

# **A Change Detection Method for Time-Interval Sequential Patterns**

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## **ABSTRACT**

Current business undergoes the challenge of a rapid evolving market in which customer's needs are changing over time. There have been several studies in data mining field focusing on mining changes of sequence in different time-period databases. Analyzing these changed sequences provide useful information for decision makers to make better marketing strategy to attract more customers. However, the time-intervals between successive itemsets in the sequences are not considered in their proposed methods. In fact, changed patterns with time-interval can reveal important time information for decision makers to take the right actions at the right time. Therefore, this research develops a time-interval sequential pattern change detection method to derive the change trend of customers' behavior in two periods. First, the TI-AprioriAll algorithm, which integrated Apriori-like algorithm and k-means cluster algorithm concepts, is proposed to generate time-interval sequential patterns from two different time-period databases. Then, a time-interval sequential pattern is clarified as one of three change types (emerging sequential patterns, unexpected sequence changed and added/perished sequential patterns) through the proposed sequential pattern matching method. Finally, a set of time-interval sequential patterns with significant change are retrieved for further business analysis.

**Keyword:** Data Mining, Time-Interval Sequential Pattern Mining, Change Mining