Enhanced (meta)model for Helpdesk Support Services

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Abstract. *Smooth functioning of an organization that works in certain controlled conditions must meet the requirements imposed by the legislator, the market, interested parties, owners and employees. The organization, as such, must have technical support that ensures continuity and functionality with the least time possible execution or process monitoring. Service support (Help Desk) must develop principles for problems/incidents that are caused by users, and it is with that kind of support in a position to remain competitive in the market, that leaves its customers the competitive part of the market that are being discussed. In this paper, we present some of the developed processes and methods applicable to a larger number of companies, which are in its nature, dealing with the same or similar jobs and for which we will present a metamodel for processes.*

Keywords. Metamodel, Support, Help Desk Process.

1. Introduction

We are witnessing a growing demand for software services. Companies engaged in software development are forced to have a very strong and competitive segment of administration and maintenance of the system in a way to establish a system department in the company (Department of systems and networks, design, planning and implementation of the tasks). According to increasing number of clients there are increasing number and workers (working personnel). And by that fact, there is third service called service support or Help Desk. Help desk is designed as a three-layer (3-tier) sub organizational unit and it is made up from existing personnel. Three-tiered structure of support services operates in the following manner:
- Tier 1:
  - On-line consulting
  - Telephone support
  - Simple tasks (resolution time – up to 30 minutes),
  - more complex tasks are forwarded to the second and third layer
- Tier 2:
  - „How to...“
  - Correction of certain services (XP/Vista/W7, ...)
  - Mistakes in dealing with applications
  - Identifying and forwarding tasks on the lower (Tier 1) or higher layer (Tier 3)
- Tier 3:
  - A complex system incidents
  - Changes to the application source-code
  - Adaptation of the process performing

The goal of data modeling is the modeling of the structure and functions of the executive (business processes) organization [6] [4]. In this context, business processes can be described as a series of logically related activities that are using the resources of the company whose main goal is the satisfaction of customer needs for products or services of adequate quality in an adequate period of time, while achieving some value [5]. In the global competition in the market, organizations can achieve competitive advantage only if they offer a cheaper and more quality products and services, and for the realization of these goals, organization requires efficient and innovative business processes. If we know the ways in which processes are performed in the company, we will be much clearer how the company operates. Processes are the core of a business operations for every company, but they are very rarely described and analyzed. In organizations that are not manufacturingly oriented, processes are not clearly defined and they are difficult to be accurately described. High standards of quality assurance requires a total control of business processes in a manufacturing organization and a leadership often begins to react to the inefficiency of business processes at a time when it adversely affects the overall operations of the organization [9]. Therefore, it is important to monitor business processes to predict and manage their dynamics and their changes in accordance to greater efficiency and better quality products or services [10].

2. Model/metamodel

The model is an approximate representation of a system or process, and we use it to understand the system and for its change or management [5]. Models

should be as simple, and yet correct for the purpose for which they are made. Models allow the description of complex phenomena, their better understanding and communication of those that are solving problems and problem solving, as well [11]. Models of technical and social systems are used for the design of new solutions, testing of the solutions, and selecting the best solution. Modeling is an art, not a science, and requires common sense, the power of abstraction, systematization and experience. One should pay attention when choosing the system boundaries with the environment, so the model should include only items of interest. It is difficult to understand complex models, while simplified models lose the essential elements to explain the causes of behavior.

A method to build unified process metamodels for information systems engineering was proposed in [7]. This method is based on pattern system and it is used to select the needed metamodel concepts for a particular context. Metadata model [2], [11] is an abstract representation of the observed physical environment, and a metamodel is a model that formally defines the syntax and semantics of the observed metamodeled environment. The term metadata (data about data) occurs in the early 90's in connection with another concept - data warehouse - an electronic repository of stored data designed to support reporting and analysis. Metadata describe not only the data but also the way that the organization understands their own actions, people, geographic connectivity, time and motivation. As stated in [8], the general intention of using metamodels is to span diversity of information systems environments [1]. Process integration favors optimizing organizational performance and also reduces the "noise" in the communication within the organization or in communication with the end-users.

3. Method and processes description

The subject of this paper is a metamodeling method in combination with given models, in example of the method Seven habits od highly effective people and processes of support services (Help Desk service). The method is applied to the actual organization. We propose a metamodels for given method and process presentation. From presented metamodels, we are performed an integrated common metamodel. Metamodel and a common metamodel are checked in the example. Method and process are represented by individual metamodels, which are then integrated into a common metamodel (they are represented in simplified real-world things table. Method and process are analyzed through the Entity-Relationship-Attribute model. These two models are integrated into a common metamodel, through the mutual *Methods* entity; Figure 1).

3.1. Seven Habits of Highly Effective People

Method Seven Habits of Highly Effective People is a collective term for a wide range of methods and principles described by Stephen Covey in his bestseller "Seven habits of highly effective people" [3]. These principles were derived in part from a study of the actual habits of highly successful people and organizations and for the most part by studying the literature published in the last hundred years of dealing with people and the success of the organization and the literature of popular religion.

First, according to Covey, you have to break loose from being dependent upon others. How? By Achieving the practice of the first three „habits" (principles): We need to become proactive, we must take responsibility for our actions. Second, begin with the end in mind. We have to prepare in advance, because a lot of successful businesses operate if the ultimate goal is defined in advance. Third, put first things first, it tells us that in every job we have to first realize the goals that will lead us prior to the realization of our vision, not the ones that seem urgent or why we feel better. With the first three principles we have come full circle principles that determine an individual's independence, or its internal values that predetermine the success in achieving our goals. Following three principles tell us about the interaction (interdependence) of the individual against the other people. We must set the principle of mutual victory. One person's success does not necessarily require someone else's failure. You seek solutions to problems that allow all parties involved (including yourself) to benefit. Understand first, then try to be understood; fifth principle. The fifth principle tells us that if we acknowledge the opinion of others, it helps us to be taken into account by the other party (let's try to understand how we present our observations and make it easier to remain accepted by other listeners). The sixth principle tells us that "four eyes see more than two". Synergy is something that we need, to take advantage quickly as possible and with as little loss accomplish goals. With sixth principle we rounded the circle of interdependence. But even after all this, we cannot afford that "we are lying on our laurels", we must constantly strive to be better, we must strive for continuous learning and applying what has been learned (seventh principle) [5] [3]. We create simplified real-world things table of Seven Habits of Highly Effective People method (Table 2).

Seven principles, application to support services:
 1. Proactivity:
  What answer to give? (solve or forward)
 2. Beginning, keeping the end in mind:
  What is the goal of solving? (method selection for problem solving)
 3. First things first:

Set priorities! (contact, request, detailed problem, ...)

4. Win-Win thinking:

Solve the problem! (the mutual satisfaction/victory)

5. Understand and remain understood!

Adopt the terminology of the user. (an easier access!)

6. Sinergy:

How to solve the problem? (the exchange of opinions within the team)

7. Sharpen the Saw!

How to prevent the problem? (To improve the process, build new applications, ...).

3.2. Description of the process (receiving and processing problems-support service)

Users call the service support upon seeing the problem (the request over the Web, e-mail, telephone, fax, on-line form). Staff on the first layer of support receives the request and creates a work task that is initially stored in a database. If the problem is not solved in the first layer, it will be forwarded to the second or third layer. If the problem can not be solved by telephone conversation (lasting up to 15 minutes). A user can check, in any moment, in what status (level) is problem solving and who should be contacted on further clarification of the problem. Each step, in resolving a problem, must be recorded. If the problem is forwarded to higher or lower layers, the user receives notification of the status of the problem. According to the executed work, for solving the problem, the user receives notification of the work which has rectified the problem, the user must verify and evaluate the work of staff working to fix the problem (satisfaction score consists of assessment on the speed of execution, evaluation staff behavior in communication with the user and the user must provide a general assessment of the problem. Addition to assessment, the user can provide a descriptive comment for the execution of the work, which were recorded in the items of work order). Only after receiving feedback from users (receipt form with scores of satisfaction), work on the problem is considered to be executed in full and such records can be archived. Also, simplified real-world things table has been created (Table 1).

4. Common metamodel

Analyzing processes and models of action within the support services and methods Seven Habits of Highly Effective People, we impose a several common entities: *Organization, Repository of methods, Methods and Solution/Result*. Organizations usually have limited resources available to optimize the use of existing resources. Generally, we can say that the method of the seven habits of successful people improves policy of responses to requests/problems, especially in the area where is necessary to determine the organizational order and competence to deal with incoming requests. This is especially important when "major systemic failure", for example, problems with the power supply, natural disasters, computer viruses, ... As the main link between the metamodels, we use entity *Method*. Also, we use entity *Method* to create enhanced metamodel for technical support (Figure 1) with elements of optimization that characterize method Seven Habits of Highly Effective People. Integration of processes within an organization is shown by a workflow diagram [12] [13] which defines the process flow divided into levels of responsibility within and outside the organization (Figure 2). The user can make a request for intervention through an online form and with that kind of submission it automatically generates a work order with the proper ID number. Submission of problem by fax, by phone, in person or by e-mail goes directly to a T1 technicians. He receives the request, opens a work task for the described problem and if able, immediately solves the problem. If T1 technician resolves the problem, he records performed work and then sends an e-mail, notifying the user that the problem has been solved. After notification, the user is required to send a feedback assessment of satisfaction for the performed works. The user has a deadline of 5 working days for evaluation of satisfaction, after which a notification is automatically resent again. Requests that are sent via an on-line forms, first will be reviewed at the T1 level and here will be solved, if is possible. If T1 technician is not able to resolve the issue, he will forward the work order at T2 level. T2 staff analyzes the problem, performs testing records work task procedure and ends with sending notifications to the user. In case that neither T2 level is not able to resolve the problem, the problem is delegated to the T3 level. At T3 level, the problem is analyzed. T3 staff provides a solution and creates guidelines for T2 technicians who will implement it. Once implemented, the work order items will contain work descriptions that are made by a T2 and a T3 staff and such document (the work order, the form with the assessment of satisfaction) will be completed and stored on a platform designed for archiving and storage (Share Point, Knowledge Base …).

5. Conclusion

Metamodeling, as a tool for a conceptual process linking, is successfully applied for visualization of business processes and good management practices, to display their models and relationships between their models. Connection, seemingly unrelated methods, thus becoming visible and it becomes easier to find inconsistencies in the processes that coexist in the organization with a different and/or the same protagonists.

Metamodeling as a method – by unifying a way of performing processes (Helpdesk service) and method (Seven Habits of Highly Effective People) shows potential application of the common metamodel in one of the major business processes in the organization. Unifying metamodel is created based on the connectivity of these concepts that occur in the process of Helpdesk and organizing methods Seven Habits of Highly Effective People. In this way we come to the overall knowledge base that could be used for further operational and process optimization.

6. References

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Appendix

Table 1. Section of the simplified real-world things table for current supporting process

Metamodel model	OBJECTS: "Entity Class" "Attribute"					
A data model	Entity Class: „Organization" Attribute: „ID_org" „Name"	Entity Class: „Method" Attribute: „ID_method" „Name"	Entity Class: „Request" Attribute: „ID_req" „req_descript"	Entity Class: „Scope" Attribute: „ID_service" „Name"	Entity Class: „Problem Description" Attribute: „ID_problem" „Problem"	Entity Class: „Goal" Attribute: „ID_goal" „ID_priority"
Data about real-world things	Organization: „Infosys ltd."	Method: „Seven Habits of Highly Effective People" „Priority Matrix"	Request: „Mouse malfunction" „There is no icon on desktop"	Scope: „HW service" „SW service" „Consulting service"	Problem Scope: „267 SW problems" „314 HW problems" „514 consulting problems"	Goal: „SW problem solving" „HW problem solving"
Real-world things	Infosys ltd.	Seven Habits of Highly Effective People Priority Matrix	Mouse malfunction There is no icon on desktop	HW service SW service Consulting service	267 SW problems 314 HW problems 514 consulting problems	SW problem solving HW problem solving

Table 2. Section of the simplified real-world things table of Seven Habits of Highly Effective People

| Metamodel model	OBJECTS: "Entity Class" "Attribute"					
A data model	Entity Class: „Organization" Attribute: „ID_org" „Name"	Entity Class: „Procedure" Attribute: „ID_process" „Name"	Entity Class: „Responsible person" Attribute: „ID_resp_pers" „Name"	Entity Class: „Tier" Attribute: „ID_tier" „Name"	Entity Class: „Category" Attribute: „ID_cat" „Name"	Entity Class: „Record" Attribute: „ID_record" „Description"	Entity Class: „Satisf_score" Attribute: „ID_score."
Data about real-world things	Organization: „Infosys ltd."	Procedure: „Helpdesk1" „Helpdesk2"	Responsible person: „Aldin" „Mirnad"	Tier: „T1" „T2" „T3"	Category: „HW" „SW" „Consult."	Record: „Description HD1" „Description HD2"	Satisfaction score: „4" „5" „2"
Real-world things	Infosys ltd.	Helpdesk1 Helpdesk2	Aldin Mirnad	T1 T2 T3	Hardware Software Consult.	Opis HD1 Opis HD2	4 5 2
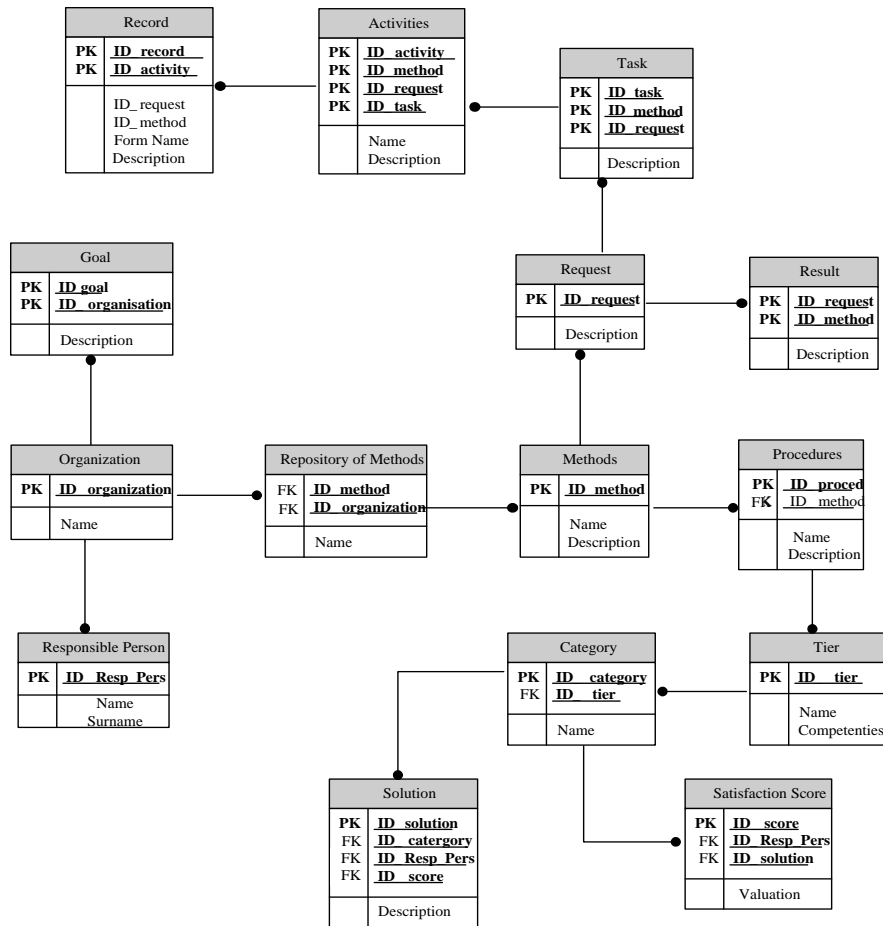
Figure 1. Common metamodel
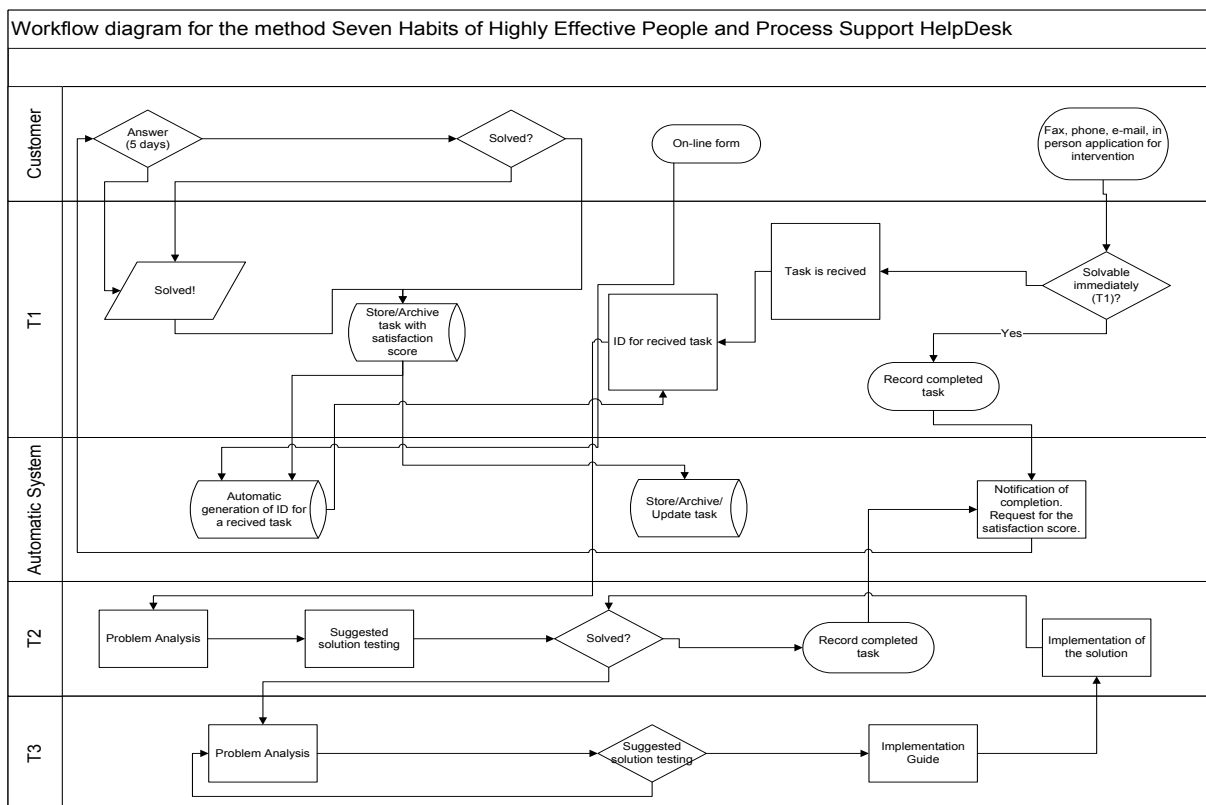
Figure 2. Workflow diagram for proposed metamodel