Abstract

Huge amount of data is being gathered, processed and analyzed in every sector to derive useful information. So, automated tool like data mining has evolved in order to extract information and solve the overhead in manual approach. Association rule mining which is an essential part of data mining fails to address the vague and uncertain situations. In shopping applications, traditional approach estimates rules containing frequently bought items. In real world, data being mined might be vague. The items that are ‘almost bought’ or considered by customers are also helpful in planning efficient strategy. Identifying the hesitation in buying such items improves the profit drastically. Also, the traditionally used majors are not sufficient in addressing the profitability concern. There is a need to incorporate appropriate parameter changes in the currently used measures to deal with profitability. Additionally, the items being sold on special occasions or on a season are considered interesting only at the time of that occasion or the season respectively and not throughout the year. So, the mining that involves generating patterns that are considered interesting at some point of time or within a time interval are needed. To accomplish the above objectives, vague set theory is used which addresses the
uncertain situations, over the temporal database for a particular occasion, followed by vague association rule mining algorithm with measures that combines the statistical data and value-based data for finding association rule that yields maximum profit. Elephant Herding Optimization (EHO) is used in optimizing the obtained resultant rules. The proposed methodology thereby generates optimal profitable seasonal rules that address vague situations and removes hesitation of a product, which is beneficial for any enterprise in the current scenario for effective decision making.

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**Index Terms**

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**Keywords**

Association Rule Mining, Vague theory, Profit Mining, Elephant Herding Optimization, Temporal rules.