



FINDINGS THE TEST OF BALANCED SCORECARD FOR ESTIMATING THE ENHANCEMENT OF PRODUCTION MANAGEMENT AND ORGANIZATION THROUGH IT APPLICATION IN BULGARIAN FURNITURE ENTERPRISES

Marina MLADENOVA

UNIVERSITY OF FORESTRY – SOFIA, BULGARIA

ABSTRACT:

This paper discusses the underlying principles of the Balanced Scorecard for estimating the enhancement of the production management and organization through the application of information technology (IT) in the furniture enterprises. The findings from the test of the system in furniture enterprises in Bulgaria are also presented and analyzed, along with setting out the arguments for the system applicability as a mechanism for monitoring, assessing and managing IT assets.

KEYWORDS:

Balanced Scorecard, enhancement of production management and organization, IT application, furniture enterprises

1. INTRODUCTION

The Balanced Scorecard for estimating the enhancement of the production management and organization in the furniture enterprises through implementing IT applications has been developed on the basis of the assessment of their economic efficiency and the impact of the enhancement made. The Balanced Scorecard methodology for IT economic efficiency assessment has been applied. This makes it possible not only to argue for IT implementation, but also to smoothly incorporate it in the company development plan both on the strategic level and operational level (budget level). The latter, as the experience shows, plays an important role in the successful implementation.

2. ESTABLISHING THE BALANCED SCORECARD

To establish the Balanced Scorecard the following steps should be completed:

1. Setting out, not just on paper, the objective of the system;

In this study it is: enhancement of the production management and organization in the furniture enterprises through implementing IT applications.

2. Establishing the groups of indices (P_i);

An index group is analyzed on the basis of the following principles:

- a. index;
- b. key factors for success;
- c. indices of efficiency;
- d. enhancement.

However, the analyses of the index groups of: economic indices, indices of relations with customers, and indices of internal business processes are, to a great extent, company-specific. It is only the group of indices of innovations, development and training that is common for all companies in the sector.

3. Determining the factors for success;

These involve a set of actions which determine the possibility for achieving the real objective G . Each success factor should belong to an index group P_i , and a measurement unit should be set out. In this study all factors are expressed in a universal measurement unit (%).

4. Balancing indices and factors.

At this stage it is necessary to estimate the relative index weight by index group and success factor. The terminology of the Balanced Scorecard includes the term "balancing" the system of indices. There are no directions for the method of system balancing. It is assumed that the index weight can be estimated by any of the known methods. In this study the calculation of the relative index weight is made using the weighted average method based on expert assessments of five experts who used 10-level scale of index or factor significance.

The study also made use of a statistical method for estimating the enhancement impact under balanced system conditions, and of the average world indices of the impact of IT implementation. The expected enhancement of the success factors has been specified. In accordance with the measurement unit used, the significance Fe_i determining the weight of the enhancement made of the factor Fi should be set out along with calculating b_i which is the relative weight of the enhancement Fe_i made of factor Fi .

3. USING THE BALANCED SCORECARD

Considering the known significance Fe_i as well as the calculated significance values of the relative weight of factors and indices, it is necessary to calculate the value of the target function E by index group and as a total value.

$$E = \sum_{i=1}^n a_i P_i + \sum_{i=1}^n b_i Fe_i$$

where: a_i – relative weight i of index P_i ;

b_i - relative weight of the enhancement Fe_i made of factor Fi .

This target function is an integral index of the estimate of the enhancement of the production management and organization in the furniture enterprises through implementing IT applications. It allows determining the extent to which the IT applications match the company targets. Moreover, both financial and nonfinancial company targets are considered, which can guarantee that the estimate is complete and reliable.

An additional personification of the Balanced Scorecard can be made by setting out weight coefficients for the various index groups and success factors (it is recommended that their sum is 10 or a multiple of 10); thus, the system will account for the priorities of the development strategy of a particular furniture company.

4. FINDINGS FROM THE TEST OF THE BALANCED SCORECARD

The testing was performed in companies belonging to each of the four types of the Bulgarian furniture enterprises: a small company with regional market (A); a middle-sized company with successful domestic market and partial export (D); a company with mainly export activities (B) and a multinational company (C). This is the reason to believe that the study covers all main types of furniture enterprise in Bulgaria, and that the conclusions on the applicability of the developed system of indices are objective.

The obtained values for the index groups have been converted to relative units to make the comparison possible. When the Balanced Scorecard is used in a particular ready-to-assemble (RTA) furniture manufacturing company or in a particular target group of RTA furniture manufacturing companies of the same type, this conversion is not necessary; but, in the case of comparative analysis of different types of RTA furniture manufacturing companies, it is obligatory as they have economic, financial and production indices of different size. If the indices which impact the total result positively have decreased in value, the obtained results are with a minus sign.

No	P1 – economic indices	α_i	A	B	C	D
1	Productivity and efficiency	0,10	+0,0520	+0,0318	+0,0188	+0,0191
2	Length of financial cycle or cycle of turnover of monies	0,11	-0,1228	-0,0186	-0,0418	-0,0418
3	Own capital lending	0,08	+0,1143	+0,2017	+0,1905	+0,1444
4	Losses resulting from non-optimal use of assets	0,10	-0,0658	-0,0860	-0,0989	-0,0987
5	Reduction of costs per unit of production	0,11	+0,0180	+0,0120	+0,0241	+0,0120
6	Share of low-cost company internal business processes	0,11	+0,0481	+0,0180	+0,0602	+0,0361
7	Proportion of reported costs by using the method of activity-based costing (in %)	0,03	+0,0169	+0,0086	+0,0132	+0,0075
8	Reported growth per worker	0,10	+0,0353	+0,0589	+0,0942	+0,0236
9	Volume of sales and market share	0,04	+0,0002	+0,0071	+0,0048	+0,0119
10	Number of new products and services	0,02	+0,0165	+0,0028	+0,0221	+0,0055
11	Number of new customers and markets	0,04	+0,0095	+0,0095	+0,0238	+0,0143
12	Number of new production distribution channels, service differentiation, delivery methods and prices	0,02	+0,0025	+0,0050	+0,0125	+0,0025
13	Number of new price strategies	0,02	+0,0055	+0,0028	+0,0221	+0,0028
14	EVA (Economic Value Add)	0,11	+0,0358	+0,0782	+0,0586	+0,0271
	Total:	1,00	0,1662	0,3320	0,4041	0,1664

The relatively highest sum index obtained for company C is due to the fact that it is in the process of transition from one product range to another, and it has very high indices of new products/services, new customers and markets, reduction of costs per unit of production and reported growth per worker, as well as to the production process which is well technologically supported and the involvement of consultant companies and highly qualified specialists in managing this transition.

The relatively high index of company B resulting from its leading position in own capital lending, cycle of turnover of monies and high value of EVA is due to the fact that most of its production is exported to Austria and Germany at high export prices, and to the low amount of own capital necessary for production.

Companies A and D have very similar indices even though they have significant size differences. The reason is that company A has the leading position in productivity and efficiency, and therefore its losses from non-optimal use of assets are relatively low.

The unsatisfactory index of company D is due to its small share of low-cost company internal business processes, its reported growth per worker, EVA as well as the large losses from non-optimal use of assets.

The relatively highest index obtained for company B is again due to the fact that it exports its production, which results in a relatively large order size per customer as well as a high frequency of orders from regular customers.

Company C has a relatively high index because of the increase of the number of new customers, the large order size per customer, and the relatively low costs per customer.

The result obtained for company A is mainly due to the high total profit per order per customer (compared to the costs made for it).

The unsatisfactory index of company D is due to the large number of customer claims, and the low ratio between the sales and the number of enquiries.

No	P2- indices of relations with customers	α_i	A	B	C	D
1	Increase of the amount and volume of sales to regular customers (increase of the number of orders)	0,13	+0,0357	+0,1428	+0,0892	+0,0178
2	Frequency of orders, meetings and contacts with regular customers	0,11	+0,0305	+0,1219	+0,0457	+0,0305
3	Number of failed orders (number of customers lost)	0,05	-0,0335	-0,0134	-0,0335	-0,0468
4	Average costs for attracting a new customer	0,07	-0,1041	-0,0833	-0,0625	-0,0729
5	Number of new customers and total volume of sales to new customers	0,13	+0,0546	+0,0729	+0,1093	+0,0546
6	Ratio of the number of sales to the number of enquiries for receiving product information	0,03	+0,0327	+0,0327	+0,0286	+0,0164
7	Average sales or average profit per order per customer	0,03	+0,0446	+0,2230	+0,1338	+0,0892
8	Market share of the company	0,09	+0,0006	+0,0061	+0,0245	+0,0307
9	What part of their budgets (in %) do customers spend for products of the company?	0,03	+0,0372	+0,0186	+0,0186	+0,0372
10	Number of customer claims	0,12	-0,0335	-0,0335	-0,0167	-0,1171
11	Number of customers pleased with the products	0,12	+0,1398	+0,1572	+0,1398	+0,1223
12	Total profit per customer	0,05	+0,0502	+0,0251	+0,0309	+0,0368
13	Costs per customer or per economic operation	0,05	-0,0360	-0,0219	-0,0269	-0,0319
	Total:	1,00	0,2189	0,6484	0,4810	0,1668

No	P3 - indices of internal business processes	α_i	A	B	C	D
1	Time for product appearance on the market	0,11	-0,0538	-0,1722	-0,1076	-0,0646
2	Critical time for product appearance on the market	0,10	+0,1928	+0,1928	+0,1928	+0,1928
3	Profitability of particular market segment	0,10	+0,0206	+0,1031	+0,0928	+0,0516
4	Profit (in %) that can be obtained as a result of developing a new product	0,11	+0,0215	+0,0323	+0,0646	+0,0538
5	Profit (in %) that can be obtained as a result of attracting new customers	0,09	+0,0179	+0,0897	+0,0807	+0,0448
6	Quantity of reject products	0,11	-0,0211	-0,0316	-0,0211	-0,0422
7	Length of production cycle	0,10	-0,1543	-0,0964	-0,1350	-0,1928
8	Production costs	0,11	+0,2108	+0,2108	+0,2108	+0,2108
9	Number of timely deliveries	0,04	+0,0686	+0,0762	+0,0724	+0,0610
10	Relative number of defects as a result of delivery	0,03	-0,0027	-0,0016	-0,0005	-0,0011
11	Deficit as a consequence of untimely supply	0,04	-0,0152	-0,0076	-0,0076	-0,0152
12	Average level of customer satisfaction	0,03	+0,0583	+0,0583	+0,0583	+0,0583
13	Number of customers who have placed a second order within a year of the first one	0,03	+0,0269	+0,0161	+0,0161	+0,0135
14	Number of customers who have not placed a second order	0,03	-0,0269	-0,0377	-0,0377	-0,0404
	Total:	1,00	0,3435	0,4322	0,4791	0,3303

The relatively highest index obtained for company C is due to the profit that can be made as a result of developing a new product, which leads to attracting new customers and ensuring high profitability of the particular market segment. Other factors are the relatively low quantity of reject products, and the rare occurrence of deficit as a consequence of untimely supply from contractors.

Company B has an index with a similar value, and its high market segment profitability compensates for the long time new products take to appear on the market and for the quantity of reject products.

Company A again has an edge over company D, which is due to the short time new products take to appear on the market, and the low quantity of rejects; these compensate for the relatively low profitability of the market segment.

The high index of company A is due to the nature of its activities: tailor-made production which requires developing new models and modifying old ones; other factors include the relatively high number of computer equipped work places (desks) with simultaneous access to the local network, and the relatively higher qualification of its employees, which compensates for the high staff turnover and low level of employees' satisfaction.

Nr	P4 – indices of innovations, development and training	α_i	A	B	C	D
1	Productivity of employees (manufactured products per employee, profit per employee, etc.)	α_i	A	B	C	D
2	Staff turnover	0,15	+0,1734	+0,0764	+0,0502	+0,0589
3	Level of employees' satisfaction	0,13	-0,0454	-0,0333	-0,0076	-0,0605
4	Number of employees who have the qualifications to take key positions compared to the expected need for such employees	0,06	+0,0133	+0,0232	+0,0531	+0,0100
5	Number of accepted and implemented suggestions per employee	0,04	+0,0052	+0,0103	+0,0310	+0,0052
6	Salaries paid	0,04	+0,0144	+0,0005	+0,0384	+0,0048
7	Number of computer equipped work places (desks)	0,08	+0,0923	+0,0503	+0,0537	+0,0704
8	Number of work places (desks) with local network access	0,11	+0,1292	+0,1292	+0,1292	+0,1292
9	Number of employees that can simultaneously receive information through the network	0,11	+0,1218	+0,0609	+0,1218	+0,0244
10	Number of work places (desks) with Internet access	0,08	+0,0959	+0,0959	+0,0480	+0,0959
11	Number of processes for which the information about the quality, quantity, length, losses, etc. is easily accessible	0,04	+0,0480	+0,0240	+0,0480	+0,0096
	Total:	0,15	+0,0867	+0,0434	+0,0520	+0,0520

The relatively high index of the next company, company C, is due to the low staff turnover, the high level of employees' satisfaction and the relatively high number of accepted and implemented suggestions per employee.

The index value of company B is due to the fact that its management is pleased with the sales of the products manufactured by the company and its profit.

The unsatisfactory index of company D is due to the high staff turnover and the lack of qualified employees.

The table below shows the sum $\sum_{i=1}^n a_i P_i$ by index group and as a total of the four indices. The optimal sum of the four indices is 4 (1 for each index group)

	A	B	C	D	Average % of the optimal result
P1	0,1662	0,3320	0,4041	0,1664	26,72
P2	0,2189	0,6484	0,4810	0,1668	37,88
P3	0,3435	0,4322	0,4791	0,3303	39,63
P4	0,7347	0,4808	0,6177	0,3999	55,83
Total:	1,4633	1,8934	1,9819	1,0633	40,01
Average % of the optimal result:	36,58	47,34	49,55	26,58	

The obtained percentages of the relative estimate of the production management and organization in comparison to the optimal result are indicative for all four companies. The results confirm the assumption of the sector IT experts that the load threshold of production lines that cannot be exceeded without the use of modern IT management systems is 60%.

These results show the initial state of the companies, and allow drawing conclusions on which index group has weaknesses related to the production management and organization, and, therefore, also has potential for production enhancement through implementing IT applications.

If the initial values of the success factors are 1, and considering the average world indices of the impact of IT implementation and the obtained coefficients of relative weight of expected enhancement by factor, then $\sum_{i=1}^n b_i F e_i = 1,8751$ for the initial state of the companies. The obtained values of the target function of initial states per company are shown in the table:

	A	B	C	D
$\sum_{i=1}^n a_i P_i$	1,4633	1,8934	1,9819	1,0633
$\sum_{i=1}^n b_i Fe_i$	1,8751	1,8751	1,8751	1,8751
$E = \sum_{i=1}^n a_i P_i + \sum_{i=1}^n b_i Fe_i$	3,3384	3,7685	3,8570	2,9384

The results per index and the sum result are shown illustratively in Fig. 1.

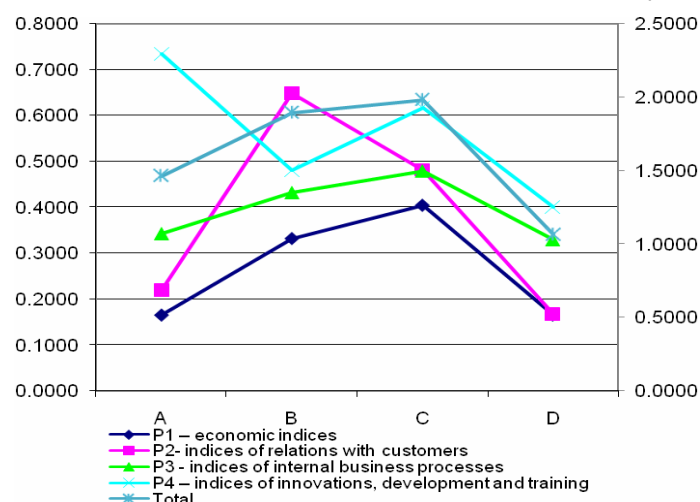


Figure1. The results per index and the sum result

After analyzing the obtained results, and taking into account the priorities of the company strategic development plan, the next step was the implementation of IT applications and their integration with the existing ones.

The tables below show the results by success factor after estimating the enhancement impact (Fe_i) on the balanced system by group of success factors. The obtained success factor enhancement after the implementation of new IT applications or/and the integration of the IT applications used is presented.

Enhancement of success factors by index group

The expected enhancement after the IT implementation for the index group P1 (economic indices) is $\sum_{i=1}^n b_i Fe_i = 0,4081$ according to the average world indices.

№	Success factors for P ₁ (economic indices)	Fe_i	b_i	A	B	C	D
1	Reduction of the time and efforts for preparing the financial statements	-60%	0,06	0,0381	0,0305	0,0191	0,0458
2	Reduction of the time for preparing the budget	-70%	0,06	0,0890	0,0445	0,0356	0,0445
3	Accuracy of costs reporting	30%	0,13	0,0394	0,0355	0,0473	0,0315
4	Reduction of transport and initial costs	-60%	0,06	0,0381	0,0305	0,0229	0,0381
5	Reduction of the time for closing the reporting for a period	-90%	0,06	0,1144	0,0572	0,0858	0,0572
6	Increase of turnover of monies reported	30%	0,21	0,0636	0,0318	0,0445	0,0636
7	Reduction of administrative and management costs	-30%	0,08	0,0254	0,0381	0,0508	0,0305
8	Reduction of unbudgeted production costs	-50%	0,13	0,0636	0,0636	0,0953	0,1271
9	Profitability of invested capital	20%	0,19	0,0114	0,0248	0,0186	0,0086
	Total:			0,4830	0,3564	0,4199	0,4469

The enhancement for company A is mainly due to the significant reduction of the time for budget preparation, the reduction of the time for closing the reporting for a

period and the increase of the turnover of monies as a result of discontinuing the use of accountancy software and implementing an integrated information system.

The obtained results for companies B and C are a consequence of the increased profitability of the invested capital; as both companies operate with a highly profitable market segment, even a small percentage increase can account for large financial results.

Both companies have reported reduction of the administrative and management costs and reduction of the unbudgeted production costs.

Company B has achieved this result by integrating its IT applications for preparation of design documentation, optimal cutting patterns, and automated processing of work-pieces and model units.

Company C has reported this result as a consequence of finalizing the process of setting up and preparing design and technological documentation of the new products.

High percentage enhancement has been reported for company D; it has logically followed the inefficient use of assets and the overall organization improvement after the implementation of an integrated information system for processing accounting information and warehouse management.

The expected enhancement after the IT implementation for the index group P2 (indices of relations with customers) is $\sum_{i=1}^n b_i Fe_i = 0,6300$ according to the average world indices.

Nr	Success factors for P2 (indices of relations with customers)	Fe_i	b_i	A	B	C	D
1	Increase of warehouse-sales coordination	50%	0,30	0,1350	0,0900	0,1125	0,1575
2	Increase of timely delivery	80%	0,30	0,3888	0,4320	0,4104	0,3456
3	Improvement of after-sale service	60%	0,40	0,1920	0,0768	0,1152	0,1920
	Total:			0,7158	0,5988	0,6381	0,6951

There is high enhancement of this index group for companies' A and D, as the effect of the implemented modules has been significant improvements of the coordination between the warehouses and sales departments. Their customer information support has adopted some applications based on the Customer Relationship Management technology, which has led to significant improvements of the after-sale service. As a whole, the companies have improved those indices that were problematic for them, and had the greatest potential for improvement.

The enhancement reported for companies B and C is due to the fact that there is significant increase of timely deliveries as a result of the implementation of some applications based on the Supply Chain Management technology. Company C has also started to focus on improving the after-sale service by beginning to use the implemented modules of Customer Relationship Management more efficiently.

Nr	Success factors for P3 (indices of internal business processes)	Fe_i	b_i	A	B	C	D
1	Reduction of non-utilizable materials in store	-40%	0,08	0,0380	0,0319	0,0228	0,0410
2	Warehouse area reduction	-25%	0,05	0,0119	0,0178	0,0148	0,0237
3	Stock-turn increase	65%	0,16	0,2057	0,1306	0,1286	0,1543
4	Reduction of reject products	-35%	0,08	0,0051	0,0077	0,0051	0,0103
5	Reduction of time for transportation of finished production	-45%	0,05	0,0228	0,0228	0,0228	0,0228
6	Abandoning manual preparation and handling of documentation	90%	0,10	0,0775	0,1595	0,1139	0,1823
7	Reduction of the production cycle	-50%	0,15	0,0759	0,1139	0,0949	0,1519
8	Reduction of labour intensity of operations	-40%	0,15	0,0608	0,0759	0,0608	0,1215
9	Reduction of errors in developing the production plan	-90%	0,08	0,1481	0,0741	0,0741	0,2222
10	Reduction of time of maintenance and repairs	-7%	0,05	0,0038	0,0038	0,0038	0,0038
11	Increase of use of machinery and equipment	2%	0,05	0,0009	0,0009	0,0009	0,0009
	Total:			0,6504	0,6389	0,5425	0,9347

The expected enhancement after the IT implementation for the index group P3 (indices of internal business processes) is $\sum_{i=1}^n b_i Fe_i = 0,5022$ according to the average world indices.

The high enhancement for company A is due to the fact that the impact of IT has led to significant reduction of errors in developing the production plan, reduction of the production cycle, stock-turn increase, reduction of non-utilizable materials in store, i.e. to improvement of those indices that were problematic for the company and had potential for enhancement.

The enhancement reported for companies B and C is a result of abandoning manual preparation and handling of documentation, reduction of the production cycle and reduction of the time new products take to appear on the market.

The sum enhancement of the success factors for this index group for company D is very high. The conclusion can be made that the IT implementation and integration has led to significant change of its internal business processes, not only with regard to the new tools used, but also in view of the management and organization improvement. It seems that it is this result that is the most pragmatic evidence of the capabilities of IT for production management optimization and, as a whole, business processes' enhancement in enterprises which constantly expand; IT supports their development and ensures sustainability and continuity in the course of time.

The expected enhancement after the IT implementation for the index group P4 (indices of innovations, development and training) is $\sum_{i=1}^n b_i Fe_i = 0,3349$

№	Success factors for P4 (indices of innovations, development and training)	Fei	bi	A	B	C	D
1	Improvement of staff qualifications	20%	0,22	0,1303	0,2084	0,1824	0,2128
2	Reduction of the time for documentation processing	-30%	0,22	0,0749	0,1368	0,1238	0,1400
3	Optimization of product life-cycle	20%	0,28	0,3395	0,3395	0,3395	0,3395
4	Reduction of the cycle for developing new products	-60%	0,28	0,0781	0,1137	0,0900	0,1188
	Total:			0,6227	0,7984	0,7356	0,8111

The obtained result of the enhancement of this index group for company A is the lowest. The result accounts for the reduction of the time for documentation processing, and optimization of product life-cycle. The market position of the company provides the availability of wide choice in the selection of labour resources, and, therefore, the staffs are relatively better qualified resulting in higher labour productivity.

Companies B and C have comparative results. Their enhancement is a consequence of the improvement of staff qualifications and reduction of the cycle for developing new products.

The sum enhancement of the success factors for this index group for company D is very high again. It is a result of the significant improvement of staff qualifications following the impact of the implemented IT. In turn, this has led to reducing the time for documentation processing and the cycle for developing new products.

The management of only one of the studied companies reported a strong, direct link between the management of human capital and the organization value.

Two of the companies performed further personification of the Balanced Scorecard by setting out weight coefficients by index group and success factor, thus accounting for the priorities of the strategic development plans of the particular company.

As a result of the developed thesis Balanced Scorecard for estimating the enhancement of the production management and organization in the RTA furniture manufacturing companies through IT application, the following summary findings have been obtained:

1. Impact of enhancement made ($\sum_{i=1}^n b_i Fe_i$) by index group and as a total for the four index groups:

Impact of enhancement made	A	B	C	D	Average in %
P1	0,4830	0,3564	0,4199	0,4469	42,66
P2	0,7158	0,5988	0,6381	0,6951	66,20
P3	0,6504	0,6389	0,5425	0,9347	69,16
P4	0,6227	0,7984	0,7356	0,8111	74,19
Total	2,4719	2,3926	2,3360	2,8878	63,05

These results allow each company to obtain an estimate of the enhancement made of its production management and organization through the application of modern IT. Analyzing in which of the four index groups a certain company has achieved the highest relative enhancement can determine the extent to which the implemented IT applications have matched the company targets, and it can plan actions for further enhancement of the indices of the various groups.

2. Relative estimate of the production management and organization with regard to the optimal result before and after the IT implementation (in percentages):

	A	B	C	D
Overall estimate: % of the optimal result before IT implementation:	36,58	47,34	49,55	26,58
Enhancement of indices made after IT implementation (in %)	62,73	61,62	60,09	77,43
Overall estimate: % of the optimal result after IT implementation:	59,53	76,50	79,32	47,17

These results clearly show the strong impact of the modern IT on the production management and organization in RTA furniture manufacturing companies.

3. Improvement of the integral index of the enhancement estimate of the production management and organization through IT application in RTA furniture manufacturing companies:

	A	B	C	D
$E_{nav.} = \sum_{i=1}^n a_i P_i + \sum_{i=1}^n b_i Fe_i$	3,3384	3,7685	3,8570	2,9384
$E_{pez.} = \sum_{i=1}^n a_i P_i + \sum_{i=1}^n b_i Fe_i$	3,9352	4,2860	4,3179	3,9511
Improvement of the target function ($E_{pez.} - E_{nav.}$)	0,5968	0,5175	0,4609	1,0126
Improvement of the target function (economic efficiency), in %	17,88	13,73	11,95	34,46

The improvement percentage obtained for company A, even though ranking second is the lowest with regard to its real value. This result is due to the enhancement of these indices that were problematic for the company before the implementation of the new IT applications and the integration of the existing ones. As a consequence of the increase of monies turnover, financial resources have been made available, and the management has regarded this as an important advantage.

The improvement percentage obtained for company B is due to the high enhancement percentage of the success factors for P4 (indices of innovations, development and training), which compensates for the lack of focus, on the part of the management, on enhancing the relations with customers where there is a lot of potential. The managers are pleased with the product sales and company profit. This improvement percentage combined with the high profitability of the company's market segment has led to the high real value of the reported result.

The lowest improvement percentage obtained by company C is due to the fact that relatively few IT applications have been implemented in it, and its management

had a good record of best practices before the study. However, this improvement percentage when linked to its financial and economic indices has led to significant economic efficiency in real terms.

The highest improvement percentage obtained by company D is due to the fact that the highest number of new IT applications has been implemented in it, which has led to significant change of its internal business processes. This is evidence that IT implementation is, in practice, one of the stages of management system optimization in RTA furniture manufacturing companies.

5. CONCLUSIONS

1. The assessment of the IT needs, use and economic impact on the production management of furniture companies underlines the significance of IT in their activities and the understanding of the gain of financial resources through the use of IT. The enhancement values obtained as a result of the implementation IT applications have undisputedly convinced the managers of this fact.
2. The Balanced Scorecard has allowed assessing the used IT applications regardless of the fact that furniture companies have implemented fragments of IT applications focusing on various aspects that are determined by the management strategic development plans. On the basis of this assessment it is possible to make a well-grounded decision for implementing new IT applications and integrating them into the overall information system i.e. achieving optimization of the information infrastructure. This would lead to the following main results:
 - reduction of the IT costs by identifying the main sources of costs and efficiently managing them;
 - improvement of servicing the business tasks by redistribution of funds spent on IT;
 - ensuring the consolidation of IT by optimization of the technical infrastructure;
 - efficiency enhancement of the used IT applications and distribution of costs in accordance with the actual use of IT by adopting the model for IT management, and implementing the respective instruments.
3. There are options for additional personification of the Balanced Scorecard by setting out weight coefficients by index group and success factor, which accounts for the priorities of the company strategic development plans, and shows its flexibility and adaptability.
4. The developed Balanced Scorecard System is applicable as a mechanism for monitoring, assessing and managing IT assets.

REFERENCES

- [1] Atkinson A., Epstein M., Measure for measure: Realizing the power of the balanced scorecard, CMA Management, September 2000, p. 22-28
- [2] De Haas M., Kleingeld A., Multilevel design of performance measurement systems: enhancing strategic dialogue throughout the organization, Management Accounting Research, vol. 10, 1999, p. 233-261
- [3] Kaplan R.S., Norton D.P. The Balanced Scorecard - Measures then drive Performance, Harvard Business Review, Vol. 70, 1992, p. 71-79
- [4] Norreklit H., The balance on the balanced scorecard - a critical analysis of some of its assumptions, Management Accounting Research, 11, 2000, p. 65-88