Abstract

This project report involves the investigation into how well project management techniques are used within large group projects. In particular this report has been written within the context of the CM2301 group project. By writing this report within the context of a real module within the School of Computer Science & Informatics I can use real stakeholders and use more investigative skills. The skills I have decided to use are surveys and sample groups in order to gain an insight into what problems the students have already perceived and what solutions they would prefer. This project report has many aspects to include but the most important is the building relationships with the students to truly reflect what they want. From undergoing investigative approaches, I found that people's perception of project management differ from the traditional definition. The students found that Gantt charts and formal plans were too inflexible for what they required in planning their project due to the complexity of their schedules and other commitments in further modules. They preferred a more agile approach to software development and therefore any plans must reflect this. They found formal project management programs hard to use and this made them less enthusiastic about planning their project. Instead they perceived non-educational communication tools such as Facebook a more effective tool as they can quickly delegate tasks and keep a record of what people have done in an informal manner. From the student's reactions to the current tools I have understood that they are not satisfied. The next stage of this project will involve understanding the dissatisfaction further by performing heuristic evaluations on the tools identified and also research further into the project management market in areas not so popular to see if there are any tools available that meet their requirements better. From this investigation I will then produce a set of recommendations and designs that satisfy their project management requirements.

CM0343 Interim Report

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1. Introduction

As my final year project, I chose to study how usable project management tools really are? Do they adhere to all our needs in software engineering when in large teams? This is a topic very relevant to the School of Computer Science & Informatics as undergoing a software engineering group project is a compulsory module in the second year programme of study. This module involves being allocated a specific brief by a client describing software that they would like to be implemented. Throughout the year the group must work on developing this in order to meet the client's specification.

In order to do this effectively, they are strongly encouraged to evoke some form of project management and communication tool which will aid communication and organization of tasks. The aim of my final year project is to analyse the current tools that the students have available to them and make recommendations for a new project management tool. The recommendations will be based on an analysis of the usability of the tools currently used and what the students perceive would aid them.

The main scope of this project is to make recommendations on improvements in project management and communication tools within the context of the group project studied by second years. If time allows, I would also like to produce designs of a new project management tool which incorporates the recommendations made and dramatically improves the usability in comparison to other tools. The usability of identified tools will be analysed using human factors techniques such as Jakob Nielsen's Heuristic Evaluation. This is one of the main approaches used within the project along with Soft Systems Methodology to help define the problems and to help plan my project myself and identify the areas we need to study. Further to this, I will use investigative tools such as questionnaires and interviews with the current students studying the modules and will undergo extensive research to analyse how project management should be done in a team situation.

As stated in the initial project plan this interim report will mainly consist of gathering the student's requirements for a project management tool. I will do this by using investigative tools such as surveys and interviews and keep them involved throughout my project in every decision I make. I hope that in turn they will do the same so that any system changes I recommend will be reflective of the whole group project module and not just the start. I want to develop a comprehensive list of what tools the students currently use, how they use them and what they are missing. These areas will then be used to compare against current tools in order to analyse whether they can effectively perform the task without hassle to the students. I think it is vital in a group project which is self managed by the students that some planning is adopted and we need to ensure a program is available that will allow them to do so in a way that suits them.

2. Background

2.1 The situation

In the current market, there are many tools which currently flood the project management area. Within the School of Computer Science & Informatics there is only really one stand out software that is encouraged to be used to aid project management this is called Microsoft Project. Students are constantly reminded that planning and managing your own project will be of benefit to you and will result in project success but can they perceive the benefit? It is unsure how easy the students find the suggested tools such as Microsoft project to use and whether they really see a true benefit.

Within this project, I will investigate what the students really require and understand whether this is actually readily available to them. This topic is very relevant within the school so any findings and recommendations made will reflect the view of the stakeholders present. It will feature stakeholders such as students and lecturers within the school and is based on how the school operates this group project module. Even though the scope is so that the tool designed and the recommendations stated will be accurate in the context of the group project I believe that this is transferable in any group project management.

2.2 The Context

My project was set in order to reflect activities within the second year group project module. This module is studied by all second year students on degree schemes within the school of computer science and is a module which is a requirement to pass in order to continue to the third year. The students will be assigned a random group with people from multiple degree schemes. This means that communication and project management is a large necessity as the first task in this group project will be to build a relationship with your team and communication tools will really help in building these quickly and keeping the team on aim. I will use the students themselves currently studying the module in order to help me understand what they really require in project management. Being a student myself who studied the module previously, I have already have a good basis for the requirements in this project and what tools we found useful as a team.

2.3 Areas for Concern

2.3.1 Agile Methodology

As part of the group project module the students are encouraged to use agile methodology as this is best to use in large teams. According to Tolfo, a C et al agile methodology is a fairly new technique which emerged as an

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attempt to improve quality & performance in software development. I have performed research on what the benefit really is of using agile methodology is and how this will relate to the group project as their chosen method. Agile methodology has a manifesto which describes how it differs to traditional process driven approaches. Below I have investigated each point in the agile manifesto and described why they are useful in the group project setting.

- *"Individuals and interactions over processes and tools"* - this is relevant due to the fact that each student is involved in a group with ten individuals and their main mark will be based on the client's satisfaction in fulfilling his brief.
- "*Working software over comprehensive documentation"- this* is true in the group project as the focus is on developing the software to meet the clients needs. That is their main priority. Other documentation is important but this is the project aim and should be made high priority
- "*Customer collaboration over contract negotiation"* the client is the most important person within this module so integration with them in key stages such as requirements, design and then implementation is imperative to project success.
- "*Responding to change over following a plan"* as the client is involved and this is marked you need to be able to quickly interpret what your client wants and adapt the solution to incorporate this.

No project management tool really considers an agile way of doing things. Typical methods in agile project management including scrums which are an incremental iterative function and weekly builds. Unfortunately well used tools available to the students such as Microsoft Project focus more on the process driven tools as they only allow for you to plan a full calendar of the project and input milestones. For a project which is constantly changing and which requires you to adapt to your clients brief and team members schedule it is often very hard to plan in advance and these plans are often unreliable and regularly ignored.

2.3.2 Large Group Sizes
The group project module involves real students and the group sizes are very large. I must consider this in analysing project management programmes. The typical group size ranges from 9-10 pupils across several different degree schemes. This means that the groups will have to

contend with more opinions and ideas. Also they will have to work around different schedules as team members span across several degree schemes. The larger group sizes mean each team member needs their own role and responsibility. According to Adams, S & Anantatmula, V, Team members can lead to the success or failure of a project, lack of cooperation and support from a team member can be detrimental to the delivering of important tasks and the overall success of a project. Being in a large group comes with many challenges. According to Langmaid, R & Mac, A being in a large group gives people the opportunity to become invisible. Many people become scared to share ideas and feel intimidated by the amount of different personalities. This is true from my own experience as each group incorporates people from many different degree schemes. From this you can tell people have different passions and interests and it is important to attempt to incorporate these as they are likely to do their tasks to a better standard if they are enjoying what they are doing. As the module that we are basing this project management tool on is group marked, it is important that everyone contributes as much as each other. In larger group sizes it is increasingly more difficult to get your voice so it is important that there is effective communication channels and well documented tasks so that everyone within a large group has a means of contacting members and knows what they must do each week.

It is extremely important to interact with every person within your team and develop close relationships. Motivation and good team morale according to Tonya, M has a direct relationship with project success. Enthusiasm for your project can inspire, encourage and stimulate individuals to feel the same. A happy team will likely lead to project success so good planning and no stress will help achieve this.

2.3.3 Students Attitude to Project Management
Planning a project is usually seen as a tedious task. Most people especially in a university setting – get their brief and our enthusiastic to get started. They do not want to sit down and plan the whole project initially. They see this as a waste of time as this usually is not a deliverable to a client and is for the group's use only. According to Rosenfeld, E, one of the biggest reasons IT projects fail are because of failure to plan. He too noticed the fact that groups often see project planning as avoiding the real work. By planning effectively you can save yourself time in long run by not overrunning deadlines and not forcing stress onto your project team.

2.4 Stakeholder Involvement

As the project is so relevant within the School of Computer Science & Informatics it was important to involve the students as much as possible. In order to do this, I gathered a sample group of students all willing to share experiences of past group work and the future group project that they are currently working with. I have also signed up a full group of students currently working on a brief in the current group project module that will keep me informed of issues in project management and communication and also are willing to try out new project management tools which I have suggested to inform me how well they incorporate into their group project. I think using real life clients has enabled me to understand the problem better and to get a real understanding of what the client's want from this project management tool.

According to Alan Cooper in the "inmates are running the asylum" software engineers usually ignore the users and just add in extra features which hinder usability and just frustrate the user. When I complete this project I have will have a detailed set of recommendations and some designs to improve usability. The end goal would be to deliver these deliverables in a way that if necessary the findings from my project could then be used to implement a tool which would improve the project management techniques. By having the user involved I can focus all recommendations on what the users wants and avoid designing a system such like every other project management tool currently on the market which does not aspire to meet what our students really want.

2.5 Identified Tools

Within Project Management, there are various tools available in the market. The most common tool is Microsoft Project and this is the tool where the students studying in the group project module would have the most exposure too. This was the tool which when surveyed the groups in the second year group project 100% of respondents said that they have used this previously. The school of Computer Science & Informatics actively promote this tool as an easy tool to learn Gantt Charts and tutorials are given by lecturers on how to effectively use this tool. However when questioned about the usability of this project many respondents commented on its inflexibility and complicated features. They want simplification and integration with communication tools they already use.

Not only is Microsoft Project a potential tool but there are other tools available online. There are handfuls of project management tools which are available as trials on the internet and this is definitely a flooded market. None of which have a reputation as big as Microsoft and this is probably why they dominate the market.

3. My approach

In my project plan, I stated that a lot of research would need to be initially done. The importance within my project is ensuring the stakeholders are considered at every stage. The end goal is to analyse why project management techniques are not at their highest standard and suggest improvements on how we can encourage the students to see project management as a great benefit in any group project they undertake. In order to do this effectively I had to build a relationship with the students and ensure that I am portraying what they require in my findings.

3.1 Survey

I first decided to administer a short survey to quickly retrieve what project management the students have used previously and what they thought of it. This initially was a good idea as I believed I could get a high volume of information for a low amount of effort from the students. However the response was below expectation. It resulted in only 17 respondents which did not give me a large enough sample size. Even though this sample size was small I did gain valuable findings which became the basis for my further investigation – these are noted below. For detailed survey results please see Appendix 2.

- The first area I noticed was that within the School of Computer Science & Informatics they are strongly encouraged to use Microsoft Project as this is installed onto all the school's windows machines and is easily accessible to all the students. Even though this is not strictly enforced, the students felt like they did not really have an option on what project to use to create their project plan. Within previous group projects that these students had to complete they were given the instruction to use a Gantt chart and therefore they were forced into perceiving that process driven methodology would be more beneficial for them. They have developed a relationship between project management and Gantt charts - however there are other options.

- The biggest development I gained from this was that I really needed to define what I classed as "Project Management". At first I perceived project management as the allocating of tasks and I assumed a Gantt chart or table as I had gone through the same experience in my group project as the students portrayed to me in my survey. The students instead expressed that project management should include communication between team members and should be more flexible than a fixed project plan. This incorporates ideas included in the agile manifesto explained above and follows an agile approach to software engineering. No project management tool incorporates team communication and easy change. This enabled me to then consider the usability of tools which are not

necessarily classed as educational or project management tools but do aid the delegating of tasks and sharing of resources and documents. These tools included Social networking sites such as Facebook and conventional tools such as email. When I reflect on my own experience within my group project I remember that even though we created a strict plan this was often neglected and replaced with casual tasks delegated over facebook or via our mobile phones. This worked well for us as you could do things when you need them and only focus on them then. The only downfall I found was that we often forgot about big milestones.

3.2 Sample Group

Obviously with the disappointing number of respondents from this survey, I needed to create a contingency plan which would enable me to gain the requirements for a new project tool. This plan was to instead approach the students currently studying the module and encourage them to keep in contact with me at every stage. I managed to find one group of nine students who were happy to respond. From this I have managed to keep in touch which them weekly about their progress and what tools they find the most helpful. At the beginning of this project, I asked them to identify the tools they aspire to use throughout their group project and I used them as a basis for understanding how they help or hinder in group project management. The tools identified are listed and analysed below.

3.2.1 Facebook

Facebook was identified by the selected students as being their primary way of contacting each other outside of university. The benefits of this tool to project management are that it is not strictly an educational tool. Group members would log onto this for other purposes but could then check on group progress and see any messages left. It also helps with distributed teams. Over Christmas break the students will return home which could possibly be across the country. Having a tool which can be accessed whilst at home can mean work can continue to progress even when the teams are distributed meaning that the project is less likely to overlook deadlines.

The biggest condition in using this as an effective project management and communication tool is ensuring that all users have a Facebook account and are happy to use this for educational purposes. In the sample group this was not the case, one team member out of nine did not have Facebook and the group decided to continue and make a group space regardless. The initial idea was to send out emails to the student who did not have an account with any information that it shared on the facebook

page however this was often forgotten meaning this student missed valuable information. The solution to this was to tell the remaining student to make an account as the students could not find an alternative suitable tool. This obviously is not ideal and would probably reduce morale for this student as they shouldn't have to sign up for a new service if they don't want to.

3.2.2 Microsoft Project

As mentioned previously Microsoft Project is the most common project management tool as stated by Computer Weekly and readily available to the students. This was identified as a possible tool to use in help plan this project but in practice was not really used. The group tried to create a project plan however found the setting the calendar and allocating resources tedious. They found themselves spending more time creating a plan than actually doing any work which was marked. This is obviously a huge issue that needs to be considered. Microsoft project is perceived as too complicated especially if you're working hours vary around other commitments such as lectures. By setting this in an academic environment and being part of a team you have a lot more to schedule than the typical project and Microsoft project does not really allow for the amount of flexibility required.

3.2.3 Cardiff University E-mails

Every student is enrolled onto a course within the School of Computer Science & Informatics and therefore has a Cardiff university email. The sample group perceived that this was a good tool to share documents and information – they already had to keep in contact with their supervisor using this tool. This is a convenient tool as everyone has access to it however this is a big problem of versioning. Versioning according to Plone (2000) is a system which tracks changes over time. By using emails to send documents you will have multiple versions of the same document circulating the group.

3.2.4 Google Docs & Dropbox

"Google docs" & "Dropbox" are free web based storage services offered on the internet. As each team member needs access to the same information and need to share their work, a group space is a great idea. Again these services require sign up and creation of an account. An advantage is that it only takes one process to upload to one of these services, where as several emails need to be sent to each group member. Another issue is the problem of versioning as mentioned above. This is a

slight improvement on sending emails as you can time and date that items were uploaded but there still could be multiple versions.

3.3 Issues found

As discussed above, project management can be expanded to include not just planning but communication and document sharing. According to (REFERENCE) Project management is the discipline of planning, organizing, securing and managing resources. I think this definition includes not just the typical project management tools but also communication amongst the team, scheduling meetings, sharing resources etc. To achieve all this at the moment with the tools currently available, you have to use multiple programs. This is not ideal and complicates the process for the group. I think in any recommendations made there should be a program which incorporates all of these into a more usable format.

3.4 Requirements

From looking at the information presented to me from the students and from looking at the programs myself. I have a brief set of requirements for what the student want from a system. These are listed below with evidence of why that is,

- ***A system should allow you to build complexity into it over time and not force you to do it immediately****.* This requirement was derived after a discussion with the sample group about Microsoft Project. They had experience of using this and found that at the beginning of a project they do not know whose going to do what task and what resources they require for this. Also in order to set up an accurate time scale you need to add in working hours – for students, this changes each week due to other commitments in coursework and lecture timetables. As there are many degree schemes free time will vary so at the beginning of this project is not feasible to set up definitive working times.
- ***A system should incorporate change management and there should be flexibility in it to quickly to do this without hassle.*** This requirement has been included due to the need for agile methodology. Each group will meet with their client every couple of weeks to see if they are fulfilling their brief, usually after these meetings there will be need for change. This change needs to be quickly implemented into the plan so that they can react to anything the client requires. Change management is the process of shifting teams and process from the current state to a desired future state [reference]. They should be able to add tasks with ease and adjust times to ensure the plan is accurate at all times.
- ***A system could be web based in order to incorporate functionality from many of the programs such as communication & document sharing.*** I have defined that project management can also be incorporated into communication

with teams and sharing of documents. They all help achieve the aims of the project.

- **_A system could utilise an already existent login (e.g. University)_**. - People should not be forced to sign up for things they do not necessarily want to. People all have different preferences on programs they want to use and to force a program upon someone will not build team morale. As this is a yearlong project then a strong team is vital in success. A way of solving this would be to integrate with the universities login and create a system which allows everything you need to be accessed just like you would your emails. This would massively reduce complexity and would allow users to detach from university work rather than using their social programs to communicate.
- **_A system should not confuse or frustrate the user_** – The biggest issue noted from the initial investigation is the lack of usability within a lot of these programs to deal with the amount of flexibility the group requires within this plan.
- **_A system could incorporate different types of formal plans_** – Each student will have a different view of what they perceive to be good planning. Some will prefer typical table like format where some students use less traditional approaches such as Soft Systems Methodology or "Post It's to do notes". A program could have support for these different methodologies.

3.5 Soft systems methodology

As part of my requirements gathering approach I decided to use Soft Systems Methodology in order to help me plan my project and identify areas which I need to consider such as the students & the academic constraints on the module.

3.5.1. Root Definition

A system owned by my supervisor and operated by myself to make recommendations for a new project tool to be used with the second year group project module for students by analysing usability of existing project management and communication tools and identifying areas for improvement from them, whilst constrained by time and academic legislation.

C   *Students studying the group project module*

A   *myself*

T   *to make recommendations for a new project tool*

W   *by analysing usability of existing project management and communication tools and identifying areas for improvement from them*

O   *my supervisor (Helen Phillips)*

E   *time and academic legislation*

3.5.2 Conceptual Model
For full conceptual model please see Appendix 1.

3.5.3 Analysis of Activities
From creating this model I was able to develop a plan for the areas I noted in my CATWOE. From understanding this conceptual model, I clearly identified that the students will be the beneficiaries of the system and their input will be the basis for all my requirements. I can also clearly identify that this is an academic project and it is important that I ensure that I the investigation I carry out leads to what the supervisor wants to find out when she set this project. I have clearly set space in my soft systems methodology to perform an activity that allows me to define what the supervisor really wants me and this activity will be revisited over the course of my project.

I have also taken into account the variety of skills I will need to develop. I want to be able to produce accurate recommendations based on what the students really want. According to Alan Cooper, programmers do not consider end users and only really design for what they want and most of the time they are not the end user. This is a clear problem and I need to ensure that when making recommendations that I detach from what I want and ensure I deliver a consensus view of what the students want. I aim to analyse usability and create potential designs. For this I will need skills in human factors and soft systems methodology areas. I need to analyse my capabilities and ensure that I have the skills in order to do this. If I don't then I need to quickly develop the skills. I have included this into my conceptual model as a lot of the skills I have used previously but I will need to refresh these in order to do these effectively.

Finally the conceptual model also deals with constraints on the project. I think this is where the strength of doing this method lies as I would never have considered these constraints previously. These are academic constraints such as module guidelines and plagiarism. I need to ensure that I not only enforce these on myself but also in any design. I think Soft systems methodology is a really good way of clearly breaking down the key areas in your project and defining the aim of what you are trying to do. I now feel I am focused on what this project will achieve and can effectively perform the activities that will get me there.

4. Conclusion
My final year project deals with how well project management techniques are actually used within the School of Computer Science & Informatics. These project

management techniques in particular are used within a group project module studied by second years. My job was to investigate how they currently use project management techniques and how effective they find it? I identified within the initial project plan that there is a potential problem but from investigation I can now see that this is true. I have identified that the current students have challenges to face in their group project module which is not easily modeled in a project plan such as Agile Methodology and large group sizes with people across multiple degree schemes. This group project module has begun for the students so I have already been given the opportunity to talk to them and see how they have planned the start of their project. From interviews and surveys with these students I have noticed that many of them find planning a tedious process which is not worth doing. They perceive it as a barrier from the real work. This is because programs used do not have the functionality they require and are too complex to use. They expressed a alternative approach to project management which project tools do not possess which focuses on good communication with team members and the ability to share information quickly across a team. These included non educational tools such as Facebook and document sharing sites such as Dropbox. These have all been identified as good ways to ensure everyone is meeting tasks and also delegating further tasks without the need for constant meetings. With the problems expressed of project management tools and the multiple programs being used in order to compensate this I can clearly identify there is a problem but I am still unsure of the extent of this problem and the solutions for this. I need to investigate in what project management tasks are these problems and how we can improve these in recommending a new project system.

4.1 Future Work

To continue with this project I really want to investigate the issues highlighted by the students in the usability of the project management techniques made available and the integration of other tools such as communication and document sharing. Project management has such a vast range of what it includes. It can range from strict project plans to notes on a piece of paper. According to Henry, J, There are several guidelines into understanding project management and these include improving team morale and prioritise tasks in the right order in order to gain project success. In order to make the best recommendations I will undergo further investigation into the usability and tools available in project management. The first tool will be a heuristic evaluation on various programs. The programs I have chosen to analyse are Facebook groups, Emails, Dropbox & Microsoft Project. This is because there is a large array of tools which all aid different types of project management identified and these are the tools that I know from investigation have already been used in a group project setting. As I identify problems I will try to suggest solutions. Each solution will then be

screened by the sample group and I will administer another survey and hopefully get more responses than this try. I want to ensure that at every stage I consult the students so every recommendation made will be reflective of what they really want.

I have made a more detailed project plan which will clearly describe my progress after writing this interim report. This plan is detailed in Appendix 3.

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