

Real Life Experience – How to Develop CMMI Processes?

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Abstract

In December 2003, BIMAR, which is a software company, initiated an SPI project to reach CMMI L2 in 2004 using XP practices at the same time. Nitelik Danismanlik Ltd., which is the consulting company, planned and conducted the project. A total of seven processes [1] described in CMMI L2 were divided into two groups. The first group included four processes, namely, Requirements Management, Project Planning, Configuration Management, and Supplier Agreements Management, which were completed in March 2003. The second group included three processes, namely, Project Tracking and Oversight, Process and Product Quality Assurance, Measurements and Analysis. We learned a lot while developing the first group's processes. We then applied these lessons to the second group's processes. As a result, we were able to complete the second group's processes in a much shorter time without sacrificing the end results at all.

This paper aims at sharing our real life experiences gathered during developing the CMMI L2 processes in the SPI project of BIMAR. Four examples from the process development activities will be given to further clarify the process development activities. These examples will be from the following processes: Project Tracking and Oversight, and Process and Product Quality Assurance.

1 Introduction

In December 2003, BIMAR initiated an SPI project to reach CMMI L2 in 2004 using XP practices at the same time. Nitelik Danismanlik Ltd. planned and conducted the project. The quantitative targets of the project were 20% decrease in the duration and the cost of projects and 30% decrease in the number of defects delivered to customer. This paper aims at describing

the best practices experienced while developing CMMI L2 Processes.

When we began process development with the first four processes of CMMI L2 in November 2003, it took us seven weeks to finalize the process designs. Then in March 2004 when we began the remaining three processes of CMMI L2, we managed to conclude the process design activities in four weeks without experiencing any time pressures or sacrificing the work quality. That is to say, the second set of processes were designed to have as the same quality as that of the first set but were executed twice as fast.

The company culture of BIMAR, which has focused on creating a friendly environment of teamwork and clear and continuous communication among all levels of the company, as well as the sincere and uninterrupted commitment from the top management of the company were very instrumental in the successful outcome of this project.

This paper aims at sharing our experience gathered during this project. Since the SPI project was performed in a small software company by a small consulting company and performed in Turkey, where such projects are very rarely done, this paper can serve a useful case study.

2 Process of process development

Process of process development has the following building items.

Process development activities are planned to be completed in around 12 weeks in which 1 day is for training for the process, 3 weeks are for process design, 6 weeks (over lapping with 2 weeks of

training) for pilot project and 8 weeks (overlapping with 3 weeks of pilot project) for institutionalizing the process as shown in *figure 1*.

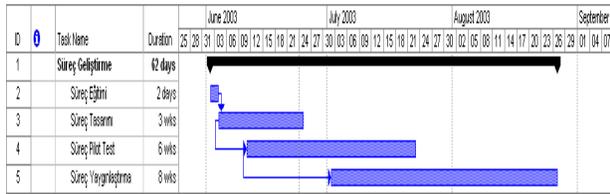


Figure 1 – Process development activities plan

This paper is giving examples for the designing of the processes. In the examples you will see these topics will be explained:

Roles: The roles played within the process design teams

Purpose: How the purpose of the process identified

Metaphor: Metaphor is a daily life story which has certain analogies with the process designed. [1]

Customer: It is important to identify the customer of the process. Under this heading it will be explained how the customer found

Main Steps: One of the most important outcome of the process design is the main steps. The other important outcome is the documents designed that will be used while performing the process in the projects

Brain Storming: The most used technique in designing process is Brain Storming. Using this technique it is possible to make everybody participate to teamwork and a feeling of ownership towards to process created.

Simplifying: We want our processes to be simple, applicable and measurable. To make them simple, after main steps identified we question every step whether it is really required.

Applicability: Under this heading, the question is “what do we need to have to make the main steps of the process easily applicable, i.e. how can we make the life of the process performers easier?”

Measurements: To improve the process performance we know that we have to measure it so that we can follow the improvements.

Lessons Learned: After each meeting of process design, we ask ourselves “in the next meeting, what do we need to “do better” or “not do” for a better meeting next time”

2.1 Project Tracking and Oversight

Project Tracking & Oversight (PTO) Process is designed to ensure finishing a project in the promised period of time and with minimum amount of bugs.

The *Process Policy* is: [1]

- To ensure that the projects progress as planned,
- To ensure that the risks are tracked and the promises are kept,
- To ensure that the problems are analyzed and solution actions are tracked,
- To track the planning parameters,

2.1.1 Roles

Five different roles are defined to determine the responsibilities in the *Process Developing Team* and to ascertain that the *Process* is embraced by the team members as shown in *figure 2*. These are:

- **Manager:** S/he is the process leader and manages the meetings.
- **Script Writer:** S/he is responsible from preparing and keeping the *Process Development Documents* up-to-date.
- **Timer:** S/he is responsible from keeping track of time spent for agenda topics and from giving warnings related to time.
- **Reviewer:** S/he is responsible for making critics on the Process Development Studies.
- **Staff Member 1:**
- **Staff Member 2:**

Only the member at the managerial role is kept fixed, and for the others a table which shows the changing holders of the roles every week is prepared.

PTO Process Development Team's role table is below. The lines marked in red, indicates the *Process study* at the mentioned date is completed.

Tarih	Yoneticisi	Sunucu/Yazici	Süre Tutucu	Eleştirmen	Eleman 1	Eleman 2
09.03.2004	Ozge YILMAZKURT	Murat FERUZ	Senol BOLAT	Habil SENOCAK	Zeynep YURTDAS	Hüseyin YAĞCI
16.03.2004	Ozge YILMAZKURT	Hüseyin YAĞCI	Murat FERUZ	Senol BOLAT	Habil SENOCAK	Zeynep YURTDAS
23.03.2004	Ozge YILMAZKURT	Zeynep YURTDAS	Hüseyin YAĞCI	Murat FERUZ	Senol BOLAT	Habil SENOCAK
30.03.2004	Ozge YILMAZKURT	Habil SENOCAK	Zeynep YURTDAS	Hüseyin YAĞCI	Murat FERUZ	Senol BOLAT
06.04.2004	Ozge YILMAZKURT	Senol BOLAT	Habil SENOCAK	Zeynep YURTDAS	Hüseyin YAĞCI	Murat FERUZ
13.04.2004	Ozge YILMAZKURT	Murat FERUZ	Murat FERUZ	Hüseyin YAĞCI	Hüseyin YAĞCI	Hüseyin YAĞCI
20.04.2004	Ozge YILMAZKURT	Hüseyin YAĞCI	Murat FERUZ	Senol BOLAT	Habil SENOCAK	Zeynep YURTDAS
27.04.2004	Ozge YILMAZKURT	Zeynep YURTDAS	Hüseyin YAĞCI	Murat FERUZ	Senol BOLAT	Habil SENOCAK
04.05.2004	Ozge YILMAZKURT	Habil SENOCAK	Zeynep YURTDAS	Hüseyin YAĞCI	Murat FERUZ	Senol BOLAT
11.05.2004	Ozge YILMAZKURT	Senol BOLAT	Habil SENOCAK	Zeynep YURTDAS	Hüseyin YAĞCI	Murat FERUZ

Figure 2 – Process developing team roles

As an outcome of the PTO Process Development Studies, a new role, PTO Manager (PTOM), is considered necessary for the applicability of the Process. PTOM will be responsible from executing the *process* steps, and preparing/distributing the relevant reports. The function of the PTOM begins the moment a project reaches the Project Office and a Project Manager (PM) is appointed. In this context, it is decided that the PTOM and PM have to be appointed simultaneously.

2.1.2 Purpose

Before starting any *Process Design*, the purpose of the *Process* must be defined. The members of the *Process Design Team* have to be sure about the necessities for, and the expectations from the *process*. By setting a *purpose sentence*, the path to be followed during design and the borders of the *process* become sharper. The ideas which are chosen among the ones that emerged during the *brain storming session* executed to determine the *PTO Purpose Sentence* and comments on them are shown below in *figure 3*. The team discussed all items one by one and the ones which are found irrelevant (in dim letters) are eliminated.

	TO DEFINE THE PURPOSE
CHOSEN ITEMS	
A	To track that the project plans are correct
A1	To track the project risks
A1	To track the risks
A2-B2	To be aware of the delays asap
A3	To track whether the communication plan is applied or it is sufficient
A4	To track the human resources management
A-B-C-D	To control whether the project goes on in harmony with the plan and the necessary corrective actions are taken
Purpose	To ensure that the project sticks to the proposed time and quality
To be investigated (tbi)	To follow the integration management
B	To follow the consistency with the plan
B	To determine the problems related to project plans
B-C	In case of deviations from plans, determining the causes and requesting precautions
Inform	To inform the upper management about the course of projects
Inform	To ensure that the created BIMAR values are saved
Inform	To report the statuses of the projects
Inform	To inform the relevant parties (persons) about the deviations
C	Requesting corrective actions in inappropriate (with the plan) cases
C	Triggering the renewal of planning
Decision 2	To produce healthier plans for the future projects
Decision 2	Taking precautions so as not to live similar problems in future projects
Decision 2	Recording and sharing lessons-learned
Eliminated Items	
	Predetermining cost/time deviations
	Predetermining and/or keeping the exact finishing date and cost of the project up-to-date

	Controlling products and data
	Foresee the problems asap
	Keep the out-of-date risks out of sight
	Ensuring that the resources are utilized in the most efficient manner
	Managing changes
	Revising the project plan oftenly, so decreasing the effects of the deviations which are expected in the near future
	To inform the parties
	To fulfill the requirements of Quality Assurance, Measurement & Analysis, Configuration Management Processes
	To perform Contract Management

Figure 3 –Brain Storming results for “Process Purpose”

Following that step, some simplifications are made in order to make the *purpose sentence* clearer by focusing on the remaining ideas. After simplification, the initial form of the *purpose sentence* is developed, and it later became a guiding principle in defining the *process* steps. The *purpose sentence* for the *PTO Process* is as follows;

To inform the PM and upper management as soon as possible about the deviations in plans and to track the captured problems until they are solved in order to assist the PM in delivering the project in the promised period of time and with minimum amount of bugs.

2.1.3 Metaphor

Samples from the daily life are seek in order to ascertain that the *process* and its functions are easily understood. [1]

3 candidate metaphors are determined as an outcome of a brain storming. These are:

- A season of a football team
- A building under construction
- Formula 1 Pit Stop

Formula 1 PIT Stop is chosen as the *process’ metaphor* since it is found more suitable and it is expected to attract more attention. The leading reason for choosing the F1 Pit Stop as a metaphor was that all relevant processes and process responsibilities can be shown on it. In this metaphor, the *PTO Process’* steps are easily followed if the operation which begins when a racing car enters the pit stop -and ends when it leaves the pit stop- is taken as a project.

The PM’s, pairs’, Measurement & Analysis Group’s, Quality Control Group’s, upper management’s, and PTO Manager’s duties and relations are easily tracked

during the tasks such as replacing tires, taking in gas and so on. Since the pit stop process takes only seconds, they are changed to hours in order to make the analogy more traceable and understandable.

2.1.4 Customers

After the requirements for and the purpose of the process are made clear among the team members, then came the step where the person(s) that the *process* will serve will be determined. The intent of this step was to determine the person(s) who are affected by the process and who are denominated as *customers*.

As an outcome of a *brain storming*, following *customers* are found:

- * Coordination Committee
- Project Team
- All company
- Customer Relations Manager
- * PM
- Manager of the Project Office
- Other PMs

(Only the ones marked with “*” are kept as *customers* at the end of the process studies)

2.1.5 Main Steps

Following the afore-mentioned (pre)studies, the team passed to the development step where the *main steps* of the *process* would be determined and another brain storming session was executed. The items which did not serve for the purpose and/or were found out of context are eliminated first, and the remaining ones grouped under certain classes. The ideas that emerged during the brain storming are evaluated by making use of the simplification principles.

Following the evaluations, the first frame of the *process steps* is formed. They are as follows:

PTO Main Steps (First Form)

A. TRACKING

A.1. PLANNING

A.1.1. Tracking Plan is prepared

- Up-to-date statistical data related to criteria are received from the Measurement & Analysis Process

PTOM & PM fills in the Tracking Plan Template

A.1.2. The roles and responsibilities in the Tracking Operation are announced

- The holder of PTOM role is announced in the *Project Opening Message*

A.2. TRACKING

A.2.1. The compliance with the *project plan* is tracked

- PTOM controls the compliance of the project documents with the project plan according to the Tracking Plan.

B. PROBLEM DESIGNATION

B.1. TO DESIGNATE A PROBLEM

B.1.1. The data obtained during the tracking sub-process are analyzed and problems are determined

- PTOM puts forth the deviations in the project plan
- PTOM compares the deviations with the threshold values stated in the Tracking Plan

B.2. PRIORITIZATION

B.2.1. The costs that the problems may cause are asked for

- PTOM demands the costs of the effects that the problems may lead from the PM.

B.2.2. Problems are sorted

- PTOM prioritizes the problems of which the costs are forecasted.

C. MONITORING THE PROBLEM

C.1. TO REQUEST A SOLUTION

C.1.1. A solution is asked for

- Solution is requested from the PM with its cost-benefit analysis

- PM refreshes the project documents according to the solution plan

- PTOM tracks the refreshed plans

- In case the PM cannot offer a solution the matter is escalated

C.2. TRACKING THE PROBLEM

C.2.1. PTOM tracks the statuses of the problems.

C.2.2. Unsolved problems are escalated by PTOM

D. CLOSING THE PROBLEM

D.1.1. PTOM refreshes the status of the problem in the tracking plan

D.1.2. PTOM enters the information related to the problem in the database

- PTOM records the information related to the project in the general PTO database

- PTOM derives lessons learned by filling in the comments area in the general PTO database

2.1.6 Brain Storming

During the process design studies, *brain storming* is adopted as the dominant design method in order to;

- Provide full participation of the team
- Put no boundaries to the ideas.

Thanks to the *brain storming* method,

- Team members declared their ideas without any limitations and as they wished,
- Time management could be accomplished,
- More effective and visionary discussion media could be attained.

During the “Determination of Main Steps” study which was carried out by the *brain storming* method, the items that are found by the team members are first recorded without any comments as shown in *figure 4*. Then, the items which are considered out of scope or do not comply with the purpose of the *process*, are eliminated by evaluating all items one by one. The eliminated items are kept as dim lines in the *process development documents*. The simplifying procedure is explained in detail in section 4.2.7 *Simplifying*. The determination of the *process* steps, can be given as an example of brain storming sessions executed during *process development studies*. The initial outcome of *brain storming* about *process steps* are as follows:

DETERMINING THE STEPS		
23.03.2004	REQUESTING SOLUTION	
C1	Requesting explanations from the PM about the problems of which priorities are determined	
C1	Requesting solutions and solution plans from the PM about the problems whose priorities are fixed	Risk
C2	Escalation of the problem in case no solution is suggested	Time Plan
C1	Requesting the cost/benefit analysis of the proposed solution	Comm
Reporting	Informing PM about the probable dangers / existing problems	Resources
Reporting	Informing upper management about the probable dangers / existing problems	Cost
Reporting	Submitting information to the relevant person(s) about the problem and its priority	Scope
Reporting	In case of no solution, escalation report	Social Dimension
	Deciding from whom solution will be asked	Decide
	Asking the periods of time required for the proposed solutions	Inform
	Requesting solutions for the prioritized problems	Request
	Evaluating the requests of PM related to	Determine

	the solution and supplying them	e
	Pass on the problems to the PM	Supply
	Requesting explanation/solution from the PM	Transfer
	Requesting report from the PM about the solution plan	Prepare
	Requesting the PM to fix the cause/root of the problem	Escalate
	Requesting the PM to fix the responsible person(s) and due dates about the solution	Guess
	Requesting solution proposals for the problems starting from the most important	Analyze
	Expecting alternative solution proposals when necessary	Satisfy
	Requesting the threshold value for starting the alternative solution	Warn
	Forecasting the solution's capability for meeting the requirements	
	To be satisfied by the proposed solution	
23.03.2004	TRACKING THE SOLUTION	
D1	Tracking the problems' and solution plans' statuses	
D2	Escalating the troubles encountered during execution of the solutions	Risk
Reporting	Reporting the progress of the solution plan to the upper management	Time Plan
	Preparing an escalation report in case of un-coordination with the plan	Comm
	Tracking whether there are improvements	Resources
	Recording the difference that the solution creates	Cost
	Tracking whether the risks are updated	Scope
	Recording the problem and the solution's success or failure in the lessons-learned database	Social Dimension
	Requesting the status of the solution plan	
	Tracking the conformity with the solution plan	Follow
	Tracking that the project plan is revised	Track
	Tracking that the baseline of project plan is saved	Escalate
	Informing the PM about the risks of the solution plan	Request
	Requesting information regarding the plan during the tracking of the solution	Inform
	Observing the solution's capability for meeting the needs	Ask for information
	In case the solution does not suffice, determining the root/cause of the problem	Observe
	Requesting the PM to execute the solution plan	Determine
		Submit a report

Figure 4 – Brain Storming results for “Determination of Main Steps”

The marginal or similar ideas that arose during the brain storming sessions are simplified and/or merged together by means of *win-to-win* principles or accepted as they were, provided that a consensus is reached among team members.

2.1.7 Simplifying

The suitability of process steps with the metaphor is evaluated following the constitution of the first version. A scenario is prepared on which the *process steps* are executed to make them more applicable, fitter for purpose, and of higher quality. While evaluating the steps that emerged as the result of the brain storming sessions, 3 questions are utilized;

- Is this specific brain storming session output under discussion, a main step? Or does it define a sub-step of any main step?
As in the case of the “designation and prioritization of problems.” (This is decided as a sub-step)
- Is this specific brain storming session output under discussion falls in the scope of the *process*? Does it suit to the purpose and metaphor of the *process*?
As in the item “determining the source of the problem.” (This item is out of the scope and does not fit to the purpose of the process.)
- Is this specific brain storming session output under discussion really necessary?
In order to answer the above question, 3 additional questions are utilized;
 - o What if this is not performed?
As in the case of “determining the risks that may be triggered by the problem”.(This item falls into the responsibility area of the PM, so is unnecessary.)
 - o Is it trivial?
As in the case of determining the person(s) from whom solution would be asked for (This is unnecessary since the roles are defined)
 - o Is it a very perfectionist approach?
As in the item of “determining the cause in case of delay” (The purpose of the process is solely to designate the problem. Trying to find the causes or roots of the problem is evaluated as a perfectionist approach)

During the *simplification* studies, the *sub-steps* which are utilized in determining the *main process steps* are also taken into consideration and all *process steps* took their latest form as below:

PTO Main Steps (Last Version)

A. TRACKING

A.1. PLANNING

A.1.1. Tracking Plan is prepared

A.1.1.1 Up-to-date statistical data related to criteria (average delay percentage) are received from the measurement and analysis process.

A.1.1.2 PTOM & PM fills in the relevant sections in the *PTO Status Report*.

A.1.2. Roles and responsibilities in the Tracking Operations are announced.

A.2. TRACKING

A.2.1. Compliance with the project plan is tracked

A.2.1.1 PTOM controls the compliance of the project documents with the project plan according to the Tracking Plan

A.2.1.2 *PTO Status report* is published at a frequency stated in the *tracking plan*

B. PROBLEM DESIGNATION

B.1. TO DESIGNATE A PROBLEM

B.1.1. The data obtained during the *tracking sub-process* are analyzed and problems are determined

B.1.1.1 PTOM puts forth the deviations in the project plan.

B.1.1.2 PTOM compares the deviations with the threshold values stated in the Tracking Plan

B.1.1.3 PTOM records the problem in the Problem Tracking Excel Sheet

B.2. PRIORITIZATION

B.2.1. Approximate costs that the problems may cause are asked for

B.2.1.1 PTOM requests the approximate cost-benefit analyses of the problems from the PM. PM sorts the problems according to the projected costs.

[(The cost of the problem to the customer (ARKAS) * Probability of materialization) – The cost of the solution = Aggregate utility cost.

All 4 values must be requested separately.]

C. MONITORING THE PROBLEM

C.1. TO REQUEST A SOLUTION PLAN

C.1.1. A solution plan is asked for

C.1.1.1 PTOM follows the project plans which are revised according to the solution plans by the PM

C.1.1.2 The priorities are refreshed by deleting the solution cost in the status reports for the problems for which no solution plans are suggested. PTOM tracks the refreshed plans.

C.1.1.3 In case the PM cannot suggest a solution, the problem is escalated.

C.2. TRACKING THE PROBLEM

C.2.1. PTOM tracks the statuses of the problems and refreshes the *Problem Tracking Excel Sheet*

C.2.2. The problems which cannot be solved, are escalated by the PTOM.

D. CLOSING THE PROBLEM

D.1.1. PTOM refreshes the status of the problem in the tracking plan.

D.1.2. PTOM puts the information related to the problem in the relevant database.

D.1.2.1 PTOM records the problems related to the project in the general PTO *Problem Tracking Excel Sheet*.

2.1.8 Applicability

After setting and testing the process steps, the applicability headings are filled. The purpose of this milestone was to put forth the “sine-qua-non”s for applying the process steps and the matters which would ease their application. It is observed that the *applicable* decreased considerably after *simplification* milestone, and the *process* steps became easily usable. As an example, the *applicability* items determined for the *tracking main step* are below:

- * PTOM must be appointed at the same time with PM
- * *Measurement & Analysis Process* must provide the necessary statistical data for the PTO *Process*
- * PM must prepare the project plan and submit it to *Configuration Management*

2.1.9 Measurements

Following completion of main process steps, *measurements* which mean “the information set that can be measured during the execution of the process to be presented in the reports requested by the upper management” are defined as well as *applicable*. [1]

These items can also be defined as “base measurements which will be taken into consideration to be tracked in the upper management reporting by the Measurements & Analyses Process”

As an example, the measurements which are defined in the “Problem Designation” step are given below:

Measurability:

- * Measuring the time passed during prioritization process
- * Measuring how many problems are designated

2.1.10 Lessons Learned

During the team studies, many benefits are attained in many disciplines including *team management*, *process design study management*, *discussion styles*, *applied methods*. These benefits are mostly attained by utilizing the critics that were made by the Reviewers at the ends of the sessions. The rules that followed are perceived as *lessons-learned* and compiled under the heading “*Process Design Team Working Principles*”.

PTO Process Design Team Working Principles

- 1 – The process team must be precise about the working hours and rest intervals.
- 2 – Every member of the process team has a defined role which changes weekly. The only exception is the team leader.
- 3 – At the end of each session, the positive/negative critics, first of the Reviewer, then of all participants are asked for and recorded.
- 4 – Some games, research and conversation topics are also accepted as process development studies as long as they contribute to the participation of and communication among the team members
- 5 – Documents prepared by single/multiple members of the team can be considered as official process documents with the condition that they are shared and confirmed by all members
- 6 – The problems that arise during the process development studies shall be solved by making use of the *win-win principle* wherever possible.

2.2 Process and Product Quality Assurance

2.2.1 Roles

In CMMI Process and Product Quality Assurance process design studies held at BIMAR, distribution of roles in process group, is described below:

Process Group Leader : A person responsible for overall success of the group.

Scriptwriter : A person responsible for writing study notes during process design studies.

Timekeeper : A person responsible for keeping accurate time during process design studies.

Quality Assurance Observer : A person responsible for criticizing process design studies for improving productivity of next study.

2.2.2 Purpose

In CMMI Process and Product Quality Assurance process design studies held at BIMAR, following ideas related to purpose were suggested by process group.

- Improving efficiency and productivity of other CMMI Processes.
- Providing a point of view to management with which they can evaluate performed processes against designed process descriptions.
- Supplying services at registered quality level to customers.
- Providing transparency about processes to high level management.
- Improving satisfaction of high level management by instituting quality management concept in BIMAR and improving quality level.
- Focusing on processes that manage and produce product instead of the product itself.
- Establishing a self-evaluation mechanism for all CMMI processes.
- Helping high level management to control company.
- Providing visibility on processes to high level management.
- Assuring project managers that task are completed with minimum number of errors.
- Increasing added value of processes in the way of the company reaching its objectives.
- Strengthening company's competition power by application of processes.

From these ideas, an idea about self-evaluation mechanism was embraced by process group and it was strategically agreed to institute BIMAR's Quality Assurance System based on this mechanism.

As a result, the purpose of CMMI Process and Product Quality Assurance process design studies was defined as;

Establishing a process focused Quality Management System based on self-evaluation mechanism, to help high level management to control company by providing them a point of view with which they can evaluate performed processes and work products against the designed process descriptions and standards.

2.2.3 Metaphor

In CMMI Process and Product Quality Assurance process design studies held at BIMAR, following metaphors are suggested by process group to use in process design studies.

- Turkey's EU accession process and inspections.
- Pregnancy and Gynecologist.
- Military investigations and maneuvers.
- Aircraft manufacturing.
- School inspections.
- Traffic and Traffic Police.

From these candidate metaphors, "Pregnancy and Gynecologist" was chose to use in process design studies by process design group. Periodic checks done by Gynecologist were likened Quality Assurance Evaluations.

Another important reason to choose this metaphor was naturalness of pregnancy process and thus its closeness to perfection. However mother's bad habits can have harmful effects on pregnancy process. In periodic checks, Gynecologist tries to find out these bad habits, their harmful effects and then discourages mother from carrying on these bad habits.

Also in software development, developers who have been educated in software engineering, try to be faithful to software engineering processes. On the other hand, because of some restrictions like cost, deadline etc. applied by management to projects, processes could not be executed completely. With evaluations in company, Quality Assurance Persons would try to provide complete execution of processes.

2.2.4 Customers

In CMMI Process and Product Quality Assurance process design studies held at BIMAR, following customer groups of Product Quality Assurance process were determined:

- Other CMMI Processes
- High Level Management
- Software Development Group
- Project Managers
- Customer Relationship Managers

2.2.5 Main Steps

In CMMI Process and Product Quality Assurance process design studies held at BIMAR, following steps has been defined as main steps of process.

1. Planning the evaluation
 - 1.1. Establishing a Quality Assurance Plan
 - 1.2. Adding Quality Assurance work products into Configuration Management Plan and Measurement and Analysis Plan
2. Maintaining the evaluation
 - 2.1. Collecting Self-evaluation Data
 - 2.2. Performing Evaluation
 - 2.3. Communicating evaluation results
 - 2.4. Communicating noncompliance issues and ensuring their resolutions.
3. Closing Project
 - 3.1. Preparing Project Quality Assurance Report
4. General Quality Assurance Steps
 - 4.1. Preparing General Quality Assurance Report which includes Quality Trends.

2.2.6 Brain Storming

In CMMI Process and Product Quality Assurance process design studies held at BIMAR, Brain Storming idea generation method was used effectively. All ideas about Quality Assurance activities that could be performed in BIMAR, were recorded, regardless of they were reasonable or not. All ideas were explained in detail for correct understanding. Finally these ideas were grouped under process main steps and main steps of CMMI Process and Product Quality Assurance process were obtained. In the next step, which was simplifying, unnecessary steps were eliminated.

2.2.7 Simplifying

In CMMI Process and Product Quality Assurance process design studies held at BIMAR, ideas produced with brain storming method, were reduced according to tree criteria. These three reduction criteria are shown below.

- Process step has more superiority then required.
- Absence of process step does not have effects on process sufficiency.
- Process step is performed naturally in process.

For example “Establishing a Quality Assurance Risk Plan” process step was eliminated, because its conformity to first criteria. “Customizing Quality Assurance Plan according to project type.” process

step was eliminated, because its conformity to second criteria. And “Performing evaluations according to Quality Assurance Plan” process step was eliminated, because its conformity to third criteria.

2.2.8 Applicability

In CMMI Process and Product Quality Assurance process design studies held at BIMAR, to provide applicability of process steps, some pre-requisites and support activities required for performing process step, were defined. Thus it was tried to expose missing points which could be appear during the application of processes.

Some examples to these items are below.

- For each project Quality Assurance Responsible must be appointed by Project Office Manager.
- Self-evaluation reports must be placed in Configuration Management System.

2.2.9 Measurements

In CMMI Process and Product Quality Assurance process design studies held at BIMAR, for obtaining improvable and thus for obtaining measurable process steps, some measurements were defined. Some samples are below.

- Project Quality Assurance Plan Establishment time.
- Evaluation time.
- Time spent for communicating noncompliance and resolution.

2.2.10 Lessons Learned

In CMMI Process and Product Quality Assurance process design studies held at BIMAR, it was experienced that despite designing a process requires intensive work, it is pleasant study. Other lessons learned are below;

- Being present in studies on exact time and regular attendance are important for success.
- Bringing each process group member’s understandings to same level, prevents the discussed idea to appear in later studies.
- Preparation to studies and looking over previous notes increase the speed of current study.

3 Conclusion

We have tried to describe in this paper the ingredients of the process design. Namely, the roles required in the process design team, the value of using a metaphor, how to find the purpose of the process designed by using the techniques such as brain storming and simplifying then how to make processes more applicable and measurable. The last point explained was the lessons learned to make better meetings.

We believe that the secret of good work is teamwork and communication. We managed to become team and we never underestimate the value of good communication and encourage participation. Then the conclusion is success.

4 References

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