

Work Breakdown Structure (WBS) in Project Management

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Abstract

As modern management techniques, specifically the WBS application may determine the success of a project, regardless of its objectt, as such achieving predetermined performance indicators. Contained within this framework, we propose in article to present the approach particularity, specific reasonings, additional to considerations regarding the necessity and usefulness of this particular technique.

Given the complexity and dynamic internal process specifically of the framework Project Management Unit (PMU), additional to the necessity of resolving with professionalism the problems which are subject to this type of entities, WBS may constitute by itself a particularly effective method regarding resource management, the risk management and the achievement objectives in conditions of technical and economic high performance.

From the perspective of exercising the least three attributes towards management (planning, organizing and controlling) the WBS application may confer a competitive advantage specifically obvious by the fact that makes it possible that the prioritization activities/operations/and service tasks in close correlation with the own objectives or the UMP pyramid. Consequently, large-scale application of the WBS chart in which fully supports the management team to realize with a higher accuracy the key elements concerning the resource requirements and their judicious allocation, cost estimation, schedule deadlines, etc., all in their interconnection, are apt to provide a more qualified substantiation of managerial decisions.

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JEL classification: M10

1. Introduction

The main service obligation of a project manager consists of taking responsibility regarding the fulfillment assembly of objectives that constitutes itself in which is meant to be an entity that is leading in conditions the efficient use of resources. Along with the manager, experts and staff recruited within the PMU they complete all responsibilities allocated according to current tasks arising from

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specific conduct internal process. Along with the manager, experts and staff co-opted in the framework of the PMU they should complete each task in accordance with their responsibilities allocated to them, in the current fulfillment of tasks arising from the specific implementation internal process.

A relatively recent definition of project management states that it may be represented conceptually as: „*a way of developing structure in a complex project, where the independent variables of time, cost, resources and human behavior come together.*” (Burke., R., 2010).

From the perspective of the specific responsibilities: „*the project manager is expected to integrate all aspects of the project, ensure that the proper knowledge and resources are available when and where needed, and above all, ensure that the expected results are produced in a timely, cost- effective manner.*” (Meredith, J., R., Mantel. Jr., J., 2012).

Other authors suggest that through „*focusing on business projects, Project Management can be perceived as value creating. The authors indicate mainstream PM should ‘shift away from the traditional engineering view of projects’ to embrace the concept of business projects as ‘creating value and benefit for different stakeholder groups’.*” (Winter et al., 2006).

Therefore, in terms of performance management professionalization and increasing effectiveness: „*it may be useful to review a traditional ‘procedure, concept or technique to provide a report on the traditional engineering view of projects.’*” (Rozenes, S., Vitner, G., & Spraggett, S., 2004).

In this relational and conceptual framework, WBS has been defined as a representation as „*...total decomposition of all the works/stages included in a project from start to finish*”. (PMI Lexicon of Project Management Terms, 2012). The WBS has been defined, as well as a „*... deliverable-oriented hierarchical decomposition of the work to be executed by the project team*”. (Project Management Body of Knowledge”, PMBOK, 2013). It mentioned here that by "deliverable" it will be understood that "product" that is expected to be done by a responsible approach at end, according to the service tasks which concern him directly and personally.

WBS has been defined also as a „*organization tree, which presents a subdivision of effort required to achieve a specific objective, such as a program, project and contract.*” (A Guide to the Project Management Body of Knowledge, 2008). In those circumstances, WBS enable the performance a summary of the estimated costs for all subsequent project tasks, regardless of whether these relate to salaries, materials, services etc. Therefore, each element of the structure WBS (work definitely identified), generated a description of the financial burden falling to be included in the overall project budget.

WBS also represents „*... an instrument that project managers use to divide projects into more manageable units.*” (Project Management Body of Knowledge PMBOK 2013). In the specialized literature, it also, suggests that „*Breakdown Structure (WBS) is considered a foundation concept of PM*” (Kolltveit, Karlsen & Grønhaug, 2007). In other words, this method itself is compatible to the highest degree with project management, its application being capable of increasing the effectiveness of such approaches.

In light of these representations theoretically the role of WBS consists of decomposing the internal process specifically within the PMU-oriented activities individually towards a "deliverable", the latter representing a component subsequent to the final result as it is predetermined by the technical documentation of project. In consequence, the WBS defines an activity (vector) leading to the "deliverable" additional to its related performance indicators. „*The natural assumption, that WBS is product-oriented, may be due to the fact that WBS in relation to contracts for a final product. This is not such case. A wide variety of researchers and practitioners view the WBS from very different perspectives. For example: process, work, organization, teams and cost*”. (Ahlemann, 2009).

Theoretical and procedural approaches of professional reasoning which have to be considered whilst concerning the WBS application is founded on the separation of attributions and thus avoiding overlapping of responsibilities and competencies. This professional judgment succinctly enunciated above assumes the judicious distribution of responsibilities/competencies/attributions so that no person or department could not control all of the important stages of a process or an event. This consideration is based on the planning and exercising of internal controls that via those themselves are capable to reduce the risk of error, fraud, or violation of applicable legal provisions. *Finally, the professional judgment mentioned herein leads naturally to a stronger collaboration between departments/employees subsequently to an increased balanced dispersion of activities including specific responsibilities contained within the internal process of the UMP.* ” (Zecheru, V. & Bădică, C., 2013).

In a natural process, the project manager becomes the architect, and the main beneficiary of the WBS application technique that we considered briefly above in which we will present in detail, below. Alongside the project manager, mainly responsible, are all other members of the team they theoretically should have a good organizational climate of high performance and exceptional achievements.

We know that the organizational climate is also influenced by the organization culture and the project manager can use the different constituents of organization culture for achieving the established objectives (Cercel, 2013).

Thus, the entire internal process specifically within the UM shall be shared and distributed rationally yielding, in this way, its activities components and prioritization are according to their importance, as such, structuring reasonable organizational framework and procedures makes it possible to exercise an effective management control over all project activities.

2. The general terms of organizing procedural

Procedural organization involves establishing the main work processes in order to achieve their objectives within the PMU system. The essence of this approach consists in the derivation internal process specific functions, activities, responsibilities and tasks. The organization procedural is such as to emphasize UMP in its dynamics, or in other words, to point out the "physiology", ie operation. Thus,

are defined within the multitude processes necessary to achieve the objectives and the decomposition of their functions, responsibilities and tasks. The organization means: „...all management processes through which established and limited physical and intellectual work processes and components (movements, times, operations, works, tasks etc.) as well as grouping them into jobs, work formations, departments and assignment of personnel, according to certain criteria managerial, economic, technical and social a view to achieving in best possible conditions, anticipated objectives. ” (Nicolescu, O. coordinator overall, 2011).

The function is divided into activities; an activity represents homogenous whole process or related who participate in the achievement of the second degree. The commercial function, for example, contains three activities: marketing, supply and sale. In their turn, the activities are divided into attributions which designate the work processes undertaken for the achievement specific objectives while the tasks are divided into other tasks.

Procesual organization of function refers to the organizational system, ie emphasizes physiology, its operation which is brought about by the whole internal activities the specific organizations. So, organization procedural implies all of the activities, tasks and work assignments in relation to principles, criteria and specific requirements but also in parallel with their breakdown by departments and employees to operationalize them in order to ensure optimal in meeting the objectives that the organization wants to achieve. As examples, we are presenting the derivation of specific activities within the accounting function (f-c).

2.1. The procesual organization of functions f-c

The function (f-c) represents the totality of activities that provides the necessary funding for achieving the objectives regardless of its business objectives. So, it can be said that function f-c provides the senior management within an organization the information strictly necessary for deepening the instruments foreseeable, analyzing environmental factors significant in relation to the entity, the dimensioning of resources and funds from its own budget, but not only.

The function (f-c) contains the following main and complementary activities: (i) all financial activities; (ii) the accounting; (iii) all activities regarding financial control. Additional, the preparation auditing of function (f-c) involves, prior to any, a minimal management for upgrading of knowledge applicable.

Financial activities follows from the whole processes should be designed to furnish financial resources for achieving of the objectives. Some examples of these activities are: (i) the global strategies and policies development in public financial institutions, expressed via the budget; (ii) financial policy the substantiation in order to attract financial resources as well as in their allocation; (iii) the preparation of the budget revenue and expenditure according with the operational plan.

The accounting activities follow from the complete processes through which records and highlighted in terms of value and material resources of the institution. The main activities of accounting are: (i) preparation of the analytical and synthetic

records; (ii) the balance sheet accounting and reporting in compliance with applicable legislation, ensuring highlight of fixed assets, inventory items, supplies, etc., organizing / conducting inventory, and archiving the registrations obtained.

The preventive financial control refers to the processes through which verify legal compliance concerning the existence, integrity, use and storage of material goods, efficiency and effectiveness of spending. Through preventive control the visa it is realizing a precise verification. The purpose of execution of internal financial control is the prevention and detection of deficiencies which may lead to consequent damage.

2.2. The correlation of activities with objectives

Defining the management objectives and goals developing a view to improving them are used to describe the project as a group of activities or tasks. The dependencies between project activities presents the relationship between two successive orders, express connection between activities. The most common connection type is the "end beginning", ie linking the finally activity event preceding with the start of next activity event. Logical dependencies between activities can be defined using a network diagram of activities that allow identification of a critical path.

Function correlates the multitude of activities (work processes homogeneous, similar or complementary) that contribute to achieving the goals derived grade I. Through derivatives objective grade I means that the major objective of the organization which deriving in its turn, naturally and organically, from the fundamental goals. In the framework of function (f-c) they are predominantly using the concepts, methodological and procedural knowledge including specific tools and expert staff who work here possess, for the most part, appropriate training. *The function (f-c)* is composed of several distinct activities.

Actually, *the activity* constitutes the whole homogenous or related tasks that contribute directly and immediately to achieving the objectives derived by grade II (namely those objectives resulting from derivatives objectives grade I). Achieving grade II presupposes a narrower and deeper specialization performer. Achieving a set of goals grade II assures the achieving a more complex, of higher level.

The *attribution* consists, at the turn from multiple tasks. Division of attributions in the service tasks and their actual distribution the employees envisages, in particular, strict qualification of employees, their professional experience, knowledge, skills and personal skills. Through the attributions are solved specific objectives, at their turn, are derived from the objectives of the II degree.

Service tasks defined as a primary component of process tasks in which designates a simple job of achieving a goal directed individually, by spreading it in realization of a single individual. Therefore, the burden of service is characterized by a high degree of operational autonomy so that it can be relatively simple personalized and given in the responsibility of an employee and/or distributed. The service task can be divided, in its turn, in other simpler components (operations,

movements, times). The term "task" is, generally, considered in planning as synonymous with activity. We also need to mention that in many applications, *"the activities are considered to be subdivided into tasks."* (Zecheru, V. & Bădică, C., 2013).

3. Presentation of the WBS Structure

As it is apparent from the definitions specified WBS is, in actual meaning, the proven method of management concerning the specific activating derivation of the UMP. The conceptual terms concerning WBS have been developed in the context of program management methodology entitled *Evaluation and Review Technique (PERT)*, made by United States Department of Defense. From the point of view of its usefulness, in the framework of planning UMP a special emphasis falls on the development of a structure decomposition project in its component activities, those having, individually, a reasonable justification as well as different weightings on achieving the overall goal. In the narrow sense and strictly "technical" WBS represents the main method managerial of subdivision internal process specific to the PMU, its decomposition in smaller activities and more manageable, ie "deliverables" that together contribute to achievement of the project as it was assumed by the contractor. Amid the project structure, as it has been shown, that the constituents are expected to be assimilated to "products" identifiable (a data set, a service or any combination thereof etc. generically called "deliverable").

Compared to other similar techniques as the utility and complexity, WBS distinguishes itself through the fact that induce a high level of clarity in the hierarchy of activities that constitute the internal process specific, the detailed description of the working stages by specifying phase sequence and timing of limits concerning achievement of deliverables etc. In a natural way, the method reveals, also, the correlation between activities and pyramid objectives, potential risks and controls that are imposed to be operationalized in order to counter possible events that may affect predetermined achieving of the objectives.

3.1. The utility of WBS Structure

WBS is necessary for the project decomposition in its components activities, the latter, being distributed in the form of nominal responsibility activities, operations, functions and tasks. From the practice it showed that the most significant stage in terms of importance must be managed in a work time of two weeks, an essential rule is the generic entitled "8/80". This requirement provided that only one activity does not have to be less than 8:00 or more than 80 hours.

WBS is conceived in the surrounding of the primary products of the project (expected results for each job separately), so that in order to produce the desired overall effect. Given that the expected results represents the culmination of the project, those as a whole, constitute a relatively stable set of guidelines which can be metered costs. Normally, the WBS analysis assumes that the project is carried out in

early and precedes into a thorough and effective mode, so the entire process from the predicting specific internal UMP.

The WBS constitute, thus, a beginning of planning process of the UMP is often called "foundation" of a project forecasting. Between the advantages of using WBS stated that it: (i) provides a solid basis for exercising forecast management, (ii); makes it possible to derivation project activities and stages/phases of work easily manageable; (iii) provide an effective way to accurately estimate costs; (iv) highlights the "deliverables" (important objectives that need to be made); (v) provide the support for allocation of resources; (vi) provide a bank of solutions to recurring situations etc.

3.2. The compilation WBS Structure

Elaborating WBS, as a diagram enshrined in the subject, constitute the simple method for a specific internal representation from the MP process, specifically when well formulated and understood within the team work and the goals and objectives identified certain "deliverables" required completing the project within deadline. The culmination of this approach is represented by the setting up of the process phases/stages, and, consequently, the composition of a clear perspective on the development activities that are necessary for achieving the objectives. Overall, this approach presupposes stimulating creativity this can only be achieved within a team composed of specialists, each of whom being tasked to present their opinions and to advance optimal solutions to precisely identify the major outcomes "deliverables" and activities that are to be operationalized.

From a cost perspective, this package of activities/operations/tasks can be grouped and assigned to a department. Decomposition of each deliverable is a good practice in order to achieve within a period of two weeks. This is because it has been found that in two-week work cycles they are easier to manage than those which require a longer working periods. In the situation whereby, subsequently the identification of activities and tasks which were not included within WBS, they should be planned in phases of work at the end of the project.

3.3. Considerations for using the method

The WBS can be presented in graphical form making possible an overview of the entire process specific internal UMP. Applying this method, also, brings a number of important benefits concerning a project definition and organization of its activities, such as the planned budget and, in general, the whole allocation of resources can be managed with efficiency and flexibility. In the process of execution of the project, particular sections of the WBS may be followed in order to identify individual performance additional to adequate problems arising in the project. Frequently, the WBS chart is used also to identify potential risks that may affect achievement of the objectives.

In the event that, for instance, some elements of WBS were inadequately defined, the activation likelihood of triggering a cause of unwanted events is significant and therefore, it is necessary to project the action of the internal control by which are to be able to counteract such situations.

In practice, were outlined two formats in which the WBS can be used effectively i.e. tabular and graphical form. Thus in the first form, WBS is presented as a table in which shall be numbered each main and secondary level. In the second form, i.e. the graphical, WBS may be made through a drawing, in this case also resulting in a tree diagram. In general, as the first level of each is the represented name of the project (overall result), then add all superior deliverables required to complete the project.

Form of the tree refers to a tree structure which is the most popular form of diagram for WBS, because it presents an understandable way the phases of the project. However, it is difficult to create without a special projection application such plan.

Tabular format represents an organized table of WBS, which is a precise option for organizations in which prefer this format. In some cases, these forms can outline a hierarchical structure that is similar to a text, but without indentation, however this format can be useful if there are several levels of branched and the developed of WBS.

4. Conclusions

Thus, WBS facilitates specifically the performance of forecast management, organization and control, reflecting their main features; the method it provides at the same time, some additional safeguards in terms of quality performance management and objectives from the PMU as those arise throughout the mission.

Consequently, the project manager using WBS shall provide itself an obvious competitive advantage in the management of the issue date performance accountability. The method guarantees a high level of rationality induction in the adoption and implementation of decisions within the UMP.

The basis of the finding that the method presented has not yet a relatively small area of distribution, our approach promotes and recommends the application of WBS within the project management and not only. In a prudential possibility, we additionally recommend a prior method adapted to the specifics of each entity in hand and a proper correlation with the other management techniques used consequently.

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