A DECISION SUPPORT SYSTEM FOR THE OPTIMIZATION OF CAR SHARING STATIONS

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Abstract

Approximately half of the world’s population is living in cities and it continues to grow. Along with urbanization, scarce natural resources, rising energy costs, shortage of space, increasing traffic congestion, and environmental pollution require populations to rethink personal vehicle ownership. Car sharing is an alternative that allows individuals to satisfy their mobility needs and addresses modern transportation issues. The location and accessibility of car sharing stations are critical success factors. We provide decision support for planning car sharing stations, both existing and new ones. Therefore, we constructed and evaluated research artifacts according to the design science research principles. We suggest an optimization model to determine the prime location and size of car sharing stations. Based on this model, a decision support system (DSS) called OptCarShare 1.0 is used for exact optimization. This system integrates several applications to import, edit, and export data, solve the problem numerically and visualize optimization results. Using a major German city with 500,000 people to illustrate solutions, we evaluate and show the applicability of the DSS OptCarShare 1.0. According to Green IS, our DSS can provide a contribution to environmental sustainability.

Keywords: Car sharing, decision support system (DSS), optimization model, Green IS.