International Journal of Innovative Technology and Exploring Engineering (IJITEE)
ISSN: 2278-3075 (Online), Volume-8 Issue-12, October 2019

Improvement of Management Efficiency of Material Resources in Service Sphere

Semakhin E.A., Romanovskaya E.V., Andryashina N.S., Semenov S.V., Lebedeva T. E. Orlova A.I. Kuznetsova I.A.

Abstract: ***The article considers the problem of improving the management of the material resources in a service enterprise. The authors suggest a methodology for determining the ratio of costs for material resources and the cost of providing services, with optimal delivery terms, quality, volume and nomenclature of material resources at hospitality enterprises. Practical use of the proposed methodology was tested at the service enterprises of the Nizhny Novgorod region. The article examines the directions of increasing the efficiency of use of material resources based on an analysis of their correlation and distribution relative to the value of the number of rooms of hospitality enterprises. The article examines the main factors that affect the efficiency of the use of material resources and suggests approaches which improving their effectiveness by the example of a service enterprise.***

Keywords: efficiency, effective use of material resources, material costs, room cost, hospitality enterprises, material consumption, delivery time.

I. INTRODUCTION

The aim of the research is to increase the efficiency of using material resources based on an analysis of their correlation and distribution, using the example of the Sheraton Hotel. The company "Sheraton" is located in the city of Nizhny Novgorod and is quite a serious representative of the hospitality industry of the metropolis.

With increasing efficiency of planning economic costs for material resources, the competitiveness of the service enterprise increases, therefore hospitality enterprises must create conditions for increasing the efficiency of the use of funds in order to improve the profitability of the provided service.

Revised Manuscript Received on October 30, 2019.
***** Correspondence Author
Evgeny A Semakhin*, Minin Nizhny Novgorod State Pedagogical University semahinea@mail.ru
Elena V Romanovskaya, Minin Nizhny Novgorod State Pedagogical University alenarom@list.ru
Nataliya S Andryashina, Minin Nizhny Novgorod State Pedagogical University natali_andr@bk.ru
Sergey V Semenov, Minin Nizhny Novgorod State Pedagogical University svsemenov@gmail.com
Tatyana E Lebedeva, Minin Nizhny Novgorod State Pedagogical University taty-lebed@mail.ru
Anna I Orlova, Nizhny Novgorod State University of Engineering and Economics annasamurina@mail.ru
Irina A Kuznetsova, Nizhny Novgorod State University of Engineering and Economics nosovair@rambler.ru

At the present stage of the development of hospitality in the run-up to the World Cup, many enterprises (Figure 1) in this sphere of the Russian economy have faced difficulties in effectively investing their resources in material resources, for the subsequent achievement of maximum productivity and profitability.

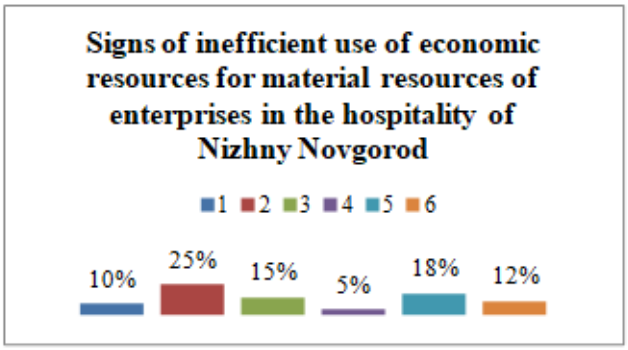

Fig. 1. Efficiency of the use of material resources in the hospitality of Nizhny Novgorod

Figure 1 shows: 1 - violation of the contract system in the procurement sphere - 10%; 2 - an entrepreneur purchases goods (work/service) at inflated prices - 25%; 3 - expends funds, but does not receive result - 15%; 4 - there is payment of fines, singing, forfeits for compensation of harm, which the enterprise allows - 5%; 5 - purchase of equipment, inventory and material assets that are not used in the future (unclaimed at the enterprise) - 18%; 6 - purchase of goods of inadequate quality - 12%. Enterprises are experiencing difficulties and are suffering economic losses from inefficient use of economic resources, which leads to a decline in the quality of services, imbalances in income and expenses for fixed assets, which leads to a decrease in profitability.

II. LITERATURE REVIEW

To increase the efficiency of using the material resources of a service enterprise, it is necessary to increase the efficiency of the existing equipment of hospitality enterprises and upgrade the number of rooms in general:

1. To engage those fixed assets that have the greatest production capacity (service life = actual equipment wear);
2. To sell or lease equipment, inventory and material assets that are not used, but simply idle at the enterprise;
3. Automate the process of providing services in the hospitality industry.

The provision of services in the service sector is associated with the use of material resources (external and internal) that affect: change in the volume of services; the level of the cost price of the services rendered; volume of services. The effective use of material resources affects the revenue of the hotel, as the volume of services rendered (services) will increase, therefore, the financial state will improve on the example of the Sheraton Hotel.

The Sheraton Hotel is the first 5-star international hotel in the city of Nizhny Novgorod. The hotel has 500 rooms, a restaurant, parking, a gym, laundry, dry cleaning and more.

First of all, it is necessary to assess the degree of provision of material resources and the quality of material and technical supply plans. To do this, we give the calculations of the availability ratio according to the plan (Coe.p.) and the actual availability ratio (Coe.f.).

$$Coe.p. = \frac{The\ cost\ of\ material\ resources\ under\ concluded\ contracts}{Planned\ demand} \quad (1)$$

$$Coe.f = \frac{Cost\ of\ actual\ delivered\ material\ resources}{Planned\ demand} \quad (2)$$

III. METHODOLOGY OF THE RESEARCH

Analysis of these coefficients is carried out for each type of material in Table 1.

Which are carpets, bed linen, paintings in the room, toilet paper and more.

Table 1
Execution of the plan by the delivery date, quality, volume, nomenclature

Type of material resources supplied	Volume of supplied material resources under	The volume of supplied material resources on the	Accounted for in accordance with the terms of the contract	Not counted due to breach of contract			
				Delivery time	Quality	Volume	Nomenclature
Furniture:	5000	5170	4340	10	15	20	15
Bed	1100	1140	1080	-	10	-	10
Cabinet	2500	2530	2490	-	5	-	5
Table	400	500	390	-	-	10	-
Chair	1000	1000	980	10	-	10	-
Equipment and machinery:	1420	1470	1365	-	30	15	10
Mini fridge	500	500	480	-	5	10	5
TV	500	500	480	-	10	5	5
Vacuum cleaner	20	20	15	-	5	-	-
Kettle	400	450	390	-	10	-	-
Chemicals:	2110	2360	2075	5	30	-	-
Shampoo	1010	1250	1005	-	5	-	-
Soap	500	500	490	5	5	-	-
Detergent	600	610	580	-	20	-	-
Other:	2870	2800	3420	5	10	10	20
Total:	11400	11800	11200	20	85	45	45

The plan for providing the enterprise with material resources:

$\frac{11800}{11400} = 1{,}035$ - Availability ratio according to the plan;

$\frac{11800}{11400} * 100 - 100 = 3{,}5$ - Over fulfillment of the plan in percent.

Provision taking into account contractual obligations:

$\frac{11200}{11400} = 0{,}982$ - Factor of availability in fact;

$\frac{11200}{11400} * 100 = 98{,}2\%$

Let us determine the degree of influence of the causes of the defect:

100% – 98,2% = 1,8%

Including in connection with the violation:

Delivery time

$$\frac{20}{11400} * 100 = 0{,}2\%$$

Qualities

$$\frac{85}{11400} * 100 = 0{,}8\%$$

Volume

$$\frac{45}{11400} * 100 = 0{,}4\%$$

Nomenclature

$$\frac{45}{11400} * 100 = 0{,}4\%$$

Let us analyze the calculation of material resources which necessary to purchase for the reporting and previous year (Table 2 and Table 3).

Table 2
Price calculation for the previous year

Nomination	Pieces	The cost of 1 piece, rub.	Total cost
Furniture:	5000	44480	81650000
Bed	1100	15000	16500000
Cabinet	2500	25000	62500000
Tables	400	3050	1220000
Chairs	1000	1430	1430000
Equipment and machinery:	1420	22269	9898780
Mini fridge	500	5990	2995000
TV	500	13000	6500000
Vacuum cleaner	20	2389	47780
Kettle	400	890	356000
Chemicals:	2110	450	309900
Shampoo	1010	120	121200
Soap	500	93	46500
Detergent	600	237	142200
Other:	2870		2985037
Total:	11400		94843717

Table 3
Calculation of cost for the reporting year

Nomination	Pieces	The cost of 1 piece, rub.	Total cost
Furniture:	225	44480	1470000
Bed	40	15000	600000
Cabinet	25	25000	625000
Tables	150	3050	214500
Chairs	10	1430	30500
Equipment and machinery:	38	22269	210417
Mini fridge	10	5990	59900
TV	10	13000	130000

Vacuum cleaner	3	2389	7167
Kettle	15	890	13350
Chemicals:	2110	450	309900
Shampoo	1010	120	121200
Soap	500	93	46500
Detergent	600	237	142200
Other:	510		100000
Total:	2883		2990317

In the previous year, the Sheraton Hotel spent material resources on the purchase of items necessary for the provision of services in the amount of 9,484,377 rubles, and in the reporting year at 2,990,317 rubles. However, if you shift the value of the investment of material resources to the cost of the room and the demand for it, another difference in indicators is obtained (Table 4, 5). Table 4 shows the number and cost of rooms in the hotel.

Table 4
The cost and the number of rooms of the Sheraton Hotel

Name of the room	Amount	Price for one room at night	Total cost
1. Room "Classic"	200	7900 rub.	1580000 rub.
2. Room for people with disabilities	50	7900 rub.	395000 rub.
3. Superior Room with view on theater.	90	8400 rub.	756000 rub.
4. Superior Room with view on theater (2 Single Beds)	90	8500 rub.	765000 rub.
5. Superior Room with Kremlin View	70	9650 rub.	675500 rub.

To determine the actual demand during a year with different cross-country capacity, it is possible to estimate the effectiveness of the invested material resources and their return must be calculated based on the cost of services rendered for the reporting and previous year (Tables 5, 6).

Table 5
Cost of services rendered for the previous year

Month	Possibility					Cost of services rendered					Total:
	1	2	3	4	5	1	2	3	4	5	
January	20	50	90	90	70	1580	3950	7560	7650	6755	4171500
	0					000	00	00	00	00	
February	180	40	80	80	65	14220000	3160000	6720000	6800000	6272250	3717250
March	180	50	85	85	70	14220000	3950000	7140000	3825000	6755000	3589000
April	200	40	70	80	60	15800000	3160000	5880000	6800000	5790000	3743000
May	150	30	50	50	55	11850000	2370000	4200000	4250000	5307750	2797750
June	110	10	45	45	43	8690000	7900000	3780000	3825000	4149450	2123450
July	150	50	75	85	70	11850000	3950000	6300000	3825000	6755000	3268000
August	190	40	85	85	70	15010000	3160000	7140000	3825000	6755000	3589000
September	180	30	65	75	60	14220000	2370000	5460000	6375000	5790000	3421500
October	170	35	80	80	55	13430000	2765000	6720000	6800000	5307750	3502250
November	180	40	90	90	65	14220000	3160000	7560000	7650000	6272250	3886250
December	200	45	90	90	70	15800000	3555000	7560000	7650000	6755000	4132000
Total for the year:	2090	460	905	935	753	16511000	3634000	7602000	6927500	7266450	41940950

Table 6 The cost of services rendered for the reporting year

Month	Possibility					Cost of services rendered					Total:
	1	2	3	4	5	1	2	3	4	5	
January	160	45	68	85	70	1E+06	355500	571200	382500	675500	3248700
February	160	40	70	70	60	1E+06	316000	588000	595000	579000	3342000
March	130	40	75	75	65	1E+06	316000	630000	637500	627250	3237750
April	130	30	60	50	60	1E+06	237000	504000	425000	579000	2772000
May	120	25	50	50	55	948000	197500	420000	425000	530750	2521250
June	110	10	45	45	43	869000	79000	378000	382500	414950	2123450
July	150	40	75	45	70	1E+06	316000	630000	382500	675500	3189000
August	180	35	40	85	70	1E+06	276500	336000	722500	675500	3432500

September	100	30	45	85	60	790000	237000	378000	722500	579000	2706500
October	170	35	80	80	55	1E+06	276500	672000	680000	530750	3502250
November	180	40	90	90	65	1E+06	316000	756000	765000	627250	3886250
December	200	45	90	90	70	2E+06	355500	756000	765000	675500	4132000
Total for the year:	**1690**	**415**	**788**	**850**	**743**	**1E+07**	**3E+06**	**7E+06**	**7E+06**	**7E+06**	**3.8E+07**

In Tables 5.6 for calculating the permeability in money terms, the cost of the services rendered is to be multiplied by the cost of the room. In total, the amount is equal to the cost of the services rendered at the rate of five rooms in a certain month.

IV. ANALYSIS RESULT

Based on the data obtained, we calculate the use of material resources.

To do this, we use the following formulas:

1. MO = cost of production / amount of material costs
2. ME = the amount of material costs / cost of products
3. Um = the amount of material inputs / total production costs
4. Km = the sum of the actual material costs / the amount of material costs for the actual release of products (services)
5. CME = cost of consumption of raw materials and materials / cost of production
6. TME = fuel consumption cost / product cost
7. EME = cost of energy consumed / cost of production
8. UME = the cost of all material inputs consumed per product / product price
9. MOpr. = (Output in current prices for the reporting period minus material costs) / direct material costs
10. Absolute change = fiscal year minus previous year
11. Relative change = (absolute change multiplied by 100%) / reporting year

Table 7 Indicators of the use of material resources

Indicators	Designation	For the previous year	For the reporting year	The planned change in%	
				Absolute, rub	Relative, %
1. Output in comparable prices without VAT, RUB	OP	41940950	38093650	-3847300	-10.09
2. Material costs, rub	MZ	94843717	2990317	-91853400	-3071.69
3. Direct material expenses, RUB	MZ pr.	94701517	2848117	-91853400	-3225.06
4. Material capacity, total,%	ME	226.14	7.85	-218.29	-2780.77
5. Material consumption according to direct costs.	ME pr,	225.8	7.48	-218.32	-2918.72
6. Total material efficiency	MO	0.44	12.74	12.3	96.54
7. Material efficiency of direct cost	MO pr.	-0.56	12.325	12.885	104.54

The analysis of the total material consumption of the Sheraton hotel room is given in Tables 8 and 9 and we will be able to analyze the influence of factors on the total material consumption by chain substitutions and integration.

$$ME^{l} = ME^{pr}{}_{0} * K^{MZ}{}_{1} = 7.477 * 1.05 = 7.85$$

Table 8. Analysis of the influence of factors on the total material consumption by means of chain substitutions.

Factors	Algorithm	Calculation	The result of the effect, the coefficient
Changing the ratio of the coefficient of the material and direct material cost	$\Delta ME^{MZ}{}_{K} = ME^{l} - ME_{0}$	7.85 - 7.85 = 0	0

Table 9 Analysis of the influence of factors on the total material consumption by integration

Factors	Algorithm	Calculation	The result of the effect, the coefficient
Changing the ratio of the coefficient of the material and direct material cost	$\Delta ME^{MZ}{}_{K} = \Delta K^{MZ} * ME^{ПР} + K^{MZ} * \Delta ME^{ПР} / 2$	0 * 7.477 + 0 * 0 / 2 = 0	0

V. CONCLUSION

The analysis of the hospitality enterprise showed the need to maintain the optimal supply, i.e. observance of certain proportions of distribution between the most important types of material resources and their correlation with the results of activity. The imbalance of supply, as a rule, leads to a violation of quality and timing of the provision of services, disruption of the assortment and the possible decrease in the volume of provided services. The results of the hospitality company were positively influenced by timeliness of the assignment on the terms of delivery of materials (especially in the kit), which determine the rhythm of the service. Infringement of terms of delivery (purchase) of materials conducts to infringement of assortment, decrease in volume of the rendered services. Uninterrupted work of the hospitality industry is impossible without creating the optimal amount of reserves for the implementation of the service delivery program.

In the process of analysis, the correspondence between the actual size of the stocks of the most important types of raw materials and materials to the standard sizes specified to the number of rooms is determined.

For this purpose, based on data on the actual availability of material resources in kind and in terms of value and their average expenditure, the actual availability of the numbered fund materials is determined.

In the conditions of a market economy, the filling of the service is constantly changing, reflecting the state of the needs of customers at a given time. As a result, hospitality enterprises may have surplus stocks of raw materials. Surplus and unclaimed materials, based on the assortment, are determined from the data of warehouse accounting by comparing the income and expenses. Those types of materials that have been unclaimed for a year or more are referred to a group of non-traveling (unnecessary) groups.

The quality of consumed material resources exerts a great influence on the volume of services rendered and their cost. The change in quality determines the quantity of services being sold. Decrease in the quality of consumed material resources leads to rapid deterioration of equipment, electrical appliances, etc., violation of the norms of material consumption, increase in the cost of the service, and a decrease in the quality of the services rendered.

Therefore, when analyzing the availability of material resources, it is necessary to correlate the quality of materials received in the reporting period with their cost, to clarify the reasons for the receipt of materials of reduced quality at inflated prices, to determine what measures were taken by the supply department to obtain materials of appropriate quality. The quality analysis is carried out by a random check, according to the results of the inspection, acts of acceptance of materials that do not meet the requirements, which is the basis for imposing sanctions and claims against suppliers.

On the basis of the analysis, we propose a methodology for determining the ratio of costs for material resources and the cost of providing services, with optimal delivery terms for quality, volume and nomenclature of material resources at hospitality enterprises.

The analysis, carried out with the help of this technique, allows evaluating the efficiency of using the invested funds in the opening of the Sheraton hotel, and its subsequent functioning. At the Sheraton Hotel for the reporting year: there is a significant reduction in material costs for items necessary for the provision of services; the ratio of the cost of output to the cost of material costs is improving; the expenses for rendering services are reduced, the profit considerably increases in comparison with the previous period.

Based on the conducted research, it is possible to draw a conclusion about the effective use of material resources. (Table 7). The drawback of the Sheraton Hotel is its high price and a critical reduction in the terrain during the summer. However, in the future it will reach the planned capacity, which will increase the competitiveness of this service enterprise in the market.

REFERENCE

1. Garina E., Kuznetsov V., Romanovskaya E., Potashnik Y., Yashin S. Management of industrial enterprise in crisis with the use of incompany reserves // Contributions to Economics. 2017. № 9783319606958. Pp. 549-555.
2. Garina E.P., Kuznetsov V.P., Romanovskaya E.V., Lapaev D.N., Yashin S.N. Formation of the production system elements and R&D product development processes in the early stages of the project // Journal of Applied Economic Sciences. 2017. E. 12. № 2 (48). Pp. 538-542.
3. Kuznetsova S.N., Garina E.P., Kuznetsov V.P., Romanovskaya E.V., Andryashina N.S. Industrial parks formation as a tool for development of long-range manufacturing sectors // Journal of Applied Economic Sciences. 2017. E. 12. № 2 (48). P. 391-401.
4. Romanovskaya E.V., Semenov S.V. Analysis of approaches to the quality management system // International Journal of Applied and Fundamental Research. 2016. No. 8-2. P. 236-239.
5. Semenov S.V., Romanovskaya E.V., Starikova O.Yu. Application of mathematical methods for increasing the economic efficiency of enterprises. International Journal of Applied and Fundamental Research. 2017. No. 6-2. Pp. 323-326.
6. Semenov S.V., Semakhin E.A., Romanovskaya E.V., Andryashina N.S. Adaptation of methods of project management in the hotel business // Economics and entrepreneurship. 2017. No. 8-4 (85-4). Pp. 938-941.
7. Lebedeva T.E., Akhmetshin E.M., Dzagoyeva M.R., Kobersy I.S., Ikoev S.K. Corporate governance issues and control in conditions of unstable capital risk // International Journal of Economics and Financial Issues. 2016. E. 6. № S1. Pp. 25-32.
8. Khizbullin F.F., Sologub T.G., Bulganina S.V., Lebedeva T.E., Novikov V.S., Prokhorova V.V. The direction of transformation of information and communication technology (ict) at the present stage of development into an electronic and information society// Pertanika Journal of Social Sciences and Humanities. 2017. E. 25. No. S. Pp. 45-58.
9. Bulganina S.V., Lebedeva T.E., Varivoda V.S. Creation of a resource base for expansion of the hotel services sector in the region // Bulletin of the University of Minin. 2014. No. 4 (8). P. 2.
10. Vakulenko R.Y., Egorov E.E., Proskulikova L.N. Investigation of the effectiveness of the enterprise's activities / / Bulletin of the University of Minin. 2005. № 4. P. 3.
11. Kuznetsov, V.P., Romanovskaya, E.V., Egorova, A.O., Andryashina, N.S., Kozlova, E.P. Approaches to developing a new product in the car building industry (2018) Advances in Intelligent Systems and Computing, 622, pp. 494-501.
12. Perova, T. V., Kuznetsova, E. A., Vinnikova, I. S., Kaznacheeva, S. N., & Chelnokova, E. A. (2017). Essence of the role and characteristics of the operating conditions of enterprises before and after the transition to market relations from a macroeconomic position. International Journal of Applied Business and Economic Research, 15(12), 103-112.
13. Vaganova O.I., Ilyashenko L.K. The main directions of implementation technologies of student-centered education in high school. Vestnik of Minin University. 2018. vol. 6, no. 3. p.2 DOI: 10.26795 / 2307-1281-2018-6-3-2 (in Russian).
14. Potashnik, Y.S., Garina, E.P., Romanovskaya, E.V., Garin, A.P. & Tsymbalov, S.D. Determining the value of own investment capital of industrial enterprises (2018) Advances in Intelligent Systems and Computing, 622, pp. 170-178.
15. Smirnova ZH.V., Gruzdeva M.L., Krasikova O.G. Open electronic courses in the educational activities of the university. Vestnik of Minin University, 2017, no. 4(21), p. 3. https://doi.org/10.26795/2307-1281-2018-6-3-9 (in Russian).
16. Smirnova Zhanna V., Mukhina, M.V., Kutepova, L.I., Kutepov, M.M., Vaganova, O.I. Organization of the research activities of service majors trainees (2018) Advances in Intelligent Systems and Computing, 622, pp. 187-193.
17. Tsyplakova S.A., Grishanova M.N., Korovina E.A., Somova N.M. Theoretical bases of designing of educational systems. Azimuth of Scientific Research: Pedagogy and Psychology. 2016. vol. 5. no. 1 (14). pp. 131-133 (in Russian).
18. Vaganova O.I., Gladkov A.V., Trutanova A.V. Formation of professional competencies of bachelors in the conditions of e-learning. Baltic Humanitarian Journal. 2017. vol. 6. no. 2 (19). pp. 190-193. https://elibrary.ru/item.asp?id=29415561 (in Russian).
19. Yashin, S.N., Yashina, N.I., Ogorodova, M.V., Smirnova, Z.V., Kuznetsova, S.N., Paradeeva, I.N. On the methodology for integrated assessment of insurance companies' financial status (2017) Man in India, 97 (9), pp. 37-42.

20. Natalie V. Kamenez, Zhanna V. Smirnova, Olga I. Vaganova, Natalia V. Bystrova and Julia M. Tsarapkina, Development of Instructing Techniques in Professional Training, International Journal of Mechanical Engineering and Technology, 10(02), 2019, pp. 899–907
21. Lubov K. Ilyashenko, Zhanna V. Smirnova, Olga I. Vaganova, Elena A. Chelnokova and Svetlana N. Kaznacheeva, Methods of Conducting Practical Training on the Subject "Power Sources for Welding", International Journal of Mechanical Engineering and Technology, 10(02), 2019, pp. 908–917

AUTHORS PROFILE

Evgeny A Semakhin, Minin Nizhny Novgorod State Pedagogical University
semahinea@mail.ru

Romanovskaya Elena Vadimovna
Elena V Romanovskaya, Minin Nizhny Novgorod State Pedagogical University
alenarom@list.ru

Nataliya S Andryashina, Minin Nizhny Novgorod State Pedagogical University
natali_andr@bk.ru

Semenov Sergey Valerevich
Sergey V Semenov, Minin Nizhny Novgorod State Pedagogical University
svsemenov@gmail.com

Tatyana E Lebedeva, Minin Nizhny Novgorod State Pedagogical University
taty-lebed@mail.ru

Anna I Orlova, Nizhny Novgorod State University of Engineering and Economics
annasamurina@mail.ru

Irina A Kuznetsova, Nizhny Novgorod State University of Engineering and Economics
nosovair@rambler.ru