

Knowledge Managers for Small and Medium Size Service Organizations

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Abstract-The main objective of this paper is to demonstrate that a knowledge manager is able to lead an organization from a low position on the market to a high position with an important benefit generated by operating activity. This objective will be applied to the architectural organizations, namely those entities that undertake architect and design services for their customers. The main characteristics of the architect services entities consist of the high level of specialization required by each project developed (i.e. the design plan of a house is different of those for an office building) and the necessity to assess the profitability rate of each project in order to attain the overall targeted profit. Why for architectural organizations? Because our team has analyzed the activity of 20 architectural small and medium size companies from Bucharest and the conclusions were unfavorable for those companies. Some of our conclusions are as follows: the activity of all companies was generating loss; managers are not economists and they did not know to ask for appropriate accounting information to sustain good decisions; strategies were inexistent; the market was unknown, etc. Thus, the general conclusion was: without knowledge it is impossible for managers to ensure the success of a company.

Knowledge managers should possess varied backgrounds such as: information sciences, organizational behavior, culture, processes, business management, economic information, etc. So, in our opinion, to create knowledge managers, three steps are to be followed: 1) the creation of a culture by learning, 2) the practical application of learning effects, 3) share the best practices. All these steps are important, but the first step will ensure a strong background for managers, because they need to understand that without information it is impossible to decide how and where the organization will go.

Based on these arguments, our team has decided to help those organizations by demonstrating the importance of all kind of information in the decision making process, especially economic information and how and when that information must be provided. Consequently, we have conceived a model for a particular Balance Scorecard for architectural organizations, in order to summarize only the most important information that must be known by managers. We think that information about costs, costs component, cost calculation for different types of products, target prices, target profits, number of products that must be sold for a target profit, the level of the price that may be negotiated, are very important for a manager.

Another model that was conceived by our team concerns cost management in order to realize the profitability objective.

Keywords- Knowledge Managers; Knowledge Management; Performance; Cost; Balance Scorecard

I. INTRODUCTION

In the knowledge society we are now living in, the importance of information, number, quality and relevance of an organization is steadily growing. Information may be presented in different ways and covers all organizational aspects. A manager, especially a knowledge manager, must be informed in time and must be able to use this information for improved decisions. Information that characterizes a knowledge management may be viewed in terms of:

- People or culture: how to increase the ability of an individual in the organization to influence others with their knowledge;
- Processes or structure: the number unlimited and quite different from one organization to another;
- Technology: shall be chosen after a knowledge management initiative will be established.

Generally, the main reporting instruments (such as balance sheet, profit and loss account, notes) contain reliable data, as they report on the past. The use of historical data diminishes the forecasting power of the above mentioned reporting instruments, whereas actual and potential stakeholders need future-oriented data to be able to prepare their decisions (Lungu, Caraiani, Dascălu, 2008). Consequently, future-oriented data can be selected after an analysis of past data, of current and future tendencies, of risks and uncertainties. That means to understand the economic environment, to identify present and future changes in this environment, to select and to prepare information that may sustain decisions regarding the mission and the vision that the manager intends to implement within an organization.

Information that managers need to know is provided by accounting, financial and managerial fields and they contain data about the organization's relationship with third parties and data about the internal efficiency, about the strategy and tactics adopted by an organization.

Accounting may be considered as a specific language which facilitates the communication and the dialogue between internal and external actors, between accountants and managers, between people with different cultures and specializations.

For an efficient management it is necessary to have a performing information system, a reliable tool, which allows a

continuous control of the organization's objectives, as well as the competitor's situation, coherence, reliability and promptness being the basic characteristics of the information system (Almășan, Grosu, 2008).

Through this paper we want to help managers to understand accounting information, mainly management information related to cost calculation, profit forecasting, the best production mix for a level of profit, and indicators they need for the decision making process.

II. LITERATURE REVIEW: BASIC TERMS FOR A KNOWLEDGE MANAGER

Knowing all about costs, revenues, products, services, customers, prices, prices policy, market share, it is a major requirement for a manager that has as objective to increase the performance of an organization. All information must be organized in a relevant presentation, for the manager, for decision making regarding the present and the future of the organization.

What does this mean? To understand terms such as: knowledge, knowledge management, knowledge managers, cost management, balance scorecard, etc.

Tom Devenport, management guru, says "*knowledge* is information combined with experience, context, interpretation and reflection".

Most knowledge is built on the knowledge based economy and it actually represents just information-data, facts and basic business intelligence. Knowledge is deeper.

The Dimensions of Knowledge may be as Follows:

- (Alavi, Leidner, 2001): tacit Knowledge, internalized K that an individual may accomplish a particular task; explicit knowledge-that the individual holds consciously in mental focus, in a form that can be easily communicated to others.
- (Sensky, 2002): embedded knowledge of a system outside the human individual; embodied knowledge representing a learned capability of a human body's nervous and endocrine systems.
- Exploratory creation of new knowledge (innovation).
- Transfer or exploitation of "established knowledge" within a group, organization, or community.

Why are these dimensions relevant for our paper? Because it seems they emphasize certain qualities of the managers as individuals.

Knowledge management (KM) (Wikipedia free encyclopedia) comprises a range of strategies and practices used in an organization to identify, create, represent, distribute and enable the adoption of insights and experiences that involve knowledge, either embodied in individuals or embedded in organizations as processes or practices.

KM may refer to the ways organizations collect, manage and use the knowledge they obtain.

KM (Kristy Annely, 2009) is a term applied to techniques utilized for the methodical compilation, transfer, security and management of information in organizations, along with schemes designed to aid in making best use of that knowledge.

KM focuses on organizational objectives such as: improved performance, competitive advantage, innovation, the sharing of lessons learned, integration and continuous improvement of the organization.

Knowledge managers have varied backgrounds ranging from Information Sciences to Business Management.

A knowledge manager is likely to be someone who has a versatile skills portfolio and is comfortable with the concepts of organizational behavior/culture, processes and branding-marketing.

A knowledge manager must be a creative one that may optimize the quality of the idea pool (creativity) and implementation (innovation). Creativity involves: motivation, organizational culture, structure, knowledge mix-structure, goals, procedures, valuation methods. Innovation is the art of creating new products and involves development, selection, control techniques.

Knowledge managers contribute to the creation of a culture (learning, innovation, knowledge sharing) and propose new measures of performance and appropriate rewards.

Cost management is a term used for describing the methodologies and activities used for managing the short-term and long-term planning and controlling decisions to increase the value to the customer and for reducing the costs of the products and services (Bhimani, Horngren, Datar, Foster, 2008).

Horngren (2003) identifies the main characteristics of the cost management which express a wide range of applications, such as:

- Calculating the product or service cost and other cost purposes;
- Obtaining the necessary information for the planning process, controlling and performance evaluation;

- Analyzing information for the decision making process.

Considering the characteristics above, we can say that the company can verify the cost management process by performing the following (www.knowledgeboard.com, 2004, 12):

- Ensuring the accuracy and appropriateness of the decisions;
- Improving the efficiency of the process;
- Improving the service capacities.

Consequently, we can say that the cost management includes measures and activities of management in order to provide information for making appropriate decisions, achieving the optimum use of resources and controlling the costs to attain the excellence of the organization by providing high-valued products to the customers.

A traditional cost management (Drury, 2000) involves the following traits:

- It is routinely applied on continuous basis;
- It keeps the status quo without reconsidering the current performance of the activities;
- It ensures that the cost includes more than one cost reduction.

Nowadays, in our world, companies compete in a “knowledge economy”, where skilled functions are performed by “knowledge workers” and firms that improve their experience are “learning organizations” (David A Klein, 1998).

Knowledge managers must contribute to the creation of knowledge economy by sharing the best practices to other companies to save money and by creating new products and services faster and better.

A *Balance Scorecard (BSC)* is a strategic performance tool which maps organizations objectives into performance metrics in four perspectives: financial, internal processes, customers and learning and growth.

The term “scorecard” signifies quantified performance measures and “balanced” signifies that the system is balanced between: short-term and long-term objectives; financial and non-financial measures; lagging and leading indicators; internal and external performance perspectives. (NetMBA.Com)

The first BSC was created by Art Schneiderman in 1987 at Analog Devices. In 1992 Kaplan and David P. Norton published an article about BSC that was a popular success.

The perspectives proposed by Kaplan and Norton:

- Financial: how do shareholders see us?
- Customer: how do customers see us?
- Internal Business Processes: what must we excel at?
- Learning and Growth: can we continue to improve and create value?

These perspectives provide relevant feedback as how well the strategic plan is executed so that the necessary adjustments can be made.

For each perspective the organization must define:

- Objectives: strategic objectives to be achieved in that perspective;
- Measures: how to measure a particular objective;
- Targets: to target values for each measure;
- Initiatives: action programs, what will be done in order to facilitate the targets’ achievement.

For a knowledge manager, a BSC must be an indispensable tool where information about the organization is presented in target figures and in real figures in order to sustain decisions. Also, variations are explained, causes are identified and actions are to be decided.

Generally, when we talk about BSC, we associate this tool to large organizations where a Management Control Department and specialized employees to prepare such a statement exist. BSC must also be prepared for small and medium size organizations in an appropriate form for this type of organizations, in order to summarize relevant information for the decision making process.

III. COST-VOLUME-PROFIT MODEL FOR A KNOWLEDGE MANAGER

Through our proposed model, we intend to help managers in the decision making process by providing information based on different scenarios. Therefore we consider that a model based on the relation between target costing principle and cost-volume-profit analysis should be an interesting tool for the decision making process. Finally, we decided to prepare such a model based on information provided by architectural organizations, in order to calculate targeted profit in different circumstances and for different level of fees.

Our model is based on the following hypotheses:

- The average target profit should be 22% on sales, but for each cost object profits are different based on the nature of the service provide by this organization;
- An average fee per hour is considered and computed for each cost object based on the market fees;
- Probabilities to change or to maintain the same level of fees should be: 0.2 for no change in fees; 0.6 for a decrease by 10% and 0.2 for a decrease by 20%;
- Probabilities to use the total capacity: 0.1 for 90% of the total capacity, 0.6 for 80% of the total capacity, 0.3 for 70% of the total capacity;
- The model was projected for 80% of the total capacity;
- Cost objects that should generate profit were classified in: standard projects (SP), medium projects (MP), high level projects (HLP) and other consultancies (OC);
- The number of working days 240 per year (48 weeks*5 days);
- Total number of hours worked per year for an 80% capacity utilization: 3072H (240*8*2*80%);
- Number of employees: 2;
- Variable costs are 60% of the total cost.

Basic principles used:

- Prices are determined by the market (target prices);
- Costs are determined by the market (target costs);
- Organizations need to achieve a target profit;
- Possible costs are calculated;
- Gaps must be determined (target cost-possible cost);
- Gaps must be eliminated (decision making).

Production mix for 80% capacity:

TABLE I TARGET PROFIT CALCULATION

Products (1)	Number of products (2)	Hours per product (3)	Total hours (4=2*3)	Fee per hour (5)	Total fee (6=4*5)	Target profit % (7)	Total profit (8=6*7)
SP	120	10	1200	100	120 000	16	19 200
MP	19	40	760	400	304 000	20	60 800
HP	5	100	500	1 000	500 000	25	125 000
OC	39	8	312	50	15,600	10	1 560
Total	183		3 072		939 600	22	206 560

Different scenarios could be developed where expected value of profit may be calculated by combined probabilities assumed as hypotheses, as follows:

TABLE II EXPECTED PROFIT CALCULATION

Hypotheses	Probability	Capacity utilization	Probability	Combined probabilities	Capacity	Revenues	Profit	Expected profit
No change in fee	0.2	90%	0.1	0.02	90	1057050	232380	4648
No change in fee					80	939600	206560	4131
No change in fee					70	822150	180740	3615
Decrease by 10%	0.6	80%	0.6	0.12	90	951345	209142	25097
Decrease by 10%					80	845640	185940	22313
Decrease by 10%					70	739935	162698	19524
Decrease by 20%	0.2	70%	0.3	0.06	90	845640	188264	11296
Decrease by 20%					80	751680	167346	10041
Decrease by 20%					70	657720	146428	8786
Total						7679760	1679498	109453

Revenues for different capacities are calculated based on revenues computed for 80% capacity. For example for 90% capacity, revenues were calculated: $939\,600 \times 90/80 = 1\,057\,050$.

Profits were calculated by applying the average percentage profit 21.98382% on revenues ($1\,057\,050 \times 21.98382\% = 232\,380$).

Expected profits were computed following the relation: $\text{expected profit} = \text{profit} \times \text{combined probability}$. For example for 90% capacity, expected profit was $4\,648 = 232\,380 \times 0.02$.

The total expected profit is not represented by the potential outcomes in the table; it is the weighted average of those outcomes. If the manager chooses this scenario, the position of this organization's management has a neutral-risk attitude. Other scenarios are possible, as well as different risk attitudes.

Knowledge managers need to know the level of sales at break-even, in order to make good decisions regarding the price policy. The break-even point (BEP) may be calculated in number of projects and consultancies and in sales based on targeted figures included in Table 1. The target cost may be calculated as follows:

Target sales	Target profit	Target cost
939 600	206 560	733 040

For a BEP analysis, the target cost must be divided in variable and fixed components based on the cost behavior. In architectural organizations, variable costs represent 60%-70% of the total cost. We have considered in our model a variable cost percentage of 60%, with a fixed cost representing 40% of the total cost, say, $\mu 293\,216$ ($733\,040 \times 40\%$). The fixed cost is calculated as a total amount for the organization as a whole, while the variable cost is calculated for each product and also the contribution generated by products. These elements will be calculated in the following table:

TABLE III COST CALCULATION

Products (1)	Sales (fee) (2)	Total cost (3)	Variable cost (4*60%)	Total number of hours(5)	Variable cost per hour (6=4/5)	Contribution (7=2-4)
SP	120 000	100 800	60 480	1 200	50.42	59 520
MP	304 000	243 200	145 920	760	192	158 080
HP	500 000	375 000	225 000	500	450	275 000
OC	15 600	14 040	8 424	312	27	7176
Total	939 600	733 040	439 824	3 072		499 776

(1) For each project, the total cost was calculated by deducting the target profit (Table 1) from sales.

Currently, all data are available and BEP in sales (*BEPS*) may be calculated following the relation: $BEPS = FC/CMR$, where: *FC*-fixed costs; *CMR*-contribution margin ratio = $C/Sales \times 100$.

$$CMR = 499\,776 / 939\,600 = 0.53 = 53\%$$

$$BEPS = 293\,216 / 53\% = \mu 553\,238$$

Sales of $\mu 553\,238$ will generate a zero profit.

If managers need to know more details about sales at BEP, the production mix (on sales) will be used for the calculation of BE for each product, as follows:

$$SP = 120\,000 / 939\,600 = 0.13$$

$$MP = 304\,000 / 939\,600 = 0.32$$

$$HP = 500\,000 / 939\,600 = 0.53$$

$$OC = 15\,600 / 939\,600 = 0.02$$

BEPS for each product will be calculated by applying the sales mix on the total BEPS, as follows:

- $BEPS_P = 553\,238 \times 0.13 = \mu 71\,921$
- $BEPS_M = 553\,238 \times 0.32 = \mu 177\,036$
- $BEPS_H = 553\,238 \times 0.53 = \mu 293\,216$
- $BEPS_O = 553\,238 \times 0.02 = \mu 11\,065$

Total **$\mu 553\,238$**

How many projects must be realized for zero profit? How many projects must be realized for a target profit? Answers for these questions may be found in a BEP analysis, used to prepare realistic forecasts.

To calculate the number of projects at BE, we assume that *Q* is the number of hours for HP at BE, and all other projects will be related to *Q*, as follows:

$$QHP = 2.4 Q SP$$

$$QHP = 1.52 QMP$$

$$QHP = 0.624 QOC$$

At BEP, revenues equal expenses and the relation for the profit calculation will be: Sales-Variable costs- fixed costs=0 or $Q*SUP-Q*UVC-FC=0$; where: Q: number of hours of each project; SUP: fee per hour; UVC: unit variable cost for each project. Using our equivalences the relation will be:

$$2.4Q*100+1,52Q*400+1\ 000Q+0.624Q*50-2.4Q*50.42-1.52Q*192-Q*450-0.624Q*27-293\ 216=0$$

$$783.53Q=293\ 216$$

$$Q=293\ 216/783.53=374H/HP$$

$$SP=2.4Q=2.4*374=897H/SP$$

$$MP=1.52Q=1.52*374=568H/MP$$

$$OC=0.624Q=0.624*374=233H/OC$$

Total hours at BEP 2 072

Number of projects at BEP may be calculated by dividing total hours per project at BE to the number of hours needed for a project: for example for SP: $897H/10H=89$ projects.

IV. BALANCE SCORECARD FOR ARCHITECTURAL ORGANIZATIONS: PERSPECTIVES AND INDICATORS

Financial perspective requires appropriate indicators such as: revenue from projects and consultancies, revenue from other activities, sales at BEP, contribution margin ratio, labor costs, other operating costs and fixed costs.

Based on the indicators computed based on the cost-volume-profit model developed above, the Balance Scorecard model could be summarized as follows:

TABLE IV BALANCE SCORECARD MODEL

Products (1)	Target Sales (fee) (2)	Target profit (3)	Total cost (4=2-3)	Break-even point sales – BEPS (5) mu	No of hours at BEP (6)	No of projects at BEP
SP	120 000	19 200	100 800	71 921	374	$897:10 = 89$
MP	304 000	60 800	243 200	177 036	897	$568:40=14$
HP	500 000	125 000	375 000	293 216	568	$374:100=3$
OC	15 600	1 560	14 040	11 065	233	$233:8 = 29$
Total	939 600	206 560	733 040	553 238	2072	

Using this model of targeted indicators and comparing them on a periodical basis with the realized ones, managers have at hand a clear picture of the status of the profitability per projects and of the business in its entirety.

The main challenge for constructing the appropriate Balance Scorecard model is to understand the business specificity, to identify correctly the cost carriers (the personnel) and the profits centres (the projects) and the interdependences existing during the operational process. This aspect regarding the decomposition of general information into small parts is a necessary process in various areas of the knowledge management and has been identified also by Yucong Duan and Roger Lee in the paper “Knowledge Management for Model Drive Data Cleaning of Very Large Database”.

“In all, we identify the real challenge always as following: the ability to manage the multiple source complexity from problem identification, solution modelling, evaluation and harvesting the result related to comprehensive knowledge”.

Customer perspective

Generally, customers view the organization in terms of time, quality, performance and cost. Consequently, relevant indicators may be: customer satisfaction, on time delivery, number of new customers, repetitive customers, % of sales from new products, number of cancelled or delayed projects, target waiting time, number of complaints and market share in target segments.

Internal process perspective

Objectives and measurement for the internal perspective should be as follows:

- Services (production) excellence: cycle time, yield;

- Design productivity: engineering efficiency, new ideas, new practical solutions;
- Reduce project launch day: actual launch day versus plan;
- Cost-quality: cost reduction, increase quality.

Learning and growth perspective

Learning and growth perspective is generally focused on employees. Therefore, the objectives and measures may be: the time to learn new processes, the number of projects where new processes were applied, the number of new projects in the total project, the time for a project versus competitor time, employee satisfaction and skills.

Indicators that were selected must be calculated each month and compared against forecasts. Variances must be calculated and the causes of those variances must be identified in order to take corrective actions.

A simple and appropriate model of a balance scorecard may be designed by the manager himself, assisted by an accountant, whose role is to advice the manager how to select the best indicators for decision making.

V. CONCLUSIONS

- Architectural organizations, small and medium size, must survive and grow and in order to achieve these goals, managers have to be informed, to be knowledge managers.
- Without a good strategy, it is impossible to achieve the objectives fixed by an organization.
- Architectural organizations fall under the auspices of management accounting based on project accounting; they involve project management and include estimates.
- Management accounting information is the main source of information for a manager in the decision making process.
- Information about how targets were achieved is vital for a manager.
- To understand the market and to know the competitors is indispensable for the future of an organization. We consider that managers need to know the environment where they live, work and survive in order to win new customers.
- A cost-volume-profit analysis is necessary for price policy and for multiple scenarios that may be prepared for a manager and from which he will select the best scenario for the organization's stage in the business life cycle.
- Scenarios must be prepared for different activity levels, possible to be realized by the organization, like in the model that was presented earlier. Probabilities are computed after a deep analysis of potential customers and their demand.
- A periodical analysis of relevant indicators is also necessary, because the level of variances tells us how the objectives were attained.
- Financial and non-financial indicators must be calculated and a knowledge manager must decide what types of indicators are necessary for the best decisions.
- Information about cost calculation and cost management should be provided in an acceptable and understandable form.
- The elements of the cost must also be analyzed in order to survey their evolution, for different periods and in respect with predetermined figures. If variances are important, corrective decisions are necessary.
- A balance scorecard should help a knowledge manager to manage the organization to profitability for a long period of time.

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