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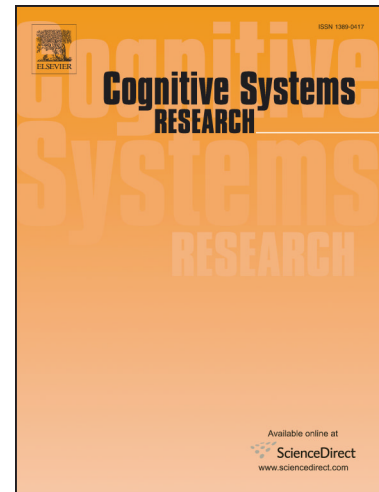
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# Discovering frequent patterns for in-flight incidents

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## Abstract

**Objectives:** In order to get a clearer idea of in-flight medical emergencies management, the application of Data mining tools can be useful to facilitate knowledge discovery from data collected by existing studies. The objective of this work is to conceptualize the construction of a Clinical Decision Support System (CDSS) in three stages corresponding to the representation levels necessary to extract knowledge from information and raw data.

**Method:** The method can be summarized in three parts: 1) in-flight medical incident data search, 2) the validation of this data using Data mining tools, 3) the construction of the CDSS in 3 steps corresponding to the levels of knowledge representation. These three steps will be carried out using tools such as EORCA (Event Oriented Representation for Collaborative Activities) which includes action codification with regard to an ontology and event representation.

**Result:** Data processing services provide a good structuration for information about in-flight medical incidents from which useful knowledge can be generated could improve the handling of other incidents by adapting the medical emergency equipments, for example. This structuring can be facilitated by the use of CDSS to fill in any gaps, increase coherency, and provide decision makers with a more complete picture of options that might be involved in a critical situation.

**Conclusion:** We proposed an evolving framework facilitating the description of in-flight medical emergencies with adequate data collection and appropriate information that are required for producing interesting rules and better decisions. The data collected nourishes the organization of information, which can be improved over time by continuous integration of evidence gained from the number of incidents treated. Finally, it is proposed to strengthen requirements concerning the medical equipments available on-board, particularly in the light of knowledge resulting from the selection and approval of interesting rules.

**Keywords:** *Data Mining; Association Rule; Ontology Reasoning; Decision System; Air Transport.*

## 1. Introduction

While airline companies yearly carry about three billion people (Peterson et al., 2013)(Naouri et al., 2016), commercial airplanes are still places where medical coverage is not optimal. This large increase in passengers have naturally increase the number of medical incidents and the management of these incidents have become a crucial problem. Even if there is a lot of work reporting these incidents, the exploitation of data to improve the management is very difficult. This is due to several factors among others, the lack of a common administrative and legal framework to harmonize the management of these incidents, and the lack of appropriate tools for collecting and structuring this data. In the work described in this document, we will focus on this last point in order to facilitate the

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