

# Evaluation of Workflow Strategic Plans

Ziad Mohammad Abu-Hamour  
Department of Information Technology  
Faculty of Information Technology  
Middle East University  
Amman, Jordan

Abdulameer Khalf Hussain  
Department of Information System  
Faculty of Information Technology  
Middle East University  
Amman, Jordan

---

**Abstract**—this paper presents a new model to automate and evaluate manual strategic plans to produce a standard plan depending on the recommended criteria for any standard strategic plan. The difference between this model and the previous works is that the latter studies construct the strategic plans manually, while the proposed model depends on an automated implementation. In the evaluation phase of the proposed model, it compares different manual strategic plans and provides guidelines for planners to improve their strategic plans. The results of this model reveal many shortcomings in the construction of manual strategic plans, for example the poor utilization of the plan's resource and poor job assignments for different human resource. Finally, this model is implemented successfully in Free Zones Company in Jordan whose job is related to all free tax products.

**Keywords**- strategic plans; workflow processes; evaluation criteria; strategic components.

---

## I. INTRODUCTION

Managers always consider future planning in order to identify all actions that can be utilized to outperform their competitors. To identify these actions, the managers need a systematic approach which is called the strategic planning [3].

In management research, the strategic making is the center of business process of any organization. It is very strange to imagine a firm without considering any business strategy. Strategic planning is still the most popular and widely analyzing tool of strategic management [2]. In addition, most organizational processes are designed around the organization's strategy. Planning is defined as the process that cannot be outsourced. The firm can use outside help but the decision of the strategic plan is still made by that firm as it has inside knowledge to perform its goals [4]. The companies maintained a high level of a strategic control when these companies had developed operational control over several experience years. Essentially, strategy making and strategic planning are at the core of every organization. Some researches define prescriptive approaches. The prescriptive approaches recommend the use of rational, formal ways of generating strategic planning. By using this idea, we can expect that the process of the strategic planning is a formal and standardized process. The content of the strategic plan would take advantages of qualitative elements and measurable components [1]. To evaluate each strategic plan, it is necessary to define the components of each plan. These components are:

1: The vision: It is the state that the organization is eager to achieve within certain number of years. Based on that vision,

the organization puts forward its mission. Although the vision exists in the strategic plan, we must consider the mission of the organization as a base component of the strategic planning. 2: The mission: It is a detailed explanation of the vision. It contains answers to questions such as: "Who are we? How can we meet our goals? What services can we provide and to whom?" and so on. The aim of the mission is to answer these questions briefly and clearly. 3: The goals: Goals are the anticipated activities that must be achieved upon the completion of the plan programs. These goals are derived from the mission components. 4: The policies: Policies represent the methods and approaches used by the organization to implement its programs and materialize its promising goals. 5: The programs: The programs represent the business operations carried within the plan framework. It is essential to specify the starting and the ending time for every program, and the related evaluation indicators if these programs are not connected to the activities or to tasks. Also, the organization must specify the employees who will implement these programs. In addition, the cost of each program should not be ignored and must be stated in the plan because the total cost of the programs makes up the budget of plan. 6: The activities: Each program is divided into activities and each activity is divided into a group of tasks. If these activities are implemented, then the organization can assure the completion of the program. 7: The tasks: Each activity is divided into a number of tasks to facilitate task's completion. These tasks can be connected to the corresponding evaluation indicators. 8: Evaluation indicators: Instead of program evaluation indicators, evaluation indicators can be used to evaluate each activity of the strategic plan. These indicators provide information to explain the achievement percentage

which results in a perfect evaluation. This information is feed backed to help for making modifications of the plan. Evaluation indicators are also important in decision making and putting a comprehensive vision about the state of the organization and thus it is an effective way for plan progress [5].

The preceding models and studies had constructed workflow systems to facilitate business and ordinary tasks. However, none of these models deal with the possibility of applying the workflow in the process of executing the strategic plan.

The purpose of the workflow systems is to automate the manual procedures such that the workflows automatically transfer tasks and work from one person to another and from one stage to another according to a predefined procedure. Workflow is defined as the process of performing work according to automated procedures. These procedures transfer documents, information and tasks to different parties of the organization according to a consistent and well-defined procedural rules to achieve the goal of the whole business sector.[ 6]

Workflow management systems (WFMS) are designed to support different types of business processes. A business process consists of a number of steps (activities). These activities can be executed automatically, manually, or by using a combination of these two methods. A workflow management system does not only support the execution of activities, but also takes into account the distribution and assignment of work items to employees. Also, these systems provide the ability to keep track of cases and to produce statistical data (for instance management information) of the process and the workers.

The execution of these tasks is based on a process model [7]. There are many kinds of business processes. Some examples of the workflow tasks are the production of bottles of soft drinks, the processing of an insurance claim, the hiring of a new employee, the assembly of a car, the ordering of office supplies, etc. Every company has its own processes. Some of these activities are core processes, such as the assembly of a car in a car company; others are supporting processes, like the processing of invoices or the ordering of office supplies at the car company [8].

## II. RELATED WORKS

In [9], a research classified the workflow management systems. This classification was based on five major criteria: workflow design, scheduling, fault tolerance, information retrieval, and data movement. The authors explained that the design of workflow is affected by four factors: structure of the workflow, workflow modeling (abstract or concrete), workflow composition and quality of service. Scheduling of workflows was examined from the view of scheduling architecture, decision making, planning scheme, scheduling strategy, and performance estimation. This research also examined the scheduling of workflow from scheduling architecture view, decision making, planning scheme, scheduling strategy, and performance estimation.

A workshop examined different applications and several workflow management systems in terms of their structure, design, success of handling the complexity of workflows, and their ease of use. This workshop also discussed the high importance of different issues related to workflow enactment such as efficiency, robustness and monitoring of the workflow. Finally, this study considered other important factors including security and the way of binding data sources to workflow patterns and templates [10].

SHI Meilin et al [11] provided a survey in the workflow management area and explained the current WFMS researches with a description of some concepts of workflow and its topologies. They clarified the basic related concepts of WFMS such as workflow, activities of workflows, process in the workflow and different models. This research did not only study the grid WFMs but also discussed WFMs in business and in many different areas. In this survey, WFMS could be classified into four different topologies: a) structured or ad-hoc, b) document-centric or process-centric, c) email-based or database-based, d) task-pushed or goal-pushed. The existing workflow managements were compared in terms of the following criteria : a) flexibility, b) object-oriented structure, c) intelligence, d) support for synchronous cooperation, e) support for mobile users, and they are categorized as: a) web based WFMs, b) distributed WFMs, c) transactional WFMs, d) interconnecting heterogeneous WFMs.

TevfikKosar et al [12] designed and implemented another workflow system. This system can transfer data reliably, automatically and process data in a large scale of astronomy applications. In this research, the designed system transfers data to grid resources where processing is performed, and transfers it back. System is also responsible for recovering from any failure that can be encountered in any step of the application.

## III. THE PROPOSED MODEL

The objective of the proposed model is to evaluate the strategic plan against different criteria. The model consists of two phases. The first phase is dedicated to build the strategic plan and the second phase is concerned with the evaluation of this strategic plan.

### *Phase one: Model Design*

This phase is divided into two steps. Step one creates the database of the strategic plan while the second step is related to application interface with the plan management.

#### *Step 1: Strategic plan and work flow database design*

This database includes all components of the strategic plan as well as all information of the workflow process. Figure 1 illustrates the database components that include all the related data for the strategic plan and the management process.

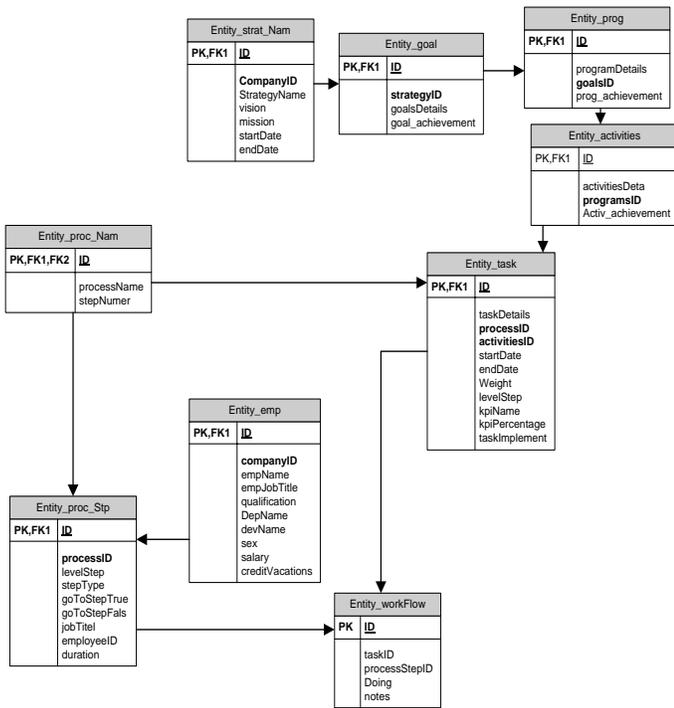


Figure 1: Database components.

The design process of the database begins by inserting all the components of the strategic plan as explained below:

This database contains different entities. The "Entity\_strat\_Nam" entity includes all data related to strategic plane name. Each strategic plan has an identification, strategic name, strategic vision, mission and the start and end date of the strategic plan.

The "Entity\_goal" entity contains all data of the strategic plan goals .Each goals has its own identification, goals details and achievement process type of that goals. This entity is related to another entity which is called "Entity\_prog" (program or project). The program entity contains all data related to each program in the strategic plan such as the details of each program which describes the title of each project and the achievement parentage of that program. The program entity is combined to another entity which is called "Entity\_activities" entity that contains the activities details of each program .The strategic plan must store all data related to each activity of the strategic plan in an entity "Entity\_tasks" including related data of each task corresponding to that activity such as start and end date of each task , the weight of each task , the level step of the task within that activity ,the kpiName, kpiPercentage, and task implementation (taskImplementation field ). This entity also extracts data from another entity,"Entity\_proc\_Nam", which describes the implementation of each task. "Entity\_proc\_Nam" includes data about the number of steps performed by each process. This entity is connected to another entity,"Entity\_proc\_Stp" , which includes the characteristic of steps of each process.

Finally, all actions performed on each task are registered in "Entity\_workFlow" .This entity stores data to explain whether the task is performed or not in a "doing" field. In addition, this entity contains notes about that task.

This strategic plan database is connected to human resource database, "Employee", which is related to each employee that deals with strategic plan.

*Step 2: The interface design of strategic plan and workflow management.*

In order to provide all information of the strategic plan database, this step is dedicated to construct an application interface with that database that contains screens for all functions such as adding, modifying, deleting and so on. This application interface is built separately from the DB creation by SQL. This process will be illustrated in the evaluation phase.

*Phase two: Evaluation and comparison process:*

From our experimental in strategic plan for many years, this model proposed different criteria that can be used to evaluate each strategic plan. The result of this evaluation is to guide planners for well-designed plan with better criteria. The proposed criteria used for evaluation and constructing a standard plan are:

- Criterion 1: All relevant goals of the programs.
- Criterion 2: Testing the level of utilization of the human resources.
- Criterion 3: Testing of uniform distribution of the program over the implement period of the plan.
- Criterion 4: Programs division into activities.
- Criterion 5: Activities division into tasks.
- Criterion 6: Each task has its own performance indicator (KPI).

The standard strategic plan is used to analyze and compare the components of any strategic plan in the organization against these criteria. The purpose of the evaluation process is to provide guidance for planner to improve their strategic plan components according to standard criteria. This evaluation procedure is implementing as explained below:

Criterion 1 examines whether all goals are related to each program. To perform this procedure, the data stored in the "Goals" entity are accessed to consider each goal separately to get its own ID. Next, it is necessary to ensure that this ID doesn't exist in the "programs" entity in a field named "GoalsID". If this ID is used currently, the next goal has to be considered. But if this ID is not used, the program would notify the planners that "the strategic plan cannot achieve this goal". Accordingly, the planner has to adjust the plan and choose certain programs that can justify this goal. The evaluation of this criterion is explained in the figure 2.

```

GoasCounter =select Count ID of goals
N= GoasCounter , GoalsVal=null
While N <> 0
GoalsVal= Select ID form Goals where ID=N
If GoalsVal = null , GoalsChec = Select goalsID from programs goalsID =N
If GoalsChec<> null , " Tell a planners there is a mistake in the plan "
GoalsVal = null , N =n-1
End while
    
```

Figure 2: Algorithm for criterion of all relevant goals of the programs.

Criterion 2 examines the utilization level of the human resources. This criterion assumes that every employee works eight hours per day and 22 days every month. Then, this

criterion calculates the time needed to complete all the tasks of the strategic plan to find the average percentage utilization of the human resources during the working years of the plan to let the workflow to complete the plan's job.

The calculations of this criterion depend on number the employees in the human resources system of the company and then use the following formula:

$$\text{CapacityEmp} = 22 * 8 * \text{Total Employees}$$

where capacityEmp represents the total number of working hours of all employees.

Next, the total weight of the strategic plan in "Weight" field of the "Entity\_tas" entity is extracted and stored in a variable called "planWeight." Finally, the following formula is:

$$\text{Utilization} = (\text{planWeight} / \text{capacityEmp}) * 100\%$$

Where utilization represents percentage of total hours dedicated for strategic plan implementation.

If the utilization percentage is low, then the system must notify the planner that "this plan is underutilizes of the available employees and thus the plan should be reconstructed by adding more programs."

Criterion 3 checks whether the programs are fairly distributed throughout the years of the plan. This criterion, which depends on the outcome of the previous criterion, takes the weight of the tasks for each year and compares it with the previous years to determine the level of human resources utilization for the current year and suggests the proper recommendations for adjusting this utilization. If the differences between years are wide, then the model would inform the planners that "there is a wide deviation in human resources utilization over the years and hence they have to come up with more programs for selected years to reduce that deviation".

Criterion 4 ensures that all programs are divided into activities. This criterion takes the ID for each program in the plan and checks whether this ID exists or not in the "programsID" field of the "Entity\_activities" entity because the program must has at least one task. If the ID doesn't exist in the "activity" table, the model informs the planners that "this program is not divided into activities and it is difficult to perform this program, so the recommended decision is" divide that program into at least two activities ".Figure 3 illustrates the algorithm of criterion 4.

```

For each ID from programs
If ( SelectprogramsID from activity where programsID= ID)= null
" Tell a planners there is a mistake in the plan "
End if
    
```

Figure 3: Algorithm for criterion( programs division into activities)

Criterion 5 ensures that all the activities are divided into tasks. This criterion checks whether each activity ID exists in the field "activityID" of the "Entity\_tas" entity or not since it is essential that each activity must include one task at least. If the

task doesn't exist, the model notifies the planners that "this activity is not divided into two tasks, and therefore its execution would be difficult".

```

For each ID from activities
If ( SelectactivitiesID from tasks where activitiesID= ID)= null
" Tell a planners there is a mistake in the plan "
End if
    
```

Figure 4: illustrates the evaluation this criterion.

Criterion 6 verifies that each task has an indicator that measures its level of achievement. This criterion checks every task and confirms that the fields of "kpiName" and "kpiPercentage" have numerical values and cannot be empty. If these two fields are empty, this model informs the planners with suitable message which is "some of the tasks don't have evaluation indicators and it is difficult task to measure their level of achievement". Figure 5 explains this criterion.

```

For each ID, kpiName , kpiPercentage from tasks
If kpiName = null OR kpiPercentage= null
" Tell a planners there is a mistake in the plan "
End if
    
```

Figure 5: Algorithm for criterion 6

#### IV. RESULTS

To check the feasibility of the proposed model, it is possible to apply it in many governmental organizations in the Middle East countries because their constructed strategic plans are identical with this model. Among these organizations is Jordan Free Zone Company which has been chosen for the implementation of this model. The following results have been obtained:

This result of criterion 1of this model indicates that the strategic plan of the Free Zone Company is compatible with this criterion in that it has programs to achieve goals to reach the optimal situation of zero.

The result of evaluation of criterion 2 reveals that the utilization of human resources working in the plan is a low percentage of the total human resource in Free Zones company while the rest of human resources are still working on daily routine functions as explained in table 1.In this case ,the proposed system advices the planner to add more programs for the strategic plan in order to increase the utilization percentage of human resources by suitable message like the following " add more programs to your strategic plan " . This recommended decision indicates that the percentages listed in table1 don't mean that whether the human resource utilization is poor or good. This decision depends on the planner's view.

TABLE 1: UTILIZATION PERCENTAGES FOR HUMAN RESOURCES

Daily work	Strategic Plan	Years
93%	7%	2009
94%	6%	2010
92%	8%	2011
93%	7%	2012
93%	7%	2013
93%	7%	AVERAGE

The results of criterion 3 is explains that the distribution of the programs over the period of the strategic plan is not uniform .The result of this evaluation is explained in figure 6. From this figure we can show that more programs are concentrated in some years than others. Also, the utilization percentage of human resources in 2010 is very low as compared with other years. In this case , the model advises the planners with the following recommendation : “add more programs in that year to increase the utilization percentage of the human resources” .

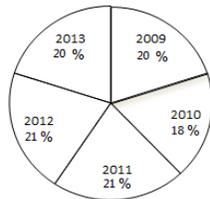


Figure 6: Distribution of programs for different years

This evaluation of criterion 4 checks the strategic plan of the Free Zone company and finds that this plan is compatible with this criterion. In this case, the plan needs not to be adjusted because it has an optimal level of zero.

The result criterion 5 discovers that this model was not completely consistent because it found that there are some deviations relative to this criterion. This criterion shows that the deviation, measured by the number of activities that are not divided into tasks, is a result of non-optimal considerations. Using this criterion, the model generates a suitable message to modify strategic plan by dividing the activities required into tasks.

Criterion 6 shows that all tasks in the strategic plan of have performance indicators. Thus, it is unnecessary to modify the strategic since the level of performance is zero (optimal).

CONCLUSION:

The proposed model had been implemented successfully in Free Zone Company in Jordan and we get valuable results if the effectiveness of this model especially in strategic planning and management. The standard criteria used in this model reveal some deviations relative to the standard criterion in

strategic plans of that company such s the poor assignment of human resources working in strategic plan implementation. One of the important advantages of the proposed model is it discovers inappropriate activities assignments in the strategic plans and some of these activities are not divided into their corresponding tasks which lead to difficulty in strategic plan implementation. Also, this proposed standard strategic plan is used to implement annual plans and even the implementation of emergent projects in any company, but these plans must be adjusted to perform the required jobs.

Finally, the proposed model evaluates any manual strategic plan depending on the standard evaluation criteria and then provides guidelines for planners to get the best plans .This needs comparing the manual strategic plan with this standard proposed model. These guidelines are provided to the planners by suitable messages.

REFERENCES

- [1] Ruigrok, W. A. Pettigrew, et al. *Corporate Restructuring and New Forms of Organising: Evidence from Europe*, Management International Review 2(Special), 1999.
- [2] Rigby D , *Management Tools and Techniques*. Boston, MA, Bain&Company, 1999.
- [3] zarkesh M ,*customizing strategic planning model for iran's cement industry*, 2008.
- [4] NauheimerM, *on studying the strategic planning process in large companies theoretical perspectives and evidence* , PhD theses , DISSERTATION of the University of St. Gallen , 2007.
- [5] Wheelen, T.L. Hunger. J. D , *Strategic management and business policy* (13th ed), UK: Prentice Hall , 2007.
- [6] Hollingsworth, D. *Workflow management coalition the workflow reference model* , Workflow Management Coalition ,Hampshire, UK, 1995.
- [7] Vanderfeesten,*designing workflow systems an algorithmic approach to process design and a human oriented approach to process automation* , masters thesis , technischeuniversiteit eindhoven, 2004.
- [8] W.M.P. van der Aalst and K.M. van Hee, *Workflow Management: Models, Methods, and Systems*. MIT press, Cambridge, MA , 2002.
- [9] Jia Yu and RajkumarBuyya, A Taxonomy of Workflow Management Systems for GridComputing, *Journal of Grid Computing*, Volume 3, Numbers 3-4 / September , 2005.
- [10] Fox G and Gannon D, *Workflow in Grid Systems Editorial of special issue of Concurrency&Computation: Practice&Experience based on GGF10 Berlin meeting* , *Concurrency andComputation: Practice &Experience* Volume 18 , Issue 10 .August 2006, 2006.
- [11] Shi Meilin, Yang Guangxin, Xiang Yong, Wu Shanguang, *Workflow Management Systems: ASurvey*, *Communication Technology Proceedings*, 1998. ICCT '98. *1998 International Conference*,vol.2, On page(s): 6 pp., 22-24 Oct 1998
- [12] TevfikKosar, George Kola, Robert J. Brunner, MironLivny, and Michael Remijan Reliable,*Automatic Transfer and Processing of Large Scale Astronomy Datasets*, In *Proceedings of 14thAstronomical Data Analysis Software &Systems Conference .ADASS 2004*, Pasadena, CA, 2004