

The Optimization Of The Higher Education Organizations Promotion Plan*

UDK 371.214.1:65.012.2

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Summary:

In this paper we discuss the methodology of planning the promotions of the higher education organizations, which are aimed at target group of potential users of the high education services. Intention is to stress the necessity of planning communication activities in higher education institutions, with the main goal of building positive corporate image and reputation in order to gain leading position on the educational services market. The research problem is to determine the precise timetabling of visiting the secondary schools in order to promote higher education organizations which have equal aims, contents and expected results, but different places of promotion. The original Goal Programming model of deciding process of organizing the visits to the secondary schools is developed. Scheduling the promotion participants in the secondary schools, as the target destination, is done by the model, and the basic criteria were uniformity of their workload. In the case study of organizing the promotions, the suggested model was applied on target group of students in secondary schools as the potential users in The Faculty of Organizational Sciences, University of Belgrade. In addition, we developed and implemented an original algorithm for solving the promotion participants scheduling problems of large dimensions.

Key words:

Promoting, Goal Programming, Higher Education Organizations, Timetabling

Rezime:

U ovom radu, predstavljena je metodologija planiranja promocije visokoobrazovnih organizacija, usmerene ka ciljnoj grupi potencijalnih korisnika usluge visokoškolskog obrazovanja. Problem istraživanja je utvrđivanje preciznog vremenskog rasporeda (timetabling) poseta srednjim školama, u svrhu promocije visokoobrazovnih organizacija, koji su jednaki po ciljevima, sadržaju i očekivanim efektima, a različiti po mestima održavanja. Razvijen je originalni Goal Programming (GP) model procesa odlučivanja o organizovanju poseta srednjim školama u svrhu promocije visokoobrazovnih organizacija. Modelom se vrši raspoređivanje učesnika promocije po srednjim školama, kao ciljnim odredištima, a osnovni kriterijum je ravnomernost njihovog opterećenja. Predloženi model primenjen je na studiji slučaja organizovanja promocije Fakulteta organizacionih nauka Univerziteta u Beogradu, ciljnoj grupi učenika srednjih škola, kao potencijalnim korisnicima.

Ključne reči:

Promocija, Ciljno programiranje, Visokoobrazovne organizacije, Vremensko raspoređivanje

* This paper forms part of the results of research on project TR35045 financed by Ministry of Education, Science Technological Development of the Republic of Serbia

1. INTRODUCTION

The aim of this paper is to point to the necessity for the introduction of a communication strategy within the business strategy of a university and faculty. Furthermore, the aim of the paper is to prove the hypothesis that it is necessary to plan promotional activities at universities within the communication strategy, in addition to service planning, determination of optimum sale price, and definition of the ways of providing service. The extent and form in which the university will plan and systematically conduct promotional activities, depend on factors such as: competition; the quality of service; the manner in which the university responds to changes in the environment; the level of management responsibility; organizational structure, available resources, current image and reputation, etc [8].

An important aim is to point out the possibility of modelling the university promotion problem, as well as optimization of the plan for specific promotional activities. In this case, the authors observed the allocation of university representatives, delegated as university and faculty promoters at high schools, to high school students as the potential customers. In order to solve the problem of timetabling, the participants in the promotion of a university, an original mathematical model of Goal programming (GP) [14] was developed. That model will be presented in this paper.

The problem of timetabling was previously resolved with GP as well. GP models which could be used for making timetables for college and university courses were described in [3] and [13]. The problem of time distribution and balancing sports events on several locations and its modelling with GP was described in [16]. Kwak&Lee in [10] and Azaiez in [2] develop GP models for the distribution of medical staff, while Mathirajan&Ramanathan in [11] also deal with the problem of allocation of employees with GP, but in the field of marketing. In the field of public relations, Slijepcevic, Kostic-Stankovic and Makajic-Nikolic developed GP model of the decision making process regarding the selection of the optimal public relations campaign implementation method [15]. The authors in [6] present a GP model for the optimization of a timetable for production processes, which provides maximum productivity and minimum duration of resource employment. Due to the specific nature of the problem of timetabling promotion participants which is considered in this paper, the problem of timetabling was formulated as a system of distinct representatives (SDR) [1].

2. IMPORTANCE OF MARKETING ORIENTATION IN THE HIGHER EDUCATION ORGANIZATIONS

In modern business conditions, it is impossible to make business decisions without considering the conditions of the market environment, regardless of the activities of the organization. For a long time it was believed that terms such as: *market, customer, competition, marketing and public relations*, were only related to business enterprises. University and faculty executives believed that it was only necessary to develop a good study programme, which would in the absence of choice, or spontaneously, enrol a certain number of students each year. Such a management philosophy could operate in an environment of a complete monopoly of education institutions. However, with Serbia's shift from a centrally planned economy to a market economy, strengthening of the private sector, the opening of borders as well as gradual termination of government subventions, many higher education organizations have been marginalized since they did not realize the necessity for market orientation in time. Also, according to [12], our country is situated in a very delicate moment, going through transition process, which includes many radical changes, especially in education institutions, that, among other roles they have, should be creators of the sociological model and founders of new values.

Marketing orientation of higher education organizations is becoming indispensable in achieving the desired market position. According to the criteria used in awarding the *Balridge* awards to the most successful companies, which are applied in the USA to evaluate the success of higher education institutions, the basic values which a university needs to adopt in order to be competitive in contemporary business conditions are the following (www.baldrige.com/Baldrige/Quality Award Programs in [7]):

- **Customer orientation:** The customer defines the quality. Universities should identify market demands and the needs of their target groups, and struggle to keep the users of their services for a longer period of time.
- **Leadership:** The university management must be personally involved in the efforts to improve quality. They must also emphasize the importance of customer orientation and conduct human resources policies based on the respect of the employees.
- **Continual improvement and advancement:** These must be approached with a well-defined and achievable plan based on previously collected information about the operation of a university.
- **Employee participation and their development:** Employee satisfaction and customer satisfaction are closely connected. It is necessary that the

employees participate in decision making which concerns the university and their position and role there.

- **Fast response:** A faster and more flexible response to customer needs means implementing procedures which shorten the time from the moment of recognizing the need to its resolution by providing service.
- **Quality establishment and prevention:** By reviewing the existing processes and carefully developing new ones, the university prevents possible problems in the future.
- **Strategic orientation to future:** University focuses on its development and activities in the future, through investing in the development of employees and the anticipating customer needs.
- **Management with the help of facts:** University seeks for and collects data which are the basis for planning, performance evaluation and improvement of quality by using the benchmarking method.
- **Establishing partnerships:** University should establish partnership relationships with other organizations with the same or different activates, in ordered to achieve its goals.
- **Social responsibility:** Activities and goals of the university must be in accordance with business ethics, they should contribute to the promotion and protection of the values of the society, to safety and principles of preserving the environment.

Higher education organizations operate within an environment that is constantly changing. In case of universities, for example, whose curriculum lasts four years, a quarter of the students population (which represents the main group of organization service users) gets replaced every year. Since it is not possible to achieve and maintain a guaranteed quality of service, education organizations must constantly improve their offers. Frequent revisions, modifications and additions to the curriculum, changes of the organization of teaching and methods of teaching, training of staff (academic and professional) and so on, have become necessities.

Before defining communication strategies, it is necessary to determine the real quality of the concrete higher education organization offer or to determine the extent to which offer complies with users needs. It is also necessary to point out the possibilities of quality and work improvements, especially within areas that relate directly to the target groups of higher education organizations, so positive image and reputation created by successful communication could match the real situation. Generally, factors that influence the estimation of quality by service users are [9]:

- Compliance with standards or specifications. This primarily refers to whether the higher education organization's service (curriculum,

seminars, project content) fulfill what was stated in the information booklet, seminar advertisement or project realization offer.

- Consistency. This means the provision of services in the same way each time, and consistency in quality.
- Quality of the results. This answers the question if the service user got what he wanted. For example, whether student has acquired adequate education, whether graduate can get a job with a degree of a particular university, whether a seminar attendee can later use the knowledge gained in the seminar, whether the scientific project is sustainable in practice etc.
- Quality of the process. It describes the way services are provided – whether target groups – users are treated politely and respectfully by representatives of higher education organizations. For example, a student can obtain required information from student services (good quality of results), but if the process takes too long or the procedure of seeking such information is not clear enough, then it means a poor quality of the process.

Numerous factors point to the necessity for planned and opportune communication between higher education organizations and their environment [8]: education reform; changes in the sources of financing (the introduction of self-financing student status, for students who fully bear the costs of their studies); higher scholarships; establishment of private universities; expansion of university activities (participation in projects; cooperation with the economy; research; seminars; etc); introduction of the Bologna Declaration (and the inevitable need for change, in this context, [4]), a tendency of hiring the young after their graduation from high school, due to the decrease in the standard of living.

Generally, business communication can have three goals [5]: changing public opinions / attitudes, creating opinions / attitudes where were none, strengthening of already created public opinion / attitudes. Higher education organizations most often set a global goal of business communication, as well as specific goals that can be related either to a certain target group of the public or to a particular program of the organization. Specific goals should be realistic, achievable and measurable.

For example, the main goal of a university may be: introduction of the target group to the university offer (teaching programs, seminars, human and material resources for the implementation of various projects) and building of the positive image and reputation in public.

The objective of public relations formulated this way can be further concretized in relation to the target group or specific programs of the university, as follows:

- Improvement of the relationships with internal and external target groups of the public;

- Improvement of the qualitative structure of students who enroll in the university;
- Creation of the awareness about the social responsibility of the university;
- Introduction of affirmative business communication principles among employees;
- Formalization of written communication with external audiences;
- Creation of positive culture and atmosphere at the university;
- Creation of a sense of affiliation among university staff and students.

The process of planning communication activities of higher education organizations requires constant improvement and advancement, until certain quality standards are reached. Quality standards are considered to be reached when target groups are defined and precisely profiled, when there is a well defined plan of business communication activities within the organization, and when the consistency of implementation and communication programme control is provided. When planning the communication activities of higher education organizations, there are various tools of marketing and corporate communication at one's disposal: advertising, sales improvement, personal communication and communication through the Internet, as well as public relations. Considering the nature of the activities of higher education organizations, the specifics of the services they provide and the relationship they establish with the environment, it can be concluded that the concept of integrated business communication is the most suitable for the organization of communication activities, with equal development of marketing and corporate communication tools [8].

3. DESCRIPTION OF THE PROBLEM

In general, bearing in mind the specifics of the offer of higher education institutions, the environment in which its business process develops, as well as the manner in which the functions of marketing and public relations at universities are commonly organized, the process of communication can be achieved within the following phases [7]:

1. Analysis of the university and its environment;
2. Identification of the target public;
3. Research and determination of the existing image and reputation;

4. Setting communication goals;
5. Formulation of a communication strategy;
6. Setting communication activities and tasks, and
7. Evaluation and monitoring of the accomplished results, and the evaluation of their effects.

Considering the topic of this research, phases 5 and 6 will be considered in more detail.

For the purpose of achieving the goals of the Faculty of Organizational Sciences, University of Belgrade, bearing in mind the information gathered in the analysis of the University, the analysis of the environment, the identification of target groups and determination of the university's image with the public, it is possible to define the following strategies:

- Informing the public about the study programmes and extracurricular programmes, as well as the development of a positive image, will be established through corporate identity development, promotional material, special events organization, establishment and maintenance of good relationships with the media, as well as multimedia promotions.
- Development of a sense of belonging to the faculty in the employees and students will also be established through the above mentioned activities, with intensive work on the improvement of formal and informal internal communication, as well as the organization of various events which would positively influence interpersonal relations and satisfaction at the workplace.

Considering the fact that, the budget for promotion is limited, in the case of state faculties, it is necessary to develop communication activities with a precisely defined target auditorium. With regard to this, the possibility of mass communication was not an option, in the promotion strategy of the Faculty of Organizational Sciences in Belgrade; therefore, the strategy of personal communication was applied. In this case, it was necessary to determine a database. When setting up a specific model in this paper, the target group of the most numerous potential users – high school students – was observed as the priority target group. High school students are becoming the target market for a greater number of faculties, both private and public, and the competition of the Faculty of Organizational Sciences, University of Belgrade, is identified in various forms (see Fig. 1).

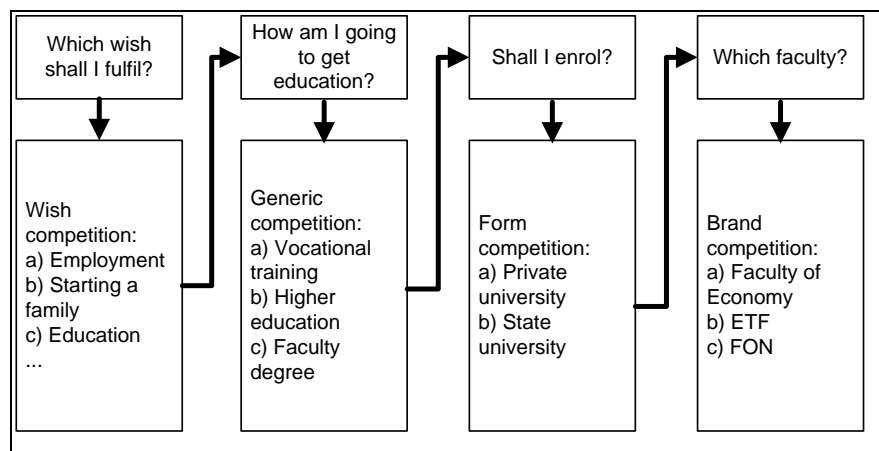


Figure 1 Example of different forms of competition to graduate studies at FON

It was necessary to identify an appropriate tactic for the implementation of the communication strategy of the Faculty of Organizational Sciences, University of Belgrade. In this case, the tactic is a list of activities, or tasks, which must be executed; and the persons in charge of executing these tasks, as well as the deadlines for their execution. Therefore, a tactical plan of activities should include answers to the questions: who; when; what; where; how and why.

The activities that needed to be conducted within the implementation of the communication strategy, within one academic year, are grouped as follows: development of corporate identity; organization of special events; design, publishing and distribution of informative and promotional material; internal communication; media relations and the promotion of the Faculty and its services. In addition, different approaches to particular activities have been established, depending on the development of the strategy for specific target groups of the public:

- Undifferentiated strategy – development of corporate identity.
- Differentiated strategy – communication adapted for various target groups of the public (students, seminar attendants, associates from business organizations), which, among other, includes the use of various informative and promotional material.
- Focus strategy – intensifying the communication and promotional activities during the period when high school students are choosing a university (presentations in schools, separate Internet presentation, posters, etc).

This paper pays special attention to one of the activities applied within the focus strategy: promotion in the form of a presentation of the study programmes and extracurricular programmes of the Faculty of Organizational Sciences, University of Belgrade, to high school students in Serbia. At the operational level, this activity is performed by a designated group of university/faculty representatives (in the following text: promoters), consisting of its employees. They should visit schools they attended, or those schools that are related to their profession or geographical origin. When doing so, attention is paid to making sure that they are equally loaded, considering the fact that, during the period of the promotions, they have everyday work at the university/faculty as well.

The presumptions of the problem addressed in this paper are as follows:

1. A group of schools is observed, and a promotion must be held in each of the schools.
2. The group of promoters going to the selected group of schools is observed.
3. Each school receives the time of the promotion.
4. Each promoter receives a group of schools where she/he can hold a promotion.
5. The time of each promoter should be in approximately equal intervals.
6. If it is not possible to fully comply with the listed presumptions, it is necessary to make a schedule of promoters which varies as least as possible.

4. FORMULATION OF THE MODEL FOR PROMOTIONS SCHEDULING

Prior to the mathematical model, the notations will firstly be presented, as well as the relations that define the previously mentioned assumptions. Let k be the number of promoters participating in the promotion, and n the number of schools where the promotions are held. Each promoter is assigned a school where she/he can participate in the promotion, defined by parameter $a_{is}, i = 1, \dots, k, s = 1, \dots, n$:

$$a_{is} = \begin{cases} 1 & \text{if the promoter } i \text{ can go to the school } j \\ 0 & \text{otherwise} \end{cases}$$

By introducing variable:

$$x_{is} = \begin{cases} 1 & \text{if the promoter } i \text{ should go to the school } j \\ 0 & \text{otherwise} \end{cases}$$

it is possible to define the two following conditions:

$$\sum_{i=1}^k a_{is} x_{is} = 1, \quad s = 1, \dots, n \quad (1)$$

$$\sum_{i=1}^k x_{is} = 1, \quad s = 1, \dots, n \quad (2)$$

Equation (1) models the condition where in each school, the promotion is held only on the days when it was possible, and equation (2) provides a promotion held in each school once.

Let $b_s, s = 1, \dots, n$ be the parameter, which denotes the time (date) when the promotion is to be held in school s . The basic problem that needs to be solved is the setting of different times for each of the promoters. When doing so, attention needs to be paid to making sure that the load on the promoters is distributed equally, which is expressed by the condition that the interval between two rounds must be at least five days.

In accordance with the previously introduced notation, let y_{is} be the time (date) when promoter i will go to school $s, i = 1, \dots, k, s = 1, \dots, n$. This variable is not independent, and its value depends directly on the value of the variable x_{is} . The relation that connects these two variables is:

$$y_{is} - b_s \cdot x_{is} \quad i = 1, \dots, k, \quad s = 1, \dots, n \quad (3)$$

Now, the condition that the time interval between two rounds of each promoter is at least five days can be expressed as follows:

$$|y_{is} - y_{iq}| \quad i = 1, \dots, k, \quad s, q = 1, \dots, n, \quad s \neq q \quad (4)$$

Condition (4) is nonlinear. The formula/equation with an absolute value can be linearized in several ways. Here, this will be done by introducing an additional binary variable $\delta_{isq}, i = 1, \dots, k, s, q = 1, \dots, n, s \neq q$:

$$\delta_{isq} = \begin{cases} 1 & \text{ako je } 5 \leq y_{is} - y_{iq} \leq m \\ 0 & \text{ako je } -m \leq y_{is} - y_{iq} \leq -5 \end{cases}$$

where m is a large number, at least $n - 1$. Now the non-linear condition (4) can be replaced with the following equivalent linear conditions:

$$\begin{aligned} y_{is} - y_{iq} - m \cdot \delta_{isq} + 5 \cdot (1 - \delta_{isq}) &\leq 0 \quad i = 1, \dots, k, s, q = 1, \dots, n, s \neq q \\ y_{is} - y_{iq} - 5 \cdot \delta_{isq} + m \cdot (1 - \delta_{isq}) &\geq 0 \quad i = 1, \dots, k, s, q = 1, \dots, n, s \neq q \end{aligned} \quad (5)$$

Input data, i.e. parameter a_{is} , can be such that it is not possible to make a time interval of 5 days for each promoter. Condition (4) will not be satisfied then. However, based on presumption 6, this condition can be receded. This is why deviation variables d_{isq}^- , $i = 1, \dots, k, s, q = 1, \dots, n, s \neq q$ are added, and their value will in fact show in which case and how much the set demand has varied. These deviation variables are also the reason why the mathematical model was formed as the model of goal programming.

Based on the previously introduced parameters, goals and conditions (1-5), the following mathematical model of mixed integer programming is proposed:

$$\min z = \sum_{i=1}^k \sum_{s=1}^n \sum_{q=1, q \neq s}^n d_{isq}^- + \sum_{i=1}^k \sum_{s=1}^n \sum_{q=1, q \neq s}^n d_{isq}^+$$

s.t.

$$y_{is} - y_{iq} - m \cdot \delta_{isq} + 5 \cdot (1 - \delta_{isq}) - d_{isq}^+ \leq 0 \quad i = 1, \dots, k, s, q = 1, \dots, n, s \neq q$$

$$y_{is} - y_{iq} - 5 \cdot \delta_{isq} + m \cdot (1 - \delta_{isq}) + d_{isq}^- \geq 0 \quad i = 1, \dots, k, s, q = 1, \dots, n, s \neq q$$

$$\sum_{i=1}^k a_{is} x_{is} = 1, \quad s = 1, \dots, n$$

$$\sum_{i=1}^k x_{is} = 1, \quad s = 1, \dots, n$$

$$y_{is} - b_s \cdot x_{is} \quad i = 1, \dots, k, s = 1, \dots, n$$

$$y_{is} \geq 0 \quad i = 1, \dots, k, s = 1, \dots, n$$

$$x_{is} \in \{0, 1\} \quad i = 1, \dots, k, s = 1, \dots, n$$

$$\delta_{isq} \in \{0, 1\} \quad i = 1, \dots, k, s = 1, \dots, n, s \neq q$$

$$d_{isq}^+, d_{isq}^- \geq 0 \quad i = 1, \dots, k, s = 1, \dots, n, s \neq q$$

The dimensions of the model depend on the number of schools and the number of promoters. The mathematical model has $k \cdot n^2$ binary and $k \cdot n \cdot (2n - 1)$ real variables.

5. METHODS FOR PROBLEM SOLVING

The formulated model was tested using the Gnu Linear Programming Toolkit/Gnu MathProgramming Language (GLPK/GMPL), an open-source program for solving problems of linear and mixed integer programming (GNU). In this paper, branch-and-cut algorithm was chosen among other methods integrated into GLPK [17].

The solution to the described problem of allocating six promoters to 16 schools will follow. Table 1 shows the time when the promotion is scheduled at schools. This time is the ordinal number of the date, during the period designated for all promotions. Table 2 shows the parameter a_{is} , i.e. the relationship between the promoters and the schools.

Table 1 Times of promotions in schools

School	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
Time	5	12	2	9	15	7	4	10	3	8	20	17	21	1	23	19

Table 2 Connection of promoters to schools

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
A1	1	0	1	0	1	1	1	0	1	1	0	1	0	1	1	1
A2	0	1	1	1	1	1	0	0	0	1	1	1	1	1	1	0
A3	1	1	0	1	1	0	1	1	0	1	1	1	1	1	0	0
A4	1	1	1	0	1	1	1	1	1	0	1	0	0	0	1	1
A5	0	1	1	1	0	1	0	1	1	0	1	1	1	0	1	1
A6	1	0	1	1	1	0	1	1	0	1	1	0	1	1	0	1

The observed problem has relatively small dimensions, six promoters and 16 schools. However, mathematical model of the problem has 1536 binary and 2976 real variables. Considering that the mathematical model, which was formulated for the given input data, is of large dimensions, it was not possible to obtain an optimal solution within an acceptable time. This is why the time of the execution has been limited to 3600 seconds, after which the solution shown in Table 3 was obtained.

Table 3 Optimal schedule of promoters

	S14	S3	S9	S7	S1	S6	S10	S4	S8	S2	S5	S12	S16	S11	S13	S15
A1					1							1				
A2						1					1					1
A3	1								1						1	
A4				1						1						
A5			1					1						1		
A6		1					1						1			
Time	1	2	3	4	5	7	8	9	10	12	15	17	19	20	21	23

Based on the obtained results, it is evident that the condition of distribution was met for all of the promoters. The columns are sorted based on the last row of the table, which represents the time of the promotions, so that the condition of distribution could be more easily noted.

Considering that dimensions of the mathematical model non-linearly grow with the dimensions of the problem and that was not possible to obtain an optimal solution within acceptable time for the problem of relatively small dimensions, it can be expected that exact solution can not be determined for many real problems. Therefore, an original algorithm for problem solution was developed, that would allow obtaining satisfactory solutions for larger dimension problems. Input parameters of the algorithm are a_{is} , relation among promoters i and high school s , and desired interval between promoter's engagement, in this case was 5 days.

Algorithm for scheduling promoters in schools (ARP) consists of the following steps:

1. Repeat:
 - a. Choose a school s' with the least number of assigned promoters, which is with $\min_s \left\{ \sum_{i=1}^k a_{is} \right\}$ assigned promoters.
 - b. Among promoters assigned to school s' choose the one i' with the least number of assigned schools, i.e. with $\min_i \left\{ \sum_{s=1}^n a_{is} \right\}$. Mark parameter $a_{i's'}$ as selected, which means that school s' is assigned to promoter i' .
 - c. Eliminate all of $a_{i's}$ for which $|y_{i's'} - y_{i'q}| < 5, q = 1, \dots, n, s' \neq q$ holds. This has eliminated all departures of promoters i' who are less than five days away from the selected term.

until all a_{is} that were not marked as selected are eliminated.

2. If all schools have a promoter assigned, go to step 7. Otherwise, set that $j = 1$ and go to step 3.
3. Restore all eliminated a_{is} for whom

$$|y_{i,s'} - y_{i,q}| < 5 - j, q = 1, \dots, n, s' \text{ is chosen } s' \neq q$$
 can be applied.
4. Repeat steps a, b and c until all a_{is} not marked as selected are eliminated.
5. If all schools have a promoter assigned, go to step 7. Otherwise, if $j < 4$ set that $j = j + 1$ and go to step 3, if not go to step 6.
6. Termination. No acceptable solution.
7. Termination. All selected a_{is} represent solution.

By applying described algorithm on input data in Tables 1 and 2, the solution shown in Table 4 was obtained.

Table 4 Schedule of promoters obtained by application of the ARP algorithm

	S14	S3	S9	S7	S1	S6	S10	S4	S8	S2	S5	S12	S16	S11	S13	S15
A1			1				1				1					
A2		1												1		
A3					1				1							
A4				1						1			1			
A5						1						1				1
A6	1							1							1	
Time	1	2	3	4	5	7	8	9	10	12	15	17	19	20	21	23

By applying this algorithm, particular solution was gained and condition that the interval between departures can not be less than 5 days was not breached. However, total deviation from the desired interval between promoter's departures (exactly 5 days) is higher with this solution than in the case of solution obtained by optimizing formulated mathematical models. This is particularly evident in case of promoter A2, in which the distance between two departures equals 18 days.

ARP algorithm execution time is almost instant and grows slower with problem dimensions, than optimization in software GLPK. Consequently, the algorithm can be used as a tool for gaining efficient schedule of

promoters in schools where, due to large dimension problems, the exact solution can not be achieved.

6. CONCLUSION

Process of planning of the promotion of higher education organizations must be constantly refined and improved, until certain quality standards are reached. Quality standards are considered achieved when target groups are defined and precisely profiled, when a well-defined plan of promotional actions exists and is being regularly tested and controlled, when promotional goals are established and tactical promotion plans for each target group prepared and when consistency of application and control of communication program is ensured. It is also very important for persons responsible of the promotion of higher education organizations to be fully informed on all important aspects and events within organization. For conducting the communication activities of the Faculty of Organizational Sciences, University of Belgrade, the following basic goals have been defined: introduction of the faculty to the public (study programme, extracurricular activities programme, the existence of human and material resources for the realization of curricular and extracurricular activities) and the development of a positive image and reputation with the public. Business communication goals formulated in such a manner and related to the target groups of the public or specific study programmes of the University and Faculty are further defined in the following manner: improvement of relations with internal and external target public groups; improvement of the qualitative structure of students who enrol the faculty; creation of an idea of social responsibility of the faculty; introduction of the principle of positive business communication between the employees; a more formal correspondence with external target groups; formation of a positive culture and atmosphere at the faculty; formation of the feeling of belonging to the Faculty, in both its employees and its students.

In order to achieve the defined goals, communication strategies have been identified. As a strategy for achieving a number of goals, the strategy for promotion of the Faculty of Organizational Sciences in Belgrade has been defined. In this case high school students were identified as the most numerous and strategically important target group, or potential higher education students. While setting and identifying the specific activities within the promotion strategy, a clear need to plan the profile of the participants emerged, i.e. the promoters, as well as the optimization problem of allocating the participants (promoters), depending on the need for a promotion at specific high schools. In order to solve this problem, a mathematical model of goal programming has been developed, and its application on the problem of scopes similar to real ones has been

illustrated. The model can be further expanded by giving schools the opportunity to choose a period that is more suitable for holding a promotion. Significant improvements could be made by including an analysis of data on expected and/or wanted effects of the promotion, expressed through the number of expected students, as well as data regarding the expenses of the promotion. Significant contribution was accomplished by developing the original algorithm for solving large dimension problems, that can be efficiently used in case when optimal solution is impossible to be obtained.

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To cite article, use the following format: Kostić-Stanković, M., D. Makajić-Nikolić, M.Martić: The Optimization Of The Higher Education Organizations Promotion Plan, *Industrija*, Vol. 40, No. 3, pp 111-127