Gritzalis, 2009). This chapter provides a brief overview of this emerging field, clarifying how data mining and knowledge discovery in databases are related to each other, and especially focused on application of data mining algorithms in establishing social development management systems. In this aspect, this chapter intends to illustrate a few real-world applications, but specifically focused to data mining algorithms; challenges involved in those applications of knowledge discovery to assist the society for taking intelligent decision, including contemporary and future research directions in the arena of establishing knowledge centers at the grass roots. The chapter emphasizes on ethical aspects of data mining algorithms when it has been related to data that concerns the people at large.

An algorithm can be seen as a procedure that describes, in an unambiguous manner, a finite sequence of steps to be performed in a specified order. The objective of the algorithm is to implement such a procedure to solve a problem or at least approximate an appropriate solution to the problem. Pseudocodes are required to describe the algorithms, which specify the form of the input to be supplied and the form of the desired output. However, it has to be noted that all numerical procedures may not be able to give satisfactory output for an arbitrarily chosen input. Hence, a stopping technique independent of the numerical technique needs to be incorporated into each algorithm to avoid running infinite loops (Burden & Faires, 2011).

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