The Process of Selecting Project Team Members in a Matrix Organization with Multiproject Environment

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Abstract
In a matrix organization, the process of selecting project team members is a collaboration between the functions and the projects. A project’s success or failure does often depend on that collaboration. This thesis work examines the present situation at Saab Gripen Customer Support.

The process is examined from four different perspectives: the roles of the functional and the project manager, competence development, behavioural science team roles and the complexity of the projects. The result shows that the roles of the project manager and the functional manager in their collaboration are not properly defined. The communication between the project manager and the functional manager is insufficient. The competence development during the projects is not fully taken advantage of. There is a need to use behavioural science.

Recommendations on how the situation can be improved are given. A model is proposed to give guidance in the process of selecting project team members.

Keyword
multiproject enviroment, matrix organization, competence development, behavioural science, project complexity, selection, team
Abstract
This thesis work was performed at a line of business at Saab Aerospace called Gripen Customer Support (GC). GC has a multi-project environment and is organized as a matrix organization. In a matrix organization, the process of selecting project team members is a collaboration between the functions and the projects. A project’s success or failure does often depend on that collaboration, instead of the project manager’s ability to manage the project. In spite of this, the problems with the process of selecting project team members are seldom highlighted.

This thesis work examines the present situation at GC in the process of selecting project team members. The thesis examines the process from four different perspectives: the roles of the functional and the project manager, competence development, behavioural science team roles and the complexity of the projects.

The result of the thesis shows that the roles of the project manager and the functional manager in their collaboration are not properly defined. The functions have different ways to handle the process of selecting project team members, which result in a high uncertainty in the collaboration between the projects and the functions. Furthermore, the communications between the project manager and the functional manager is insufficient. It is also a problem with that some functions have a poor competence development. There is a lack of understanding for competence and competence development. Furthermore, the competence development during the projects is not fully taken advantage of. There is a will and a need to use behavioural science. At the present time, behavioural science cannot be fully used in the process of selecting project team member at GC.

Recommendations on how the situation at GC can be improved are given. A model, based on the recommendations, is proposed to give guidance in the process of selecting project team members at GC.
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1 Introduction

The chapter aims to clarify what is studied and why it is studied. The chapter starts by giving a background to the problem. The background is followed by a discussion over the problem, which leads to a definition of the problem. The delimitations are also presented.

1.1 Background

A team is a number of individuals that under guidance of a team leader work together or with integrated assignments in the purpose to reach some goals. The team is used to reach a so-called synergy effect, i.e. when the result of the team is more than the result obtained if the individuals are working by themselves. However, there is a problem with teams. Individuals could sometimes not use more than 75 per cent of their energy that would be used if the individuals worked alone. This means that the result of the team becomes lesser good than the result obtained if the individuals are working by themselves. To avoid this, the team should be formed as a cross-functional task team, i.e. compounded with complimenting competences, or formed with different personalities. The best is if both could be considered. (Wenell, 2001)

The concept of teams, with the purpose of work, is of a relatively late date. But it is hardly surprising to not find the word ‘team’ noted in the history. The word is hardly a fitting description for the many key groupings of people that has had a crucial impact on events the past three thousand years. There is however one exception during an early era, when closely knit bands of hunters and gatherers roamed around the earth. The social life was here much different from what followed later. Traces of surviving indigenous populations shows that there is a pattern of social behaviour, which has an elemental, spontaneous and sharing character. These small dynamical groups developed relations that were not build on authority. This primeval team gave away to, or was overwhelmed by the patriarchal society. (Belbin, 1996)
Working relationship changed when populations built and settled down in cities. The material progress became worth defending from outer threats, which led to building of weapons. However, weapons and violence were not enough, there had to be a disciplined organization. This organization was build by the patriarchal leaders, whom grounded the ideas on the war leaders’ authority. Its common feature was practise of and respect for power. The power begins according to its nature from the top and is exercised downwards through a series of subordinate relations. It was this system that industrial organizations took over. (Belbin, 1996)

The level on economical and cultural success that the industries reached depended however on division of labour. So the question became how work should be distributed. When time regulated work was introduced, age, sex and race became the guiding principles of dividing people and this way is still used in many modern societies. (Belbin, 1996)

When the old power structure began to fade, a problem arose with the old way to divide people. It neglected individual differences. Therefore, instead of the old mechanistic classification, a new began to breathe. This classification was based on individual skills, i.e. education and practice. (Belbin, 1996)

Through introduction of the public school, the basic chance for employment increased. However, after a time the public school created unwanted side effects. For the first became the later age at the entrance of working life, due to extension of education, that suitability for work had to be presumed. This was however often presumed wrongly. Young students could follow an education without much insight into the reality of the demands of the work. The second problem appeared with the higher amount of education. When more people became eligible for work, employers could discover that eligibility was not enough. In theory could any candidate be suitable for the work. The third problem was the higher complexity and flexibility that the works begun to have. With the fast progress of technology and strategic thinking, employers began to attach
higher importance to flexibility and teamwork. Therefore, a new way to divide work has to be used. (Belbin, 1996)

For a century ago all work was well defined and well understood. Today, however, organizations are more complex and flexible, which make it more difficult to divide work. The complex organization puts a higher demand in technical, organizational and social skills on the individual members. Due to this there is a pressure on the resource owners to select right person for the tasks. This makes it essential to every organization to have a clear strategy for the division of work to help the resource owners. (Belbin, 1996)

One of the most common ways to organize work today is to make projects of it. Project are in literature often describe as means to solve tasks that are unique. However, projects are today often used to handle all kinds of task, not only unique ones. The reason for this is that some firms view projects as a superior way to organize work. The former VP on Prevost Car in Canada states (Meredith & Mantel, 2000. see Gagne, 1997): “Right now it’s a question of finding what couldn’t be better managed by projects”. The projects do therefore become numerous. This situation in a company is called a multi-project environment (Wenell, 2001). With the growing popularity to organize work as projects, the concept of teams has become very important. This is because the project members often are formed as a team or as several teams.

The distribution of work is dependent on how the project teams are put together. This process will hereon be called the process of selecting project team members. This process is dependent on the project organization of the firm.

A popular way to organize projects in high-technology firms, with a multi-project environment, is to use a matrix organization. Ford and Randolph (1992) write that matrix management often is whatever a company defines it to be or how a researcher defines it for the purpose of the study. The
main characteristic with the matrix organization is however that it openly violates the management principle of unity of command by having dual lines of command (Larsen & Gobeli, 1987). In the matrix organizations, which are treated in this thesis work, the lines are the projects and the functions. Each function has a functional manager, which is also often referred to as line manager or resource holder, and each project has a project manager and sometime several sub-project managers. The projects and the functions share the responsibility over the personnel (Ford & Randolph, 1992). The process of selecting project team members is therefore a part of the interplay between the functions and the projects. Engwall (2001) describe it as a negotiation between the functional manager and the project manager.

This thesis work examines the situation at the costumer support department (GC) for the line of business called Gripen at Saab Aerospace. GC offer military aircraft costumers total solutions as well as products and services within the field of integrated logistic support and training. GC has a multi-project environment and is organized as a matrix organization. The department is adapting from having only one major costumer to sell its products and services to many different costumers. As part of this adaptation, a project called the multi-project is driven at GC. This thesis is meant to contribute to the adaptation work by examine the processes of selecting project team members at GC.

1.2 Discussion of Problem

As the above background of problem shows, there is of a high interest to master the assignments of people to project-teams in an organization. Surprisingly, there is not much research about it. The project literature does not take the organizational context in consideration. According to Engwall (2001), research studies have, during the last decade, shown that the organization is closely coupled to the projects. Further on has those findings indicated that the organizational context has to be included. Project teams are dependent on a complex environment of people, resources, organizational structures etc. One example is that there is always
an ongoing competition about allocation of resources and attention in an organization. The selection of individuals to a project is a negotiation process, which goes on during the whole project duration, between resource holders and project managers (Engwall, 2001. see Eskeröd, 1997). The success or failure of an individual project might often depend on those negotiations, instead of the skills that are taught in the project manager literature. We find it therefore interesting to examine the process of selecting project team members. In this thesis the meaning of project team members refers to all the members of the project team except the project managers and subproject managers.

The lack of literature about the studied topic, is however a problem. In order to tackle this and to emphasize different aspects of the studied phenomenon, the thesis approaches the topic from the following four perspectives (see Figure 1):

- The roles of the project managers and the functional managers.
- Competence development.
- Behavioural roles.
- Complexity of the projects.

Figure 1: The four studied perspectives, which the thesis deals with.
By doing this division, it was considered that a general view of the studied phenomenon could be achieved. It was also a way to shed a light on the situation at Gripen Customer Support (GC). In the following text the perspectives are discussed more closely.

The usual description of a functional manager is, according to Engwall (2001), a person that is a supervisor who directs the activities of its subordinates by direct orders and structures. The roles of these managers include planning, organizing, leading, coordinating and controlling, i.e. one that has great control over the functional division. However, in a multi-project environment, most of the operations of the division are controlled and supervised by different project managers. This can create power struggles, which is due to the dual command in the matrix organization (Davis and Lawrence, 1977). Instead of the direct supervision, the functional managers role is as a resource owner, i.e. to control the assignment of people and other resources that are in demand of different projects. This is not as easy as it seems. There is a high pressure from the different project managers, which want to have the same resources to their projects at the same time. (Cleland, 1984; Engwall, 2001) As was mentioned early the selection of individuals to a project is a negotiation process that undergoes during the whole project. This demands a good dialogue between the functional manager and the project manager. However, if there is a power struggle or if there is a high pressure on the functional managers, the dialogue is restrained. As Wenell (2001) points out, to get a matrix to work there has to be a feeling of responsibility over the collaboration between the functions and the projects. There must not be any “we” and “them” in neither the functional division nor the project. Therefore it was considered that it is important to get a deeper understanding over:

*What should the roles for the functional manager and the project manager be in their collaboration in the process of selecting project team members?*
It is also interesting to know how this collaboration works today at GC and what is good and less good with the present situation. This is an essential part in the selection process, therefore is this part the most important in the thesis. Some delimitation has been introduced to this perspective. The first delimitation is that the thesis does not bring up resource planning tools and techniques, due to that GC has an undergoing project that deals with this. The second delimitation is that there are only the roles for the functional manager and the project manager in the collaboration that is determined. Other roles for the functional manager and project manager fall outside the studied topic.

The importance of competence is not any new idea. It is therefore surprising that the management of competence has not been widely spread until recently. The question is why this is the case. One likely cause is that the companies’ values have come to be increasingly dependent on intangibly assets, knowledge assets, intellectual capital and intellectual property (Little, Quintas & Ray, 2002). Another cause can be that it is an accelerating change in the market, competition and technology that force companies to have a continuous competence development. This has also made the companies to realise that people are the focus of competence. Many more causes can be enumerated, however the result is that competence has become an essential idea in today’s organizations. In a multi-project organization it is usually the functional managers that are responsible over the long- term knowledge base, on which successes of the short- term projects are drawn (Engwall, 2001). There is a need to have the responsibility of the knowledge base in the functional division in order to collect, accumulate and develop the individual development (Wenell, 2001). According to Wenell (2001) there is often forgotten that there is a competence development in the projects. Wenell (2001) also points out that there are many opportunities, in almost every project, for competence development. Due to the importance of the competence development in an organization, it was considered that this should be included as one of the perspectives. The questions that were asked were:
How does the competence development affect the process of selecting project team members?

This part was regarded as the second most important part in the thesis.

The third perspective that is treated is behavioural roles, or more precisely team roles. This part has been added, due to that a project team that has been constructed only after how skilled people are will not automatically be a successful project team. As Florén, Ingelgård and Roth (2001, p.7) points out:

“The group is often formed by chance and people are chosen for their competence and not according to their personal character. When it does not work, it is seldom a question of competence but rather of personal chemistry”

Also Wenell (2001) points out the importance of team roles, but continue with that the team roles is not used in the process of selecting project team members. During the project start, it is, however, interesting to analyse how project team members works together, which team roles there are and so on. Wenell (2001) does however believe that behavioural roles will play a more important part in the process of selecting project team members in the future. The question that was asked is:

How can behavioural roles be used in the process of selecting project team members?

This part was considered to be the third most important perspective in the thesis.

Shenhar & Wideman (2001) points out that the projects are almost limitless in their range in objectives, size, complexity and technology. Therefore it is a benefit to have some way to classify the projects into a manageable framework. One way to do this is to classify the projects in how complex
they are. The research that has been made about this perspective is about how different projects with different complexity should be managed through the projects lifecycle. There is however a lack of research over how the projects complexity affects the composition of the project teams. This is strange due to that this should be very beneficial when constructing a successful project team. Take for example if a project has a high organizational complexity, then should maybe an extra team member with planning ability be selected. Another example is if it is technological complex, then maybe a member that is very competent on technology should be selected. This should be even more beneficial in a matrix organization, due to that this should contribute to a more effective use of recourses. Therefore it was considered that the projects’ complexity should be more closely researched and added to the thesis. This is the least important perspective and the question that was stated to be answered were:

*How is the process of selecting team members being affected by the projects different complexity?*

All perspectives is important for the selection process. The priorities among them has been set due to the thesis would be to complex and to large to be in time if every perspective would have the same priority. However, it was also considered that all four perspectives had to be included so that a general view over the studied topic could be obtained.

It was considered that views of the project managers, functional managers and team- project members should be studied. This was due to that it was those that had to do directly with the process of selecting project team members. This delimitation causes that priority between projects come to be placed outside the studied framework. This is due to that priority is not set by any individual project manager or functional manger.
1.3 Definition of Problem

The above discussion with the four perspectives leads to the following problem questions:

*Which problems are there at GC in the process of selecting project team members?*

*How could a basis for a model be design to improve the process of selecting project team members?*

1.4 Purpose

The purpose of this thesis is to, with the above given problem discussion, study the process of selecting project team members to find and analyse possible problems and to give recommendations for how the process could be improved. The recommendations will be used to create a basis for a model that can be used as a tool in the process of selecting project team members.

1.5 Delimitation

Since this thesis is only about the process of selecting project team members, the thesis does not discuss how the projects are performed. It is also impossible to cover all aspects of the studied topic in five months, which was the available time for the thesis. Therefore is the following delimitations introduced:

- The thesis work does not cover the topic of resource planning tools and techniques.

- Only the roles for the functional manager and project manager in the collaboration are studied.
• Only the view of the project managers, functional managers and project members is examined.

• How the priorities of the projects are set is not a part of the thesis.

• The proposed model is only a suggestion, since the model is not tested and therefore not evaluated. The main reason for not testing is that it would have taken too much time.
2 Method

This chapter describes the thesis’s scientific approach. It also describes how the work was carried out and why it was carried out in that way. The chapter ends with a discussion about the used method.

2.1 Scientific Approach

It could in general be said that there exist two major perspectives on science; positivism and hermeneutics. Positivism is based on that science should be exact, verifiable and free from subjectivity. The advocators of positivism have through history emphasized the importance of making a sharp distinction between knowing and believing. (Gustavsson, 2000)

The advocators of hermeneutics argue that it is impossible to reach true objectivity and that it is also undesirably to do so. Researchers should strive for an understanding of people and the world they live in. Phenomenon can only be understood in its context and they are therefore dependent on persons, time and culture. (Gustavsson, 2000)

This thesis is based on our own subjective understanding and interpreting of the studied phenomenon. The adopted view is therefore more closely related to the hermeneutic than the positivistic perspective.

Scientific work can be deductive or inductive. Deduction is conclusions about single cases that are drawn from general principles. Induction is conclusions about a general law that are drawn from single cases. If knowledge is built deductive the researcher starts from a theory and derivate statements from it. The statements are then tested empirically. If knowledge is built inductive the researcher gathers information about the phenomenon, systemizes the information and identifies statements from it to form new theories. (Patel & Tebelius, 1987)

The thesis work is based on the inductive conclusion, from the orderer at SAAB, that there exist problems in the process of selecting project
members. The work started, however, with a theoretical study followed by a phase where the work changed between theory and empiric. It could therefore be said that the work was mainly deductive, with elements of inductive work.

Qualitative research builds on that it is possible to take part in each other’s inner world through language. The researchers’ values and experience is a tool, which is used to come close to the people, who have the needed information. Quantitative research aims at describing and explaining the information that measurements have given. The researchers should try to neutralize the subjective elements in the information and try to collect the information as objective as possible. Quantitative research should give the same result if it is repeated. (Patel & Tebelius, 1987)

Patel and Tebelius (1987) argue that scientific work is in reality seldom true qualitative or true quantitative. This thesis work uses empiric information gained from both qualitative and quantitative research. Qualitative research was mainly used to gain information from management and quantitative research was mainly used to gain information from project members.

This thesis could be described as a case study with elements from action research. Patel in Patel and Tebelius (1987) describe case studies as thoroughgoing studies on a smaller group, e.g. one organization, which is a description that fit the thesis work well. According to Patel, the researchers that are committing action research should actively participate in the change of the studied phenomenon. This has to some extend been achieved through awaking insight to the involved persons about the problems.
2.2 Frame of Reference

The theoretical material serves two purposes. It increases the knowledge about the subjects and serves as a tool for analyzing the empirical material.

The literature on the subjects related to the thesis work was examined and an abstract of each of them were written. Material that was judged to be reliable and deliver the general view of the world of science was prioritized. It is difficult to make the judgment, but a used method was to try to use material that was found to be frequently referred to by others.

How the members of the teams are selected is directly depended on the project organization. The literature on matrix organization and neighbouring organizational forms was therefore studied. Information about the relationship between the project manager and the functional manager was extra interesting. There exist a large quantity of literature on the subject and the used literature is judged as reliable, but it is important to note that each company implements the organizational form differently.

The literature that deals directly with the selection of team members is not totally satisfying. Long-term goals, like knowledge development, are seldom taken into consideration and few of the given guidelines are adoptable to the matrix organization. The literature argues that the project managers should fight for the best people. That there are other projects, which also need resources, is not mentioned.

The literature about competence development was studied to get an understanding about how knowledge and competence is created and expanded. This was needed to better understand the problems and what is causing them. It also gave some ideas about how they could be solved.

The direction of the master thesis is towards the individual competence, but organizational competence has been added to get a comprehensive picture over the topic competence. The same is true for the part about the
knowledge creation process, there more than is actual needed for the master thesis has been added to be able to give a comprehensive picture.

Another aspect that needs to be taken into consideration when creating teams is behaviour science team roles. The models that where judged to be most suitable is presented in the report.

Different methods for estimating the complexity of a project were studied. Not much materiel on the subject was found and it was difficult to judge its reliability.

2.3 The Company Study

The company study has several purposes, it will result in an analysis of the present situation and point out problems and what it is that causes them. Since the organization is undergoing changes, the company analysis will also to some extent examine how the parts of the organization, that is relevant for the thesis work, is meant to be after the changes has been made. The company study will also give insight in what the employees, with different positions in the company, thinks needs to be done to solve the problems and what they think about some possible changes.

The needed information was gained with several different methods. Two work-shops and one tollgate meeting was attended, face-to-face interviews was committed and paper surveys was mailed out. Information was also gained at meetings with supervisors and orderer. The viewpoint has been that the best understanding is achieved by studying the situation from several different angles.

Help with selecting suitable respondents for the interviews were received from the supervisors at the company. The respondents were chosen to cover a broad range of views and situations. Because of prior experience, the importance of a proper preparation before conducting survey research is fully understood. A literature study on the subject has therefore been done.
The art of interviewing is a combination of improvisation and preparation. The better the preparation is the more successful the interview becomes. (Jacobsen, 1993)

Anderson, Wright & Rossi (1983) points out that if it is the researchers themselves that is collecting the data and if the data are not to be handled statistically, no strict formal questionnaire is required. A too formal questionnaire can inhabit. A battery of questions was put together before the interviews. This served as a support to get a dialogue during the interviews, but was not used strictly. Leading questions were tried to be avoided.

Three functional managers, three project leaders, one expert on behavioural science and one contemplated team leader were interviewed. The interviews with the functional managers, the project managers and the team leader were recorded. Each interview was approximately 45 minutes long. Each interview where shortly after it had taken place summarized.

The interview with the expert on behavior science was used to get information of both theoretical and empiric nature. Of extra interest was information about how the models could be used in practice and how they are used at SAAB today.

A paper survey was used to reach the project members. The reason for the usage of paper survey was to get a statistic view over project members’ opinions on the subject. The paper survey was mailed out after the interviews were done, so that information gained from the interviews could be used when designing the questionnaire. The surveys were sent out to 50 project members, of which 17 responded. The questionnaire can be found in appendix A.

The collected information can be in two symbol forms: numbers and words. Interviews and paper surveys can be adopted to attain either kind of them (Patel & Tebelius, 1987). In this thesis the interviews, gave
information with words as the symbol form and the paper surveys gave information with numbers and words as the symbol form.

2.4 The Analysis and Model Creation

After the company study, the literature and the empiric material was analysed and conclusions was drawn. Short complementary questions were mailed out to the interviewed project managers and functional managers. The model was then designed based on the conclusions from the analysis.

Lastly a seminar, with people, with different positions at Gripen, was done to present and verify the analysis and the model.

2.5 Discussion of Method

That only 17 of the 50 mail surveys where returned was below expectation. However due to that the return questionnaires had a good spreading among the different sections and of period of employment, the mail survey was considered to be of value to the study. The result was, however, critically examined before it was used in the thesis.

The help that was given to select the respondents for the interviews might have resulted in that the respondents represented a specific view not corresponding to the general view of the company. This was however judged as unlikely.

That the phenomena were studied from four perspectives limited the time available to study each perspective. If the complexity perspective, which was the lowest prioritised perspective, were removed, more time would have been available to study the remaining perspectives.
3 Theoretical Frame of Reference

This chapter presents some of the views and theories relevant to the thesis. It is divided into four sections: Project Organization, Transferring Competence, Behavioural Roles and Project Complexity.

3.1 Project Organization

This section presents the three major organizational forms for projects, with focus set on the matrix organization. The two other organizational forms are shortly presented, with their pros and cons, to be able to get a better understanding of the matrix organization and why it is used.

3.1.1 Functional Organization

In a functional organization, the project is a part of one of the functional divisions of the company. The chosen division is the project administrative base. Individuals with needed expertise are temporarily assigned to the project. Experts can be switch back and forth between projects with relative ease. Another advantage is that the project group has access to the entire technical knowledge in the functional division. The functional division also serves as a base of technology, procedural, administrative and policy continuity, which lower the damage when individuals leave the firm. The fact that the division contains the normal path of advancement for individuals whose expertise is in the functional area might motivate individuals to do a good job. (Meredith & Mantel, 2000)

There are unfortunately numerous disadvantages with housing projects in functional divisions. There are often several layers of management between the project and the client, which tend to make response to the client slow and uneasy. The functional units own work is usually given a higher priority than the work of the project. Often is the motivation of the people assigned to the project low, since individuals might see the project as a professional detour. Problem oriented thinking in the sense that the main goal is to make the project as successful as possible tends to be counteracted to the benefit of the activities related to its function. Project
issues that are directly linked to the division tend to be much higher prioritized than other issues. Complex technical projects can only be well designed if they are designed as a totality, but no functional division can avoid focusing on its own areas interest. In order to perform those projects well, another organizational form needs to be used. (Meredith & Mantel, 2000)

3.1.2 Pure Project Organization
In the pure project organization the project is separated from the rest of the parent system. The project becomes a self-contained unit with its own administration and technical staff. The project manager has full authority over the project and all the project members are directly responsible to the project manager. The project manager communicates directly with senior cooperate management, which results in faster communication with fewer failures. Quicker decisions can therefore be made, making the projects able to react more rapidly to new demands from the clients and senior management. Since the project team in this organization has a strong and separate identity the team member tends to develop a high level of commitment and motivation. The risk that the project is focused on a specific part of the project rather than the project as a whole is greatly reduced compared with in a functional organization. (Meredith & Mantel, 2000)

The pure project organization also has its disadvantages. When there are many projects at the same time in a pure project organization, it is common that each one of them is fully staffed, which is both expensive and restraining. The project manager is also likely to attempt to stockpile resources in order to be sure that it will be available when needed. People with critical knowledge are often hired when they are available rather than when they are needed. Project members often fall behind in those areas of their technical expertise that is not used in the project. Wenell (2001) expresses that the permanent functional division is needed to collect, accumulate and develop the individual learning. Pure project groups seem to foster a hostile attitude against the environment outside the project,
which might lead to that a strong we-they mentality is developed. Another common symptom is that the project members’ worry about what will happen to them after the project ends. They are therefore likely to try to prolong the project as long as they can. (Meredith & Mantel, 2000)

3.1.3 Matrix Organization
The matrix organisation can be described as a combination of the functional organization and the pure project organization. The matrix organization were first “developed” by high-technology firms that had to integrate several technologies and wished to time-share expertise between different projects. Their big and complex projects often required a systems approach. Two or more subprojects at the firm might later have to be joined together. For example one project might be a jet aircraft engine, the second a weapon system and the third an airframe. The integrated result rarely performs as originally thought because the parts are not design as a unified system. (Meredith & Mantel, 2000)

Housing the project in a functional organization was too constraining, while housing it in a pure project organization was too expensive. One way out of this was to use the matrix organization, were the project manager can temporarily draw technological competence from all relevant functional groups. (Meredith & Mantel, 2000) The matrix organization has in its early history been called “system organization” due to the fact that it supports system thinking (Cleland, 1984).

Structure
The matrix project is not separated from the parent organisation nor is it a part of a functional division (Meredith & Mantel, 2000).

In a matrix organization, there are usually two chains of command. Those are called “horizontal” and “vertical”. The horizontal chain deal with issues related to the functional division and the vertical chain with issues related to the project. The projects usually only exists temporary while the
functional line is permanent. Each project has a project manager and each functional division has a functional manager. (Badiru & Pulat, 1995)

Figure 2 shows a sketch over a classic matrix organization. The matrix is implanted differently in different companies, but they are all based on the structure shown in the figure. It is common that there is a program manager who has an overview of all the projects and sometimes all the functions are organized as one large division. (Cleland, 1985)

![Figure 2: A classic matrix organization (Cleland, 1984, p.74)](image)

The matrix organizations vary in how much relative power the projects and the functions have. The matrix organizations can be dived in three subclasses after how the power is distributed, these subclasses are strong, balanced and weak (Larsen & Gobeli, 1987). A strong matrix mostly resembles the pure project organization and a weak matrix mostly resembles the functional organisation (Meredith & Mantel, 2000). Larsen & Gobeli (1987) and Wenell (2001) write that matrix organization usually starts as weak matrixes and tends to become stronger and stronger over time.
In a strong project-driven matrix the project assigns needed people from the different functional divisions. The individuals are assigned to the project full-time or part-time. For example, a project can assign three people from the manufacturing division, four from R&D, one and a half from marketing, a half from finance and so on. The project manager controls when and what these people will do, while the functional managers control who will be assigned to the project and which technology that will be used. (Meredith & Mantel, 2000)

In a weak functionally driven matrix, the project manager may be the only full-time person assigned to the project. Instead of having actual individuals assigned to the project, the functional departments devote capacity to the project. The main task for the project manager is to coordinate the project activities carried out by the functional departments. The project manager informs the functional division about what needs to be done. This work is added to the normal workload of the division. (Meredith & Mantel, 2000)

Between the strong and the weak matrix is the balanced matrix. In a balanced matrix the project manager is responsible for defining what needs to be accomplished and the functional manager is responsible for how it is accomplished. This requires that the project manager and the functional manager share the responsibility and the authority over the workflow. (Larsen & Gobeli, 1987) Wenell (2001) writes that it can be difficult to get a balanced matrix to work.

**Functional and Project Managers**

The cooperation between the functional manager and the project managers is vital for the matrix organisation to work. It is therefore important that their roles are clearly defined and fully understood within the organisation. Their roles vary depending on how the matrix is implanted (Meredith & Mantel, 2000), but their general responsibilities are the same. (Cleland, 1984)
Since the project manager is responsible for a project, which is temporary, the project manager is focused on short-term goals, while the functional manager, who is responsible for a permanent division, is more focused on long-term goals. This is a good thing if the cooperation between the managers is working, since both short-term and long-term goals are considered, but it is also a large source for conflicts. (Cleland, 1984)

The functional manager is responsible for providing the projects with the resources they require to meet their objectives (Cleland, 1984). In order to achieve this, the functional manager needs to (Cleland, 1984):

- Avoid excessive peaks and valleys in the use of personnel and other resources.
- Maintain records of personnel utilization among the projects.
- Negotiate with project managers regarding the projects resources.
- Predict the future demands of resources.
- Handle personnel matters, e.g. training.

It is common that the functional manager is under great pressure from the project managers to give them more resources. The functional manager must be able to prioritize and look at the totality. (Cleland, 1984) Wenell (2001) points out that there is a limit for how many projects a person can take part in and still get something done.

The project manager is responsible for that the project meets its objectives. The project manager is depending on the functional managers to get the resources needed to meet the project’s objectives. To be effective, the project manager must prepare realistic requirements for resources and then successfully negotiate for them. Wenell (2001) expresses that it is good if the project manager has wishes for specific co-workers. The project manager needs to be able to look outside its project and understand the functional manager’s situation. The fact that other projects may have a higher priority must be understood and accepted. In other words, the
project manager is not only responsible to meet the projects objectives, but also to serve the whole company. (Cleland, 1984)

**Advantages and Disadvantages**

In a strong matrix, the advantage of strong attachment to the project from its members is shared with the pure project organisation and the motivation is therefore high. This might, as in pure projects, lead to that project members are worrying about what will happen when the project is completed. However, since each member also is part of a functional division, the feeling of insecurity is lower than in pure projects. For weak matrixes both the attachment and the feeling of insecurity is lower. (Meredith & Mantel, 2000)

An important advantage with the matrix organization is that it creates lateral communication channels that increase the frequency of communication in the organization. Matrix organizations also have a high flexibility in the use of resources. (Larsen & Gobeli, 1987) The duplication of work in pure project organizations is reduced in matrix projects. The sharing and utilization of resources is efficient. Projects can be staffed and given other resources so that a whole system is optimised, instead of just single projects. The project managers are unfortunately often more interested in the project than the company as a whole, which makes it difficult for the functional manager to balance the divisions’ resources. Since the projects get resources through negotiations, it is also hard to get away from that the project manager needs strong negotiation skill to be able to succeed with the project. (Meredith & Mantel, 2000)

The matrix organization breaks the general management principle of unity of command, since the project members have both the functional manager and the project manager as bosses. The unavoidable result of this is discomforts, split loyalties and confusions. (Meredith & Mantel, 2000) Conflicts between functional managers and the project managers are frequent. The most intense areas of conflicts are results of the split authority problem between project managers and functional managers. The
conflicts could be lowered through clarifying the authorities. (Larsen & Gobeli, 1987)

3.2 Transferring Competence

Competence is one of the most important intangible assets in an organization and it is the people that mainly have the competence in the organization. Unfortunately many employers see people as a cost, which means that competence development is seen as a cost not an investment. (Sveiby, 1997) It is important, but difficult, to persuade owners with short-term interest that competence development is a long-term investment and is of necessity. Further on, it is essential that resources, i.e. time, money and manpower, must not be allocated to knowledge creating activities, even though there might be beneficial in the short term and on economical rational grounds. (Florén, Inglegård & Roth, 2001)

This section discusses the two concepts knowledge and competence. It also discusses how knowledge is created and some different types of learning. Lastly, there is a short description on how individuals’ competence is determined.

3.2.1 What is Knowledge?

There are many definitions on what knowledge is and philosophers over ages have tried to define the word, without reaching a generally accepted definition. The definition that is used in this thesis work is based on the two philosophers Michael Polanyi and Ludwig Wittgenstein theories. The definition is that knowledge is a capacity to act. This is not a universal definition but a rather practical notion for managers. (Sveiby, 1997) However knowledge is dynamic, since it is constructed through social interactions among individuals and organizations or collectives. Knowledge is also context based, since without context the knowledge is only information. Information becomes knowledge when it is interpreted by individuals and put in a context that is directed by the individual’s beliefs and commitments. (Litte, Quintas & Ray, 2002 ; Sveiby, 1997)
There are two types of knowledge: the explicit knowledge and the tacit knowledge. Explicit knowledge can be formed into information and shared in form of data, specifications etc. It can be processed, transmitted and stored easily. Tacit knowledge on the other hand is very personalized and very hard to formalize. Knowledge like hunches, intuitions and subjective insights falls in this category. Tacit knowledge is deeply rooted in actions, procedures, routines, commitments and so on. It is difficult to transfer this kind of knowledge, since it is an analogue process that needs a kind of “simultaneously” processing. (Litte, Quintas & Ray, 2002)

When tacit knowledge is made explicit through language, it becomes static. It can then be distributed, analyzed and increased (Sveiby, 1997).

### 3.2.2 What is Competence?

Competence is the best way to describe knowledge in business context. The human competence cannot be copied exactly. It is obtained through training, mistakes, practise, reflections and repetition. With other words, competence is transferred by doing. (Sveiby, 1997)

The keyword “competence” lacks a distinct meaning. There are, however, some different apprehensions of it. One vital starting point is to see the difference between individual- and organizational competence. (Wolvén, 2000)

Organization competence is more and different than the sum of all individual co-workers competence. It can be described as the result of an organizations common learning in collaboration with the world around and the carrying out of its tasks. This learning is in the form of the organizations culture and the co-workers acting. The organization unique competence can also be described as its collected capacity to carry out the business concept, i.e. its superior ability. The main components are people’s competences and the organizations material and technical structures. The people are the main carrier of the competence. All this means in concrete manner that the organizations competence consist of the
organizations ability, which is stored in instructions, norms, rules and customs. (Wolvén, 2000)

Another description is that organizations competence is a complex phenomenon of knowledge that has been created in some way (Wolvén, 2000). Four forms can be distinguished (Wolvén, 2000):

- *The scientific research knowledge* that is often associated with the research and development department. Research knowledge is important in a long-term perspective, since the knowledge contributes to develop products and productions processes.
- *The organization transferred knowledge*, which is the knowledge that more directly belongs to the organization. It is the organizations “memory” in form of theories in the outside world, ideologies, acting, mental maps, norms and values.
- *The learning based knowledge*, which is the organization’s capacity to learn. One aspect is how good the organization, through for example routines, can be taught by experience. Another aspect is to learn from others experience.
- *The individual knowledge* (“embodied”), which is the knowledge that the individual takes into the organization and takes with it when leaving the organization. It is important to transfer the individual competence into organizational competence. It is also important to recruit individuals with relevant knowledge.

The organization competence is a mix of all four forms. The individual knowledge is the most strategic form, since it is the individual that build the knowledge. (Wolvén, 2000)

The individual competence can be sorted into five different types (Sveiby, 1997):

- *Explicit knowledge*, which involves knowing fact. This is obtained mainly from information through for example formal educations.
• *Skill*, which is obtained through training and practice. This knowing involves practical experience, both physical and mental. Rules of procedure and communicating skills are included in this knowledge.

• *Experience*, which is obtained mainly through reflecting over past mistakes and successes.

• *Value judgments*, which are perceptions of what the individual believes to be right. This works as a filter for the process of knowing.

• *Social network*, which is the relationship that the individual has with other individuals in an environment and a culture that is transferred through traditions.

The more skilled the individual gets, the more the individual can modify rules within its profession. A very highly skilled individual can even invent new rules. This individual has become an expert. The expertise cannot be transferred to another individual. (Sveiby, 1997)

A different description on individual competence is to divide it into the following parts (Wolvén, 2000):

- Psychomotor factors, i.e. different types of intentional and manual skills. For example dexterity.
- Cognitive factors, i.e. different types of knowledge and intellectual skills. For example skills to solve problems and to make decisions.
- Personality factors, i.e. qualification to act related to the type of personality. For example self-reliance.
- Social factors, i.e. different social skills. For example collaboration-and communications skill.

## 3.2.3 The Knowledge Creation Process

It is essential that the top management understand the company’s knowledge creation process and gives the knowledge management top priority (Florén, Inglegård & Roth, 2001). It was Nonaka and Takeuchi that first suggested that the knowledge was created from the interaction of the two types of knowledge, tacit and explicit. They criticized the western way
to being preoccupied with the acquisition, accumulation and utilization of existing knowledge. The western has forgotten to create new knowledge. Nonaka and Takeuchi particularly argue against those organizations, that say that organizations can manage “single-loop learning”¹ themselves but that “double-loop learning”² need an outside involvement. An organization can change its fundamental rules through the interaction between explicit and tacit knowledge. Here follows a short version on Nonaka’s and Takeuchi’s theories. (Sveiby, 1997)

Knowledge is an ongoing process that changes old context that the individuals have, into a new context. The individuals get a new view of the world and a new knowledge. Every individual also changes the context, as knowledge is created among individuals or individuals and the environment. (Little, Quintas & Ray, 2002)

The model for knowledge creation consists of three elements (Little, Quintas & Ray, 2002):

- The SECI (Socialization, Externalisation, Combination, Internalisation) process, which is the process of knowledge creation through the interaction between tacit and explicit knowledge.
- Ba, which roughly means place, is the shared context.
- Knowledge assets, which is the input, output and moderator of the knowledge process.

The three elements must interact with each other see Figure 3 (Little, Quintas & Ray, 2002).

¹ The learning is a given in a frame and the knowledge, its goal and the organization/system are never questioned (Wolvén, 2000).

² The learning process, its goal, the knowledge that are mediated, the individuals and/or organization role and system are consciously being thought over (Wolvén, 2000).
The first element, the SECI process, creates the knowledge through the interaction between tacit and explicit knowledge. This interaction is called ‘knowledge conversion’. This conversion consists of four models: socialization, externalisation, combination and internalisation (see Figure 4). (Little, Quintas & Ray, 2002)

**Figure 4:** The SECI process (Little, Quintas & Ray, 2002, p.47).
Socialization is the process where the new tacit knowledge is converted through shared experience. This conversion occurs when individuals are spending time together or living in the same environment. One example of socialization is the traditional apprenticeship. (Little, Quintas & Ray, 2002; Sveiby, 1997)

Externalisation is a process of articulating tacit knowledge into explicit knowledge. When tacit knowledge is made explicit, the knowledge becomes a base to new knowledge. In this conversion, the tacit knowledge takes the form of metaphors, models, concepts, and equations. One example of externalising is a manager book. (Little, Quintas & Ray, 2002; Sveiby, 1997)

Combination is the process of making explicit knowledge more systemized and complex. Explicit knowledge is combined, edited, or processed to new knowledge with other explicit knowledge that is collected inside or outside the organization. (Little, Quintas & Ray, 2002)

Internalisation is a process to embodying explicit knowledge into tacit knowledge. This is almost the same as learning by doing. Example of internalisation is training programs to help trainee to understand an organization and themselves. Other examples are simulations or experiment. (Little, Quintas & Ray, 2002; Sveiby, 1997)

One important thing with the SECI process is that the movement through the four models generate a spiral, not a circle. In the knowledge process the tacit and explicit knowledge is amplified through the four models of knowledge conversion. (Little, Quintas & Ray, 2002; Sveiby, 1997)

The second element, which roughly means place, is defined as a shared context in which knowledge is shared, created, and utilized. Knowledge needs context to be created. For example, social, cultural, and historical context are vital to individuals, since such context help individuals to create meaning of information. Ba does not necessarily mean a physical place. It
could also be a virtual place like e-mail or mental place like shared ideals. (Little, Quintas & Ray, 2002)

The third element, and at the base of knowledge creating process, are the knowledge assets. These assets are the inputs, outputs and moderating factors of the knowledge-creating process. Four different types of knowledge assets are proposed: experimental-, conceptual-, systematic-, and routine knowledge assets see Figure 5 (Little, Quintas & Ray, 2002)

<table>
<thead>
<tr>
<th>Experimental Knowledge Assets</th>
<th>Conceptual Knowledge Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tacit knowledge shared through common experiences.</td>
<td>Explicit knowledge articulated through images, symbols, and language.</td>
</tr>
<tr>
<td>• Skills and know-how of individuals</td>
<td>• Product concepts</td>
</tr>
<tr>
<td>• Care love, trust and security</td>
<td>• Design</td>
</tr>
<tr>
<td>• Energy, passion and tension</td>
<td>• Brand equity</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Routine Knowledge Assets</th>
<th>Systematic Knowledge Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tacit knowledge routinized and embedded in actions and practices.</td>
<td>Systemized and packaged explicit knowledge</td>
</tr>
<tr>
<td>• Know-how in daily operations</td>
<td>• Documents, specifications, manuals</td>
</tr>
<tr>
<td>• Organizational routines</td>
<td>• Database</td>
</tr>
<tr>
<td>• Organizational culture</td>
<td>• Patents and licences</td>
</tr>
</tbody>
</table>

**Figure 5:** Four categories of knowledge assets (Little, Quintas & Ray, 2002, p. 55).

**Experimental Knowledge Assets** consist of shared tacit knowledge, that has been build in the organization through hands on experience among the members and between members and their customers, suppliers and affiliated firms (Little, Quintas & Ray, 2002).

**Conceptual Knowledge Assets** consist of explicit knowledge clarified through images, symbols and language (Little, Quintas & Ray, 2002).
Systematic Knowledge Assets consist of systemized and packaged explicit knowledge, such as manuals and documented information (Little, Quintas & Ray, 2002).

Routine Knowledge Assets consist of tacit knowledge that is routine work and are embedded in the actions and practices of the knowledge. A characteristic of these assets is that they are practical. (Little, Quintas & Ray, 2002)

3.2.4 Two Types of Learning
There are different types of learning methods and some are better than others. There have been many attempts to measure how good different methods of transferring competence are. They show that the common lecture is the least effective. After five days, most people remember only about ten percent of what they have learned. Best result however, is achieved with learning by doing. Around sixty to seventy percent is remembered if this method is used. Here follows a short description of common course and learning by doing. (Sveiby, 1997)

The common course is the most dominating learning form today in the organized education. Common course means that a group of people come together for a while and through lectures, discussions and group work attain knowledge. (Dalin, 1997) According to Dalin (2000) this form of learning is suitable for following goals:

- Mediation of knowledge and experiences, which gives valuable background to profession performance, for example idea material.
- To establish new contacts.
- To exchange, discuss and analyse experience.

A better way to learn than common course is learning by doing. Competence is transferred best when the recipient participates in the process. Since the beginning the apprentice has learned from a master. The master has shown the apprentice how to do, the apprentice has tried to
imitate, and the master later judged this effort. When the apprentice gradually got better, the apprentice looked another way to be inspired, for example to another master. On this way the apprentice gradually became a master. The skills of leadership are learned this way. One problem is that learning by doing takes time, and it seems that time is a limited resource. Another drawback is that it is so tacit that an individual has to be of a profession to acquire its skills. Nevertheless, it is an effective way to transmit competence because it uses all six senses. A problem is, however, that masters or experts tend to be one-track minded. An economist, for example, believes that economics can solve all problems. This is why a system where an interaction between information and tradition, between tacit and explicit knowledge like the knowledge creating process in the section 3.2.3 above is needed. (Sveiby, 1997)

One example where the master/apprentice learning process can be used is in the project teams. There are many chances for competence development in almost all projects, but the chances are rarely used (Wenell, 2001). If a project for example need three skilled persons to accomplice a task, a forth member that is an apprentice can be added. (Sveiby, 1997) A manager can be a master or a pattern for many employees, this is why the expression “live like you teach” is important for managers. This is also the case for all the key persons that have become masters. (Dalin, 1997)

3.2.5 Team-Based Learning

Successful team-based learning is when the team gains knowledge, skills and abilities as a team, in other words when the team is able to achieve something they have not done before. Focus is lifted from the individual’s skills to the collective skills of the group. The learning is co-operative and involves everyone. The team-members first alternative should always be to learn from each other. (Hills, 2001)

If team-based learning shall work, it is necessary that the team members are committed to support both the team and each other. Team members are more likely to teach or learn if they are satisfied with how the team
operates and if they feel involved in the decision-making process. A leader in the team is needed to provide the focus for holding the team together and to encourage the team to learn and tackle new things. It is important that teams sometime stop their work and review the effectiveness of the learning process as well as what is learnt. It is however difficult to stop and review a process in mid-flow. (Hills, 2001)

The team-based learning should be planned. A skills analysis needs to be done. The skills analysis should be collective rather than individual. It can either be procedural, e.g. by using a formal model, or casual, e.g. based on a discussion with a few notes. The planning process should also include both requirements for new skills within the team and analysis of the key risks facing the team. The risk analysis should be studied to get an understanding of how the team is equipped to meet the risks. (Hills, 2001)

Howard Hills (2001) recommends a simple and quick technique to help a team plan their collaborative learning. Each team member writes, on separate post it-notes, three personal development needs and three skills they can coach others on. The notes are then attached to two flip charts, one for the needs and one for the skills. The next step is that everyone looks at the flip chart with the needs and makes offers to those they might be able to help. Help form outside can cover needs that have not been met. The team members then look at the flip chart with the skills and search it for something they want to learn. Contracts can be signed to make the process more formal. A precondition for this exercise to work is that the team members are willing to share their learning needs and willing to help each other. (Hills, 2001)

Team-based learning relies on an open flow of information between the team members. This is why internal communication is an important keyword. The members of the teams must be open about their learning needs and their skills. If the communication shall work, the team members must trust, respect and understand each other. The understanding of each
other can be increased with help from behavioural science models like Belbin team roles (see section 3.3). (Hills, 2001)

External communication is an important part of the learning process. Cross-team-sharing should be encouraged. A highly important part of the external communication is feedback on the current situation. It is not easy to get objective feedback. (Hills, 2001)

Barriers for team-based learning could be internal competition in the team, lack of openness, paternalistic approaches, distance and time, reliance on opinion, silo mentality, lack collaborative working and lack of understanding of the learning process. Internal competition could produce high performance teams, but the team members are unlikely to teach each other. Lack of openness may cause that some individuals are not willing to share their needs or skills. Lack of willingness to share learning may also be caused by a paternalistic approach. Distance and time are barriers to understanding and trust. Teams that only meet occasionally will find it difficult to understand and trust each other. Learning is based on feedback and the feedback must be objective and factual, not based on opinion. Silo mentality, in the sense that team members have much stronger loyalty to one task than others, is a barrier to a good external communication. In some effective teams, the members works on their own, concentrating on task that they are good at. The team members do not learn from each other and the flexibility is low. All team members also need to know some of the basic principles of the learning process. (Hills, 2001)

There are several benefits of team-based learning (Hills, 2001):

- Everyone’s skill is developed which result in that the team develops flexibility for the future.
- By helping each other to learn, the team members get a better understanding of the perspective of others.
- The team members will appreciate the others’ efforts more, since they will understand them better.
• It contributes to a mutually supportive environment in the team.
• The motivation to learn is increased if other team members support it.
• The sense of achievement when a new skill is learnt is increased if the other team members applaud it.

3.2.6 How to Determine Present Competence

The determination of present competence can be done in two ways (Dalin, 1997):

• Describe formal education, through past education and practical experience.
• Form an opinion on which grade the worker master different tasks.

Dalin (1997) recommends the last point and to achieve this, employees have to estimate how good they are on the different tasks. The manager must do the same for every employee. This is to prepare to a conversation between the manager and the employees. The goal of the conversation is to get a common image over the employees’ competence. A scale for every employee should than be made there the competence is graded. This scale is a base for judging every employees competence, compared with other employees competence in the organization.

3.3 Team Behavioral Roles

When a group will be formed, it is not only important to look at the competence. It is also important to look at the personalities of the individuals (Florén, Inglegård & Roth, 2001). One way to examine individuals’ personalities is to use team roles models. At management courses it is spent a high energy on teaching how to bring forward team roles, but they give seldom any practical use in the selection of team members. There are other factors that determine which individuals that are suited for the project task. There is, however, interesting during the project start to analyse the team and see what it is for individuals that is going to
work with each other. One reason to do this is to know which team roles that are represented and what this imply for the team’s possibilities to work. Another reason is to see how the team probably will act and to see the strengths and weaknesses of the team according the ‘book’. Models like Belbin’s and Margerison and McCann’s are sufficient clear to be used in the team analyse. (Wenell, 2001) Further on Wenell (2001) believes that there will be a higher use of behavioural science models in the selection of team members. The companies will not afford to not put together team right at the beginning, in the tomorrow competition. This section will therefore discuss two different models of team behavioural roles:

- The Belbin’s group model
- Marginson and MaCann’s Team Management Wheel

### 3.3.1 Belbin’s Team Roles

Belbin’s team roles build on nine years of research about how different team performs due to how the teams are compounded (BelBin Svenska AB). These roles are (Management Teams International) (BelBin Svenska AB):

- **The Implementers**, whom have a high developed self-knowing that gives some self-control. They are also very disciplined, conscientious and are aware of external obligations. Implementers are obstinate, practical, responsible, tolerant and conservative, in the way of respecting established conditions and approaches (Belbin, 1996). They turn decisions and strategies into manageable and defined task that people can handle. They favour hard work and tackle problems in a systematic way.

- **The Coordinators**, whom may not always be team leaders, but that is what they are good at. They are the ones who preside over the team and coordinate its efforts to meet external goals and targets. They are mature, trusting, confident and delegates readily. In interpersonal relations they can easily spot individuals talent and use them in pursuit of the goal.
• **The Shapers**, whom are highly motivated people with a lot of nervous energy and a great need for achievements. They are impulsive, emotional, outgoing, impatient, quick to challenge and quick to answer challenges. They like to lead and to push others into action and if obstacles arise, they find a way around. The shaper is most likely to be the team leader if no coordinator is available, or if the coordinator is not the team leader.

• **The Plants** are the teams’ innovators and can be highly creative. They provide ideas, from which major developments spring. They often want to operate by themselves at some distance from other team members. They tend to be introverted and react strongly to criticism and praise. Plants are independent, clever and original and may be week in communicating with other whom is not on the same wavelength.

• **The Resource Investigators**, whom are relaxed, sociable and gregarious. They are enthusiastic and are good at communicating with people outside and inside the company. Resource Investigators are good at negotiating and are adept at exploring new opportunities and developing contacts. They are not great at generating ideas, but they are good at picking up others idea and developing them.

• **The Monitor Evaluators**, whom are likely to be serious, prudent, not very exciting, not over imagine and a bit of a damper. Their contribution to the team lays in measured and dispassionate analysis rather then creative ideas. They are the team members that are best on stopping the team from committing itself to a misguided project.

• **The Team Workers**, whom are the members of the team that are most sensitive. They are aware of individuals’ needs and worries and are the people that can perceive the emotional problems within the group. Team Workers are mild, sociable and have grate capacity for flexibility. They can adapt to different situations and people.

• **The Completer Finishers** are worrying about what could go wrong. They are never at ease until every detail have been checked by them and made sure that everything has been done. They have a great capacity for follow through and attention to detail.
• *The Specialists*, whom are resolute. They pride themselves on acquiring technical skills and special knowledge. Their priorities is to maintain professional standard and on furthering and defending their own field.

For Belbin, each of these team roles has an important part to play in achieving an effective group process. It is the balance between the contributions of each role that delivers the opportunity for the group to make good decision through allowing the dynamic between individuals to form a complementary process, not a destructive one. (Martin, 2001)

There are some different factors that are especially important in the construction of a winning team according to Belbin. For the first, it is suitable that the personal characteristic of the team leader is of coordinator profile. The second factor is presence of a Plant, i.e. the team needs a talented and creative co-worker. Here is creativity more important than the talent, but there is a benefit if both exists in same person. A talented Plant is regarded as trustworthy, but if the Plant is not talented, it can easily lead to that it goes wrong due to that the Plant cannot fulfil its role. The third factor is a good spread of the team workers mental ability, i.e. a team needs a very talented Plant and one more team member that is talented. The team also needs a Coordinator that is some above the average in mental ability. A Plant that is talented and spectacular is an asset to the team only if the responsibility lies with another, like the Coordinator. The Plant also needs a third person with high mental ability like the Monitor Evaluator to sharpen ideas and thoughts. Another reason for that a Monitor Evaluator is needed is that there has to be someone that can analyse and evaluate scarcity of original ideas. It is suggested that other team members should have a bit lower mental ability than the average. The forth factor is a good spread of team roles. To have different team members, increases scope and decrease discords between two or more members that are competing over same role. The team will also be flexible and can adept faster to changes in the world around. The fifth factor is that it is of vital significance for the team members to find right task that correspond to their personal qualities and
capacity. The sixth and last factor is to adjust an unbalance in the team group, i.e. adjust weakness due to loss of a team role. The way to do this is to let the team identify its weakness at the first meeting and choose one of the team members to play the missing role. (BelBin Svenska AB)

Less good team constellation is, according to Belbin, to create a so-called brain trust team, with only very talented people. This is because those teams devote a long time to a discussion to persuade each other, which does not lead anywhere. Every team members sees the week point in others arguments and when a decision has to be done there is no unanimity. A lot of important and urgent task is also often neglected. (BelBin Svenska AB)

It is also less good to have a team that has similar personality. This is because the team has a tendency to amplify the jointly team roles. Another problem with this constellation is that it has problem to adapt to different situations. This is because the team is adapted to a certain situation. (BelBin Svenska AB)

3.3.2 The Margerison- McCann Team Management Wheel
Another model of group roles is Margerison and MacCann’s Team Management Wheel (see Figure 6). This model attempts, according to the authors, to go beyond the Belbin model by showing that people have a special work preferences that is related to how they play in a team. (Martin, 2001)
The model is based around the Team Management Profile Questionnaire, which measures individuals work preference on four dimensions (Martin, 2001):

- **Relationship**, which is if people interact with others in a more extrovert or a more introvert way.
- **Information**, which is if people handle information in a more practical or a more creative way.
- **Decision**, which is if people take decisions, based more on analysis or more on beliefs.
- **Organization**, which is if people organize themselves and others in a more structured or a more flexible way.

The information that is obtained from the test provides a profile of the individual in terms that can be translated onto the Team Management Wheel. Following characteristics is there to be found into the wheel (Davies, 1995):
• **Creator- Innovators** are people who have many ideas that may well challenge and upset the existing way of doing things. Those people can be independent and wish to pursue their ideas regardless of present systems and methods.

• **Explorer- Promoters** are often good at both generating ideas and getting people enthusiastic about them. They are also good at bringing back contacts, information and resources that can help innovation in the team.

• **Assessor-Developers** provide a balance between the “exploring” and the “organizing” parts of the team management wheel. They often try to find ways and means to make an idea work in practice.

• **Thruster- Organizers** are the people who will get things done. When an idea is of interest they set up procedures and systems and turn the idea into a working reality. They will organize people and systems to ensure that deadlines will be met.

• **Concluder- Producers** take a great pride in producing a product or service to a standard. They can ensure that results are achieved and that the work of the team is effective and efficient.

• **Controller- Inspectors** are people who like doing detailed work and making sure that the facts and figures are correct. They are careful and meticulous and often critical of errors or unsystematic work.

• **Upholder- Maintainers** are often people of strong conviction about the way in which things should be done. They are good at providing support and stability to the team.

• **Reporter- Advisers** are good at generating information and gathering it together in such way it is understood. Such people are usually patient and prepared to not making a decision before they know sufficiently about the work to be done.

• **Linker** is not seen as a preference as such, but as a skill that can be developed by any manager. This activity is central to team activity since it performs a connecting role in ensuring that the team operates in affective manners.
The idea of the Margerison and MacCann’s Team Management Wheel is to have a balance of individuals across the preferences in the wheel. Most important is that different situation and team objectives require different combination of roles from the wheel. (Martin, 2001)

A high performance team should according to Margerison and MacCann (Martin, 2001):

- Accept that all team members have a responsibility to undertake the linking role.
- Have high expectations and set high targets.
- Gain high levels of job satisfaction.
- Experience high levels of co-operation.
- Provide team manager who lead by example.
- Develop teams that have a balance of roles matched to skills.
- Experience high degrees of autonomy.
- Learn quickly from mistakes.
- Develop teams that are ‘customer’ orientated.
- Display good problem-solving skills and review group performance.
- Be motivated to perform.

The reason that teams fail is (Martin, 2001):

- A lack of balance across the team roles.
- A lack of effective linking between the roles.
- A lack of effective relationship management within the team.
- A lack of effective information management within the team.
- The existence of impoverished decision-making process.
- The tendency to want to take decisions too early in the process.

The models of Belbin and Marginson and MacCann could provide managers with the ability to design teams through the selecting and training of individuals. It is a kind of subtle manipulation. This does however not guarantee that individuals will perform in totally predictable ways. That is
why the Margerison and Ma cann model is specifically intended to be used for development purposes only and not as a part of the recruitment or selection process. (Martin, 2001)

3.4 Project Complexity

This section presents three different methods, which could be used to judge the complexity of a project.

3.4.1 Complexity Matrix

The complexity of a project can be divided into two dimensions: organizational complexity and technical complexity. The technical complexity is high for new technologies that are unfamiliar to the company and low for more familiar and routine technologies. The organizational complexity has a large variety of sources, e.g. project size and cultural differences. (Schneiderman, 2002)

3.4.2 Management Scope and Technological Uncertainty

Shenhar and Wideman (2001) has proposed a two dimensional matrix, with project management scope as one of the axis and technology uncertainty as the other, as a classification system for projects (see Figure 7).

Figure 7: Matrix with scope and technological uncertainty (Shenhar & Wideman, 2001, p. 7).
The two continuous scales has for practical reasons been reduced to three levels of project management scoop and four levels of technological uncertainty. The three levels of project management scoop are as follows (Shenhar & Wideman, 2001):

- **Level 1 – Assembly**: A project that consists of components and modules that is combined into a single unit belongs in this category. It can be an independent self-contained product that performs a single function or it can be a product that performs a well-defined function in a larger system.

- **Level 2 – System**: The system level is for projects consisting of a “complex collection of interactive elements and subsystems within a single product, jointly performing a wide range of independent functions to meet a specific operational mission or need”.

- **Level 3 – Array**: This level is for programs rather than single projects. A program is a series of related projects, which are working together to accomplish broad goals. An example is a national defence system.

The four levels of technological uncertainty are listed below. The technology content of the project decides which of the four levels it belongs to (Shenhar & Wideman, 2001):

- **Type A – Established Technology**: Projects in this category rely on existing and well-established technologies. The projects in this category may be large but no new technology is used in them.

- **Type B – Mostly Established Technology**: Projects in this category are similar to those in Type A, but involve some new technology or feature. Improvements and modifications to existing products do normally fall into this category.
• **Type C – Advanced Technology:** The projects that belong in this category are often called high tech projects. Most of the technologies in these projects are employed together for the first time. The individual technologies have, however, already been developed.

• **Type D – Highly Advanced Technology:** This category is for projects that use technology that do not entirely exist when the projects starts. These projects are sometimes referred to as Super high tech and research and development projects falls into this category.

Figure 8 shows this division. The figure shows what is increasing and what it is an increased need for when the technological uncertainty, the project scope or both are increased (Shenhar & Wideman, 2001).

![Figure 8: The matrix in Figure 7 with defined levels (Shenhar & Wideman, 2001, p. 8).](image-url)
3.4.3 Complexity Factors
The Pennsylvania department of environmental protection (2002) has a guide for estimating the complexity of a project. A long list of complexity factors is presented, which each should be rated with a complexity score from 0 to 5 by the project manager. Each factor should also be given a factor weight from 1 to 5. The complexity score is then multiplied with the factor weight to get the adjusted complexity score. The complexity factors are: (Pennsylvania Department of Environmental Protection, 2002)

1. Development cost
2. Development turnover risk
3. New technology risk
4. Variety of Business Functions Performed
5. Variety of Types of Information Included
6. Integration Considerations
7. Policy/Procedure Changes
8. Mission Critical vs. Support Applications
9. Security/Audit Requirements
10. Revenue Producing
11. Program Areas Affected / Organizational Boundaries Crossed
12. Application Impact
13. Number of stake folders
14. ECommerce and Web enable
4 Description of Company

This chapter gives a short description of the company and its relevant lines of business.

4.1 Saab AB

The Saab Group consists of Saab Systems and Electronics, Saab Aerospace, Saab Technical Support and Services, Saab Bofors Dynamics, Saab Ericsson Space and Saab Aviation Services. The group has 14000 employees. The largest owners are BAE Systems and Investor.

4.2 Saab Aerospace

Saab Aerospace is owned by Saab AB and the headquarter is located in Linköping. Saab Aerospace develops entire aircrafts and subsystems for the defence market. The company also serves as a partner and supplier to manufacturers of large commercial aircrafts. Saab Aerospace stands for about 25% of Saab's total turnover and has about 4000 employees.

Saab Aerospace is mostly known for its fighter Gripen. Saab Aerospace is also participating in the development of UAV:s, Unmanned Aerial Vehicles, and has developed the UAV-concept FILUR, Flying Innovative Low-observable Unmanned Research. The company is also responsible for development and integration of Tactical Mission Systems, TMS, and forward fuselages for NH 90 helicopters. Saab Aerospace will develop and produce parts of the wings for the new Airbus super jumbo A380.
4.3 Gripen

Gripen is the name of one of Saab Aerospace units of business. As the name implies, it is responsible for the Gripen products.

Gripen is a fourth-generation fighter. It is designed to handle intercept, attack and reconnaissance missions and can change missions while in air. Through a data link system, the plane can share information with other aircrafts, command systems and other defence systems.

Figure 9: JAS 39B (www.gripen.com).
There are today two models of Gripen; JAS 39A and JAS 39B. JAS 39A has one seat and JAS 39B has two seats (see Figure 9). They both have the same capacity except that 39B is without automatic gun. Future models of Gripen are JAS 39C/D, which will be delivered to the Swedish air force in the beginning of 2003, and a new two-seater, which will be finished 2010.

### 4.4 Costumer Support (GC)

Costumer support is a line of business under Gripen. GC’s business concept is:

"We offer military aircraft costumers total solutions as well as products and services within the field of Integrated Logistic Support and Training.

Through flexible concept, strong business relationships, a competent organization and long term product commitment we deliver added value to our customers and a significant contribution to Saab’s financial profitability."
GC is also divided in different lines of business (see Figure 10). The project managers belong to the project office. Large lines of business are divided in different sections. Each section is a functional division and the section manager is the functional manager of the division.

**Figure 10:** The line of business at Customer Support.
5 Selecting Team Members at Customer Support

This chapter presents the empiric material of the thesis work. The empiric was gained from interviews, one mail survey, various documents and meetings.

5.1 Project Organization

Saab used to be a functional organisation. Today almost all work is carried out within projects and the organization is formed as a matrix organization.

The general view is that the function is strong, in other words the matrix organization is weak. According to one functional manager, it is depending on the functional manager how strong the function is. Some still live in the old system. One project managers said that they seem to “swing” between a functional driven and a project driven organization. Many wrestling matches occur due to that the responsibilities and the interface is not properly defined.

The community is, with a few exceptions, mainly in the functional division. The persons assigned to a project sits in their functional division. The project manager or the subproject manager usually has too many project members to be able to keep a daily contact with them.

A project called the multi-project is driven at GC. One result of the multi-project project at GC should be an implementation of a balanced matrix, there the projects buy recourses from the functions. Two reasons for the implementation of the balanced matrix is to clarify the roles and to some extend increase the community in the projects. The persons assigned to a project will still not leave their functional division, but will be divided in teams, which are lead by a team leader. The team leader should be one of the players in the team, but should also have responsibilities to the project manager or the nearest subproject manager with the team’s activity plan.
and its follow-up. Each team should have a maximum of 10 persons, which is meant to enable the team leader to have a good contact with each of them.

The project members were asked if they understood the roles of the project managers and the functional managers. As showed in Figure 11, 82% percent answered that they did.

![Figure 11](image)

**Figure 11**: Result from the question “Do you understand the roles of the functional manager and the project manager?”.

### 5.1.1 Functional Managers

The functional managers at GC have many names: line managers, section manager and resource owners. In Saab Aerospace’s role description of the functional managers, the following general description can be read:

> "The manager has to plan, develop and lead the work within his/her field of responsibility. In addition the manager is responsible for competence and resource development of co-workers for the fields of competence concerned."

In the document about the balanced matrix it can be read that the function should be responsible for WHO and HOW. The function is therefore responsible for ensuring that the right competencies are available and that processes, methods, tools and facilities exists.
The interviewed functional managers were asked what they viewed as their most important responsibilities. One answered that it is to ensure that all co-workers know what they should do and that they enjoy working. Another said that it is to coach the co-workers, see to the totality and predict future demand on resources. The third answered that it is barely time to handle the most important responsibilities due to involvements in the projects, but emphasized the importance of predicting which resources that will be needed in the future.

Two of the functional managers worked in projects, one as a subproject manager. Being both a project manager and a functional manager forced the manager to negotiate with himself about the resources, which created an uneasy situation.

The functional managers said that they do not and should not have any responsibilities for the carrying out of the projects. The functional division is responsible for delivering the quality and the competence that the projects need. There were however one exception there the function had two projects, which it was the project sponsor for.

5.1.2 Project Managers
The general description of the project manager in Saab Aerospace role description is:

“A Project Manager plans and manages the project with a business-mined strategy, ensuring that the project goal and objectives are fulfilled. The Project Manager acts on behalf of the Project Sponsor.”

The balanced matrix document declares that the project is responsible for WHAT and WHEN. The project should be responsible for that processes, methods and tools are used correctly.
The project managers said that their most important responsibilities were to follow the timetable and the budget. One project manager described the project managers’ role at GC as jumbled.

5.1.3 The Collaboration

It can be read in the balanced matrix document that it is a delusion that the functional manager and the project manager only have to meet when resources are appointed. The possibility for the project managers to successfully facilitate a project depends on the full support from the functional organization.

The project managers and the functional managers gave a varying picture about how the collaboration between them is working. The project managers were more positive than the functional managers.

The functional managers generally blamed the problems on the project managers and vice versa. Almost all expressed that there exist a lot of indistinctness about the connection between the function and the project. They feel that they fumbles in the dark and do the best they can and usually it works okay, but a good definition about how it is suppose to work would help a lot.

The functional managers said that they only hear from the project managers when the projects are in crisis. They also said that project managers never know beforehand when they need the resources, which creates a lot of problems. They were missing a dialog between the projects and the functions. One functional manager expressed a wish for regular meetings with the project managers to discuss competence questions and such things. Another said that the contact exist, but not the mutual understanding of why it should exist. The project managers do not understand that other project also wants resources and that this collides if they do not warn beforehand.
The project managers say that it is difficult to get individuals with the right competence from the functions. All also mentioned that they thought there is too much interference from the functional division. The functions sometimes take resources from the projects without telling the project managers about it.

One of the interviewed was worried about that some functional managers might favourites some project managers that they know better and give them better resources. No one else thought that this problem existed. The functional managers and the project managers generally know each other well.

The project members were asked in the questionnaire if collaboration between the functions and the projects to select project members worked very bad, bad, good or very good. Figure 12 shows the distributions of the answers for all respondents. Figure 13 shows the distribution when only respondents who have work at GC for a minimum of three years were taken into consideration.

![Pie chart](image)

**Figure 12:** Result from the question “Does the collaboration between the functions and the projects work very bad, bad, good or very good?”.
Figure 13: Result from the question “Does the collaboration between the functions and the projects work very bad, bad, good or very good?” when only respondents who have work at GC for a minimum of three years were counted.

The project members generally described the collaboration from the functions point of view. Some questioned that it should be a collaboration:

“Is there a collaboration? Should not the project manager be happy with the resource he is given?”

A project member

Some project members wrote that it is usually few persons to choose between. One wrote that the function choose the person that has time over. Some also pointed out that there sometimes only exists one person with the right competence.

“There is seldom a possibility to select project members, since most is busy in other projects. You have to choose the person who is available, or the only person who posses the needed role”

A project member
Another question in the questionnaire was if their wishes were taken into consideration when they were selected to a project. Figure 14 shows how the answers were distributed.

![Pie chart showing responses to the question: Are your wishes taken into consideration when you are selected to a project?](image)

**Figure 14:** Result from the question “Are your wishes taken into consideration when you are selected to a project?”. 

Figure 15 below shows how many projects the project members are involved in.

![Pie chart showing how many projects are involved](image)

**Figure 15:** Result from the question “How many projects are you involved in now?”. 

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Figure 16 below shows what the project members answered when they were asked if they usually had time for their assignments during normal work time. Figure 17 only show the result of those who answered that they were involved in four or more projects.

**Figure 16:** Result from the question “Do you usually have time for your assignments during normal work time?”.

**Figure 17:** Result from the question “Do you usually have time for your assignments during normal work time?” when only those who were involved in more than 4 projects were counted.”
5.1.4 Resource Contract

As part of the multi-project project, GC is considering the possibility to start using resource contracts. A resource contract is a signed document, where a resource is bounded to a project for a specific time period. The contract can bound a specific person or a competence to a project.

Most of the interviewed persons were positive to resource contracts, but it existed many worries. It could roughly be summarized that they thought something was needed but they were not sure if it was a resource contract. A functional manager expressed it in following way:

“Resource contract sound so, what shall I say... sound so definitive, but I believe in some form of agreement in some form of document.”

A functional manager

One project manager was very positive to resource contracts and was surprised that it works at all without resource contracts, but warned that it is important to not make them too administrative complicated. The manager pointed out that the resource contract should be on person level. Resource contracts will probably make it more likely that the project will get the ‘bought’ resources.

Another project manager was not so positive to resource contracts, especially if they would be written on person level. Since the projects change a lot and its activities depend on each other, there might be many cases where the resource cannot be used when it should be used according to the contract. The project manager expressed worries for that the project would have to pay for the resource even if it was not used.

A functional manager said that the resource contract is not only the functions responsibility, the project is responsible to use the resource as planned. Another believed that the contract should be on competence level.
Further on, the functional manager said that some wants to plan the resources exact, but that will never work.

Few of the project members knew what a resource contract is, but no one of those who knew thought it was a bad idea (see Figure 18).

![Figure 18: Result from the question “Do you think resource contracts are good or bad?”](image)

**5.2 Competence Development**

In the personnel policy (2001) at SAAB it can be read that advanced products to very demanding customers puts a high demand on competence and continuous competence development. The competence development is carried on systematically from three different perspectives (SAAB personnel policy, 2001):

- *Perspective of The Company*
  The development of the total competence within the company should not only aim at today’s and tomorrow’s assignments, but also to the future’s.
• **Perspective of The Unit**

The unit manager has an overall responsible over the competence development in the unit. The manager should also work to develop the co-worker’s competence for the future.

• **Perspective of The Co-Workers**

The individual has a responsibility over his/her own development and a responsibility to influence the competence development so that it reaches both the company’s and individual’s goal.

Further on in the personal policy, there is written that learning occurs through a combination of the daily work and special competence development contributions.

At Gripen Customer Support (GC) it is the functional division that should have the overall responsibility over the essential competence development of the function members. All of the interviewed functional managers and project managers did answer that it is the functional division that has the responsibility over the competence development. Two of the functional manager said, however, that the competence development does not work properly. The development occurs more sporadic and there is a shortage of long-term thinking. There has to be a long-term planning to meet the future needs of competence for the projects. No one of the interviewed functional managers had any problem to know what competence the function’s members have.

It is a divided opinion upon if the project manager should have any responsibility over the competence development. One project manager said that functional divisions have the overall responsibility for the competence development, but the projects often have to help develop the competence. This cannot entirely be avoided. Another project manager said if the functional division could offer one member that wants to do a task, but has not enough competence, the project could contribute with some smaller development, like how to use databases. This development may even be
founded with project capital. Only one functional manager thought that the project should have some responsibility. The rest of the interviewed, two functional managers and one project manager, said or hinted that the project managers have no responsibility.

At GC the competence development should not be passive, i.e. “competence development is something you get...” (Function manager), it should be more active “You must by yourselves tell how you want to be developed, so will we create conditions for it...” (functional manager). This means that co-workers in cooperation with functional managers should plan their own competence development.

To contribute to the competence development, GC has some supporting methods, which are development interviews and the competence ladder. The development interview is a planed, prepared, retrospective and forward aiming dialog between a co-worker and its nearest manager. This dialog should touch upon topics such as goals of work, results of work, work environment and individual development. At GC this should result in a learning contract and a development plan.

The competence ladder describes the different competence areas within GC and should be used when creating roles within the department. The competence ladder should also be used for describing competence when creating roles documents and when recruiting. The roles are build up with the help of combinations from three areas: social competence, trade competence and broad competence. It should also be used for competence inventories and planning of development for the department and co-workers. The competence ladder states a need for competence in three levels from A to C. An acclimatization period of about one year is required to reach level A competence. The competence levels are:

- A: Basic
- B: Senior
- C: Master
Today, the competence ladder is not used, but there is an intention to use it in the future. One of the functional managers did not believe in the idea. The functional manager believed more in the development interviews.

There is more or less a general view that there is an uneven distribution of the competence at some sections at GC. Therefore the projects often have to fight over the same people at these functions. One functional manager said that many have a high competence while other has not. The competence has to be extracted from those that have a high competence, maybe through apprenticeship.

As shown in Figure 19, about 30% of the questionnaire respondents wrote that there are only a few in their section that has the most of the competence.

Figure 19: Result from the question “Are there only a few in your section that has most of the competence?”.
The majority of the project members did not know if the competence development was unevenly distributed (see Figure 20).

![Pie chart](image)

**Figure 20** Result from the question “Is the competence unevenly distributed among the co-workers at GC”.

The survey has shown that about 40% of the project members thought that it was difficult to develop their competence at GC (see Figure 21). When asked if they wanted to develop their competence more, everyone answered yes, except two who were uncertain. Most proposed attending to courses as a way to develop competence, one mentioned to be part of a project.

![Pie chart](image)

**Figure 21**: Result from the question “Do you think it is difficult to develop your competence at GC?”.
The project members were also asked how much competence development that occurs within the projects (see Figure 22). The respondents that answered that there occurred little or nothing competence development, usually explain it with that there were not much time for it during the projects.

![Figure 22](image)

**Figure 22:** Result from the question “Does much, little or no competence development occur within the projects.”

A project member wrote that demanding projects automatically leads to competence development. Another wrote that processes and routines take up a large part of the available time, it is therefore little competence development.

There was a high support among the project members for using apprenticeship, as seen in Figure 23 and Figure 24.

![Figure 23](image)

**Figure 23:** Result from the question “Do you believe in using apprenticeship at GC?”.
Don't know
6%

No
18%

Yes
76%

Figure 24: Result from the question “Could you consider being a mentor?”.

5.3 Behavioural Science

Most of the interviewed functional managers and project managers have heard something about behavioural science. They have heard it from the leadership training that all functional managers and project managers has to take part in. The most knowledge about behavioural science is about the Belbin Team Roles. Behavioural science is not, however, being used in any larger extent, either in the selection process or at the start up of the projects. It is more likely that the functional managers and project managers learn co-workers characteristics. When selecting project-team members, competence is more significant than how people act. The only thing that is looked upon is if people cannot work with each other, then these people are not placed in the same team. All of the project managers said, however, that the usual cause for project failure was due to communication problems and not due to that it was a lack of competence.

Most of the interviewed want to learn more about behavioural science and use it more. One functional manager did, however, express a concern that it could be hard to get all to ‘buy’ it, for example technical engineer could take it as nonsense. The team leader did also answer, in the purpose of teams, that “There is maybe not enough community to use group dynamic”.
The expert on the behavioural science at Saab said that it is too difficult to get the necessary competence so that the project can be completed, if behavioural science is to be used in the selection of project-team members. Further on, the expert believed that it is an old utopia to believe that a group can be put together with help of team roles. Behavioural science should instead be used in the projects start up, so that the project members can become acquainted with each other. This will also help the team get an understanding of the projects goals and purposes, the roles and expectations of the members, how the members communicate and which group norms there are. The expert helps those projects that want help with these aspects.

Figure 25 and Figure 26 shows that the project members are positive to use behaviour science team roles, even if many are uncertain. Figure 25 shows the view of all respondents, while Figure 26 show those who wrote that they were familiar with such theories.

![Figure 25: Result from the question “Do you believe that behavioural science theories about team roles are useful?”](image)

Figure 25: Result from the question “Do you believe that behavioural science theories about team roles are useful?”.
Figure 26: Result from the question “Do you believe that behavioural science theories about team roles are useful?” when only those who answered that they are familiar with such theories were counted.

The part about team roles in the questionnaire had no field for the respondents to write freely in, but some respondents took the liberty to motive their answer anyway. A project member who was not positive wrote:

“Everything builds on interplay between people, to simplify this through the creation of models in form of theories is to make it simple for oneself. You become a really good project manager by experience together with a special talent that is called judgement of character, which no course in the whole world can teach you.”

A project manager who was positive wrote that it is probably useful if it is possible to make it concrete and adopt it to GCs activities, but it is important that it does not become any “academic woolliness” that the grass roots does not understand.

Only two project members had been part of projects at Saab Aerospace that had used behaviour science team roles. Both thought it had helped the work in the project.
5.4 Complexity

The general view of the project managers was that it is difficult to judge both the technical and organizational complexity of a project. They were also not sure if it is useful to judge the complexity at the beginning of the project. One of the managers did however answer the following when asked if it could be useful:

”Yes, I think so, especially when you should start negotiate and do cost estimations and the like. You would know the requirements a bit better when you do the preliminary study. I think that would make things a lot easier. “

Another was more doubtful to the idea and said that it was more important to scoop the project better.

The project managers agreed on that the size of the project, the distance between the project members, cultural differences, demands on secrecy, tightness of the timetable, tightness of the budget, priority of the project, community of the project and dependence of other projects was important factors that increased the complexity.
6 The Analyse

In this chapter, the empiric material and frame of reference is analysed. This results in conclusions about problems with the present situation at GC. Recommendations are also given on how the situation could be improved. The results and recommendations are summarized at the end of the chapter.

6.1 Project Organisation

GC is organised as a matrix organization. The functional divisions are stronger than the projects, making the matrix weak. There is a sense of belonging in the functions, but not in the projects. It does however differ some between the functions. In spite of that the functions are strong, almost all activities are part of a project. The project manager could to some extend be described to have more of a coordinator role, i.e. someone who delegates different assignments to the functions.

There has however been an exception were the project members were moved out from their function and placed together. They experienced some of the problems that can be found in a pure project organization and felt that the members were too isolated from the others in the company with the same competence. A we-they mentally was developed in the organization.

If the balanced matrix is implemented, the projects will be stronger. But as Meredith (2000) points out, the balance matrix is usually not balanced. The functions will probably still be stronger than the projects. Wenell (2001) argue that it is difficult to get the balanced matrix, were both the projects and the functions is equally strong, to work. Wenell thinks it is easier and more effective to let either the functions or the projects dominate. Larsen and Gobeli (1987) do however indicate that the matrixes tend to be stronger and stronger as they evolve in the organizations. That is a relatively old study but more modern studies have showed the same thing (Wenell, 2001). It is therefore likely that this will happen at GC too, even if the
strength might swing to and fro along the way and the experiences from the exception mention above might slow down the process.

Defining and making the matrix clearer to the individuals in the organization could probably improve the situation a great deal. This is probably the biggest benefit from the multi-project, if it can get everyone on the same page.

It is not defined how the functional manager and the project manager should act in their collaboration. This was also confirmed at the seminar. Every project manager and every functional manager has its own way of handle it. If this part is not considered, the roles can be considered well defined and well founded in the organization. The result from the questionnaire shows that almost everyone states that they understand the roles of the functional manager and the project manager. However, the questionnaire also shows that the co-workers do not see the collaboration as a part of the roles.

At GC the project managers does not specify which persons and which personality they want. Wenell (2001) writes that even though it is the functional managers that have the last word, the project manager should try to give suggestion for specific persons and not only ask for man-hours. The project managers do not always know much about the individuals, whom could be chosen. The functional managers have much better knowledge about the persons. It would however not hurt if the project managers come with wishes for persons as long as the wishes are motivated. Having wishes for specific persons increases the chance for the project manager to put together a high performing team. A potential risk with wishes for specific person is however that a person that the project manager knows well is selected instead of the best-suited person. This risk can be minimized if the motivations are well-grounded and the collaboration work well.

Today, the communication between the functional managers and the project managers generally occur after something has happened. This
hinders the project manager or the functional manager to plan effectively. The project managers generally take contact with the functional departments to late. The project managers should understand that the functions need time to plan so that the resources can be available when they are needed. During the projects, the functional managers do often only hear from the projects when the projects are in crisis. However, it should be pointed out that it also is the functional manager’s responsibility to know a lot about the projects. The functional managers can also take resources from the projects without telling the project managers. This does of course cause problems for the projects. This would not happen if the communication was not so limited or if the matrix was stronger.

The interplay between the functional managers and the project managers is person dependent. This is due to that the interplay is not properly defined. To give guidance to the project managers and the functional managers by defining how the interplay between them should work will probably help a lot. Properly defined, it could stimulate a more continuous communication and a communication that is initiated in sufficient time before the resources is needed. This would make it much easier for the functional manager to plan the use of the functions resources.

In spite of the above mentioned problems, the majority of the project members thought the collaboration worked well. The project managers and the functional managers also said that they usually find a solution to the upcoming problems. However, the “wrestling matches” that occur take a lot of time and energy, and the result must usually be lesser good than if they had better possibilities to plan.

There is often only one person to select from. The other possible candidates are to busy in other projects. The problem is that this person might not be the best-suited person for the project. The only way out of this is to plan better.
Wisen and Lindblom (1999) point out that the ambition and interest of the individual should be taken into consideration in the selection. As the previous chapter showed, a bit over half of the project members thought that their wishes were often or always taken into consideration, while about 30% thought it occurred seldom or never (see Figure 14). These are not bad numbers but they ought to differ a lot between the functional divisions. This is supported by the project members’ description of how they are selected. One goal should be to improve these numbers. It is probably impossible to always follow each individual’s wishes, but every individual should at least feel that their wishes are taken into consideration.

The results from the questionnaires and opinions given by others at the company, shows that some are involved in many projects. More than one third of the respondents to the questionnaire were involved in 6 or more projects, of which 80% could not manage their workload during normal work time (see Figure 17). Wenell (2001) brings up that it definitely is a limit for how many projects a person can be involved with and still get something done. This is therefore a very important topic to look deeper into, but given the result form the questionnaire, it should not be recommended to assign more than four projects to a co-worker.

It is our opinion that resource contracts should be used. A resource contract would, among other things, be a tool for improving the communication between the functions and the projects. The resource contracts should be signed in good time before the resource is needed. That would force the project manager to contact the functional managers in time. Functions that remove resources from the projects would break the contract, and would therefore need to at least inform the project manager before the resource is removed.

Our opinion is that resource contracts should be written on personal level and not on competence level. This would make it clear, which persons that will take part in the project. In addition, if the matrix should be a balanced matrix and the project should buy resources not solutions, it only makes
sense if the resource contracts are on person level. If the resource contract is broken by a project through that the project does not use the resource as planned, the project can still be forced to pay for it. If the function breaks the contract through not being able to offer the resource as written in the contract, there is not much the project can do about it. Maybe some kind of penalty should be put on the functions if they do not live up to the contracts. However, penalties should be avoided as long as possible and only be used if the contracts are frequently broken. It is important to note that having a signed resource contract must not be an excuse to not keeping the dialogue. That would counteract the purpose of the resource contract, since it is meant to be a tool to improve the communication.

6.2 Competence Development

At Gripen Customer Support (GC) there is not any general way to handle the competence development. There are not only differences between the lines of business, but also between the functional divisions. There are almost as many differences as there are functions. Some functions have come longer with the planned competence development than others. The reason for this is complicated to establish and there could be many different causes. One could be that the unit of business strategy about the competence development has not reached the functional managers. Another could be that the functional managers interpret the strategic different. In either case, the problem that occurs is that there is not sufficient competence development at some functional divisions. To be able to meet present and future demands, project managers and functional managers at GC needs to understand the strategic management of a company’s knowledge creation. Knowledge management should also be given top priority (see Florén, Ingelgård and Roth, 2001).

Wenell (2001) points out that the functions are needed to gather, accumulate and develop the individual competence. Many other sources points out that it is the functional managers that have the competence development as one of their responsibilities (see Cleland, 1984; Larsen & Gobely, 1987). This is the case at GC, there the functional managers has
the overall responsibility over the competence development. However, there is a shortage of long-term thinking that is needed to meet future demands. This contributes to that there will be a lack of competent resources when those are needed by the projects. Another problem is that some of the functional managers seems to have other responsibilities, like subproject manager, above the responsibilities as been imposed to the role. This causes that these functional managers does not have enough time for all the function’s responsibilities. Therefore the competence development becomes neglected.

Today at GC the competence development occurs more sporadically, but there is a desire to improve. The increased use of development interviews is one proof of this. The development interviews is a good way to determine the present competence, which are in accordance with Dalin (1997) who recommends forming an opinion on which level the workers master different tasks. To determine the competence is important, partly to see which competence that is missing in the functions and partly to determine every individual’s present competence. To see what competence that is missing is a way to determine where the competence development resources should be put, partly to meet present need of competence and partly to meet future competence demands. The individuals’ competence is important to know when they are selected to the projects, so that the use of the competence in the organization is optimised.

A lot of time was spent to create the competence ladder, but there was no follow-up and it was not used. There is, however, still an intention to use the competence ladder at GC, but the functional mangers do not believe in it. There is an agitation that the competence ladder could be used by the co-workers as a way to get higher salary. It was as one functional manager said that when a co-worker had one course, the individual could come back and demand higher salary due to higher level in the ladder. Competence is, however more than just a course and it is also pointed out by Sveiby (1997) that this way to learn is one of the least effective. It is strange that competence is not directly regarded as one way to decide the co-workers
salary. This should motivate the co-worker to more actively search competence development. Another reason that advocates the competence ladder is that it could be used to get a general classification system over the competence. This is very beneficial in the selection process. The project managers and the functional managers get the same language in the dialogue to select co-workers, i.e. they mean the same thing when they are discussing levels of competence.

The results of the questionnaire has shown that 53 per cent is of the opinion that it is not difficult to develop competence at GC, while 41 per cent is of the other opinion (see Figure 21). This seems relatively good, but some functions increase the average. This is due to that some functions have a more developed competence development and at these are almost all satisfied. At those functions where the competence development is less good the co-workers are less satisfied. There could be several reasons to the less good development. One reason could be that co-workers do not seek competence development actively, due to lack of time or passivity. Another reason could be that there is no response from managers, due to lack of time or that they do not actively help the co-workers to develop competence. There is also a problem with that it seems that the co-workers sets competence development equal to courses and, as mentioned above, courses are the least effective way to learn. This should also be a problem when the co-workers actively search for competence development, due to that other learning forms are not being considered. Therefore, awareness over other learning forms, than just courses, should be worked in at GC.

It is pointed out by Wenell (2001) that the opportunities to develop competence in projects are often not taken. This is also the case at GC. The results from the questionnaire shows that the project team members think that there is little or no development in the projects today. This is partly due to that the project managers have an aversion against having a responsibility over the competence development, since they fear the costs. Another reason is that the project managers think it is only the functions that should care about the competence development. Another barrier to the
competence development in the projects is the time. Many of the project team members answered that it is hard to find time, in the projects, for the competence development. Florén, Ingelgård and Roth (2001) points out that it is important but difficult to persuade owners with short-term interest, that it is very important to see the long-term interest as an investment not a cost (see also Sveiby, 1997). Further on continues Florén, Ingelgård and Roth (2001), that it is important to allocate time, money and manpower to competence development activities. This means that GC have to persuade all with short-term interest to invest more in the competence development, even if it does not seem beneficial in short-term and/or on economically rationally grounds. The projects must also be used more to develop co-workers competence. The seminary participants agreed on this.

There is an uneven distribution of competence at some of the functions at GC. There are, however, probably more functions that have a more even distribution than those that have not. The result from the questionnaire, shown in Figure 20, supports this. There are many of the respondents that has answered that the competence is not uneven, but there is also relatively many that has answered that it is uneven. This and the interviews with the functional managers and the project managers, points to that it is uneven at some of the functions. At those functions where it is uneven, it is a problem with that the projects have to fight over the co-workers that has the main competence. This leads to that some co-workers are in many projects and get to high workload. Another problem is that the project managers generally take contact with the functional managers to late when they want to have resources to the projects. This leads to that the functional managers does not have time to choose other than the co-workers, who do not need time to prepare before the project. This result in that those that should be in the project to learn are not selected. The research has not shown if these that have the main competence get the most competence development. Nor has the research shown the opposite. That which advocates, that it is those that has the most competence get the most competence development, is that they are given the challenging assignments. That which speaks against it, is that they are selected because they already have the competence and that
they are in too many projects. Too many projects decrease the time for learning.

Florén, Ingelgård and Roth (2001) points out that the functional managers and the project managers has to understand the knowledge creation process, as the one that is proposed by Nonaka and Takeuchi. The knowledge development should also be given top priority and the management of knowledge should be handled by care since knowledge is very fragile. At GC there is not a general understanding about the knowledge creation process among the functional managers and project managers. The competence development is also very often down prioritised. There is, however, a changing wind at GC where the competence is slowly given a higher priority. The understanding about the importance of the knowledge is also increasing.

The research has shown that there is a high support for mentorship, but to get it working at GC it needs to be allocated recourses to this. At GC, this means that there has to be a so-called order number, i.e. charge someone’s budget. One spokesman for this way to have competence development is for instance Sveiby (1997). The use of mentorship is also a way to have the knowledge conversion from tacit to tacit according to Nonaka and Takeuchi (Little, Quintas & Ray, 2002). The mentorship can be used to solve the problems that arise due to an uneven distribution of competence.

6.3 Behavioural Science

According to Wenell (2001) much time is spent on leadership courses about the important behavioural role science, but they are not being used practically in the selection of project team members. This is also the case at Gripen Customer Support (GC). At the leadership course for project managers and functional managers it is the Belbin’s team role model that is learned out. After this course, the model is not being used in any greater extension. There is, however, a will to use it more, e.g. in the projects or in the functions. The reason for that it is not used is either because there is not enough knowledge about it or because there is an agitation about that the
co-workers think it to be nonsense. This agitation is not justified, the result from the questionnaire has shown that the most co-workers believe that behavioural science is useful. The two co-workers, who have been in contact with behavioural science in projects, believed it had helped the work.

Florén, Ingelgård and Roth (2001) points out that it is not only the competence that is needed to be considered when putting together a project team, it is also essential to find individuals with complimentary personalities. There is also as Martin (2001) points out that models of Belbin and Margerison and McCann, could be used as a way to improve the probability of success of the projects through using the models in the process of selecting team members. It is a kind of subtle manipulation. The expert on behavioural science at SAAB did not, however, believe in the idea to use the models in the process. It is too difficult to get necessary competence so that the project can be completed, if behavioural science is to be used in the selection of project-team members. Further on the expert believe that it is an old utopia to believe that a group can be put together with help of team roles. It is better to use behavioural science in the project start. Also Wenell (2001) points out that it is interesting, during the project start, to analyse the team that should work together. Wenell (2001) does, however, believe in an increasing use of the behavioural science in the process of selecting team members. In the future competition the organization has not afford to not having an optimal composition of the team at the beginning.

Most of the project managers that was interviewed answered that when a project goes wrong, it has usually to do with communication problems. Behavioural science of some kind would therefore be of help and eliminate some of the communications problems at GC. But to introduce it in the teams at GC there has to be a comprehensive training among co-workers, functional managers and project managers. It has also to be some kind of help from outside GC that can support in the beginning. The behavioural science in the process of selecting team members cannot be introduced at
GC at the present time. Procedures and routines have to be worked out. During the time these are worked out, project managers and functional managers should have behavioural science in mind when selecting members for the teams. This is to work up a long term-thinking. Whether, which of the models that should be used, is difficult to answer without more examination. But due to that it exists some knowledge about Belbin’s models at GC, this model should maybe be used.

6.4 Complexity

The projects at GC vary in both organizational and technical complexity. What Shenhar and Wideman (2001) call project management scope is, however, often high. The projects at GC often have a high level of management scope. Even though the projects often deal with highly advanced technologies not all of them should be judge as having a high level on the technical complexity axle due to that GC is familiar with the theories. Schneiderman (2002) points out that the technical complexity is high for new technologies that are unfamiliar to the company and low for more familiar and routine technologies.

The Pennsylvania department of environmental protection’s (2002) guide for estimating a projects complexity present a series of complexity factors. The entire guide does not fit GC, but some of the complexity factors are useful.

Shenhar and Wideman’s (2001) matrix, for judging a projects complexity, with management scope on one of the axis and technology uncertainly on the other, is interesting, but does not either fit entirely to GC’s needs. According to the project managers and others at GC there are other things that increase the complexity of a project. Especially was language and cultural differences highlighted. A message might mean something different to someone from a different country than it was intended to mean by the sender. This is a relatively new experience for Gripen, since they are used to only have Swedish FMV as costumer. This is the biggest argument for including language and cultural aspect in the organizational complexity.
It is however difficult to judge how much language and cultural aspects increases the complexity of a project. However, projects with high foreign interest should try to select some co-worker who is familiar with the culture and the language.

Demands of secrecy are another aspect that could complicate the projects. There were however different opinions on how much the aspect matters. This is something the organization is used to handle and should only increase the complexity relatively little.

The difference in opinion between the interviewed project managers make it difficult to judge how useful the project managers at GC think a complexity judgement would be. It is in our opinion fruitful for GC to use a tool to judge the complexity of a project. It would increase the general understanding of the project and help the project manager to understand what kind of persons that is needed.

Projects with high technology uncertainly have a great demand for creative and innovating teams. For those projects, it is important to try to compose such teams by selecting the right co-workers. Help with this can be acquired from behavioural team roles systems.

Projects, with high level of what Shenhar and Wideman (2001) call project management scope, have a high need for bureaucracy and planning. This increases the need for controllers or people with good planning abilities to support the project manager. The need for creativity is lower than in projects with high technology uncertainly. The skills that Belbin (1996) puts in the role implementer (see section 3.3.1) should be of high use for the team.

During the interview, it was made cleared that there was a certain type of complexity factors that were often mentioned that did not have to do with the project task itself, but as a result of how the project was carried out in the firm. These complexity factors could be ‘outside factors’ like the size of
the project’s budget, the narrowness of the project time plan and the priority of the project. Other examples are the community in the project and the distance between the project team members. The connection with the selection process is different than it is for the other complexity factors. The factors do not directly affect the process of selecting project team members, but the process itself affects some of the factors, e.g. the community in the projects and the distance between the project team members.

6.5 Summary Results

- The matrix is weak.
- The roles of the project manager and functional manager in the collaboration are not defined.
- The process of selecting project team members is depending on which functional manager and which project manager that is involved. This creates an uncertainty.
- Communication between the functional manager and the project manager is insufficient.
  - The project manager does not take contact with the functions in sufficient time before the resources is needed.
  - The functional manager does often only hear from the project when something has gone wrong.
  - The functional manager takes recourses from the projects without telling the projects.
- In the most cases, the functional manager has not any insight in the projects.
- It differs between different functions.
  - Some functions take the co-workers wishes in consideration, some does not.
  - At some functions is the competence development insufficient.
- Co-workers that are in six or more projects do not manage the assignments during normal work-time.
- There is no general way to handle the competence development.
The competence development happens sporadically and there is a lack of long-term thinking.

The competence development during the projects is not fully taken advantage of.

In the most cases the competence development is down prioritised.

There is a high support for mentorship.

There is a will and need to use behavioural science.

At present time, behavioural science cannot be fully used in the process of selecting team members.

High technical complexity in projects increases the need for creative teams.

High management scope in projects increases the need for co-workers with good planning and organizing abilities.

### 6.6 Summary Recommendations

- The roles of the functional manager and the project manager in the cooperation must be defined.
- Better communication.
  - The project manager must take contact with the functions in sufficient time before the resources is needed.
  - A continuous dialogue, not only during the process of selecting team-members but also during the whole project.
- The functional manager should have a better insight in the projects.
- It should be avoided to have any co-worker in more than four projects.
- Resource contract should be used and they should be written at individual basis.
- The project manager should come with motivated wishes about co-workers, when discussing with the functional manager.
- The project manager and the functional manager should have an understanding about the knowledge creation process.
- Competence development should be given top priority.
• The competence ladder should be used in the selection process to create a common language between the project manager and the functional manager.
• The projects should be used more for competence development.
• Mentors should be used and time should be allocated for this.
• Behavioural science should be taught.
• Behavioural science should be used in the project start.
• The project managers and functional manager should take behavioural science in consideration in the selection process.
• There should be a long-term planning to use behavioural science in the process of selecting project-team members in the future.
• Judging the complexity should be used to determine if there is a special need for creative team or if there is a need for special co-workers with planning and organizing ability.
7 The Proposed Model

A basis for a model over how the process of selecting project team members could work is presented in this chapter. The model is based on the recommendations in the previous chapter.

7.1 The Model

A basis for a model is here proposed to support the functional managers and the project managers in the process of selecting project team members. The advantage with using a model is to get a common system. A common system will help to avoid some of today’s problems and lower the insecurity about the process.

In order for the model to work well, certain conditions need to be met:

- The communication between the functional managers and the project manager should be continuous during the entire project. It should not only exist after problems have occurred.

- There has to be an understanding of each other’s roles among the managers. The functional managers need to understand the short-term objectives of the projects and the project managers need to understand the long-term objectives of the functional departments. There must not be any we-they mentality.

- Competence is one of the most important intangible assets in an organization. It is essential that the functional mangers and the project managers understand this.

- Competence is a wide spread expression that has many different definitions. It is therefore essential that an organization use a single definition. See section 3.2.2 for different definitions.
• It is very important for the functional managers and the project managers to understand the knowledge creation process, described in section 3.2.3. This is due to that they have to understand how knowledge is created in the organization, so that knowledge promoting actions can be taken.

• Both the project managers and the functional managers need to have knowledge about team-roles models like Belbin’s or Margerison and McCann’s (see section 3.3).

The recommended model has three different phases: Preparation Phase, Dialogue Phase and Team Phase (see Figure 27). This division has been done due to that it is three clear parts in the process. The phases could also and should be seen as milestones. Every phase must be completed before the next begins.

![Figure 27: The models three phases.](image)

The model is designed to be used when the team is put together for the first time. If an extra person is selected afterwards to the team or if a team member is exchanged, the model could be used with some adjustments.

### 7.2 Preparation Phase

The project manager needs to be prepared before the dialogue phase begins. The project manager should therefore in this phase try to establish which competence and resources that is believed to be needed. The project managers should think through if there are specific persons that would fit the project and why they fit.
A complexity analysis will increase the understanding of the project and help the project manager to establish which competence is needed. If the technical uncertainty is high, the project manager should have in mind that the project team needs to be creative. If the management scope (see section 3.4.2) is high, there might be a need for co-workers with high planning and organizing abilities.

### 7.3 Dialogue Phase

It is important that the dialogue phase starts in time. Around one month before the co-worker is needed is a good time to have the first meeting. The reason to begin this early is due to that the functional manager can prepare, which individuals that could suit the projects needed competence. This makes it easier for the functional manager to select other people than those that are in many projects. From the view of the project managers this could seem worse due to that a less competent individual could be selected, but in the long run the project manager gains on this. This is due to that there is a limit of how many projects a co-worker could be in and still get something done.

The dialogue phase is characterised of an ongoing dialogue process. Figure 28 shows this process.

![Diagram of the dialogue phase](image)

**Figure 28:** The dialogue phase.
At the first meeting, between the functional manager and the project manager, the needed competence should be established. The competence ladder could be used to establish which competence grade the co-worker should be at. This also makes it easier for the functional mangers to decide who fits for the assignment.

After the needed competence is established the project manager could come with wishes for a specific co-worker or co-workers. This wish must be followed by a motivation. The functional manager should then consider if the whished co-worker has time and if it is the best individual for the assignment. It should be avoided for any co-worker to be in more than four projects at the same time. The functional manager should also consider if the assignment fits any co-workers competence development. In that case this co-worker should be selected, if the person could manage the assignment or if the person could manage the assignment with help of a mentor, courses etc. It could also be considered to choose two co-workers instead of one, one mentor and one apprentice. The apprentice could be remunerated from the function.

When the functional manager and the project manager have reached a decision on which co-worker that best fits the assignment, they have to discuss the assignment with the co-worker and weigh in the persons opinion. After this, if the co-worker is interested, a resource contract should be written where the project manager, functional manager and co-worker impose to follow the discussed commitments.

To get the dialogue process working properly, the functional manager must know the co-workers competence in the function well. This could be obtained from, for example, the development interviews. The functional managers should also see themselves as resource mediators in the dialogue phase. The project manger must accept that it is the functional manager that has the last word, when deciding who is to be selected. It is also good to bear in mind if any co-worker fits the needed team-role in the project-team.
The following items should the functional managers and the project managers think about during the dialogue phase:

**Project Manager**
- To start the dialogue in time.
- To be well prepared.
- The role of the functional manager.
- We-they mentality must be avoided.
- That it helps if there is a mixture of team roles.
- The co-workers’ wishes.
- To have continuous communication with the functional managers.
- To have a common language with the functional manager.

**Functional Manager**
- The competence development.
- Avoiding peaks and valleys in the use of personnel and other resources.
- The role of the project manager.
- We-they mentality must be avoided.
- Avoid assigning people to more than four projects.
- The co-workers’ wishes.
- To have continuous communication with the project managers.
- To have a common language with the project manager.

### 7.4 Team Phase

In the third phase the selected members of the team is gather to a meeting. The team leader should take the initiative to gather the team. The meeting should have the following objectives:

- Secure that the team fully understand its task.
- Establish development needs and how those needs can be reached.
- See which knowledge assets there are in the company that the team can have use of.
- Establish the norms of the team.
- To get to know each other.

Every team members need to be open about that they need to learn to succeed with their task. If there is someone within the team that can teach the team member so that it reaches its need, this help should be the first
alternative to use. Everyone should have time to help with this learning. If the team wishes, Howard Hills (2001) practical tip for planning team-based learning could be used (see section 3.2.5). If the development needs cannot be met within the team, help from the company or outside help, e.g. courses, should be planned to be used. If the team discovers that the assignment was misjudged in the dialogue phase and that the team member cannot handle it, a new team member needs to be selected.

A commitment should then be signed, with the team member’s development needs and how they will be met. This should be shown to the functional manager, who discusses and helps the team member with the needs that could not be met within the group. An advantage with this is that the functional manager now knows how the co-worker will achieve the task.

One way to get to know each other is to examine the team roles in the group. Team role models like Belbin’s or Margerison and McCann’s could be used (see section 3.3). It is very beneficial to have the team compounded with different team roles. If there is some team role that is missing and there are for example two team members that has same team role, one of the two members could play the missing role. Using team roles is also a way to know how every team members are behaving.

The norms of the team should be made clear. The norms of the team are the rules for how the team members act against each other. The norms are usually not discuss spontaneously, everyone just assume that they are there. Many misunderstandings and conflicts can be avoided if they are discussed openly. These norms could advantageously be put in a written commitment, a so-called group contract.
8 Future Studies

This section brings up issues that we have found to be interesting to examine further.

8.1 Proposed Further Studies

We have fond following issues to be interesting to examine further:

- How group contracts should be written.
- The possibility to use special rooms for projects, so called project room, which the project team members could use freely for the projects.
- Communications practices for the function manager and project manager to improve the process of selecting project team members.
- Knowledge assets, i.e. which knowledge assets there are in the organization that can help the projects.
- Knowledge transferring between projects.
- Other ways than team roles to improve the communications in the project team group.
- How team roles could be introduced in the process of selecting project team members.
- How the multiproject environment affect the co-workers.
- How the organization should be organized to improve the knowledge transfer.
- How the priority of the projects affect the selection.
9 References


BelBin Svenska AB homepage. (No date) [Electronic] *Team skills*. Available: <www.belbin.se> [2002-12-04].


Appendix A- The Questionnaire

Position: ______________________________________________

Which line of business at GC do you belong to? ________

For how long have you worked at Saab Aerospace? ________

For how long have you worked at GC? ________

1. a Do you understand the roles of the functional manager and the project manager?

   Yes / No

   b If yes: Briefly describe their roles:

   Functional manager:_______________________________________
   _________________________________________________________

   Project manager: _______________________________________
   _________________________________________________________

2. a Does the collaboration between the functions and the projects work very bad, bad, good or very good?

   Very Bad / Bad / Good / Very Good / Don’t know
b Briefly describe what works good or bad:

________________________________________________________________________

________________________________________________________________________

3. Briefly describe the normal procedure when you are selected to a project:

________________________________________________________________________

________________________________________________________________________

4. Are your wishes taken into consideration when you are selected to a project?

Always / Often / Seldom / Never

5. Do you think resource contracts are good or bad?

Good / Bad / Don’t know

6. How many projects* are you involved in now? ____________

*the meaning with projects is here not changing forums or activities of inquiry character. That which is called missions is, however, included.
7. a  Do you usually have time for your assignments during normal work time?

Yes / No

7. b  If no: How do you handle the situation then you don’t have time?

__________________________________________________________________________

__________________________________________________________________________

8.  Do you get “stimulating” assignments?

Never / Seldom / Often / Always

9.  Are there only a few in your section that has the most of the competence?

Yes / No / Don’t know

10. Do you think it is difficult to develop your competence at GC?

Yes / No / Don’t know

11. How can you affect your competence development?

__________________________________________________________________________

__________________________________________________________________________
12. a Do you want to develop your competence more?

   Yes / No / Don’t know

   b If yes: Give proposals on how you would like to develop:

   ______________________________________________________
   ______________________________________________________

13. a Does much, little or no individual competence development* occur within the projects?

   Much / Little / No

   *Competence development includes all forms of learning.

   b Describe how it is much/little/no competence development:

   ______________________________________________________
   ______________________________________________________

14. a Is the competence development unevenly distributed among the co-workers at GC?

   Yes / No / Don’t know
b If yes:

1. What do you think is the cause for this?

________________________________________________________________________________________
________________________________________________________________________________________

2. Is it mainly those who already know a lot that develop their competence?

Yes / No / Don't know

15. a Do you believe in using apprenticeship* at GC?

Yes / No

b Could you consider being a mentor?

Yes / No

*With apprenticeship means here when a skilled co-worker teach a colleague

16. a Are you familiar with behavioural theories about how different people function in different groups?

Yes / No
b Has such theories been used in any of the projects you have been involved in at Saab Aerospace?

Yes / No / Don’t know

c If yes: Was it to any help in the work with the project?

Yes / No / Don’t know

d Do you believe that behavioural science theories about team roles are useful?

Yes / No / Don’t know