

Foreword

Advances in information technology and data collection methods have led to the availability of larger data sets in government and commercial enterprises, and in a wide variety of scientific and engineering disciplines. Consequently, researchers and practitioners have an unprecedented opportunity to analyze this data in much more analytic ways and extract intelligent and useful information from it.

The traditional approach to data analysis for decision making has been shifted to merge business and scientific expertise with statistical modeling techniques in order to develop experimentally verified solutions for explicit problems. In recent years, a number of trends have emerged that have started to challenge this traditional approach. One trend is the increasing accessibility of large volumes of high-dimensional data, occupying database tables with many millions of rows and many thousands of columns. Another trend is the increasing dynamic demand for rapidly building and deploying data-driven analytics. A third trend is the increasing necessity to present analysis results to end-users in a form that can be readily understood and assimilated so that end-users can gain the insights they need to improve the decisions they make.

Data mining tools sweep through databases and identify previously hidden patterns in one step. An example of pattern discovery is the analysis of retail sales data to identify seemingly unrelated products that are often purchased together. Other pattern discovery problems include detecting fraudulent credit card transactions and identifying anomalous data that could represent data entry keying errors. Data mining algorithms embody techniques that have existed for at least 10 years, but have only recently been implemented as mature, reliable, understandable tools that consistently outperform older statistical methods.

This book has specifically focused on applying data mining techniques to design, develop, and evaluate social advancement processes that have been applied in several developing economies. This book provides a overview on the main issues of data mining (including its classification, regression, clustering, association rules, trend detection, feature selection, intelligent search, data cleaning, privacy and security issues, etc.) and knowledge enhancing processes as well as a wide spectrum of data mining applications such as computational natural science, e-commerce, environmental study, financial market study, network monitoring, social service analysis, and so forth.

This book will be highly acceptable to researchers, academics and practitioners, including GOs and NGOs for further research and study, especially who would be working in the aspect of monitoring and evaluation of projects; follow-up activities on development projects, and be an invaluable scholarly content for development practitioners.

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