Managing Election Campaign with the Power of Analytical Modeling and Heuristics

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Abstract

Campaign planning is one of the important decisions to make while dealing with determining routes, schedule of the activities, and accommodation planning. The campaign planner is required to plan the schedule of the visits to the customers, to satisfy time constraints, and to organize activities at its best with a proper decision on the scheduling and routing. In this paper, we analyze the problem of election logistic arising in campaign planning. The goal is to schedule the campaigner's daily tours throughout the entire campaign period and to propose an activity plan for each day. In other words, the problem seeks to maximize the net benefit accrued by a party leader during a fixed campaign period. We introduce a new hybrid metaheuristic algorithm, called granular skewed variable neighborhood tabu search (GSVNTS). It consists of a Granular Tabu Search which is embedded in a Skewed Variable Neighborhood Search algorithm. The problem is tackled efficiently by adapting analytical model, scenario analysis, and metaheuristics. The proposed approach is tested on a case study involving 81 cities and 12 towns in Turkey. Using effective analytical models and metaheuristics, we show that promising results can be obtained to hopefully assist campaign planners in their strategic decision making.

Keywords: Campaign planning, Election logistics, Variable neighborhood search, Mixed, integer linear programming

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