

Decision Support System for Training Budget Management

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Abstract: With the passage of time corporations record a continual increase for implementing educational programs. Having to struggle with training costs and benefits, companies have been investing large amount of money, resources and time to conventional training. The evolution of learning management systems leads technology to deploy advanced learning models, supported by smart modules, and consequently to build up dynamic and scalable e-learning systems. But as companies rely more and more on learning management systems, a new module could enhance the educational procedure by estimating training outcomes. This paper is dedicated to the presentation of a new developed module entitled “Training Budget Management” (TBM), which supplies Human Resource (HR) manager with metrics and analytic components that contribute to the alignment of the training plans with the strategic and personal goals of the organization and its employees respectively. Therefore, HR manager could be able not only to determine a profitable budget policy, but also to be adequately supplied with knowledge to manage the three critical issues of training; efficiency, effectiveness and compliance, by establishing benchmarks and measures. Surveys that took place in European companies performed two types of training budget policies. The first one includes a weighed co-efficient allocation of a specific amount in order to satisfy employees’ private ambitions and company’s needs. In the second one the budget is subdivided according to company’s requirements with respect to employees’ and Line managers’ desires.

The functionalities of the TBM will be described in the context of

- Training budget flow.
- Different policies of training budget.
- Analysis of the training costs in conjunction with the evaluation components.
- Utilization of strategic and personal goals.
- Cost/benefit analysis.
- Return on investment.
- Strategic alignments with budget policy.
- Gap analysis.

This paper is based on a survey that takes place in a European IST project entitled “ELENA”, which aims at analyzing existing standards for modeling learning-relevant data beyond learning objects and providing recommendations for their further development, presenting integrated heterogeneous services, such as assessment services, content brokerage, learning delivery and HR management, and testing the applicability of smart spaces to the field of education and training from a business perspective. Furthermore, ELENA seeks to develop best practice guidelines for deploying smart spaces for learning from an organizational, technological and pedagogical perspective.

Key-Words: E-learning cost analysis, Training budget analysis, Training budget policies

1 Introduction

Business community’s necessity for a “Smart Space For Learning” (SSFL) directs the design of a more adequate training system based on a technology of a brokerage platform with plug and play capabilities such as scalable scheme. E-learning and blended learning systems

constitute a major interest for companies where new opportunities occur. Now that e-learning and blended learning has become a major new initiative, even more investment is needed in an organization. The adoption of new tools and technology enforces companies to truly apply business analytics, to understand the activity, effectiveness, and impact of e-learning and training [1],

[2]. Surveys that took place during the project conclude that HR managers require an e-learning platform which facilitates close cooperation with a tool that allows calculation of training budget policies, based on several metrics, and prediction of the company's yields and its employee's benefits. These different functionalities arise from HR managers' expectations to enhance their job by scheduling training programs subject to specific budget. The computation of training analytics grants the opportunity to decrease costs and deploy a common hierarchical scheme adaptive to the organizational strategies [4]. These measurements, that constitute the training policies management, should be accompanied with a financial metric system. The latter provide financial estimation and valuation of training programs, since it takes into consideration both expenses and revenues [5]. Thus, this functionality aids firstly to avoid risks and secondly to evaluate, through particular algorithms, the net worth of an investment [7], [8], [9]. Such metrics are:

- Cost per employee
- Cost per manager
- IRR – Internal Rate of Return
- ROI – Return on Investment
- ROE – Return on Equity (cost of investment / shareholder value)
- FROE – Future ROE (prediction of a project's results to the company → total value of the company)
- Added value = FROE – ROE

Another way at looking at ROI, is to calculate how many months it will take before the benefits of the training match its costs. This technique is called payback period:

$$\text{Payback period} = \text{Costs} / \text{Monthly Benefits} \quad (1)$$

The input data can be imported either by the company's current information systems (e.g. ERP, CRM, etc.) or by the platform itself. Additionally, HR managers are enabled to enter manual specific data, if there are not available in digital form. The output data can be exported into several reports according to the users' needs. In order to support further modification of the budget policy the output figures can also take the form of indexes. A major challenge for every HR manager is to improve the efficiency, effectiveness and compliance either of the indexes, which contribute to the budgetary policy estimation or of the users' adaptation with the framework of the company's overall educational policy (see Fig. 1). His/her task is to design valuable training programs adaptive to continuously

competitive environments and achieve lucrative investments.

By utilizing a TBM tool, the opportunities for cost saving could be categorized in:

- Lessen time for searching and scheduling training programs.
- Reduced training expenses.
- Diminished staffing expenses.
- Alleviated reporting and record-keeping expenses.
- Lower fines and penalties from the numerous regulatory agencies.
- Improved staff performance.
- Upgraded training decisions.
- Superior alternative policies.
- Enhanced educational results by the designing adaptive programs.

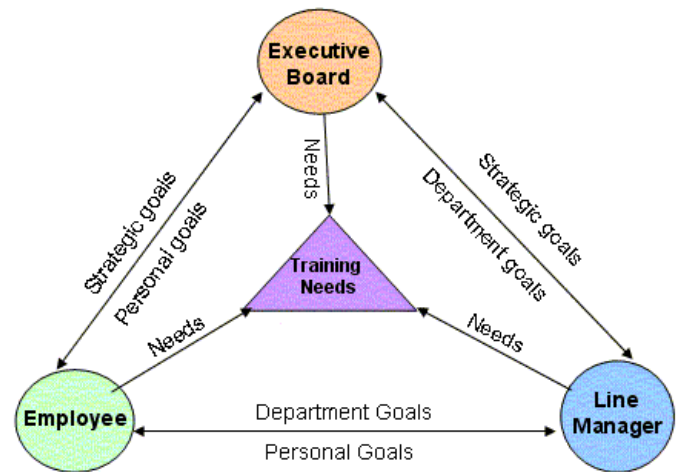


Fig.1: Participants in Training Policy

2 Description of Training Budget Management

The scope of TBM is to supply HR managers with components that are combined in order to predict a training budget policy, according to the general organizational strategic goals, with dynamic rules and smart procedures. TBM is part of a superset of other functions within the SSFL. The major classes that constitute the core of the system are:

- User.
- Select Goal.
- Goal.
- Budget Proposal.
- Training Cost.
- Process Data.
- Final Budget Policy.

The TBM module concept stems from managers' efforts to plan training courses by matching and deploying User's and Company's Profile through a Gap Analysis. The analysis performance aims at dictating training requirements in accordance with the current available monetary budget [6]. A foremost search of the costs for future seminars in conjunction with the Gap Analysis predefines the budgetary policy of the subdivision using a smart Decision Support System (DSS) [3]. Although this effort is based on existing scenarios, provided by matching User's and Company's Profile, it is necessary to use the qualitative attributes to specify the budgetary policy. The functions of this module are transparent to the employees if it is desirable from the managers. Thus, they obtain an overview of the predefined costs. Moreover, the approval of a seminar will be upon request through the system. The employees shall be able to search for a course but cannot see (if such action is desirable by managers) the amount that is allocated for them. Therefore, managers have the opportunity to compare the allocated amount of the budget for each employee with the total training course expenses, and to decide its acceptance (see Fig. 2).

The model's schema depends on a general class entitled "User", which is subdivided in three subclasses with different rights: "Employee", "Line Manager" (LM) and "Executive Board" (EB) or "HR Manager". The class "User" inherits an attribute to each subclass called "UserInterference", which is being set by the EB who is actually the super user of the system. EB is the only type of user with the authority to recall functions, after taking into consideration the user interference, the budget policy and consequently the goals. By setting to each user a different percentage of interfering with the system his/her choices and goals have a discrete weight of importance affecting both the final budget policy and the training courses. Hence, an employee does not have the capability to influence the policy in a greater degree than a department manager if this is desirable by the EB (or the HR manager). This function ensures that a company follows the desired training policy for its employees. Particularly, one scenario presumes the definition of the general organizational goals and courses. In this case the users are welcomed to select one of them. In the second scenario the EB (or the HR manager) identifies the training goals which he/her believes are necessary for the company (and the employees too). In this case each employee has the permission to introduce his/her personal goals. Additionally, the EB (or HR manager) has the responsibility to define the departmental contribution

degree to the Budget Control. Since budget is subdivided into various departments, it is therefore essential for every division manager to control the resources that has been allocated to his/her department. Hence, he/she shall be able to supervise the employees' training progress, to propose new ideas, to influence the impact of new modifications to his/her department and to provide information and feedback to EB (or HR manager).

Finally, HR manager is able to define the percentages that impacts the importance of a goal either concerns company's goals or personal training goals. This factor enables or disables the choice of being able the users to assigns their personal goals in conjunction with the strategic goals of the company.

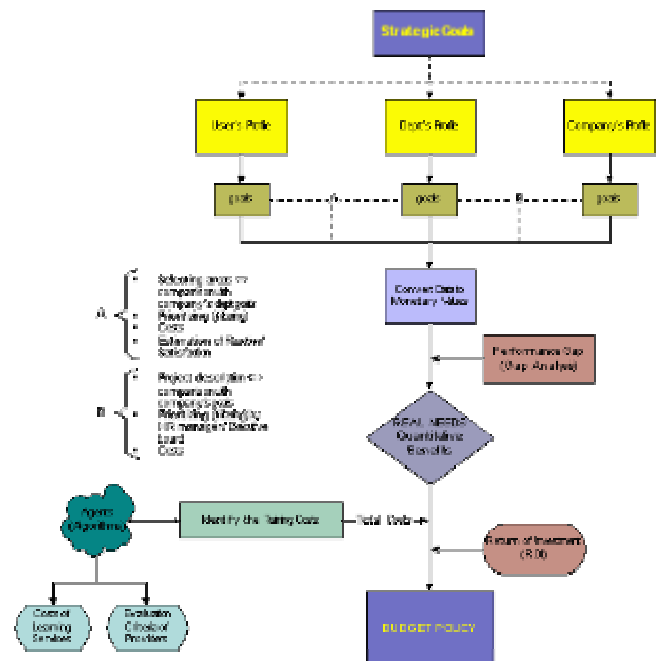


Fig. 2: Budget Policy Decision Flow

The above mentioned scenarios are practically developed through the following functions:

- setPercentageUserInterference()
- goal()
- budgetproposal()

The first function sets the weighted percentage of each user category that interferes to the design of the training plans. Every type of user according to his/her position to the organizational chart and in conjunction with the weighted percentage can affect the budget and training policy of the company he/she works for. The second one arranges the company's strategic goals by defining a selection area (class Select_Goal()) where

users make their choices regarding both company's and personal requirements. The current function supports two different activities; a course of action where the company sets specific goals and users have to select one of them and a course of action where every type of user has the ability to select particular courses from a list of goals where he/she can also place his/her personal training goals according to his/her occupational ambitions. The third function permits the EB to set the budget either to departments or straight forward to employees.

According to the above two activities, that can be implemented into the system, TBM predefines the way that budget can be subdivided. The functions of the budget are optional (O) for every HR manager and subsequently for LMs. This entails that HR managers can allocate the total available for education purposes amount to every department and/or to the employees if the latter is desirable. Consequently, LMs have the obligation to apportion the total obtainable departmental amount to each of their employees. The later amount is independent from the one that has been allocated from HR manager straight forward to employees (see Fig. 3).

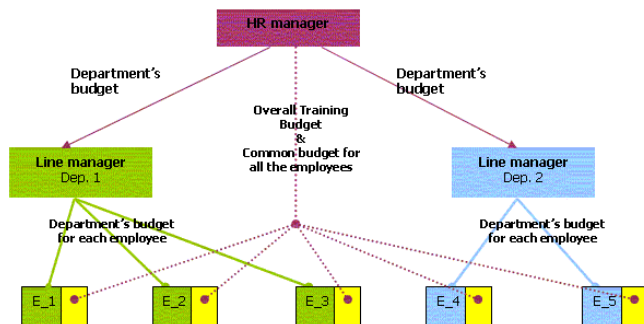


Fig. 3: Training Budget Flow

The budget allotment according to company's strategy is flexible and reinforces LMs to determine their training requirements. Feedback from the system shall be displayed upon request both for the EB and the LMs providing adequate information for scheduling future training courses.

Regarding the TBM system's data process it does not matter which scenario has been selected. Every user chooses from a predefined area the goals and courses which are either personal or general. A quantitative operation is triggered every time the user finishes the above action. Except from the types of the goals, the goals too, such as the index of priority for each one in

accordance to his/her desires, preferences and personal ambitions should be appointed in this class.

Another class of the TBM is "Budget_Proposal()". In this class the HR manager sets the total amount of the budget, the divisions that compete to the policy and the percentage of each division's contribution. The data are converted to monetary values for better performance and processing procedures.

All the quantitative data is driven to a class called "Process Data" where in conjunction with the budget proposal that was set earlier from HR manager performs a Gap Analysis. The results of this task in coordination with the predicted training costs trigger the Return on Investment function for training plan. Additionally, the system's feedback concerning the expenses supplies it with dynamic components producing adequate results from matching search criteria. Therefore, the class "Training Costs" performs operations such as searching of training costs, estimating learning service providers and cost/benefit analysis within the training system resulting in a list of courses that meet both company's and its employees' requirements. The results are then being processed to the 'Process Data' class in order to extract through its operations the proposed budget policy.

Having integrated the above operations, the system itself produces a proposed budget policy which can be accepted or regenerated by the HR manager. Storage of the proposed budget policies can facilitate EB to recall it later or associate it with the current policy.

Furthermore, the whole procedure of the budget management and the budget flow is not strict through the infrastructure of the organizational layers, from HR manager to LM and then to employees, but can be dynamically allocated from the HR manager to every employee without the interference of the LM if this is a common stated policy. This feature provides an additional advantage to HR manager; to apportion a part of the budget, which is aligned with the company's general policy, straight to the majority or all of the employees. The following figure represents in a clearer way the whole idea of this module (budget management).

Generally, the budget management behaves as an additional tool for managers to acquire knowledge and information of the current allocated amount for training and thus make up their decisions regarding the overall organizational policy (user's and company's profile, department's policy, several costs for training) and follow the whole budgeting plan guidelines (see Fig. 4).

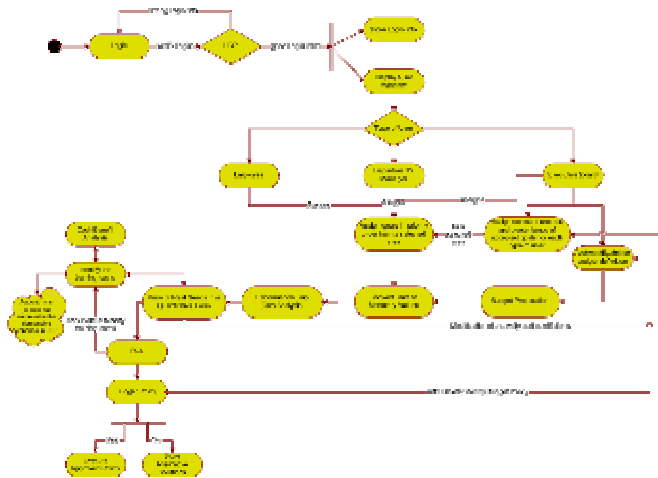


Fig. 4: Budget Management Flow

2.1 Allocation of Training Budget

The overall strategic plan of the budget can be incorporated with the company's, the departments' and the users' policies over the Universal Brokerage Platform (UBP), which comprises the mediator in a SSFL. Therefore, whenever a HR manager sets a budget ceiling in a department, the employees can select a training course according to the available budget for each employee and corresponding to the subject area of their department. The budget might be transparent or not to employees but not to managers.

As training needs and policies too, in some occasions, can be designated for every unit in the company, the subdivision of the budget concerns either the departments or the employees. Although, the LM controls the division of the budget for every employee, the HR manager is given the authority to interfere with the educational requirements of the company's employees and subdivide a part of the overall budget straight forward to every employee without distributing it to the departments. This policy helps the HR manager in situations where the training concerns all the employees or the majority of them.

The budget policy can also arise, according to Fig. 5, from a prediction of future training costs that stems from a search function through UBP. The majority of the procedures are done automatically from the system itself, whereas a proposal concerning the total amount of the budget is predefined. Consequently, managers can subdivide the budget in terms of qualitative features, since such features can be entered into the system and be converted to quantitative variables through the TBM procedures.

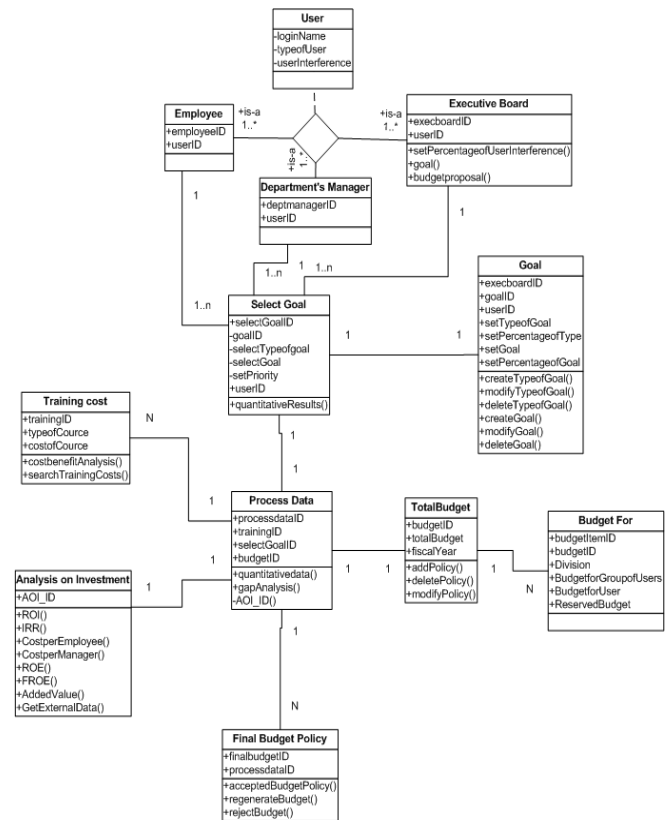


Fig 5: Class Diagram of TBM

Another aspect of the budget management module is the ability to subdivide a part of the available amount for pilot programs. Pilot programs concern courses that have been positively appraised from a team of expertise in order to be adopted later on from the company. While some organizations wish to educate their employees, they first execute, through the training department, some trials to examine whether the courses are appropriate or not for the rest of the employees. This issue requests further analysis in order to examine thoroughly all the components that interfere with the budget and the models of the SSFL.

3 Implementation Scenarios

Suppose a company, called ANDIS, which is specialized in the business consultancy area, has been registered to the SSFL. TBM consist a plug in module to the whole platform. HR manager is responsible for the design of the training program for a specific period considering the company's strategy. Although he/she is able to select between the two types of policy, his/her company agreed to follow the second one, as described above, where

every user can propose also his/her personal goals. It is obvious that the manager has to determine the weighted percentage for every user category in order to diversify the importance of each selection of goals within the system. The company, which particularly focuses in developing business plans and producing feasibility studies concerning integrated information systems for organizations and municipalities, has among others the Marketing Department (MD), and desires to educate its employees at new technological systems and methods in order to remain competitive and innovative.

Nicole is an employee in the MD. Each year Nicole has to be trained at new management policies and methods for conducting business and marketing plans. She can interfere with the design of the general training plan by assigning her personal goals and prioritizing them for better analysis. She is aware of the weighted coefficient that her choices have. Besides, all the proposals are estimated by the system in accordance with factors defined by the HR manager and the results will be summarized to a training prediction. The LM of the department decided to train Nicole by utilizing the SSFL where ANDIS is a member. He/her has a specific budget to spend, since the HR manager has implemented a cost-benefit analysis and estimated the Return on Investment of the selected training programs. Thus the LM is able to book specific programs for his/her employees through the platform and to handle the amount of budget that is assigned to his/her department. The training cost for Nicole in a course is more expensive than the ones of other employees. However, the LM knows that according to the assigned budget it is affordable or there can be an agreement of budget shift from another department (ability provided without needing the HR manager's approval).

4 Conclusions

TBM facilitates HR managers to build e-learning budgets with overall metrics, financial information and training efficiency avoiding risky investments without the proper return. The level of functionality depends on components that will be taken into consideration for the training budget policy. Current theories and surveys outline the critical reasons of associating training methods with costs through the deployment of advanced tools that compare costs with results that will be exploited. TBM constitutes a kind of such tool that works additively to the functions of a brokerage platform. Its functionality utilizes the modules of a

general system, where an exchange of information occurs in both directions, processing in this way the outcomes, and exports them to the core of the TBM for further analysis. The whole effort will be used at the deliverables of the European project "ELENA".

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