Middle East Technical University

Department of Computer Engineering

`A Unified News Exchange Server `

Configuration Management Plan

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Spring, 2006

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1. Introduction

1.1 Purpose of CMP

Changes and updates are inevitable in the development process of a software project. Design and development decisions, implementation details etc. may change during the project lifecycle and any change in one part of the project generally affects the other parts also. On the other hand, most of the software projects are carried out by a group of people and these changes or updates affect all these people or any problem or change caused by one of these people affect both the project and the all team. Therefore, all these changes and updates have to be handled carefully in order to prevent bigger problems and failures throughout the project. For this purpose, we decided to prepare a configuration management plan as I$T€ Team in order to specify our strategy for overcoming the difficulties in case of changes and updates. In the concept of configuration management, we will determine identification, management, control and audit of the changes and updates and give a solution for handling and informing the group members about these changes.

1.2 Scope of Document

In the scope of this document, we determine the configuration management plan for NewsAgent developed by I$T€ Yazilim and specify the CM activities. Throughout the document, we mention the organization and responsibilities for configuration management of NewsAgent and the CM process which includes the identification and management of CIs, version control and change audits. Moreover, we declare the CM milestones and schedule, project resources and the plan optimization strategies. In other words, we describe all SCM activities and terminologies.

We believe that large software projects require an applicable SCMP and following the plan results in the products of high quality. For this purpose, we define the coordination of CM activities and actions with the other activities in this document.

1.3 Definitions, Acronyms and Abbreviations

CA   Configuration Auditing

CCB   Configuration Control Board

CI   Configuration Item

CM   Configuration Management

CMP	Configuration Management Plan
CVS	Concurrent Versioning System
SCM	Software Configuration Management
SCMP	Software Configuration Management Plan
SCR	System Change Request

1.4 Document References

1. IEEE Standard for Software Configuration Management Plans – IEEE Std 828 – 1998

2. Software Configuration Management – METU Computer Engineering CENG 492

3. Software Engineering: A Practitioner's Approach – Roger S. Pressman, 5th Edition

4. CM Plans: The Beginning to your CM Solution –

http://www.sei.cmu.edu/legacy/scm/papers/CM_Plans/CMPlans.MasterToC.html

1.5 Document Overview

Our SCMP includes 6 sections and the followings describe the contents covered in these sections:

- **Introduction***:* In this part we introduced the purpose of CMP and the scope of this document. Moreover, we stated the acronyms, abbreviations we used in this document and their meanings. Lastly, we emphasized the reference documents that we made use of for preparing our SCMP.

- **The Organizations CM Framework:** In this part, we determined the organization and responsibilities of all team members for CM. Moreover, we explained the infrastructures and the tools we will use throughout the project.

- **The CM Process:** In this part, we examined the confiuration management process. We identified the CIs and specified the management, control and audit of these CIs.

- **Project Schedules – CM Milestones:** In this part, we determined a schedule for configuration management activities and we stated the milestones and their deadlines respectively.

- **Project Resources:** In this part, we explained the Project resources which will be necessary for CM.

- **Plan Optimization:** In this part, we examined the cases to make optimizations on our CMP and how to realize these optimizations.

2. The Organizations CM Framework

2.1 Organization

In order to implement SCM activities, organizational units should be described properly. Therefore, the organizational context is one of the most important issues for İşte Yazılım. NewsAgent has a hierarchy of organizational units. On the top of this hierarchy, there is Configuration Control Board (CCB) unit, which handles the CM activities. Since the project is developed by only 4 people, we consider each member of the team as a member of CCB also. Other organizational units that are controlled by CCB are as follows:

- Configuration Management Team (CMT)
- Developing Team (DT)
- Testing and Debugging Team (TDT)
- Release Control Team (RCT)

These 4 units are in contact with each other and each team member participates in these units.

2.2 Responsibilities

The responsibilities of the units mentioned above are as follows:

Configuration Control Board (CCB)

- ➢ Reviews SCRs offered by testing and debugging team and analyzes the effects of the changes,
- ➢ Accepts/rejects the SCRs,
- ➢ Holds audits,
- ➢ Reduces the negative effects of changes made.

Configuration Management Team (CMT)

- ➢ Creates and maintains CMP,
- ➢ Coordinates CMP activities and ensures that the activities are implemented on time,
- ➢ According to the works done, updates CM schedule,
- ➢ Reports the changes to other units.

Developing Team (DT)

- ➢ Main responsibility of CMT is to implement the project source code,

> ➢ According to the SCRs, reimplements the parts that are mistaken.

Testing and Debugging Team (TDT)

> ➢ Main responsibility is testing and debugging the source code,

> ➢ According to the result of testing process, offers SCR.

Release Control Team (RCT)

> ➢ Main responsibility is to control the releases of the project,

> ➢ Creates baselines.

2.3 Tools & Infrastructure

İşte Yazılım uses CVS and Eclipse as project resources.

2.3.1 CVS

We will use CVS, an open source version control system, as our version control system. CVS is the abbreviation for "Concurrent Versioning System" and since the modules of NewsAgent should be implemented concurrently, the need to use such a system is necessary for us.
It allows the documents to be versioned in a central repository and allows concurrent access to the documents. Besides the current source code, it also includes previous versions of the system. It is a good facility that users can merge the changes and CVS records logs of the changes.

2.3.2 Eclipse

Eclipse is a development environment which is mainly used for developing Java code. Since we will develop NewsAgent with Java, Eclipse will be used as the development environment. It is a good chance for us that it works on both Linux and Windows operating systems.

3. The CM Process

3.1 Identification

3.1.1. Code

Since NewsAgent consists of several modules for different accesses to data, namely NewsAgent database (or NewsAgent core via web services), there will be different code configuration items in it. NNTP module, Web module, SMTP module, RSS/ATOM module

and private/instant messaging modules will constitute all code configuration items for NewsAgent. By this way, clients will access data via different modules (in fact the same data for each module.), and server will call related web services and will serve data to the clients according to the module that they use.

3.1.2. Data

Additional to the code configuration items, NewsAgent also deals with huge amount of data which is stored in NewsAgent database. Newsgroups, user groups, articles, users, logs, messages between clients etc. are data configuration items that will be stored in NewsAgent database. The management of these data in a consistent manner will be controlled by web services and database access layer parts of NewsAgent.

3.1.3. Documentation

When developing NewsAgent, we should document every module, their relationships and interactions systematically for an organized development period. Specifically for NewsAgent, web module, RSS/ATOM module, NNTP, Module, SMTP module and private/instant messaging modules should be considered as parts of the whole project. Their interactions should be considered in a detailed manner for a reliable product at the end of the development phase. For this reason, following reports should be written carefully to reconsider some modules and their interactions when team faces with a problem in the development phase.

- Project Proposal
- Requirement Analysis Report
- Initial Design Report
- Detailed Design Report
- Configuration Management Plan
- Test Specifications
- User Manual

3.1.4. Baselines

For developing a product that satisfies its customers, there are some milestones which should not be ignored. For NewsAgent, we have written some reports to collect all gathered

information in an appropriate manner. In fact, each report and milestone provides us to gather new information or to consider things more carefully about modules, their interactions, data management, new features and different designs for modules.

Following list constitutes milestones for NewsAgent that we have completed or that we will consider in the upcoming period.

Analysis of Requirements

Gathering Information

Initial Design

Detailed Design

Developing Prototype

Configuration Management Plan

Implementation

Module Interactions

Testing

User Manual

Installation Plan

3.2 Management and Control

3.2.1 Change Request

For bigger projects than NewsAgent, change requests and their considerations should be handled in more professional and systematic manner. However, for NewsAgent, since communication between team members is relatively easier compared to a bigger project, there is no need to have a more systematic change request handling than using telephones or e-mails. Change requests are made for previously developed modules, but since our design is complete enough, these change requests will be for only little changes. For mailing we will have a template for understandable requests. Here are parts of the template:

- Id number of the SCR
- Date of SCR
- Deadline of SCR
- Related Module of SCR

- Priority of SCR (1 to 4, 1 is highest priority, 4 is lowest priority)
- Owner of SCR
- Assigned member of SCR
- Description of SCR
- Change Requested Module
- On which version change will be applied

3.2.2 Evaluating Changes

Consideration of whether the change should be performed or not, is the responsibility of the director of the module on which the change will be performed, by this way, changes on a specific module will all be controlled and known by the director and complexity will be discarded for SCRs. Directors of different modules in NewsAgent development are specified in Living Schedule of NewsAgent project. Obviously, directors will interact with other group members and talk about the progress of the module, changes performed on the module on each weekly meeting of the team. On CVS repository system, we have a *"to do"* file, which includes changes to be applied and changes that have been already been applied with their dates and the member who performed the already performed changes.

When director of the module is evaluating whether change should be performed or not, he/she also will take the priority of SCR (specified in Change Request part) into consideration. By this way, director will be more comfortable to approve or disapprove SCR since it is already considered by his/her team-mate.

3.2.3 Approving or disapproving changes

As mentioned in the previous comments, priority of SCR specified in the SCR e-mail content will be useful for directors to approve or disapprove SCR. If there are some controversial SCRs, weekly meetings or mailing to the project's mail address or phoning team members will be useful for directors to approve or disapprove SCRs.

3.2.4 Implementing changes

For implementing a SCR, it should be approved to perform, beforehand. After the approval of the director, implementation will be handled. As specified in the Living Schedule of NewsAgent, members who are responsible from the part that will be updated will be

responsible from the implementation. However, director of the module can give this implementation task to any other member in the team.

3.3 Configuration Status Accounting

For a huge project configuration status handling will be harder and controlling status of the project consistent will become a difficult task as a project becomes larger and larger (since data that should be dealt with, will be greater amount when compared with a smaller project), however for NewsAgent which is controlled and developed by four people, things will be relatively easier for configuration status accounting. Change Request Reports, Build Reports, Defect Reports, Bill of Materials and Release Reports are all for larger projects than NewsAgent. Since managing the configuration by using these reports are formal methods for configuration management in a project, it can not be applied in a project such as NewsAgent.

For NewsAgent, when committing a file or change to the repository system (CVS), clear comments about the change, noting the name of the member who has updated a file and date/time of the update will be enough for a holding NewsAgent in a consistent state. Also since members can communicate with each other via email or telephone, configuration of the project will not cause any problem or problems will be solved in short time. As mentioned earlier, using informal methods in configuration management of NewsAgent seems more appropriate and applicable. Furthermore, since each module of our project has a director, configuration status accounting for each module will be handled by communicating the director of the module. By this way, director will always know the state of process and progression in his/her modules, and control configurations in his/her modules more systematically.

3.4 Auditing

Configuration management audits are very significant for a high quality product and satisfied customers. Here are audits that will be considered when developing NewsAgent.

Functional audit is used for evaluating a software products' quality independent from every condition, but only considering the consistency of configuration items' actual functionality and performance with the requirement specifications. For this reason, this audit should be held before the delivery of the end-product, since consideration of whether software requirements

are met or not will be determined beforehand (before delivery.). A product which does not meet requirement specifications will be useless for a customer.

NewsAgent will meet all the requirements specified in the project specifications. It is specified that NNTP, SMTP, RSS/ATOM, Web accesses to the data which is stored at the core of the product and consistent handling of these data by accessing them via web services, should be provided to the end-users. For accomplishing these requirements, each module will access the core via web services and database access layer will handle the database accesses in NewsAgent. Since web services called by each module will be same and there is only one database at the core of the NewsAgent (ignoring archive database for the time being), interactions between modules will be handled easily. For instance, after an article is posted, data about the article will be on the database after the post and for each retrieve command for this article after that time, data for the article will be provided to the user easily.

For meeting all requirement specifications, we will test all interactions between modules after the completion of each module. Since we will also provide users additional functionalities such as instant and private messaging, we will also develop these components and test them as different modules. After the completion of NewsAgent, we will also apply alpha test phase to control whether all specifications are accomplished or not.

In order to satisfy the specifications and requirements, we will audit the changes and updates for every independent module and the person who is responsible for that module will also be responsible for the audit of it. Moreover, we will make peer reviews upon the changes in meetings and discuss the necessity of the change and its outcomes.

After the integration of all modules, physical configuration audit is applied to the final version of NewsAgent. It verifies that related design decisions matches the all items and confirms that quality control, management, testing etc are well planned and applied or not.

4. Project Schedules – CM Milestones

4.1 Project Schedule

At the beginning of this semester, we have prepared a living schedule which consists of the tasks and the process and deadlines of these tasks. We have prepared a weekly-based schedule

and the latest version of living schedule is accessible in our web site and it is updated frequently. In the schedule, we shared the tasks among the team members and all members are responsible for following the tasks and deadlines. Every team member is responsible for a system main module, however all members study on the submodules of every module. Since we have weekly meetings both with the team members and with our supervisor, we discuss the progress and update the schedule accordingly.

4.2 CM Milestones

The followings are the CM milestones:

- CMP Submission 11.03.2007
- NNTP Module Audit 15.04.2007
- E-mail Module Audit 22.04.2007
- RSS/Atom Module Audit 29.04.2007
- Web Module Audit 20.05.2007
- Data Audit 03.06.2007
- Documentation Audit 11.06.2007

5. Project Resources

In order to apply our CMP and follow the CM activities, we will use CVS. Since our team consists of four people, it is important to work on the same source without inconsistencies. By the help of CVS, the changes and updates to the source are handled easily and new versions are produced as a result of these situations without loosing the older versions. We will use Eclipse as the CVS client in order to retrieve the source. On the other hand, in our web page we will keep all project documentations, latest version of our living schedule which will help us to follow the CM activities easily. Moreover, since all team members will be responsible for keeping track of the changes and informing all other members, I$T€ Team constructs the most important part, human resources part of the project.

6. Plan Optimization

The configuration management plan will be a guide for our team in the development of NewsAgent. However, we may face with some changes in the development process and in such cases we will make optimization in our configuration management plan and our progress. Communication between the team members is an important issue in order to be aware of the changes and follow the plan. We are a group of 4 people and we have weekly

meetings with group members and with our supervisor. As a result, it will be easier to follow the changes and make necessary optimizations. All team members will be responsible for being aware of the updates and changes in the system and informing the other team members. For this purpose, team members may use e-mails for communication. On the other hand, we keep a file in the CVS system and all team members add the latest updates and notes in order to give information and we will discuss the updates in our weekly meetings. By this way, we will keep track of changes and delays in our progress schedule and make our plan optimization frequently.