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PROJECT MANAGEMENT

– Challenges for Project Leader

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PROJECT MANAGEMENT – CHALLENGES FOR PROJECT LEADER

Project management consists of two main parts, i.e, project control and people management. This thesis work concentrates on areas needed by the project leader during project implementation. All project parts need careful controlling. Project schedule should be followed as closely as possible. Schedule is easier to control with software assistent. Controlling product quality is important during the implementation. Testing team builds up the test cases to be performed to assure the quality. Also communication has an important part in all projects. Meetings are kept when milestones are reached and reports are sent in order to keep the organization informed. Responsibilies and tasks are shared clearly between organization members. Cost management should follow the given values. All project parts add their own risks to the project.

People management requires leadership skills. Project leader needs to communicate and listen. Project team should be built as solid as possible and the work environment pleasant to work in. Trust and respect are needed between team members and project leader in order to make the project organization work together effectively. Motivation is part of people management. Project leader should try to motivate his team members. Motivated employee is more productive in project work.

Game Console Project (GCP) and Documentation Project (DP) were executed parallelly. GCP remained in project planning state at the same time when DP is planned and implemented. GCP consisted of planning a project to produce handheld game consoles. DP included planning and implementing of preparing needed documents for GCP. Documents included project plan, requirement specifications, pre research and list of requirements. Schedule was needed for implementation. DP showed how good communication and responsibility sharing makes project working easier. The importance of risk management was noticed in DP when the project team was about to be one member less.

As conclusion, project management consists of so many different areas, that it makes it challenging to control all of them at the same time. Keeping everything organized makes project working as well as project management easier. Good communication prevents project from materializing unnecessary risks.

KEYWORDS:

Project Management, Project Leader, Project Implementation, Leadership

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PROJEKTIPÄÄLLIKÖN HAASTEET PROJEKTINHALLINNASSA

Projektityöskentely on yleistynyt työpaikoilla. Projektintyön hallinnasta vastaa useimmiten projektipäällikkö, joten on mielekästä selvittää projektipäällikön velvollisuudet työn kokonaiskuvan hahmottamiseksi. Projektipäällikölle kuuluva hallintaosuus jakautuu kahteen pääasialliseen osaan, projektintyöskentelyn valvontaan ja henkilöstöhallintaan. Projektityöskentelyä tulee valvoa tarkkaan koko projektin ajan. Valvonta kuitenkin jakautuu projektin toteutuksen aikana alueisiin, kuten aikataulun ja budjetin noudattamiseen, laadun tarkkailemiseen, riskienhallintaan ja organisaation sisäiseen kommunikointiin.

Projektityöskentelyssä henkilöstöhallinnan tärkeys korostuu, kun pyritään tehokkaaseen työskentelyyn. Koska hyvällä henkilöstöhallinnalla saadaan työntekijöiden työpanos tehokkaammaksi, projektipäällikön tulee omata hyvät johtajuustaidot. Tarpeellisia taitoja projektipäällikölle ovat työntekijöiden kuunteleminen ja motivoiminen. Lisäksi projektipäällikön tulisi edistää kommunikointia ja ryhmätyöskentelyä projektitiimissään päämääränään keskinäisen luottamuksen, kunnioituksen ja hyvän työympäristön rakentaminen.

Käytännön projektitöissä eri projektit saattavat olla käynnissä samaan aikaan eri vaiheissa. Pelikonsoliprojekti pysyi suunnitteluvaiheessa samalla kun dokumentaatioprojekti suunniteltiin ja toteutettiin. Pelikonsoliprojekti sisälsi projektin suunnittelun kämmenpelikonsolien valmistusta varten. Dokumentaatioprojekti toimi alaprojektina pelikonsoliprojektille tuottaen kaikki siihen tarvittavat dokumentit. Tarpeellisiin dokumentteihin kuuluivat projektisuunnitelma, vaatimusmäärittelyt, esitutkimus ja vaatimuslista. Dokumentaatioprojekti todensi, kuinka hyvä aikataulutus, vastuunjako ja ryhmän sisäinen kommunikointi edistävät projektin onnistumista. Projektin riskienhallinnan tärkeys huomattiin, kun projektia uhkasi työntekijöiden määrän laskeminen.

Projektinhallinta on kokonaisuutena niin laaja, että sen koko tekee siitä haasteellista kontrolloida. Osien ollessa järjestyksessä sekä projektityöskentely että projektinhallinta helpottuvat. Projektityössä tarpeettomien riskien toteutumista on helpointa ehkäistä hyvällä kommunikoinnilla.

ASIASANAT:

projektinhallinta, projektipäällikkö, projektin toteutus, johtajuus

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LIST OF TERMS

Batch	Measure used to determine the quantity of units in one operation.
Deadline	Time limitation by which some task must be completed.
Error	Mistake, unwanted result.
Fail	Result different from requirements.
ID	Identification.
Idle	State of power being on but not doing any work.
Milestone	End of a stage that marks the completion of a work package.
Organization	Social arrangement to distribute tasks for a collective goal.
Quality	Measurement of product meeting requirements.
Requirement	Single documented need of what a particular product or service should be or perform.
Standard	Definition of how something should be done.
Test case	Set of conditions or variables under which a tester will determine whether an application or software system is working correctly or not.

INTRODUCTION

Project form working is everyday life these days. In project someone has to be in charge of managing the project. Project management is a large field consisting of many different things. Still project management can be described well by dividing it in small parts.

Project management interests me and I am hoping to get a management job some day in future. Then I will need knowledge about management areas and understand them. I decided to focus on project management in project implementation mostly from project leader's point of view. I outlined project planning off from this work.

Project management can be divided into two bigger parts. The actual project management and people management. People management is more unfamiliar to me. In working life I have met very different kind of leaders and noticed the good and bad sides of their style of management. I wanted to choose project management as thesis topic in effort of learning more about project management and leadership in general.

On fall 2010 I attended a course "Project preparations and requirement specifications" by principal lecturer Osmo Eerola. During the course the main task was to plan a product development project, Game Console Project (GCP), and prepare needed documents for the project implementation, Documentation Project (DP). I got to be the project leader in this project work. Given the possibility to learn about being project leader in small scale project. Pressure was felt soon after implementation had started.

I got interested of finding out about the complexity of the duties of project leader. Having worked in a small project I can imagine it's not going to be easy job to handle in big scale projects.

1 PROJECT MANAGEMENT

Project management contains several different parts. In able to understand what project management really is, one has to know what project really means and what different aspects managing it includes.

Management in general is understandable concept, but in business it includes much more aspects than one would think of. Depending on the area of management, it can mean everything from taking care of the human resources and interviewing new employees to counting used work hours and reporting product quality to higher level of the organization.

1.1 Project descriptions

Even though people easily talk about painting the house or moving to a new place as projects, they most often are not really projects since the definition of a project isn't filled. All projects should have four things in common. First of all projects are always set up with defined goals and schedule when it's starting and when ending. Projects also have given resources and organization for implementation of the projects.

> Project formed working means exploiting human resources, material and financial resources in planned and organized way. In the project, well outlined process will go through, that leads from an idea to its implementation. In meaning of shortening time and expenses, which are needed in enforcing a change in both qualitative and quantitative quality. [1, p.16]

Most important issue for successful project work is well planned structure (Figure 1). Every project starts with an idea which usually tells the goal of the project. Project proposal on the other hand gives a rough picture of what would be needed for achieving these goals. Proposal also helps for setting importance and usefulness order between different projects.

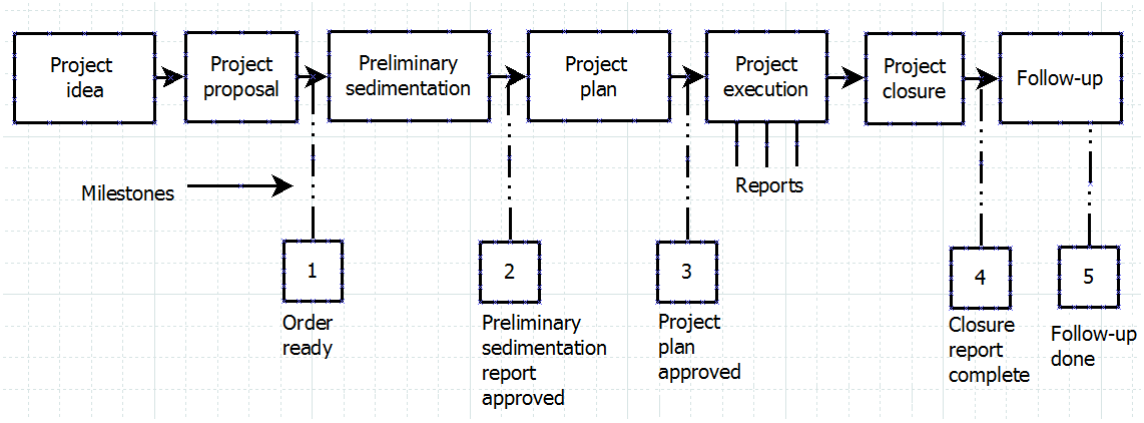

Figure 1. Project structure [1, p.21]

When a project proposal becomes accepted the order is done and it's time for making preliminary sedimentation. Preliminary sedimentation requires deeper clearance on how much resources, time and funds implementing the project would need. It usually includes things like targeting group information and competing products for the end product of the project. Finances are good to be counted in here knowing the needed resources and wanted margin. Preliminary sedimentation can therefore show target price of the product and expected sales comparing to the products already on market. It's also good to mention known talented employees in the company that would be needed in the project.

After getting preliminary sedimentation approved it's time to do a project plan. This should be done very carefully since it's the most important document and a guide line for the whole project. Project plan should have answers to everything that has anything to do with the project. It should include definitions of the goals, the whole organization working in project as well as implementation plans, budgets and controlling plans. Everything to the smallest details of when, how and what is reported to who in different parts of the project. See an example of a possible project plan content list (Appendix 1).

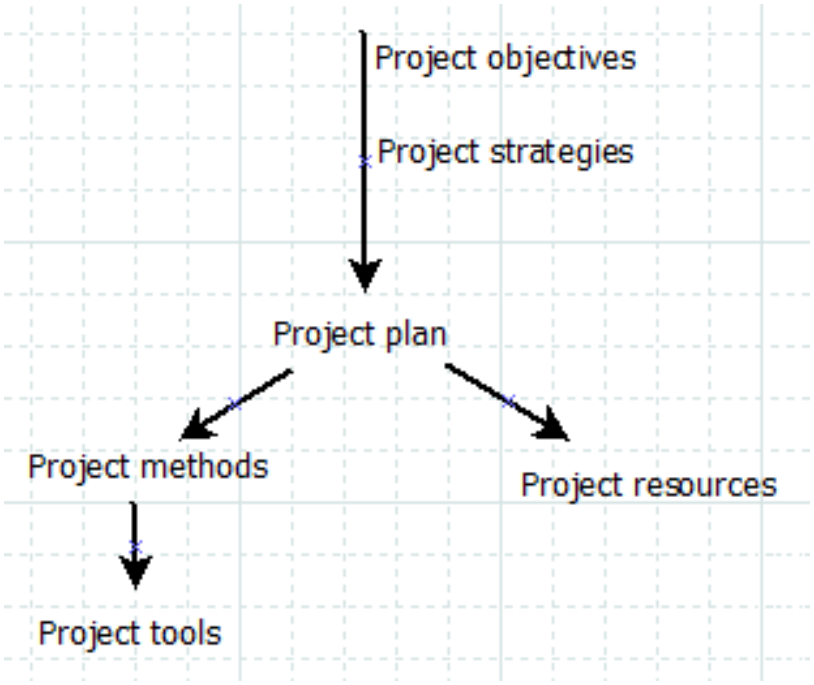

Figure 2. Components of project. [2, p. 12]

Projects are usually divided with milestones (Figure 1). Milestones make it easier to guard the progress of the project and also to determine whether the project is going towards the set goals or worth withdrawing. Project plan should also reveal when milestones are and what they should hold. Milestones are usually used as pass or not pass sections in progress before moving to the next part of implementation.

All in all project starts from idea. Project objectives and strategies are built from the project idea (Figure 2). Project plan is build using the objectives and strategies, making implementation possible. Implementing the project according to project plan requires resources and methods. Methods usually need tools for implementation. Logically easy line to follow but project requires a lot of work from an idea until finished end product.

1.2 Project management segments

Managing project has many different parts to keep in control. Project plan shows most of the parts to be supervised. Project management has 9 knowledge areas. Core functions of these are scope, time, cost and quality managements. Facilitating functions are human resource, communication, risk and procurement managements. All these combined together with project integration management form the knowledge areas (Figure 3). Besides knowledge areas, tools and techniques used in project need management as well. [3, p. 9]

Project leader's job is most often to supervise most of these areas in everyday work with the project. He usually reports to higher levels of the project organization. Therefore project management is the hardest task for the project leader.

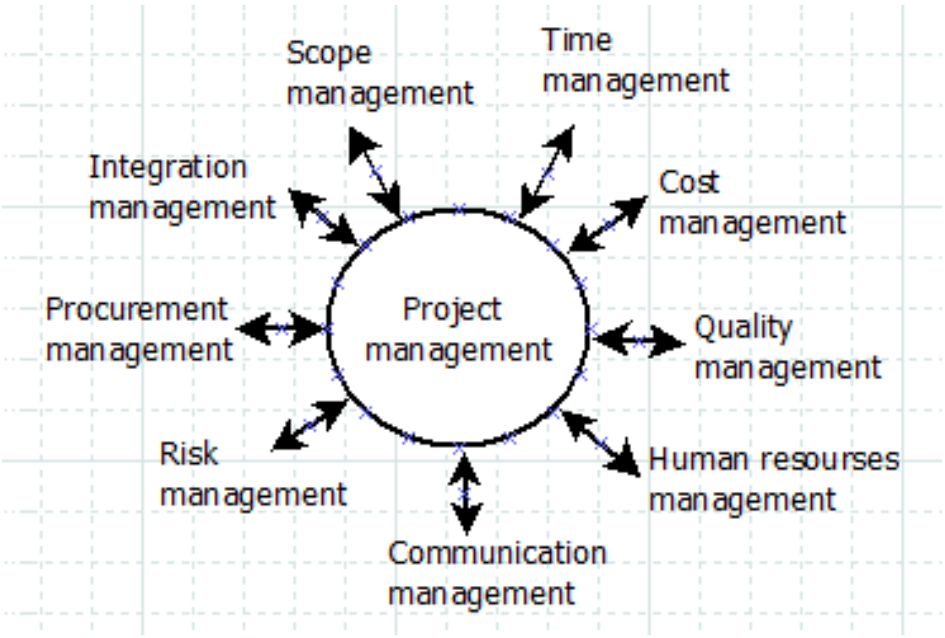

Figure 3. Project management knowledge areas. [4, p. 11]

Nowadays there's a lot of different software developed for helping to keep track of the project management with parts like time and cost factors. Quality management is often given for a separate testing team to take care of and therefore testing team manager will report about the quality of the product.

Risk management is a loose area because everybody takes part in it. Employees help on it by keeping themselves healthy and therefore limiting the amount of absence from work. Testing team makes their part for risk management by testing the quality and possible fails. Since unworkable product doesn't sell on market, so it's the biggest risk in the project to make products that won't sell at all. Risk management is usually one of the areas that are very well covered for in the project plan.

Human resources management is probably one of the hardest areas to handle for people who are used to work on technology field. Taking a new employee is easy but getting the kind of employee that is good for this project and this task, is never too easy. Humans are so different from each other that there might become conflicts between the team members. Building a good team spirit can be hard depending on what kind of personalities are together in the team.

Communication management is important as well in a good project work. Change of small detail in product plans can lead in to serious costs if all people working on the product don't get to know about the change fast enough. The harder part of communication in project is to draw lines who should inform who. It's waste of time to tell everything to everyone and work time is very valuable so unnecessary reporting should be avoided. Project plan guides in communication since it shows the whole project organization and gives assignments on reporting and communicating between the organization members and departments.

2 MANAGEMENT IN PROJECT IMPLEMENTATION

As in all works, projects require someone leading the work. Project leader's job is to lead and guide the whole team successfully through the project and supervise used resources trying to make sure everything goes as planned in project plan. Of course there's always more or less resources and time available but project plan gives estimated values that should be followed as well as possible.

> Uncertainty…is only certainty. [5, p.6]

Project management can be extremely difficult. There are several different areas and aspects infecting project success. Usual problems in project management come from time, competition and pressure aspects. Problems easily develop from connections between upper management and project management (Table 1). Project leader is between two fires, upper management and project teams trying to balance in between.

Time problems are faced often and some of the reasons for them are lay-offs and early retirement. Employees can easily leave without someone covering for them, making the team short of staff. Merging different organizations and cultures also takes time to adjust to. Dependencies such as outsourced project parts and overtime also affect time scale. Competition can affect the project with increased workforce and material expenses.

Pressure is a thing that can't be avoided. It affects employees fast and easily. Speed of technical changes, getting international and paying attention on legal, ethical and rightful managing are all things that add more pressure for project leaders. In general for whole project team, the work environment and atmosphere affect a great deal on the stress levels. The trend of 2010's is the reorganizations and changes made on work places and more is expected from smaller group of employees. If employees' wellbeing suffers, it will affect their contribution at work as well. Therefore it's important to take care of the employees.

Table 1: Problems caused by upper management. [5, p. 6]

	Anticipatory	Reacting	Slow reacting	Empty promises	Not interested
Project training	On all levels	Project group	Only for leaders	No	No
Support from managers	Continuously with	Manual	Forced	Impossible	Swim or sank
Managing process	Updated	Usual	According to customer requests	Harmful participation	No
Finance and budget with investor	Planned	Controlled	As chances	No budget power	Excessive wasting
Project leaders ruling power	Full authority	Selective delegation	Unwanted delegation	Liability without power	Unspecified
Project guidance	Comprehensive and efficient	Basic	Forcing	Arbitrary	Uncontrolled
Communication	Open for large research	Formal	Defending	Avoiding	Closed from all research

Project work needs continuous monitoring. Project monitoring should be proactive and reacting in able to success. Monitoring is easier to do if certain steps are followed. First one has to know what exactly needs monitoring and surveillance in able to get the work done in right way (Figure 4).

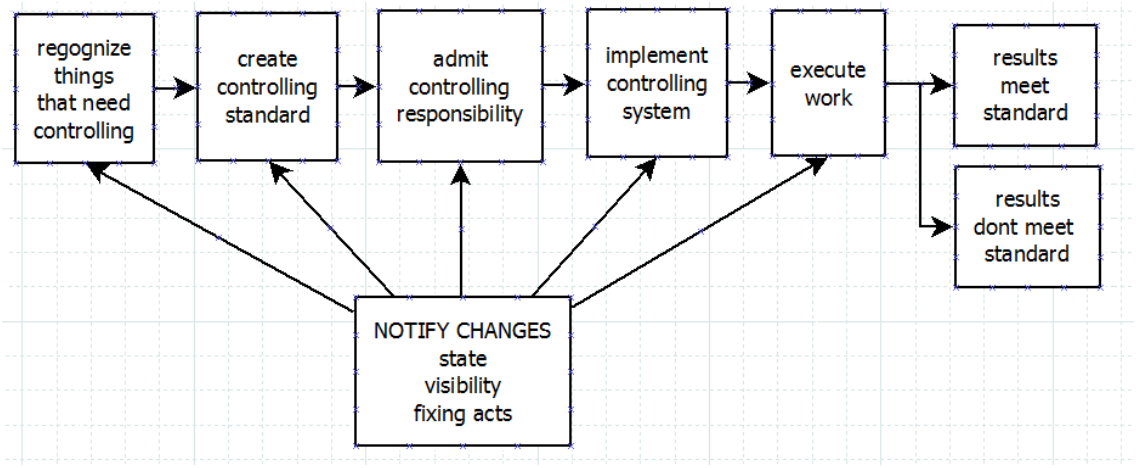

Figure 4. Project surveillance is process surveillance. [5, p. 211]

After defining what to monitor a monitoring standard is created to describe how to monitor. One also needs to admit the monitoring responsibility before going ahead with implementing your monitoring standard and executing work. While doing all this a project leader also has to keep an eye for any changes and fix them immediately.

Control cycle is a good example of how management implements controlling (Figure 5). First standards that should be followed are made. After observing and comparing actual performance the management makes needed changes and includes it in the standards. Cycle keeps spinning all the time.

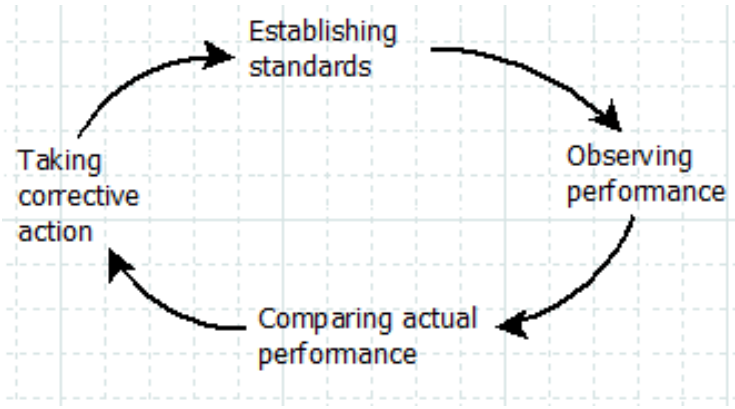

Figure 5. The control system. [4, p. 325]

2.1 Scheduling

Project schedule is one of the most clearly described areas in project plan. It includes small details adding milestones between to check up that everything's going as they should.

Problems following the schedule often come from unexpected results or lack of know-how from project team. Quality checking is also making a difference in schedule. Even though nobody plans for it, there are always errors and unwanted results in testing and fixing them takes extra time. Depending on how much time is counted in project plan for repairing and fixing, one can end up being way ahead or most often behind schedule.

Different tasks in a project have different relations between them. Next task might not be able to start before a previous one has finished or a task can't finish before other one has finished (Table 2). Making a schedule with lots of relations between tasks is not easy. It's best to use program for this, like Microsoft Project for example. There are 4 different dependencies between tasks. Project schedule is easy to understand when made into chart (Figure 6). Connections between different tasks are easy to see as well.

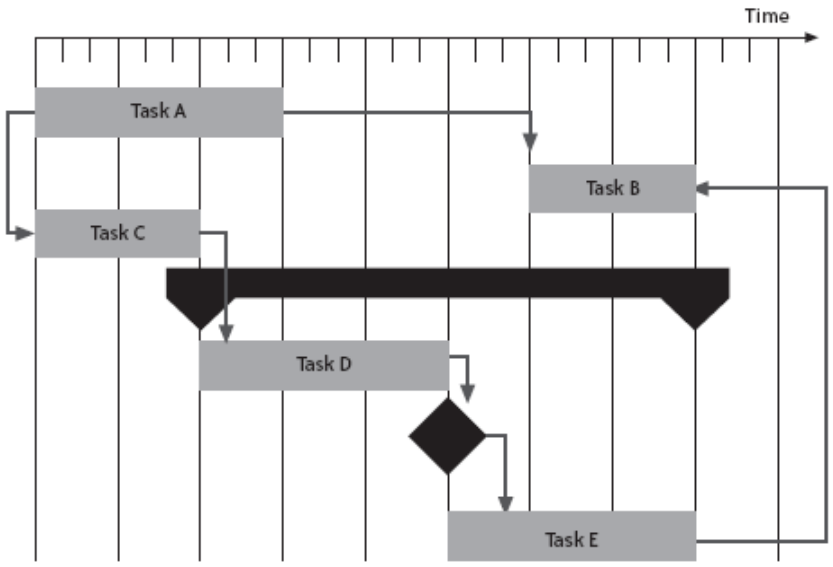

Figure 6. Gantt chart example of project schedule. [6]

Keeping track of schedule is the first thing in projects to handle with software. It is easier to follow the schedule when all different tasks are marked down and order of when they should be done. Then tracking what's done and how much is completed of each task it's easy to mark down and track how well it follows the planned schedule. This needs a lot of updating but it's a small work compared to managing project schedule and following of the schedule without any programs helping you.

Table 2: Task dependency types [3, p. 210].

Task dependency	Abbreviation	Description
Finish-to-start	FS	Task (B) cannot start until task (A) finishes.
Start-to-start	SS	Task (B) cannot start until task (A) starts.
Finish-to-finish	FF	Task (B) cannot finish until task (A) finishes.
Start-to-finish	SF	Task (B) cannot finish until task (A) starts.

It's always a good idea to reward the project team from works that are done under the estimated times. Especially since following the schedule can end up being very difficult from time to time. When schedule limits are close to being crossed, employees will be asked to stay overtime at work but what helps on schedule is bad for costs.

2.2 Quality assurance

Quality is defined as how well the product meets with its requirement specifications. Basically if requirement specifications have been done carelessly, product might turn out to be good quality even though it wouldn't meet what customer really wants. Requirement specifications are made by thinking of all groups connected to end product of the project. Customers are the first group to think about, since there's no sense on making a product that won't sell. Customer needs are only one group of many, issues like safety requirements and environment friendly materials are also things to consider when making requirement specifications.

Requirement specifications show what kind of things you need in able to get high quality product. Testing is used for finding out how well product meets the requirements. Of course if requirements have material requirements, it's easy to specify if it's made from this material or not. Testing is needed in most areas of requirements though.

Testing should be used to find out how the product works. Especially safety issues should be tested very carefully. Complicated part about testing is that you have to try all relevant possibilities. It's not always easy to think what customers might actually try to do with the product because people do some very unexpected things sometimes. As an example a common legend tells, there's a warning text in microwaves in USA, "Do not put cat in the microwave.", it's not a first thing to think about people doing with microwave but it still have to be considered that it's possible since cats are small enough to fit in microwave.

Test cases describe what and how test should be performed. Creating test cases is a complex task since one has to know all that has to be tested and write the cases the way people can only understand them the same exact way. It actually relates on many things in project working, many things need to be explained in the way it can only be understood right.

Managing testing is also easier to do with software help. Test cases should be made, marked and named clearly. It's good to keep testing in order, since same test cases are usually executed several times while developing the product. Results are important to be marked down as well. Results are reported forward from testing to the higher management.

Test cases have to be clear. There should always be a start position mentioned to know what condition to start the test from. The actual test action has to be clarified very clearly so no one will execute it wrongly. It's good idea to have the expected result mentioned as well and to reserve enough space to document test result. Testing software have spot to indicate whether the test passed or not.

Turning on laptop could be a simple example of a test case (Table 3). File consisting the test cases is, for example, named by informing product name, version of hardware and software used in testing. Every test case has it's own ID helping to keep them organized and informing about the test area. In this example test ID starting PST could be short for "Power Setting Test". Starting state should inform the condition of the product in the beginning of the test case. Input consists of specified actions that the tester should do. This is divided in steps. Usually the expected result is known and therefore also written to test cases. If a test result is the same as expected result, test case can be marked as passed. If a test result is different than expected result, it can be written down on test result column and state of the test case can be written as failed.

Table 3: Laptop test cases.

ID	Start state	Input	Expected Result	Test Result	State
PST0101	Power off	Push START-button	Laptop starts up	-	Passed
PST0102	Power on	Wait >5min in idle state	Screen turns off, power still on	-	Passed

Test cases used in actual production are usually more complicated. Input part might easily have as many as six steps. Start state is easiest to specify as idle state. Therefore it might take six different actions for completing the test. Many test cases are meant for testing multiple programs running at the same time. These tests need specified small steps to be done carefully and same way every testing time.

2.3 Notification and communication in project

Deficits in communication can lead into serious problems for striving towars the project goals. Possible example of this is a change in a small detail from original plans. If other department discovers a needed change, for example, a hole in a circuit board needs to be moved 1mm of the original planned location. Change is being notified but not to all whom should know about it, product cant be assembled and the whole batch is unusable. These kind of mistakes can easily make big losses in project schedule and budget.

> A failure to communicate is often the greatest threat to the success of any project, especially information technology projects. Communication is the oil that keeps a project running smoothly. [3, p. 418]

Even if there are communication and channels, the vocabulary can develop problems. Communication between project organization members should be as clear as possible. Too many mistakes are done by one employee understanding another wrong. There should be a project's own vocabulary helping them to be sure they understand each other right. Valuable work time won't be used on asking same things again and again if answers and orders are understood right at the first time. Different languages of course are more challenging but they just need more patience to get the right message sent in the right way.

Project plan should contain a section on communication plan. This section should give assignments of who is responsible of reporting to who and when. Project plan often has also requirements of the style of the reports to be done. Bigger companies have their own templates to be used on important documents. When readymade templates are not used project plan gives guide on the style of the reports all the way to font sizes and styles.

Communication plan should also reveal when meetings should be held. It's natural to keep status review meetings especially when the project has reached a milestone. These meetings are very important since most milestones are used to determine whether the project is worth executing or should it be withdrawn. Meetings are important informing situations for all organization as well as for team members. Meeting is an easy way to get everybody off from their desks

and force them to focus on what's been said. Team meetings are valuable time to gather information of how things are moving forward and if there's any trouble. Also a good way to find out which tasks are on schedule and which are not. Then it's easy to sign up people to help each other to finish the tasks that are behind schedule.

Communication plan keeps the organization in form and order. Communication management is probably one of the easiest areas to manage. Controlling whether reports and meetings are done and on time like they should have. If something isn't done then it needs reminding to the one responsible for it.

2.4 Sharing responsibility

Project plan should always name the organization running the project. It should also name clearly the leaders of each department working on project and inform of who is responsible for what areas of the project. The higher part of the organization members and their responsibilities is usually very clearly written down in project plan but under every leader is his team. How tasks are shared inside the teams might not be found in project plan.

Project plan doesn't necessarily name every individual working on the project. Therefore it might be a good idea to settle a document inside the team consisting all team members and their own responsibilities and work areas. This helps keeping team members focused on their own area instead of trying to do everything at the same time. In minimum, tasks and responsibilites can be marked in a simple chart naming tasks and persons responsible (Table 4).

It's important for the whole team to know their parts on the project. It also helps keeping everything under control and organized if it's agreed before hand who does what. One does not have to go around asking all team member where is the missing report when you know hows area and responsibility it is, it's easy to go straight to the right person to ask for it. Valuable time can be spared on more important things when responsibilities are clear.

Table 4: Example document of task and responsibility partition.

Task	Person in charge	Comments	Decision
Project management	Fors		OK
Testing management	Smith		OK
Error management	Scott	Parker assisting	OK
Training/Support	Fors	Smith assisting	OK
Marketing	Petersen		
Project documentation	Parker		OK

2.5 Cost management

Shareholders want the company to make profit, do well and rise up the value of their shares. Upper management level wants succesful projects that make great selling products and give a lot of profit as well as more value for the company.

Costs are oftenly determined carefully in project plan leaving wanted margin from the products target price. It's hard to predict needed work hours for project if company doesn't have experience of similar kind of projects from past. Cost might therefore change a lot during the project. Suprises might come from changed material expenses and unexpected failures during the project implementation.

> Project managers must understand several basic principles of cost management in order to be effective in managing project costs. Important concepts include profits and profit margins, life cycle costing, cash flow analysis, sunk costs, and learning curve theory. [3, p. 280]

Cost management can be made easy with good organizing and book keeping with predicted estimates compared to running expenses. Book keeping software can help a lot on keeping track of the project costs. The problem is to bother to keep an eye out and update how much time is used on the project parts and what material expenses has been needed for the implementation.

Project leader can do cost management simply by using software to plan cost estimates. All different costs of project implementation should be mentioned and resources given by the estimates of project plan. Therefore project leader's job on cost management is to compare used resources to given ones. Trying to make sure at the same that given resources are not crossed.

3 LEADING PROJECT TEAM

Project manager is usually the one leading the project team. Project manager's job needs a lot patience and capability of handling stress and pressure. He also needs a logical way of thinking to be able to see how to get things done in best possible way and most efficiently.

Since project manager's job includes so many different aspects, it would be better to have multitalented person to do this job. He also needs to be humble enough to realize that he isn't perfect and can always try to do better. Of course he has to show example to his team members and keep things in control so he shouldn't be too submissive either. It's a tough job that can wear out people fast.

> Project leader has to:
>
> Clearly specify plain responsibilities.
>
> Specify and inform project process and style.
>
> Delegate always when it's possible.
>
> Get project group liable.
>
> Balance support with guidance when necessary.
>
> Train group by own example to work as group.
>
> Solve things with under performers slowing down the group.
>
> Plan tasks and work entities the way they courage for group working.
>
> Establish rewards for the group's efforts. [5, p. 67]

Project manager's job includes a lot of more tasks that one would think of (Appendix 2). It's really a tough job to handle everything at the same time and be in top of things all the time. It needs a lot of energy and sense of humor not to be too serious all the time. Good project manager has experience, knowledge and ambition. He is good at solving problems and conflicts as well as managing people. He has good perspectives and organizing skills.

3.1 Leadership skill

No one is perfect leader by birth. There are many different aspects to learn by heart to be a truly great leader. Most important thing to remember is that even though more machines are used these days and deadlines to be reached, employees are still humans and they can't work like machines. To machines one can command to solve a task and they do it, but for humans how one orders the task to be done effects on how and when one gets it solved.

Good leaders know how to get employees excited and committed to their work as well as helps and shows example if someone is struggling. They understand the idea of sustainable development and listen for any ideas for improvement even though it would be criticizing their own leadership skills. Employees appreciate honest and inspiring leaders who know what they're doing. Leader should always be an example for his team but not rise too high above them. It's a tricky thing trying to balance between upper management and team workers. Too often you are asked to think of all the possibilities but still keep your legs on the ground.

> Experience shows that successful leaders:
>
> Look for challenges and possibilities.
>
> Experiment and dare to be creative.
>
> Are looking forward and guiding the way.
>
> Ability to make action possible.
>
> Encourage others, give them recognition, get them to commit themselves and support them.
>
> Create situations for cooperation.
>
> Set requirements and rules.
>
> Are explicit, informing and show example.
>
> Are credible.
>
> Celebrate reached goals. [1, p. 109]

Good leader also knows when leading style should be adjusted. Leading style should be chosen by the current situation of how much experience and knowledge team has for the implementation of the task and how well they take responsibility and commit themselves. Situation leading is usually divided in four (4) different styles, guiding, convincing, negotiating and delegating styles.

In leadership position it's important to understand meaning of trust in all relationships. Leader has to be able to trust himself first of all. He also has to build trust between him and his employees. Working committed relationships build trust between the parties and it's easily lost with non-logical acts in important issues. Delegating is important tool for building up trust in a team. It's important to react on problems the way team can maintain the trust. Supporting the team members on difficult moments they are more likely to turn to the leader instead of hiding problems and mistakes.

There are many different kind of leadership training available these days. Many of them focus on certain level type of leaders and many companies have their own training programs for the leaders as a support. Still a person is never hired to be in a leading job unless he has some kind of passion for it or experience. Leading kind of jobs are not for everyone and only part of people can actually do well on leading others.

3.2 People management

Managing your team is not the easiest task. One can study about different kind of management areas but team management can only really be learned by practice. Humans have so many different kinds of personalities that it makes it extremely difficult to know how to handle each person and find the golden mean in able to get each individual to be the best possible employee. How managers treat their employees, effects a lot on the mood and loyalty of the employees, affecting their work easily in unwanted ways.

Team management requires a team to manage, not several individuals separately. Building team members to actually be a team, solid group, can be

hard sometimes. One needs individuals that are able to work together as group. Not all people get along so well to work together in the same group. One needs to create environment for group working and keep it up. The enthusiasm for group working should come from management that encourages for it as well.

Working in group goes more smoothly when everybody understands being mutually dependent of each other and when there's respect for each other between the team members. This is easier if the tasks are specified clearly who's liable for which tasks and how much ruling power each individual has in the group. Dependencies between the group members should be clearly presented to the team members.

It's always a good idea to build up the team to be more solid. There are lot of different team building days available on market. Those make a good change for normal working days and the team and project can benefit from them a lot. Of course they usually need a little open minded thinking from the team members since they probably remind a little bit of public school and kids team spirit exercises. They make a good exercise for getting the team members get to know each other's and build up relationships and trust between them building up the team at the same time.

When one gets one's team to work hard together to reach the common goals one should always remember to compliment them from doing good job. Especially if they do good job under given time with good quality. Rewarding whole team also helps on building the team stronger when team members can clearly see the result what the team is capable of. Being rewarded is also remembered for long time and will encourage doing good input at work in future as well.

3.3 Motivating team members

Motivated employees are important in all jobs. Some people find it in themselves how they feel they are needed and they are doing important job. Leaders should also help their team members to feel motivated of their work. Leaders can motivate by listening their employees and keeping them informed. Critic is also important part of motivating, good critic can give reason to feel good about what you're doing and how you can improve your input. It's also important for employees to feel appreciated and respected at work. Leader can let team members to give their input on decision making which usually gives more motivation.

Feeling appreciated and respected is important for most people; it gives a lot of motivation on going on with work and getting things done. Leader should show respect for the employees and show an example to get team members to show respect for each other. When whole team feels respected of what they do, the work environment is also better and most likely more productive.

Building critic improves the input of employees, but when giving critic one has to be careful because some people might take it the wrong way and that could end up having the opposite result from what one hoped for. Building critic is needed for sustainable development. How else would you know how to get to right direction if someone doesn't show the way? When planning to give critic to someone a leader prepares oneself ahead and starts with something positive first. Trying to describe and notify the consequences, giving ideas how to improve, and letting them fail but helping them back up on their feet again.

Listening employees a leader shows he or she cares and allows them to tell the leader how things are actually going. Good leader interacts with his employees and tries to be one of them even though he or she is leading the way. Listening doesn't only mean verbal communication. Leader should also listen the mood and feelings of individuals and well as the whole groups. Therefore he or she can notice if anything is going to wrong direction.

Informing employees is affecting the mood as well. People like to know a little bit of what's going on and what is planned for the future. Living with unknown future easily bothers people and creates stress which is never good for the employees input. It's also important for leaders to listen what employees actually want to know about.

Employees should also be included on problem solving. It has a great chance on finding a good solution. Challenging people to think harder and find solutions improves their work motivation as well.

> According to motivation researcher J. Richard Hackman, the conditions for motivation are:
>
> Work has to require different knowledge and willingness.
>
> Work has to be able to be done from start to finish, in able to get full picture of it.
>
> Work has to matter for other people.
>
> Employees need to be able to plan the implementation of the work and be able to make decision on it.
>
> Input of the employee has to be able to be seen in concrete results.
>
> Employee has to be satisfied with the organization and its values. [1, p. 125]

It is good for a leader to be able to listen employees telling what things actually motivate them best. It's always good to encourage people to think what they actually want and how they get more off from their work.

Always remember to reward the employees from job well done. It motivates for future projects and it works as team building when the whole team is rewarded from a good work.

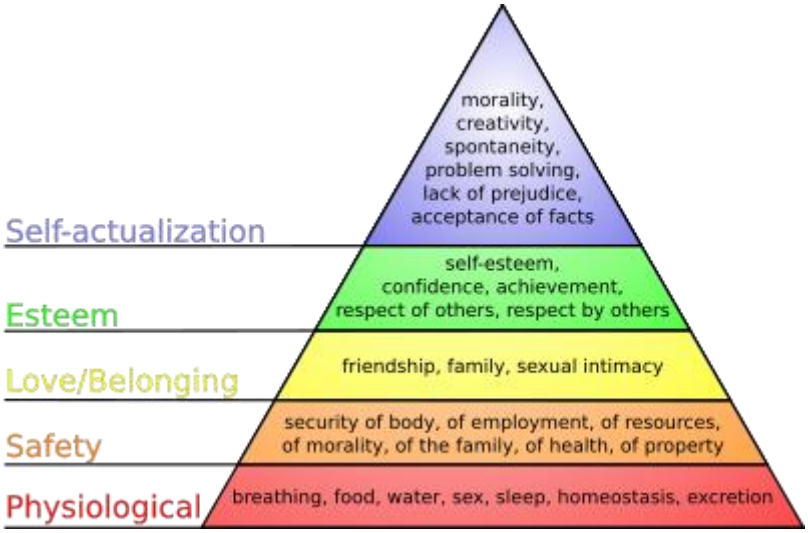

Figure 7. Maslow's hierarchy of needs. [7]

In connection with motivation Maslow's hierarchy on needs is often mentioned (Figure 7). If basic needs are not filled person cant focus on the higher levels of needs. This is also why good leader informs his team of what's going on. People might feel unsecure about their job if they dont know what's going on at workplace in general. Being afraid of loosing their jobs, employees cant live fully and it's clear that things like that bother enough to effect on the input at work as well.

A leader wants to keep the employees in best possible shape because it means also better certainty of having a good worker with little amount of sick leaves. Therefore one does not want to unbalance their mental health either nor to stand on their way in hierarchy of needs. Instead the leader wants the employees to reach as high as possible and encourage on it as well as possible.

4 GAME CONSOLE PROJECT

Game Console Project, GCP, was executed parallel to Documentation Project, DP, in fall 2010.

Work included defining a project goal for both projects first of all. Idea in GCP was to make a handheld game console to compete with products already on market. Idea of the game console was to make it serve not only the young gamer customer group but to also include possibility of programming self-created games to play with the console. Believing this possibility would give a better cut on markets thinking of all the possible customers who like to combine programming, gaming and the joy of creating something by themselves.

With a good idea and a business plan it was time to start creating project plan for GCP (Appendix 1). It was needed with details describing the product from both hardware and software sides.

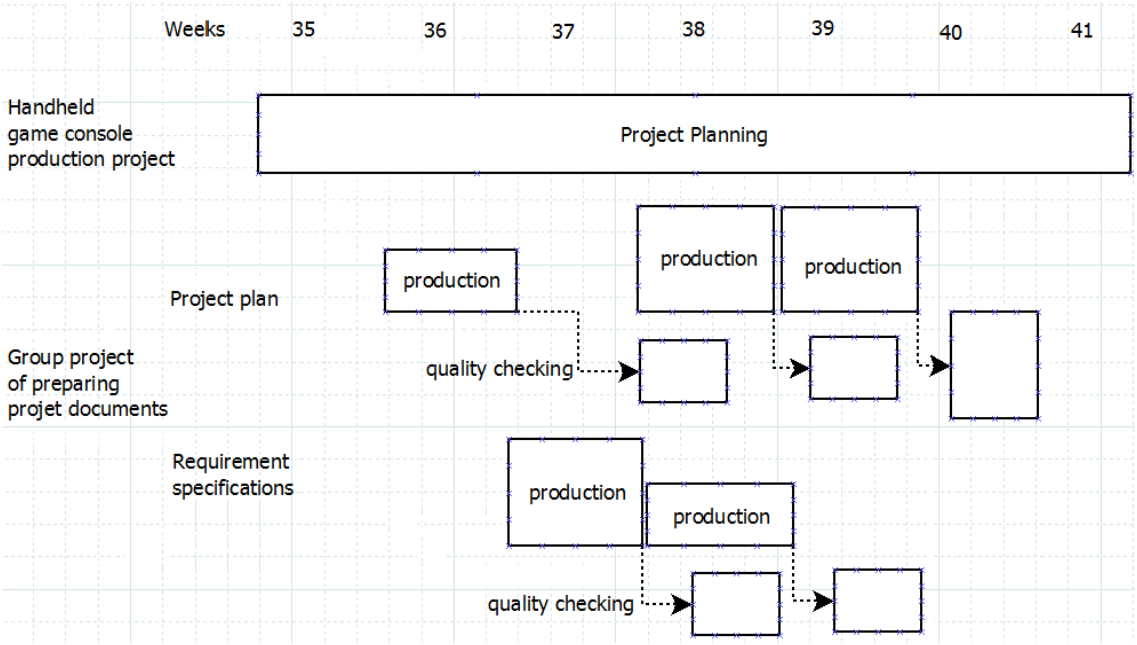

Figure 8. Two different projects running at the same time.

Running two different projects at the same time was confusing until it was understood how they were divided (Figure 8). The actual game console project stayed on planning state for the whole length of the project. Separate project of preparing console project documents was executed parallel to GCP.

DP was to prepare project plan, requirement specifications and any other needed documents for the game console project. DP had all signs of project, goal was prepared documents, given time was 6 weeks, organization and resources were defined as group members and their work force.

4.1 Project implementation

Soon after starting DP it was noticed how little time there actually was for the implementation. Schedule was created for the project implementation. In this case project implementation meant preparing all needed documents ready by the time the project work was supposed to be done.

Due to the lack of time in use and the fairly small list of tasks to be done, schedule was created with simply using Microsoft Excel program (Table 5). Knowing what was expected from project group all tasks were listed on one column in Excel file. Columns were created detailing who is responsible for the task to be done, when the task should be done, who is supposed to check it for the quality and when the checkup is supposed to be done. Last but not least column dated whether the task is done and checked. During the implementation one column was also used for informing which tasks where priority at that time. At the end of the schedule there were few columns to inform the version number, date, creator and approving person names of the schedule file. This schedule control system worked in the small documentation prepare project since the list of tasks was small compared to a big project and updating was fairly easy. There were no dependencies between the tasks otherwise but of course the task cannot be checked for quality before the task itself is done. Therefore it was needed to remind people when their tasks were waiting for quality checking.

Table 5: DP schedule.

	Author	Inspector	Ready	Production	Checking	Checked	State	**priority**
				week	week			
Project plan								
cover	Fors & Scott	Smith	x	36	38	x	complete	
content	Parker	Smith	x	36	38	x	complete	
document list	Smith	Parker	x	38	39	x	complete	
version history	Fors	Parker	x	37	38		waiting	**x**
1.1	Smith	Parker	x	36	38	x	complete	
1.2	Smith	Parker	x	38	39	x	complete	
1.3	Smith	Parker	x	38	39		waiting	
2.1	Parker	Smith	x	38	39		waiting	
2.2	Parker	Smith		38	39		started	**x**
2.3	Parker	Smith		39	40			
3.1	Fors	Parker	x	38	39	x	complete	
3.2	Fors	Parker	x	38	39	x	complete	
3.3	Fors	Scott		39	40		started	
3.4	Fors	Scott		39	40			
3.5	Fors	Scott		39	40			
4.1	Smith	Fors		39	40		started	
4.2	Parker	Fors		39	40		started	
5.1	Scott	Parker	x	38	39	x	complete	
5.2	Scott	Parker		38	39		started	**x**
5.3	Scott	Parker		39	40			
5.4	Scott	Parker		39	40			
5.5	Scott	Parker		39	40			
Schedule version	date	name		location				
v1.0	16.9.2010	schedule_v1.xls		Z:/Projects/DP/Scheduling				
v2.0	22.9.2010	schedule _v2.xls		Z:/Projects/DP/Scheduling				
v3.0	22.9.2010	schedule _v3.xls		Z:/Projects/DP/Scheduling				
v4.0	22.9.2010	schedule _v4.xls		Z:/Projects/DP/Scheduling				
v5.0	23.9.2010	schedule _v5.xls		Z:/Projects/DP/Scheduling				
v6.0	27.9.2010	schedule _v6.xls		Z:/Projects/DP/Scheduling				

The schedule worked for small project work. In small projects this is easy way to keep a schedule but if the project is bigger than what document preparation project was it needs better schedule and control of the schedule as well.

Similar picture to Gantt chart (Figure 6) was used but in very simple way. In Excel file there were small columns where was marked X letter on the task row on column that had the right week number on it (Table 6). This created a fairly simple chart just to get an idea of how the tasks are shared on different weeks during the project work.

Table 6: Task partition.

	36	37	38	39
task	production weeks			
1.1	x			
1.2	x			
1.3		x		
2.1		x		
2.2			x	
2.3				x
3.1		x		
3.2			x	
3.3				x
3.4				x
3.5				x
4.1		x		
4.2		x		
5.1			x	
5.2			x	
5.3				x
5.4				x
5.5				x

In the project plan for GCP there was an imaginary testing team for the console safety of both the hardware as well as software side. In DP the quality assurance was showed in a different way. All documents had named members who were responsible of going through the document and making changes if necessary. People were for each task for quality checking purpose at an early state of the project since it was agreed to be a good idea for at least one other person reading through the texts and not only the writer.

Quality assurance was showed as checked status on task and schedule list. Some of the tasks were fixed by the person responsible of the checking. Extra checking was kept at the end of the project before committing the project. It was asked from every member to read through all the documents and make a note when they had approved them.

Communicating within project group involved mostly oral communication during the common working times. Small meetings were kept without planning them ahead but instead inviting members to gather together when it was needed. There were only four members in the group and it made it easy to invite group together since all gathered working at the same time anyways. Outside common working times emails were used for communication. It was agreed that prepared documents and notification about tasks done were sent by email as well. This communication system worked well because of the small size of the project.

In the project work there really wasn’t many other costs except group members own time spend on working. There was no plan of time spent on working for the project since it was known that the group had to use as much time as it takes to get all tasks done properly. There was however an attempt to try to evaluate the required time for completing tasks when they were shared between group members. The idea was of course trying to balance the work load between group members as equally as possible.

There was no document about the risks in the project work. Instead it was discussed in meetings. For example one of the group members was planning to drop off the project and the group would have consisted of only three members, making the work load a lot bigger for the remaining members. With very small amount of time left back up plan of task sharing was quickly made in case group ends up being three member group. Project work was prepared for the risk of losing one member but happily enough project got back to the original plan after getting confirmation of this member staying on the group after all.

Schedule should have been prepared a little bit more loose at the beginning to help in case member leaves but the given time for the project was very limited so there was really no time to be wasted. If the project would've been any longer there would have been need for document of risk factors and back up plans in case the risk factors happen to come realized. Project thankfully moved forward even with the uncertainty of group being one member less. None of the members were sick or absent enough for it to affect much on the project work.

4.2 Project organization and roles

GCP had a big organization described in project plan. Whereas in the DP the organization was smaller. There were four members in the project group and at the beginning roles were project leader, technical specialist, hardware manager and software manager. Soon after the project work had started it was noticed the group was working too much like equal group members. Someone was needed to guide the way and keep project work in move. Project leader role was swapped in order to get project rolling forward.

New and previous project leaders took the task of collecting data of all needed tasks while other two members were signed to do the easiest task known by then. While other two were building a cover of the project plan and a logo to the imaginary company of the game console project, project leaders digged out what all is needed in a project plan and requirement specifications, at the same time a list of the needed tasks was created and processed to the schedule file.

Small meeting was kept in meaning of sharing the tasks between group members. Opinions were asked in effort of trying to get the tasks shared in a way that no one would have to do anything they hated. Another important thing in the project task sharing was that the work load between group members should be as balanced as possible. Trying also to get them understand that it is a group work and all need it done but no one needs to do it alone.

Making the schedule based on task list members were listened and their opinions asked on the matter of due dates in effort of trying to make the working less stressful and painful for the group members.

Work load was managed to be shared equally enough and timed in a good way that none of the group members got irritated about it. It was realized early that everybody was there on their own free will so as a consequence, project leading was needed to be done gently especially when giving any orders.

Project leading tried to get the members to see the way for common good in effort to get tasks completed efficiently and in schedule. When some of tasks were late there were orders of other members to help on the delayed tasks. This balanced the work load even better and most of the things were done almost in schedule. As the schedule was planned in a little loose way, one or two days late from schedule didn't really matter. The meaning was to get a little bit of flexibility without compromising the whole project work being late.

When one of the group members informed group about dropping off, all kind of panicked a little. Project leading hurried to do a new version on task and schedule list for the remaining members. It would have meant a lot of more work for the rest of the group especially since the project was running out of time with finishing up. Group mentioned to the supervisor of the project about the one member maybe dropping out and reasons behind it. Thankfully he was kind enough to settle agreement that made it possible for our member staying on the course and finishing up the project with the group. Persuading was needed for the leaving member to come back by making him realize what he would have lost for very little amount of work left in the project.

CONCLUSIONS

Project management is wide area to handle; it requires keeping everything organized and staying at the top of things all the time. Following project plan carefully throughout the whole project makes management easier and risks smaller. Communication and sharing information has a big role in project success. Shared responsibility areas help in management but they need to be well planned.

Project leader's job is challenging with many different parts to keep in control at the same time. Project leader should be a person who can take a lot of pressure and still keep calm all the time. He should also have compassion and understanding towards his project team. Leader should also make sure of the work environment being suitable and always encourage group working.

What makes project leader's job challenging? I think it's the big amount of different things to keep in control at the same time. I've noticed how much easier big amount of tasks is to be done when you can make a list of them and cross them over when they're done. With project leading none of the parts to control are done before other ones are started. Project leading is a multitasking on its best.

In our own project work of preparing the project documents I think I managed amazingly well on the role of the new project leader. I was in doubt during the implementation if I was ordering the group members too hard but I asked them nicely if I was bossing them around too much and they all said no. According to them, just enough to get things done. I noticed a lot of pressure during the last weeks of the project work. From how I saw the group members acting, I didn't notice any signs of too much stress. I guess I managed in my own goal of trying to make sure the members don't get too stressed about the project work. I can easily imagine the effect that it would have on the works to be done. I thought that as a project leader it was better that the stress piled on me instead of my group members.

As a project leader I had a little less of the normal tasks but I had the responsibility of taking care of updating the schedule and documents. We agreed early that all tasks done were send to me by email and I included them in the documents updating every time them in the schedule as well. I kept controlling the schedule all the time and informing group members of the tasks due dates and tasks that needed quality checking.

I liked this experiment of being a leader in small project. I believed I can manage the project leading otherwise but I was concerned about the people management side. I have bad memories of customer service in work life and I've never been very good with people. I get along with people but that's not enough for a leader. Of course it helped me a great deal that in this project work all the members were my class mates and I know about their ways of acting a little so I know what to expect from them.

In general the project work went well but we should have had prepared for the risks better and the given time for executing the project should have been longer. There were many people on the course complaining about the amount of work to be done in such a small amount of time. In course feedback we did mention about the idea of keeping the course during one semester instead of a half semester.

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Example of a possible project plan content

1. SPECIFICATIONS
   - 1.1 Introduction and background
   - 1.2 Documents produced during the Project
   - 1.3 Project goals
   - 1.4 Cropping and connections
2. ORGANIZATION
   - 2.1 Project group
   - 2.2 Management team
   - 2.3 Contact persons
3. PRODUCTION PLAN
   - 3.1 Partitioning and implementation phases
   - 3.2 Project Schedule
   - 3.3 Task list
   - 3.4 Resource plan
   - 3.5 Risk analysis
4. PROJECT BUDJET
   - 4.1 Cost estimate
   - 4.2 Cost control
5. DIRECTION PLAN
   - 5.1 Meeting plan
   - 5.2 Notifying
   - 5.3 Supervision and reporting
   - 5.4 Training plan
   - 5.5 Quality verification plan
6. VERSION MANAGEMENT

Example of Duties of Project Manager. [4, p. 98]

- Define the project.
- Prepare the project plan.
- Present and sell the project and project plan.
- Convey the purpose of the project.
- Implement organization policy and procedures.
- Apply effective project management methods and tools.
- Interact with general management.
- Interact with line managers.
- Obtain project resources.
- Coordinate the use of project resources.
- Interact with customers and suppliers.
- Interact with other projects.
- Prepare and review budgets.
- Review milestones.
- Develop schedules.
- Revise schedules.
- Revise budgets.
- Manage the project team.
- Delegate responsibilities.
- Define issues, problems and opportunities.
- Participate in specific project tasks.
- Analyze issues.
- Prepare management presentations.
- Make management presentations.
- Determine project status.
- Perform “what if” and projection analysis for the project.
- Deal with conflict with management.
- Deal with conflict within the project team.
- Restructure project plan.
- Understand the tools and methods used in the project.
- Learn from previous projects.
- Deal with the impacts of project change.
- Coordinate the removal of project team members.
- Coordinate the arrival of new project team members.