

# Developing team-based software organizations by applying the People CMM

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## Abstract

*Many software organisations today claim that they use “teams” in their development of software. This is often true in a limited scope, but rather there is a group of people working together without explicit common goals and without joint responsibility. The following are the usual symptoms that we find in today’s industry that is resolved or reduced by introducing team-based development:*

- *Employees do not know the goals of the project they are working in*
- *Missed deadlines, which usually are realised very late*
- *Low quality and slow learning, same mistakes repeated within the same project*
- *The skills of the employees are not utilized properly*

*This paper describes how the introduction of teams should be done. In order to succeed with the implementation the People Capability Maturity Model (People CMM) is applied since it outlines the order of what has to be in place in order to succeed with the introduction of teams. Several organisations just rush away and implement teams without setting a strategy for the introduction. This can imply that the organisation do not get the wanted effect of the introduction and that it will be very difficult to evaluate if the concept had the wanted effect or not.*

*The team concept has been introduced at different design centers at Ericsson. The results are very positive, all design centers that have introduced the concept still hold on to it since it has shown improvements in lead time precision, quality and specially responsibility and commitment.*

## 1. Introduction

Many software organisations today claim that they use “teams” in their development. But what they mean by the term “teams” vary a lot. Organisations do not anticipate what needs to be in place to get full effect of the teams. To try to explain the differences between the different kind of “teams” I have in this paper defined four kinds of teams, representing different levels of team-maturity based on People CMM practices and my own experience from introducing teams at various organisations.

### • **Mob**

At worst these “teams” are rather a group of people working together without explicit common goals and without joint responsibility in ad hoc manners.

### • **Information based teams**

Teams that exist in an organisation where information is coordinated and shared through the organisation. Commitment to work is though low - people just do what they are told.

### • **Participatory teams**

What characterizes participatory teams are that the team members are jointly responsible. The team participates in planning and decisions regarding their own work and objectives.

### • **Opportunity teams**

Teams are the way of performing assignments. They are not used everywhere through the organisation but opportunities to form teams are analysed continuously. When appropriate the composition of the team is based on complementary knowledge and skill.

People CMM [1] is a maturity model that determine the workforce capability. The model give guidance on how to continuously improve the people related practices, e.g. attract, develop, motivate, organise and retain the talent needed to improve the software development capability. A number of improvement themes course through the People CMM, which help organisations, understand the structure and dependencies of the different part of the model. One of the four themes is building themes and cultures which gives a structured path to follow when creating a team based organisation. When People CMM talks about teams (called team building in the model), it is the kind of teams that here is referred to as opportunity teams.

This paper describes how teams change maturity while the organisation applies practices from the People CMM.

The paper is structured as follows. In chapter 2 basic concepts about teams such as; potentials, hinders, types, and when to apply them are described. Chapter 3 presents different level of team maturity and how People CMM guides the evolvement of teams and finally conclusions are given in chapter 4.

## 2. Basics about teams

### 2.1 Team potentials - hinders

Applying teams right can improve:

- Quality, by shared responsibility, higher commitment and clear assignments.
- Lead-time, by creating effective teams.
- Competence, by more time for improving and learning from other team members and creating a culture that enables constructive feedback.
- Delivery Precision, by clear assignments, better time-estimations and higher commitment.
- Motivation, by higher job satisfaction, team spirit and higher commitment.

There are several examples [2, 3, 5, 8, 9] of different difficulties facing the teams:

- Management not committed to teams. If management not is committed to teams they will not fulfil their part which will lead to frustrated situation.
- Roles are unclear. The different roles (e.g. team leader, team member, project leader) must be clearly defined in order to achieve understanding and that responsibilities are taken.
- Resources not secured, people are switched between projects in an ad hoc manner
- Too large teams, will hinder joint responsibility, cooperation and commitment.

### 2.3 When to use teams

Teams are not the solution to an organisation all problems. Teams should only be formed when they make sense. There are specifically two situations when teams NOT should be used:

- Too small assignment, since it will take longer time introducing more people to the assignment than letting one individual handling the assignment.
- Too little time, if time is really pressed it will take too long time to introduce all members.

Then there are a set of situations when it is not recommended for organisations without experience in working teams to start applying teams since they will spend more effort solving the actual situation than dealing with team issues:

- Very unstable environment, customer is changing the requirements all the time.
- Independent tasks, resulting in that no normal interaction between the team members is implied.
- Low understanding, the customer expectation is very vague will lead to that the team members will spend too much time defining what actually should be done.
- Very complex tasks, will imply much more competence transfer and close interaction between the team members

For experienced teams these situations do not hinder applying teams.

## 2.3 Effective teams

What makes some teams outstanding? Knowledge and experience is the usual answer. But there are more than just these obvious aspects. In high performing teams the team members know how to cooperate so that synergy is achieved. This synergy effect means that a team can deliver result that exceeds the result that the team members would have delivered working individually (In popular speech  $1+1=3$ ). There are two basic concepts that a team needs to become high performing [3]:

- an external process describing what to do, that is a process that describes how the daily work should be done, activities to perform, documents to write, etc. The external process should include a team definition, a process to follow with activities, roles and documents.
- an internal process describing how the work must be performed. Which is the ground rules that the team should follow? How should decisions be made? How should meetings be performed? These are some of the questions the internal process should answer.

### 2.4 Implementation process

When management gets committed to teams they often rush into implementation before setting a strategy for the implementation [9]. One way to solve this is to run a vision seminar [6] where the two most important questions must be answered:

- Goal setting. What is the main purpose of introduction? To be able to conclude whether the concept was successful or not it is important to set SMART (Specific, Measurable, Accepted, Realistic, and Time-based [7]) goals so that the concept can be evaluated quantifiable measures.
- What to introduce. What parts of the concept should be introduced? All parts of the concept might not fit the organisation and it is important to determine which parts are most important to implement the set goals.

The answers to these questions will set the scope and the kind of team for the organisation. It is important that the organisation is made aware of that the possible benefits (see section 2.1) are related to the kind of team you have. Mobs do not generate the same benefits as participatory or opportunity teams do.

### 2.5 Teams in different environments

Teams can be established in different environments. This chapter describes different kinds of teams within software development [5].

- Development teams. Can be refined into two cases that both easily can adopt the teamwork model:
  - Phase Oriented, where all team members have the same skills.

- Cross functional, where the team consists of team members with different skills, e.g. testers and designers in the same team or designers with different specialities.

- Maintenance teams. These teams do not have clear assignments. Their work can be more as support day by day and can be seen as eternity work. This kind of team needs to specify specific goals for a specific time period and evaluate themselves towards those goals at the termination of the set time. This can be seen as creating fake assignments but is really important for the teams to get a chance to reach the goal and to reflect over what has happened to the teams abilities.
- Coordination teams. The team members are allocated on a lower basis (e.g. 20%). The work in this kind of team is sometimes close to nothing and sometimes very hectic. The members in the group do usually not have joint responsibility since they have other activities where they spend the greater part of their time, e.g. participates in a development team. Here it is important with short assignments that must be treated as much as possible as an ordinary assignment otherwise it is easily delayed since it not the top priority for the team members.

### 3. Different level of team maturity

People CMM is a maturity framework that describes the key elements of managing and developing the workforce of an organisation. It describes an evolutionary improvement path for an organisation's people related practices. People CMM help organisations to:

- characterize the maturity of the people related practices
- set priorities for improving the competence of the workforce
- integrate competence growth with process improvement
- establish a culture of excellence

According to People CMM one cannot expect full benefit from teams without establishing other practices first that enable the full advantages of teams. This chapter describes how the maturity of teams changes while adopting People CMM practices (i.e. moving from mobs to opportunity teams)

#### 3.1 Mobs

In mobs members think they are grouped together for administrative purposes only. Individuals work independently sometimes in different directions since goals and objectives are either personal or unclear. Other problems are that conflict situations are handled badly. Confrontation and conflict is handled the same and usually the "lid is put on" in stead of solving the situation.

#### 3.2 Information based teams

The first step to get more mature teams to create an environment where information is shared and coordinated. Key activities that are managed in this kind of teams:

- Information is spread both top-down and bottom up on a periodic and event driven basis. Open and honest communication is practiced. Everybody makes an effort to understand each other's point of view.
- Interpersonal skills needed to perform and maintain effective working conditions are developed. Conflicts are confronted promptly and viewed as normal aspect of human interaction. Treated right conflicts are a chance for new ideas and creativity.
- Meetings are conducted to make the most effective use of the time of those participating

There are still problems in information based teams. Members focus on themselves because they are not sufficiently involved in the planning of their work leading to that they approach their job simply as hired hand.

#### 3.3 Participatory teams

After that the sharing and coordination of information is under control it is time to address the major problem in information based teams, the lack of commitment. In participatory teams the decisions are made on the lowest appropriate level of the organisation and the teams participate in decisions related to their work or commitments.

In the organisation executive management initiates an effort to have decisions made on appropriate level of the organisation. Management maintains ongoing involvement in order to keep the teams committed and supports decisions made by the teams.

Teams identify the information needed to perform their responsibilities. The team members support and trust each other since they are involved in making decisions and commitments that affect their work. When there is joint responsibility in a team, members feel a sense of ownership for their job and are much more motivated to meet the deadlines and to their work in general.

Participatory teams are not spread across the organisation (usually only in the development) and the organisation do not provide support such as standard processes.

#### 3.4 Opportunity teams

The goal of the opportunity teams is to create teams that maximize the integration of diverse knowledge and skills to perform business functions.

The organisation provides a standard team process and teams are formed to improve performance. Teams are not used everywhere but opportunities for forming teams

within organisation are identified. An appropriate team structure is selected and tailored for application in each situation where a team will be formed.

The participants in the team contribute to the team's success by applying their unique talent and knowledge to realise the team objectives. Assignments are made to integrate complementary knowledge and skills. Team members are thus selected based on complementary skill and knowledge.

Team members recognize their interdependence and understand both personal and team goals are best accomplished through mutual support. Team members receive training in team skills to ensure the climate of trust and cooperation.

### 3.5 Maturity evolves by People CMM practices

In the People CMM there are other practices to be in place before focusing on teams [1]. If teams are formed without those practices in place there is a great risk for mobs being created. The maturity of the teams will change by focusing on different People CMM areas:

- **Communication**, which focuses on effective interaction by sharing and coordinating information. When the communication practices are under control teams will grow into information based teams.
- **Participatory culture**, which incorporates individuals in decisions related to their work, and to gain their support for commitments. Teams will evolve into participatory teams with participatory culture practices in place.
- **Team building**, focusing on establishing teams throughout the organisation with the above stated areas as a basis. Teams will become opportunity teams with team building practices in place.

## 4. Conclusions

Unfortunately most organisations that state that they use "teams" have either mobs or information based teams.

I am NOT stating that opportunity teams should be THE goal when an organisation is shifting towards team-based development. If an organisation tries to go directly to opportunity teams it will encounter other problems such as, that joint responsibility is harder to achieve in interdisciplinary teams since team members have less understanding of each other compared to participatory teams where team members have the same skills. The size of the teams also tend to get larger (sometimes too large) when using opportunity teams. The reason for this is that organisation gives the teams too much responsibility resulting in a too high demand of resources.

The goal should be to have opportunity teams but not before the organisation successfully established participatory teams since the gap is too large to overcome in one step.

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