

A New Method on Efficient Product Management with a Tagging System

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Abstract The Work Breakdown Structure (WBS) is now widely used in project management of software development, including scope definition, task scheduling, cost estimation and so on. However, just using WBS is not effective for product management because it is hard to keep the simultaneous update between written product items in WBS and existent products, especially in the situation of large scale software development.

In order to improve the product management based on WBS, we designed and implemented a set of metadata tags which will be attached on all the products. The metadata tags are defined in the XML format, containing necessary information of any pieces of products, such as general information (title, description, relations, etc.), schedule information (cost estimation, limit day, working time, etc) and index data (WBS package, index id, etc).

To systematically organize product-bonding tags, now we are designing a tagging system. Its aims are to organize all the product information attached on the metadata tags so that it can automatically generate the WBS and provide a platform for easily realizing the update of product management information.

Keyword Project management, Metadata, Tag, WBS, Product management

1. Introduction

In software development, the Work Breakdown Structure (WBS) is commonly used at the beginning of a project for defining project scope, organizing Gantt schedules and estimating costs. The project is usually fractionized into the task list on the WBS so that it's easy for the developing members to get caught up in the idea that a project plan should detail everything that everybody is going to do on the project. However, at present software development, only using the WBS just like the Microsoft Office Project [3] can't efficiently perform the project management, especially in the product management. Because it is unavoidable that the frequent update on the WBS will be done by a project manager and constant modification on products will be carried out by developers. Actually, a lot of examination and modification on the products should be done manually, when the tasks having been written on the WBS. As results, it will become in duplication of effort and

lack of team coordination, especially in the large scale software development. Moreover, in the development process, there is some management information (such as developing policies, requirements or deadline of product) that can assist the developers to accomplish the product. Some of these are usually delivered through meetings or e-mails and reserved in the meeting logs or mail, and thus these kinds of information are not retrievable, and prone to be ignored by developers [2]. The reason which causes these problems is that WBS, product, and management information are treated as three independent objects. Consequently, how to keep the coherence between the tasks in the WBS and products has become one of the most serious problems today. In this paper, we propose a notion of metadata tags to describe the products management information, and try to utilize the Metadata Tag Management (MTM) System to resolve the problems mentioned

above for achieving a goal toward efficient product management.

This rest of this paper is organized as follows. Section 2 presents the solution principle of our ideas. In section 3, the design of metadata is introduced. In Section 4, the application of the metadata is proposed. Finally, some conclusions are drawn in Section 5.

2. The principle of solution

In software development, the product is a unit containing a set of information recorded and structured in the form of plans, documents, forms, codes, schedules and so on. It could be utilized by the developing members or a manager. Product management refers to series of administration from the task's assignment to the realization of the product.

In the present process of software development, firstly, a project manager divides the project into small, well-defined tasks and activities in the WBS. Then, through the conference, management data which contains the interpretation and distribution of tasks is informed to the developers. Finally, the developers have to complete the tasks into the product according to the WBS and the meeting logs. In this process, the WBS, products and the management data are three relative management objects, but are separately treated. Therefore if one of these is changed, the other relative document must be checked and modified. Consequently this may cause a lack of synchronization in project management, thus influence the development efficiency. These lead us to the idea of integrating the WBS, management data and the product documents by using the metadata tags.

In this research we use the metadata to integrate the WBS, schedule, tasks, work logs, and the product information together for facilitating managements related to a project. Our proposed method comparing with a traditional method is shown in Figure1. In the project development, the management objects related to the product include project management, schedule management, communication management, task management, and document management items. In the traditional method, we use the WBS (Gantt chart), meeting logs, work logs, summary document in allusion to each item in the WBS. Due to many reasons such as

cumbersome management objects, unified tools, different users and so forth, it is not efficient and effective only to use the WBS. On the other hand, in this research, we first found out all the information involved in product development and then defined the metadata tags to describe the information so that all the product related management items can be integrated in the metadata tags. In other words, if we can effectively manage these metadata tags, we will efficiently be able to perform the product management. Therefore, as long as we can design and implement the MTM system, the goal of product management can be achieved.

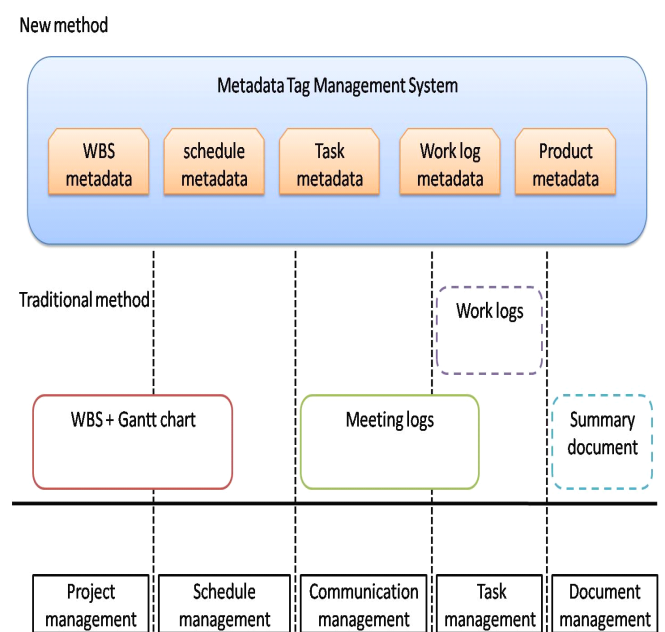


Figure1 Solutions by Metadata tags

3. Design of metadata

In this research, some metadata is utilized for describing management data and product information. This consists of a set of elements, sub-elements, or attributes, and can be summarized into three types of metadata: Product Core metadata, Product Process metadata, and WBS metadata. They are defined as follows:

1. Product Core: this metadata describes product information. We employ the Dublin core metadata [1] elements as a part of this metadata to describe the general information of the product. The others of Product Core metadata are used to conserve the management data (e.g. task list, tracking).
Element name: title, creator, subject, description, publisher,

contributor, date, type, format, identifier, source, language, relation, coverage, status, version, rights, productProperty, deadline, reviewer, tracking, primaryProduct, tasklist.

2. Product Process: This metadata describes the product process information.

Element name: Task, taskName, taskDescription, taskExecuter, taskKind, taskDeadline, taskState, taskEstimate, workLogs.

3. WBS: WBS metadata are used to describe the WBS structure of a project including the name of work package and products.

Element: Project, Package, Product

All the product information could be kept in metadata and recorded in the tags of xml file. Considering the need of reading xml file smoothly to generate WBS and perform the product management, metadata are written in two kinds of xml files. Product Core metadata and Product Process metadata are written in disparate xml file named by each product's identifier (ProductID.xml). WBS metadata is recorded together in the Index.xml file. For example, in the ProductID.xml the issued data is encoded as:

```
<Product>
<title>requirement definition</title>
<creator>den</creator>
..... <Product>
```

In the index.xml, the metadata is recorded as:

```
<project name="chocom">
<package name=" Contractor Project Initiation Complete &
Approved">
<product name="requirement definition" id="0192">
</product> .... </package> </project>
```

4. Application of metadata

4.1 Analysis and design of MTM system

This Section provides the introduction of Metadata Tag Management (MTM) system for application of metadata. The MTM system is aiming at integrating WBS, management data, and product information by organizing the metadata. Figure 2 shows an overview of the concept of the MTM system. One of its main

required functions is reading the Index.xml to build WBS. The other one is providing an interface to create and modify each product's information including its title, creator, description, or existent product's URL, which have already been recorded in the metadata of ProductID.xml. Additionally, we expect the function that system can analyze the products and automatically attach the metadata tags on them as well.

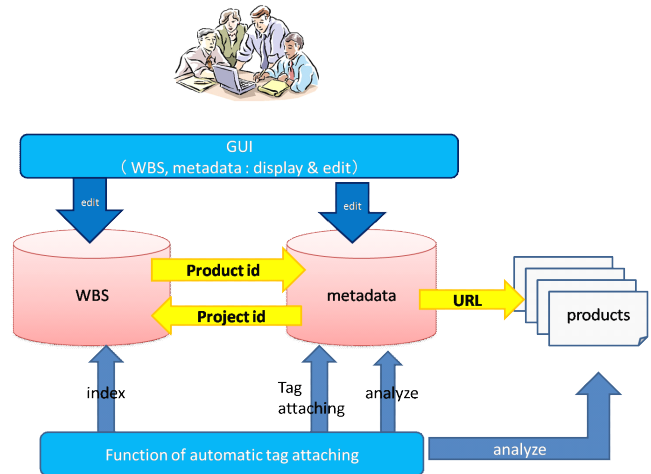


Figure2 MTM system's functions

There are two creation policies of metadata: Top-down and Bottom-up.

1. Top-down: In the software development, this is the usual process that a project manager makes the plan, creates the WBS structure, and then through conferences, explains the task (the product how to complete) requirements, outline, finally assigns the tasks to each developer. With the MTM system, the project manager can build the WBS tree, then assign the task and inform the requirement or regulation in the metadata. Certain task could directly be sent to corresponding developer (while by checking the product list, developers can also get aware of other developers' charging proportion). The developers then can work on it and give the product resource's URL or some comments to the next phase developers. After the upper developer finishes his job, the task can automatically be sent to his lower coworker without interregnum. In this procedure of development, the product can be produced just like in the product line without any break. Additionally, the whole development procedure including the communication information will completely be recorded in the metadata. Therefore, all the

information about the project development can be retrieved. Other merits such as time and space reserved for conference can also be saved; the possible oral mistake or misunderstanding can be avoided and be realized as well.

2. Bottom-up: Considering the developers also have an inclination of adding some products and sharing some information, which may contain some help documents (template, announcement), or very import but has been ignored sub-product by the manager, in this research we use this way to make up manager's autocratic management. In MTM system, the developers are granted the authority to create the metadata for products. Actually, if developers found some products were necessary, they can write the metadata for the product by themselves, and then share the product. Finally the project manager can determine whether or not this product is necessary to be added into the WBS.

4.2 Application of the MTM system

Since the MTM system has three objects of users, WBS data and product management information, we design the MTM system as shown in Figure 3. The concept layer is constructed according to the three layers of role, WBS metadata, and product metadata.

As Figure3 depicts, the functions of the MTM system are divided into the following items according to the role of a project manager and a developer.

- Project Manager
 - ✧ Examine WBS list
 - ✧ Add/modify/delete the WBS item
 - ✧ Examine product metadata list
 - ✧ Index new product metadata into WBS
- Developer
 - ✧ Examine WBS list
 - ✧ Examine product metadata list
 - ✧ Create/modify/delete product metadata

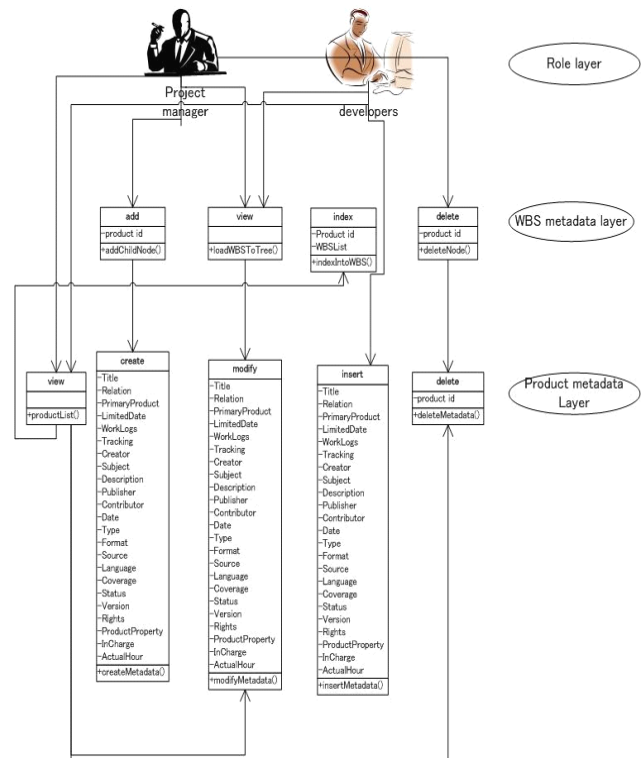


Figure3 Application of MTM system

5. Conclusion

The traditional technique in product management is based on the work packages of the WBS. This method has been proven that it is not strong and efficient. In this paper, we investigated an approach of using metadata to perform the product management in the software project management area. We focused on the design of the metadata, and implemented the MTM system to manage the metadata tags. In the future work, we will use the MTM system in a real project and evaluate its efficiency and usefulness from the view points of project management and project operation.

References

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