An Intelligent System for Improving Performance of Blood Donation

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Abstract

The need for blood is growing day by day as a result of advancement in the clinical medicine, however, the number of voluntary blood donors is steadily decreasing in recent years. This work developed a system employing clustering and classification algorithms to determine the disparities in blood donation behavior among the present donors and predict their intentions towards donation to understand the problems and to increase voluntary blood donation frequency. After clustering analysis, the dataset was separated into four groups and the highest donation rate of group is 45.8%. Among these methods, the best accuracy is 0.783. The proposed system provided the blood center management a more understanding in blood donors’ intentions and behaviors. The results are to be used as strategic references for the purpose of enhancing service quality to blood donors and blood supply quality.

Keywords: blood donation, donation intention, clustering and classification

1. INTRODUCTION

Now, blood donors play a valuable and essential role in health care system (Eder et al., 2009). The goal of blood donation is to provide sufficient amount of blood to the patients who need blood transfusions in all hospitals at all times. The safe and adequate blood that these patients receive is provided by healthy and volunteer blood donors. However, the number of voluntary blood donors is steadily decreasing over the past years (Lemmens et al., 2005). Recent evidence supports that it is becoming increasingly difficult to retain first-time donors (Wu et al., 2001), with over half of all new blood donors failing to donate a second time (Thomson et al., 1998; Ownby et al., 1999). Although

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