Advanced Vendor Evaluation

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Problem

Vendor evaluation can be defined as a permanent and objective monitoring and evaluation process of a vendor's performance regarding specific criteria as quality or timeliness. The main objective of any vendor evaluation is to ensure a company's product and service quality. This objective is highly correlated with constraints such as permanent cost reduction and maintenance of competitive advantage. It can be supported by the vendor controlling based on information gathered from the company's own experience with the vendor as the most reliable source to carefully manage and improve existing vendor relations.

Knowledge Discovery (KD) is an extraction process of implicit, unknown, potentially useful and understandable information from large data sets using data mining technologies. The goal of the described approach was the development of an integrated software solution to assist in extracting knowledge by data mining technologies from data for vendor evaluation to improve organisational and operational decision-making.

Solution

The system is based on a distributed system architecture. It consists of three main components: a database with flexible interfaces to enterprise resource planning (ERP) system (SAP R/3®) and to other databases, a data mining tool (“DataEngine”), and a web-based end user environment supporting an easy access through the browser of the SAP R/3® client or other applications. To obtain the data that is going to be used by data mining technologies, the product platform includes an interface to the SAP R/3® system.

Different analyses are available for vendor evaluation: Statistical reports e.g. for return delivery analysis, delivery date analysis and trade volume analysis. Based on a pre-defined, hierarchical key measure system, score values can be calculated for each vendor's performance with a fuzzy rule base. An important feature is the possibility to analyse different time periods. The evaluation can easily be performed on either an ad-hoc or regular basis. Key figures are derived by transforming and aggregating base table fields. Each key figure can be allocated a weight factor which allows user specific priorities. Vendor categorization that is based on a segmentation using (Fuzzy C-Means) of the whole vendor portfolio helps to identify intra-segment similarities and inter-segment dissimilarities. This, in turn, helps to get a deeper understanding the vendor portfolio structure, and to optimise this portfolio according to the company's business strategy. Based on pre-defined cluster models, each vendor will be assigned a membership value for each of the classes known.

Status and results

The main characteristics of the VendorAnalyzer are the increased software architecture’s adaptivity and modularity in order to be transferable in other business areas or sites, the adaptation of different data mining technologies to the vendor evaluation task, and the interactive and user-friendly graphical interface to enable users to carry out their daily analyses.

The vendor evaluation information is derived from the raw data stored in different tables of the ERP system and will be explored by different data mining technologies like fuzzy logic, cluster algorithms and neural networks as well as statistical concepts and models to support generation of statistical reports, development and application of advanced data mining models, ad-hoc modification of existing models, additional user specific data acquisition and trend analysis for time series data.

An interactive and user-friendly graphical interface has been designed and developed to enable easy access to the vendor evaluation data analysis results for business end-users.

Adaptivity and portability

By addressing different business applications with this approach, the system architecture and technologies for the interfaces can be re-used widely, whereas the models itself and the user interface will differ (based on the different data in the different companies). That means an increasing need of consultancy and customisation by transferring the results to other applications.
One of the general characteristics (and advantages) of data mining is the development of models based on data representing the real world situation. That means even in same business cases at different companies or locations, models will not always be the same and a re-modelling has to be carried out anyway. Regarding the other aspects except modelling, the effort for adaptation of the web user interface, the database and the pre-processing is minimized by the selected technology and implementation.

The system architecture has been adapted also to the business case of delivery analysis based on customer order data in steel industry.

More information


i2: “Supplier Relationship Management (SRM) - Powering the Bottom Line through Strategic Supplier Relationships”, WP-6709 (02/01), January 2001

Nelke, Martin; Klotz, Uwe; Poloni, Marco: “A new Vendor Evaluation Product for SAP R/3® Systems”, Session “Knowledge Discovery in Enterprise Information Management SAP R/3 Systems” of European Symposium on Intelligent Techniques, September 14-15, 2000, Aachen, Germany


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