A HUMAN RESOURCES MANAGEMENT APPLICATION FOR HOSPITALITY MANAGEMENT IN TURKEY

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─Abstract─

Today, while the competition in the hospitality market is increased permanently, human resource management (HRM) becomes a key factor to income and expense adjustment, as it is necessary for both keeping up the customer satisfaction level while reducing the labor cost. In HRM topic, as a decision making tool, scheduling organizes the resources or the capacity according to the inputs, and helps to improve the effectiveness of the organization. In this study, an approach for cost minimization problem of a hotel in Ankara, Turkey is proposed for HRM topic and mathematical modelling is used as a scheduling optimization technique. We handled the HRM problem in hospitality subject with OR point of view, but this time, thanks to our new approach, in an agile and way differently from the former examples placed in the related literature. As result, weekly staff need of the analyzed hotel enterprise is decreased from 21 to 16 employees, hence a competitive advantage is brought to the enterprise.

Key Words: *Operations research, HRM, Hospitality management*

JEL Classification: C61, Z32

1. INTRODUCTION

1.1. This is the sub-heading

As a major contributor to and a key component of the world economy, the hospitality industry continues to increase in complexity and sophistication (Hein and Rigel, 2012). Social and technological improvements realized worldwide made individuals' expectations rose, and then luxury consumption materials became as normally consumed common things. This situation increased the competition level in service sector in general.

The competitive contention brings human resources management (HRM) topic in a crucial place in especially hospitality management, so, to ensure that the hospitality and tourism industry is staffed by an effective workforce remains a challenge (Chan and Kuok, 2011). It is generally acknowledged that the success of the hospitality industry depends on human resources (HR) and that its effective management can give hotels a competitive advantage (Baum, 2007). As the efficient management of HR will increase the profit of the company by increasing the customer satisfaction level and preventing overlaboring, it will affect the satisfaction of the staff and therefore their performance positively. For this reason, especially in hotel management, HRM is a topic that must be addressed carefully and professionally.

Within the hotel enterprises, HRM is involved in front office, food and beverage outlets, club, casino, meeting and conferences (Mohsin, 2007). Scheduling is a decision-making process, which has an important place in the manufacturing and service sector (Pinedo, 2002). The main objective of the staff scheduling problem is to assign crews so that all jobs are covered at minimum total cost, while respecting working rules (Ceria *et al.*, 1998). An improved quality of crew life can lead to more productive employees, less employee turnover, and safer operations (Vaidyanathan *et al.*, 2007).

There is no studies run across which handles staff re-scheduling problem for hospitality management, when the existing literature is reviewed, even though the staff planning has a very important place in HRM in hotel management. The most popular topics for papers are summed up as service experience, followed by operations management, HRM, and accounting by Kandampully *et al.* (2013). In general, different survey studies were carried out as scientific methodologies, as recent instances of these type of papers can be listed like Mohsin (2007), Enz (2009), Chan and Kuok (2011), Naude *et al.* (2013), and Al-Refaie (2015). In only a few of these type of studies, results obtained were interpreted by using statistical data analysis as an advanced analyze, and some example works can be listed as Ahmad *et al.* (2010), Hein and Riegel (2012), Lee and Ok (2015). In this study, under the topic of HRM, the staff scheduling issue will be dealt, and how HRM can be used as an advantage provider tool in terms of high competitive business environment, will be shown. As aforesaid, any studies are not encountered which held HRM as a regenerative tool in the case of increased competition situation for hospitality management, in the existing literature, where even solely the number of studies that have been made on hospitality management topic with the employment of staff scheduling in hotel management are quite few. Soh (2009) employed Six Sigma methodology to perform scheduling and manpower allocation for banquet employees of hotels. Manap Davras (2010) developed a shift scheduling model by considering the flexible working system.

In this study, staff re-scheduling problem is handled with a specially developed software and a pure mathematical modelling technique. Our proposed approach brings an effective and a reliable solution to the staff re-scheduling problem for hotel enterprises with its mathematical modelling tools, and while providing this solution, besides dealing with all the data by a flexible method, it proposes a solution approach which enables the transfer of the changes that may occur in the future to the mathematical programming model without the need for any re-regulation.

The rest of the study proceeds in the following way; in the second section the approach put forward within the scope of the study is explained, in the third section the application of the proposed approach on a real-life problem is

performed, and in the fourth and last section, the results of the study are examined and paper is concluded.

2. PROPOSED APPROACH

Hotel enterprises are known for their twenty four hour, seven days a week operations. Therefore, in order to meet consumer demand, employees are expected to work flexible hours; have irregular working patterns; endure many confrontational interactions with guests; and put in long, unsocial hours under very stressful circumstances (Andresen *et al.*, 2007; Deery and Jago, 2009). Front office department staff are employees who have extensive interaction with guests (Kasavana and Brooks, 2001) and are the focal point for all guests' requests (Pizam and Holcomb, 2008). Therefore, front office department staff is determined to be handled within the scope of our real world application.

In this study, while dealing with the shift scheduling problem, the break times within the daily break windows will be determined for each employee as well as the working hours. In our proposed approach, all the possible assignments for the staff re-scheduling problem are found by a specially developed software, at first. Afterwards, with consideration of all of the possible assignments that were obtained as the result of previous stage, the staff re-scheduling problem is modelled by the employment of pure integer mathematical modelling, as the next stage. This mathematical model is solved in the following stage, and as the last stage, recently constituted schedules are analyzed by the managers for approval.

3. REAL WORLD APPLICATION

For the purpose of demonstrating the applicability of the proposed approach and satisfactoriness of the results, working and break times of the front office department staff of a spa and wellness hotel operating in Ankara, Turkey is scheduled for one week period, as a real-life application.

When the departments and sections in the hotel enterprises are classified according to the status of revenue they provide, the front office department is defined as a "revenue center". When they are classified in terms of the level of relationship with consumers, as the front office department provide an intensive contact with the customers, it is defined as a "department in the foreground". The staff of front office department, mainly are the staff who are in charge with the customer's check-in and check-out processes, and who try to solve the general issues of the customers. This staff play an important role in terms of providing the customer satisfaction of the hotel. Because they are the staff who are seen firstly and lastly by the customers during their arrivals and leavings.

The tasks under the responsibility of the staff working at the front office department of the examined hotel enterprise can be listed as the check-in, check-out, car rental, marketing, booking and sales of sightseeing tours, booking and sales of activities, collecting feedback such as the information regarding the organization of private days, restaurant reservations, questionnaires and oral customer complaints and requirements, night accounting, switchboard, the petty cash and reception operations. This situation shows that at every moment a sufficient number of front office department staff should be available at work to offer service.

3.1. Scheduling problem data

The hotel is operating twenty four hour, seven days a week. The daily working hours of the staff are assumed to not be divided, the staff is assumed to start to work on the hours, the daily shifts are assumed to be divided into a total of 19 pieces, as scheduling assumptions. The non-discrete shift schedule will be used in the solution. An employee can start to work at the latest 19:00 and works until the latest 06:00, the maximum daily working time of an employee can be 22 hours, the staff have to work minimum 5 hours and can work maximum 12 hours per day, the overtime wage paid to the staff per hour must be at least 50% of the regular fee, as scheduling constraints of the problem. The scheduling constraints and the right hand side values related to these constraints discussed in the real world application have been created on the basis of maximum and minimum quantities determined by the Labor Law of the Republic of Turkey and

determined by the policies which administrators of the examined hotel enterprise want to apply.

In the current situation, the break windows of the hotel enterprise are not clear, and also the staff who will take the break, and the interval in which the break will be taken is indefinite. So, new break policies are also composed in the scope of the real world application. In the current practice, the employee getting permission from the chef takes the break. According to new break policies, staff is given meal break twice a day consisting lunch and dinner, and is given coffee break four times a day. For each time, an employee has the right to have 30 minutes for meal breaks and 15 minutes for coffee break.

3.2. Mathematical computations

As the first step, all the possible staff assignments for the existing problem, by taking the aforementioned constraints and assumptions into consideration are found by the our proposed software which is developed on the Windows Forms platform with .NET Framework 4.5 in C # language by programming with Visual Studio Express Edition 2012 for desktop IDE. As result, total of 2740 possible task (shift) schedules are calculated on the daily basis for the front office staff.

After calculating all possible daily schedules, a 0-1 integer mathematical programming model covering all 2740 possible different shift schedules is constructed, which consists of 2740 variables and 49 constraints. New break window policies, working constraints and scheduling assumptions are taken into consideration in our proposed mathematical model. In this context, all the possible assignments are created according to the legislative regulations and the company policies are restricted within the scope of setting up the break times, where the right hand side values of the constraints are set upon the requests of the company managers. The closed form of the developed mathematical model and the description of the indices used in the model are shown below.

i: the number of daily shift schedule

RS_{CB1}: the number of the staff needed in the front office during the first coffee break period

RS_{CB2}: the number of the staff needed in the front office during the second coffee break period

RS_{CB3}: the number of the staff needed in the front office during the third coffee break period

RS_{CB4}: the number of the staff needed in the front office during the fourth coffee break period

RS_D: the number of the staff needed in the front office during the dinner break period

RS_L: the number of the staff needed in the front office during the lunch break period

$$\text{Min } z = \sum_{i=1}^{2740} x_i$$

Subject to

$$\sum_0^{CBztb} x_i \leq RS_{CBt}, \quad z = 1, 2, 3, 4; t = 1, 2, 3, 4$$

$$\sum_0^{CBztw} x_i \geq RS_{CBt}, \quad z = 1, 2, 3, 4; t = 1, 2, 3, 4$$

$$\sum_0^{Dzb} x_i \leq RS_D, \quad z = 1, 2, 3, 4$$

$$\sum_0^{Dzw} x_i \geq RS_D, \quad z = 1, 2, 3, 4$$

$$\sum_0^{Lzb} x_i \leq RS_L, \quad z = 1, 2, 3, 4$$

$$\sum_0^{Lzw} x_i \geq RS_L, \quad z = 1, 2, 3, 4$$

$x_i = 1$, if ith daily shift schedule is chosen; 0, otherwise

Here, the first equation of the proposed mathematical model is standing for the objective function of the mathematical model, which is to minimize the number of staff assigned, by this way all the problem constraints are met, and the profit is

maximized by means of increasing the customer satisfaction by considering the problem assumptions, while costs are minimized by minimizing the number of employed staff. The second and third equations are standing for coffee break period constraints, and represents 32 different constraints. The fourth and fifth equations are standing for dinner period constraints, where the sixth and seventh ones are standing for lunch period constraints, and they represent eight different constraints respectively.

The right hand side values of the constraints are determined by administrators of the hotel according to the density of demand encountered within the hourly periods of the shifts. Solution of the mathematical model is performed with CPLEX Solver of GAMS 2.0.24.12 optimization software. By solving the mathematical model with GAMS optimization program, it is revealed that all the tasks can be comprised with 16 employees on the daily basis, under the constraints and assumptions of the problem. The obtained data on staff needs and the days-off, working and break times of the staff in the constituted schedule are shown in Table 1.

Table 1. The daily staff schedule constituted with taking the break times into account

Schedule #	Beginning Time	Finishing Time	CB1	L	CB2	D	CB3	CB4	Total Working Time
50	06:00	18:00	09:45 - 10:00	13:00 - 13:30	15:15 - 15:30	-	-	-	720min
80	06:00	18:00	09:15 - 09:30	13:30 - 14:00	15:45 - 16:00	-	-	-	720min
86	06:00	18:00	09:30 - 09:45	13:30 - 14:00	15:30 - 15:45	-	-	-	720min
150	06:00	19:00	09:30 - 09:45	13:30 - 14:00	15:30 - 15:45	-	-	-	780min
731	08:00	21:30	09:15 - 09:30	14:00 - 14:30	15:00 - 15:15	17:30 - 18:00	-	-	810min
760	08:00	21:30	09:00 - 09:15	13:30 - 14:00	15:15 - 15:30	18:00 - 18:30	-	-	810min
761	08:00	21:30	09:00 - 09:15	14:00 - 14:30	15:15 - 15:30	18:00 - 18:30	-	-	810min
1597	11:00	00:30	-	13:00 - 13:30	15:45 - 16:00	17:30 - 18:00	21:45 - 22:00	-	810min
1607	11:00	00:30	-	14:00 - 14:30	15:30 - 15:45	17:00 - 17:30	21:00 - 21:15	-	810min
2103	12:00	00:30	-	14:00 - 14:30	15:30 - 15:45	17:00 - 17:30	21:00 - 21:15	-	750min
2545	15:00	23:45	-	-	-	18:30 - 19:00	21:15 - 21:30	-	525min
2547	15:00	23:45	-	-	-	18:00 - 18:30	21:30 - 21:45	-	525min
2569	16:00	23:45	-	-	-	18:30 - 19:00	21:15 - 21:30	-	465min
2670	20:00	06:15	-	-	-	-	-	03:15 - 03:30	615min
2671	20:00	06:15	-	-	-	-	-	03:30 - 03:45	615min
2672	20:00	06:15	-	-	-	-	-	03:45 - 04:00	615min

4. CONCLUSION

Tourism sector is a very important revenue center in today's business world, and hotel enterprises have the largest share in this sector. Labor planning, in another words staff scheduling, is a key factor to success in hospitality management, especially when there is an increased competition between the participants of the market, while a proper re-scheduling of the staff can bring remarkable gains. In this study, an integrated methodology of C# .NET programming and mathematical modelling is proposed, to handle the staff re-scheduling problem in a robust, flexible and user friendly way.

According to the obtained schedule in the results of the real world application, the maximum daily working time for the staff is 13 hours and 30 minutes, whilst the minimum daily working time is 8 hours and 45 minutes. The average daily working time has been found as 11 hours and 30 minutes. The time spent on the break times by the staff is included in these working hours. According to the former situation, there are 21 staff working in the front office. In addition to the 16 staff calculated with new daily schedule, in the weekly schedule with extra three employees who are days-off each day, weekly staff need will be 16, and in this case the number of the staff will be minimized by applying the new schedule. Thus, the weekly total labor cost will be reduced and the company will gain profit. Results indicated the validity and accuracy of the proposed approach. This integrated methodology is applied to a problem from hospitality management field in this study, but it is suitable to modifications for other application fields.

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