

THE AGENT-BASED MODELING OF THE ENROLLMENT CAMPAIGN TO RUSSIAN UNIVERSITIES

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At present time in Russia much attention is paid to career building problems by executive authorities, parents and youth themselves. This is facilitated by the increasing amount of available information on education quality and career building prospects for graduates of Russian colleges. From this perspective it is interesting to perform a research on the entrants' reaction to educational environment changing conditions.

Suchlike problems were considered in the following papers: S. Kisel'gof "College entrants' choice with quadratic utility functions", I. Prakhov "A Model of College Choice in the Context of the Unified State Examination and the Role of Students' Expectations" and others. All investigated papers apply to famous papers of D. Gale, L. S. Shapley "College Admissions and the Stability of Marriage", M. Balinski, T. Sonmez "A Tale of Two Mechanisms: Student Placement" as a basis.

In the present paper we consider the construction of a model of the entrants' behavior for admission to institutions of higher education in Russia. Each entrant is presented by virtual agent, which has a set of stochastic properties. Each property is described by a priori given distribution. These stochastic properties of each entrant include: qualification (USE – United State Exam – or other entrance examinations); entrant's interest to different specialties; place of residence; vector characterizing the significance of factors determined by the institution and the environment; family's financial situation.

Further modeling is placing created agents to an educational environment, which is presented by the following set of factors: indexes of colleges efficiency; key enrollment figures subsidized by a state or privately; minimum and average USE scores in previous years; cost of education for a fee; average salary in the region \ city; number of officially-registered unemployed; ratio of students number to citizens number of region \ city; region cultural level, region criminality; being in demand of experts in different fields in the labor-market.

Based on the results of modeling we calculate utility functions for each virtual entrant, which determine prospective pairs "college – specialty occupation". Afterwards we simulate a behavior of the entrants at submission to some explicit college. The essence of this modeling is that every entrant figures out own probabilities of successful matriculation. Then most self-assured entrants submit documents to chosen institution. It influences on the probabilities of other entrants, because they discover current distribution of entrants by universities. As a result we get entrants' distribution if we continue this procedure iteratively.

Prospects of creation and further development of proposed model include different management aspects,

among them there's a possibility of modeling enrollment campaign under conditions of changing educational environment. The model will allow to forecast entrants' reaction on creating new specialties, closing or creating new colleges and other changes of educational system. In addition, the modeling of obtained skills by agents as well as the modeling of employment processes are anticipated in the future.
keywords: agent-based modeling, modeling of enrollment campaign, factors of university choice.