Title: Personal Review of Several EMP Team Projects

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Abstract

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Contents

I. *Introduction*

- ***Objectives of This Study***

The Engineering Management Program (EMP) of Portland State University is a projected-oriented program. I have been enrolling in EMP for three quarter. During these quarters, I have participated in 6 team projects in 6 different classes, of which one team project is an on-going project at EMGT 545/645 "Project Management" class.

From a perspective of an International student, the projected-oriented program/classes system was relatively novel when I first enrolled in this program. Gradually, I have been able to understand its competitive advantages while I benefited from it deeply. Generally, I feel that the projects, whichever team projects or individual projects they are, help me very well to study the contents of the specific classes. More important, in the context of this study, they provide me excellent opportunities to educate myself in "project settings".

The requirements, terms, objectives, motivations, rewards, and environment of an EMP class team project are of much difference from a project in industrial settings. However, still the "Cost-Schedule-Performance" three-dimension structure, teamwork, leadership, and spiritual rewards of an EMP project are nearly the same as those of an industrial project. It's possible for the students like me, to obtain the precious learning experiences in project participating and project management, which prepare us well with quality and a number of skills for our future/present careers as engineer managers or project managers.

In those projects I have participated and participate in currently, there have been a lot of good and bad, which motivate me strongly to recall them and review them, with

assistance of the insights now gained from Project Management class, given such a good opportunity (individual project) to do this.

I attempt to use the following research questions as "threads" of this study:

1. How to understand EMP team projects in a context of "Systems Approach"?
2. How to evaluate the overall performance of a team project, from the perspective of an EMP student?
3. What are the key issues involved in an EMP team project?
4. How to address these issues in terms of project management?

- ***Methods and Settings of This Study***

In this study, I will review several team projects in which I have participated during recent quarters.

Because there will be a lot of content in this report related to my previous or current classmates, and all are based on personal senses that cannot be guaranteed to be unbiased even though I will strive for that in the report, hereafter I'll use characters like A, B, C and D to substitute their real names, including my own name.

There will be three team/team projects being mainly reviewed in this report:

1. Class: EMGT 520 Management of Engineering and Technology
   Term: Fall 1997
   Team Member: A and B.
   Team Leader: Initially A, later B
2. Class: EMGT 535 Decision Analysis
   Term: Winter 1998
   Team Member: C, D, E, F, and G
   Team Leader: E
3. Class: EMGT 545 Project Management

Term: Spring 1998

Team Member: H, I, J, K, L, M, N, O, P and Q.

Team Leaders: M and N

Q is a "half member" in this team because he shares part of the required load with this team and do the other part by himself being an "individual team".

Because the observations obtained from only one project may not be adequate to fit my learning from Project Management class, I'll cover all the above three team projects in their own relevant or applicable questions that will be addressed in later section. The questions addressed in Section II are not listed and responded in a one-by-one style. Instead, the questions of each chapter are selected by relevance and grouped into a variety of topics and sub-topics. The questions are used only as threads of the section.

This research is a qualitative research. The facts are collected based on my current or previous observations, project related records and materials (e.g. emails and reports) and my memory. The focus is put on attempting to extract the best practices of EMP team projects and provide guidance for future team projects.

II. Questions/Responses of Each Chapter

- ***Topic 1 – Project and Project Management in EMP?***

  - ***The Fitness of The Studied Projects With The Definition of A Project***

The projects I am studying fit very well the definition of a project, which is proved by the following facts:

1. Each of these projects involves a single, definable purpose, end product, specified in terms of cost, schedule, and performance requirements.

   In every EMP class, besides completing individual homework (sometimes individual project), passing midterm and final exams, the students are required to form a team to conduct a term project, do one or more cases study, and report guest lectures. Team projects are intended to guide the students grasp the required knowledge and skills more effectively and efficiently, and train them with project/project management practices.

   A team project in an EMP class has clearly defined purpose as above and deliverables requirements including term project report/presentation, case study reports/presentation, and guest lecture reports. All of the work needs to be done by the end of the specific quarter. Every item of these deliverables is supposed to be turned in on time according to class schedule. Every item is graded. The grades are taken account into the final grade of each student in that class, respectively.

2. EMP class project teams are formed with EMP MS and Ph.D. students, as well as the students from other programs. One segment of them is comprised of full-time students. Another is comprised of part-time students. The part-time students are

engineers, managers or other knowledge workers coming from a variety of companies. They have full-time jobs besides their study in EMP. The full-time students have more parallel classes and typically some other part-time jobs and are working on multiple team projects. All the students are of different backgrounds, skills and talents. The team projects extensively utilize their skills and talents within each team.

3. Every team project in every EMP class is unique that differs in topic, requirements, methods, contents, or team formation. And every project involves different unfamiliarity to its team members.

4. EMP class projects are temporary activities lasting one quarter normally. Every team project is the process of working to achieve its goal across its own project life cycle.

- ***The Appropriateness of Use of Project Management In EMP Team Projects***

With respect to the above characteristics, the EMP projects are nearly the same as the projects in industrial settings, except its non-commercial nature. A typical EMP team project is a two-month project, formed by 4 ~ 8 students, with a goal of utilizing their talents and what the team members learn from the class to conduct a meaningful project in the specific area.

The topic of a term project (that is the main task of that team project) is explored and established by the team members together. The team members may or may not know each other before they begin that class. Moreover, they are well-educated knowledge workers with different specialties and backgrounds, from different companies, even though different countries.

When they pick up a topic, they may not know what knowledge and skills could be used in the project or cases study. They use those in a project while they are learning

them in the on-going class. The project work is hard and tough, but it is only a part of what they have to do besides other jobs and other classes.

Properly applying project management is expected to effectively and efficiently improve the performance of a team project.

All above make the use of project management appropriate and necessary.

- ***The Category of EMP Team Project Manager***

In terms of the category of the project management used in a EMP team project, I would like to approximate it as a "product manager" in a kind of a "matrix" setting. The target "product" includes a term project and presentation, case report(s) and presentation(s), and possible guest lecture report(s). The indicated "matrix" is abstracted from the systems environment in which the students are studying.

The students have their own bosses in their jobs. They are committed to multiple parallel classes/projects. For each student, those multiple projects/tasks may have different priorities but all of them have to be done on schedule with satisfactory performance. In short, from the perspective of a EMP team project, the team members are belong to a variety of vertical lines, wherever these vertical lines located in the companies which they come from, or in whichever programs/department/classes. However these team members are connected with each other by a horizontal line, that is the team project.

- ***The Role of An EMP Team Project Leader***

It can be expected that the role of project manager in such an EMP team project is essential. The performance of a team project is largely depended on this person. However, she/he has no formal title at all. In Dr. Kocaoglu's class, each team has to identify their team leader. In other classes, some teams do not identify their leader even

though there will be some one taking the role. Not surprisingly, the project leader has little formal authority on her/his team members. The project leader works with her/his team, mostly depending on informal authority. Based on the nature of an EMP team project, the role of project leader ranges from project expediter to project coordinator.

- ***Topic 2 – EMP Project: Systems and Organizations***

  - ***The Project Organization***

Figure 1 shows a simplified model of the system environment of the EMP team projects.

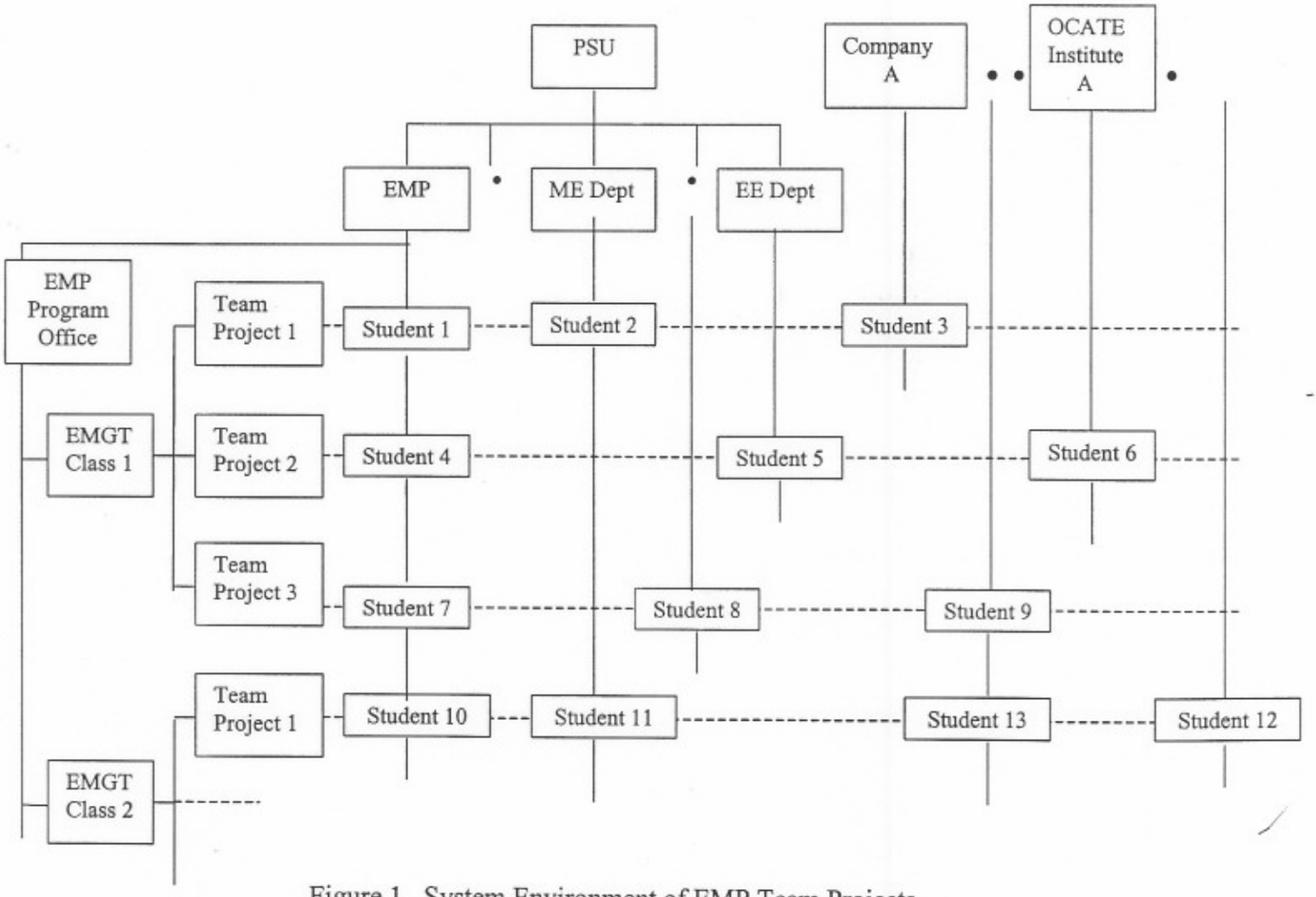

Figure 1. System Environment of EMP Team Projects

The EMP projects exist in different EMGT classes that are instructed, coordinated and administered by EMP faculty and EMP program office. EMP program is administered by PSU (Engineering School). Other parallel departments include Mechanical, Electronic and Electrical, Computer Science, and so forth. At this level, EMP and other departments can be viewed as elements in PSU. However when we delve into them, they become subsystems with elements such as department offices, research groups, laboratories etc. Specifically, EMP functional units consist of the Director of the program, program office, faculty, PICMET, IEEE Engineering Management Transactions Sector, and Computer Lab. Here our interest is the EMP class/project system.

Each class can be seen as an independent project that has a natural "project manager", the instructor of that class. The instructor has a student assistant to help the class. Also EMP program office provides administration and support to these classes. In the structure depicted in Figure 1, the EMP program office take a role as "projects office". Down to the level within a class, each class has several team projects, which are of our interests in this report. Each team project has a formal (or informal) project leader who is the project manager at this level. All the students, who belong to different or multiple projects/classes, are basic elements of this class/project system.

Figure 1 shows not only the internal system of the team projects, but also the external system and (part of) the environment. The companies (Company A and so on) from which the part-time students come can be seen as alliances of PSU/EMP, cooperating with PSU/EMP to educate the students. Also, they comprise EMP's market. The other OCATE institutes (Institute A and so on) and their programs are both PSU/EMP's competitors and cooperators (because they cooperate to offer the students courses while they are obviously competitors of each other's).

- ***The Project Leader***

The whole structure in Figure 1, with respect to our research topic, can be seen as a loosed "Matrix". Part of this "Matrix" also includes the external environment. The project leader of an EMP team project, operates within such a system environment. The project leaders (also project team members) of team projects, are classmates, cooperators or friends, as well as competitors. A project leader who is responsible for his/her team project, should work for the interests of his/her project team. Still, he/she has to have his/her team to get well along with other project teams. Because generally, among the objectives of all the students are to obtain the knowledge, to educate themselves to be well-being, to make friends with others, and so on. A team project as well as its organization is a temporary existence. The students who belong to different project teams in this class and this quarter may be in a same team in other classes or other time.

In operating the team project, a participating decision-making mechanism is often applied in most projects based on its very nature as a student project. In this sense, every team members are decision-makers. However, in specific team projects, depending on the distribution of informal authority (little formal authority is obtained by a project leader), the decision-makers vary from project leader (actual or virtual) to project members group.

- ***The Product System***

The products of an EMP team project include project reports/presentations, case reports/presentations, guest lecture reports. EMP has an excellent system serving those products. Each report from each team project is collected and maintained by program office, and assigned to student assistant to enter them into the EMP student projects database. This database represents a natural product system for EMP team projects. The EMP faculty and students can access this database from the web. Some projects are proprietary and not publicly available. This system is a wealth of the EMP students and faculty and is continuing to contribute a lot to EMP.

- ***Topic 3 – EMP Project: Systems Development Cycle***

  - ***EMP Team Project Life Cycle***

Generalized from the three team projects that I am researching, there are five development phases along an EMP team project, namely "Generating ideas", "Proposal and Commitment", "Main Program", "Reports and Presentations" and "Class Ends". These five phases are corresponding to the five system development phases such as conceptual, definition, production, implementation, and divestment, which are shown in Figure 2.

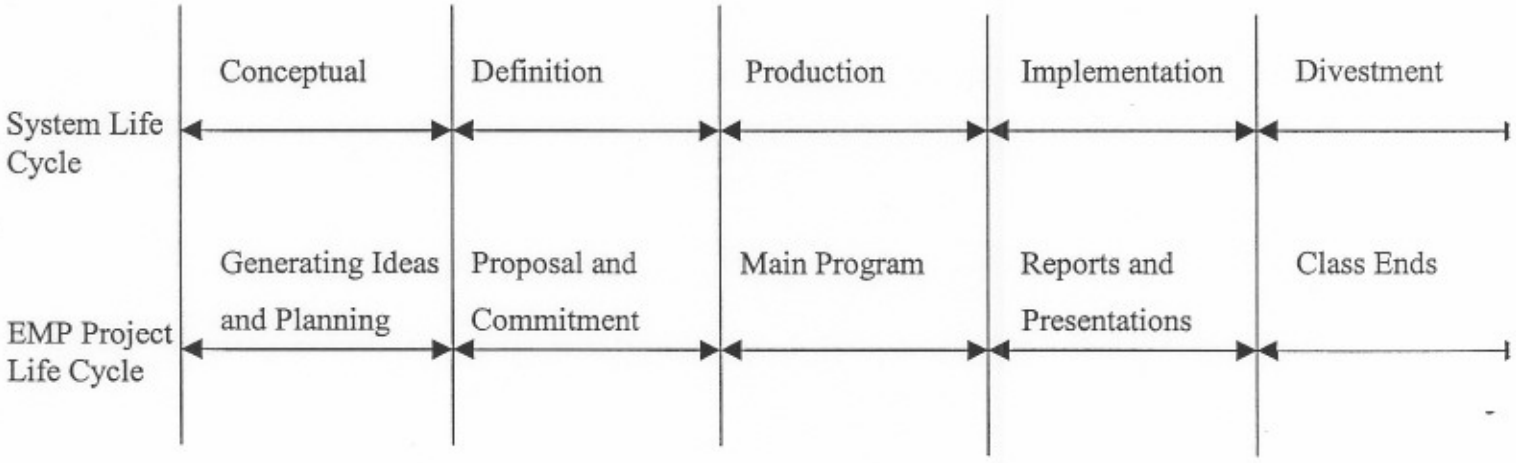

Figure 2. An EMP Team Project Life Cycle

In the first phase, all the team members are encouraged to generate ideas about the team project and plan teamwork for the whole quarter. Because the most important teamwork is the term project and the topic of the term project is open for each team, every team has to decide on which topic they want to work together for this class. Also, because the team project includes term project and other work like case study, the team has to plan all the team work at the very beginning of the quarter.

Every team member contributes his/her idea about the term project topic. Consequently, in the second phase, the team determines the term project topic together. Once a team decision is made and commitment from all the team members is obtained, the team submits a proposal for term project to the instructor to get approval. Also in this phase, all the teamwork for that class is planned.

In the third phase, namely "Main Program" phase, the team work together as a team on all the activities leading to deliver the required end-items as stated before. This phase is the main production phase. The project activities range from literature research, interviewing with or without questionnaires, data collecting, data processing and analysis, concluding, to validating research results etc. These activities may be held through team meetings or assigned group/individual work. The tasks include term project, case study and guest lecture report.

In the fourth phase, "Reports and Presentations" phase, the due times for all the required end-items are being approached. All the work packages enter the last production phase and then are integrated and wrapped up into the final products of the team project. Presentations about case study and term project are held.

The fifth phase "Class Ends" is the last phase for a team project. After the completion of all the reports, presentations and exams, the project team doesn't exist any longer. The team members conclude and evaluate the project, as well as exchange their views and feelings about it. The team project ends as the class ends. And the students are preparing for another quarter's study.

- ***How is the Proposal for Term Project Worked out?***

The first thing is to decide the topic of the term project. The (original) openness policy for the term project topic brings both realism and difficulty to the team. On one

hand, explored and decided by the team itself, the project should be practical and feasible for the team. On the other hand, they have to find a good topic that satisfies the course requirements and fits everyone's interests, at least the interests of most of the team.

Summarily, the criteria for selecting a term project are satisfying the course requirements, fitting the interests of most of the team members, being competitive to other team's project, and being practical with respect to the team itself. The team members follow the above criteria to select the best topic for the team, in team meetings full of democratic atmosphere.

The ideas about the term project topic can come from every team member, not necessarily from the project leader. Actually in all three team projects researched in this report, the original ideas about the term projects didn't come from the project leader (actual leader or nominal leader). The biggest responsibility of the project leader is to oversee the entire realization of the whole project.

In project 1, the original term project topic "Communication Technology" came from a student and obtained commitment from both student A and B, who was previously a team member of this team and later dropped the class. A simple proposal submitted to the instructor was based on this topic. Later then there was a significant switch on the term project topic. The switching idea came from B. B successfully sold his idea to A and they carried on the new topic "Internet Telephony". Initially A is project leader but in such a two-person team, B also took the role as a project leader in later phase.

In project 2, student C originated one part of idea about term project topic, Student D contributed another part of idea about the topic. The idea is "Investment decision problem analysis in apparel industry". A brief proposal based on their ideas is submitted. Student E was project leader and he designed the basic framework for the term project.

In project 3, student H originated the idea of the term project. The others helped to shape the frame. This project team is a large one, comprised of 10 team members. Student M and N are project leaders. Their term project topic is "IT and its impact on Project".

An interesting observation is: in all the three team projects, the one who successfully sold more ideas to other team members, he/she tended to guide the term project and contribute more than others. In the case that he/she was not the nominal leader, he/she tended to play a stronger role than the nominal leader. This proves that in such a student project team, the informal authority is essential.

- ***Project Planning***

A quarter lasts a bit more than two months. So the teams have to plan well at the very beginning of the class. First, the syllabus provides a sound base for a team's plan. Still, each team has to plan by themselves.

Sometimes, the project teams do not have formal (documented) plans other than syllabus. They operate based on the syllabus. This is the case of Project 1 and Project 2. In project 3, due the large size of the team, project leader M foresaw the potential problem of schedule slippage, and made a detailed, documented plan for the whole team project. However, according to my observation, the operation of the team project has not followed that plan.

One thing is true: no matter if a team has a document plan, the team has to have a plan in the mind of the project leader other than the syllabus, at least. Otherwise, a team project can easily get out of control. Typically and naturally, the project leader is more aware of team project planning.

- ***Topic 4 -- Work Definition and Project Control***

- ***WBS of an EMP Team Project***

Figure 3 shows an integration of the WBS and the project team structure of Project 2.

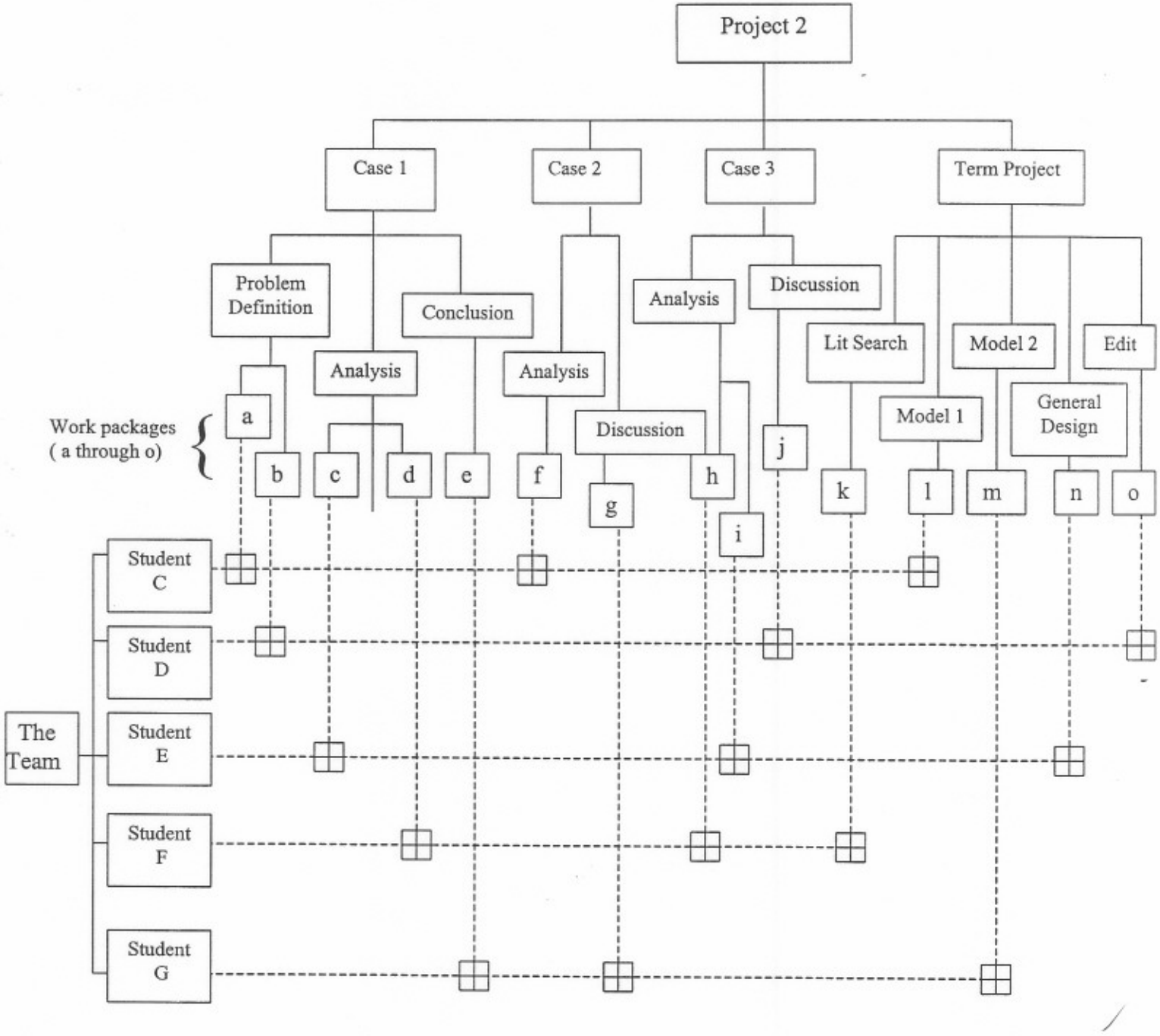

Figure 3. Integration of the WBS and the project team of Project 2

On the left of Figure 3 are Project 2 team members and on the top are Project 2 work packages. The box at the intersection of a team member with a work package, a so-called cost account, represents assignment of responsibility for that work package to that team member. It means that the team member is "accountable" for that work package. Like the work package itself, each account has prespecified start and finish dates. The quality of the work packages is secured by peer review. However, the peer-review work is not depicted in Figure 3.

It should be noted that the cost accounts are distributed to the team members with negotiation and openness. Sometimes, some team member volunteered to do some tough job, and the others balance the rest work. Sometimes, with an eye on the need of the whole project, the project leader assigned the work packages/cost accounts to approapriate team members with respect to his/her skills and interests. The assignments are wholly negotiable. Sometimes, disputes arose and were resolved through mutual forgiveness. Unfortunately, some resentment between the team members was not fully resolved. Consequently some bad feelings carried on between some team members even after the project was finished. Part of the reason may come from other aspects. This team was formed with the students all having international background. There had been some cultural difference and personality issues impacting on the team project performance. This will be discussed more on later section.

In Project 3, foreseeing the potential problem of the work packages distribution, this big project team was divided into two groups at the very beginning of this class after the team formation. A big group (consisting of H, I, J, K, L, and M totally 6 persons) is accountable for the term project and another small group (consisting of N, O, and P totally 3 persons plus "half-member" Q) is accountable for case study. Besides such stipulated accountability, the two groups also participate, help and review each other's work. As far as now, this WBS system seems to work satisfactorily.

In Project 1, there had been an similar division of the work packages of case study and term project, even though that team has only two members. In that case, one person (A) led the case study and another one (B) led term project.

- ***Project Control in an EMP Team Project***

There are two aspects of project control on an EMP team project: external control and internal control.

The external control comes from the instructor. Both case study and term project receive different types of control along with the term. Case study is controlled by case report due-time and scheduled class discussions. One team leads the discussions and other teams participate actively. The participation of each team is accounted into the team's performance by the instructor.

At the early phase of the class, a term project is approved by instructor after he review the term project proposal and return back the proposal with comments. If some problems appear from the proposal, the instructor talks to the team and provides some guidance. However, serious problems often emerge in later phase of the project. Thus, term project progress reporting is arranged in the middle of the term to control the term project. A documented report is submitted and the teams are required to talk about their progress. The instructor reviews their progress and provides guidance to the teams. Sometimes, sequent progress reporting is required along with the term. This interaction does help the term project on the track.

In Project 3, until progress reporting, there has been some serious obscurity on the research objective and scope of the term project. This obscurity led to internal disputes among the project team, which hampered the project for a while, in a hidden manner. Closely after one progress reporting, the team was aware of this problem and discussed

this to the instructor. And then the instructor helped the team to identify their direction and get on the track.

In Project 1, in project progress reporting, the instructor gave important guidance on the methods of collecting data from Internet. This made the team pay attention to some unaware risks associated with the information from Internet.

Internal controls are undertaken by the project leader and also by team members. The project leader who is put onto more responsibility may be more aware of the schedule and performance of the total team project. However, because the project performance is directly related to every team members' success in the class, usually every team member also care about the performance of other team group/members while they keep attention on their own performance. Strongly or not strongly, does the idea and machanism of Intergroup problem solving (IGPS) exist in a team project.

According to my observations, Project 1, 2, and 3 all have some loose and mild internal control. No documented and detail-measured internal control exists in these three team projects. This is perhaps due to the unique characteristic of a student project team – the team members are driven by self-esteem and at most time they are well self-disciplined. However, sometimes I felt that when the project team does need stronger internal controls, the control was not available, due to an atmosphere that every one is afraid to hurt the feelings of others'. But if the job is not done well, complaints arise sooner or later.

- ***Topic 5 – Leadership and Team Building***

  - ***Leadership Style of Team Project Leader***

A lot of EMP students are employed full time and pursue their studies on a part-time basis, while a minority of them are full time students. About a quarter of the current students have M.S. degrees in their own specialties. The EMP students' ages range from more than twenty to fifty.

About half of the students are American and another half of the students are international or have international background. Naturally, the Americans are stronger than the internationals in language skill. However, the international students are bi-lingual and bi-cultural and they can take advantage of their background, too.

There is a great deal of variability among these students as well as some common characteristics of them. Different specialties, experience, cultural background and even only different ages bring with themselves different minds, belief, styles, knowledge and skills.

Still they have something in common. They have similar good quality and similar motivation for study. They either have already had rich experience in their careers, nearly qualified for middle (or higher) management positions, or are ambitious and competitive to enter into engineering management career. Generally speaking, they are well educated, knowledge people. Starting in a same class, their knowledge and skills related with that course are basically at the same level.

To manage them within an EMP team project, one has to deal with the above variety of differences and consequently a variety of potentially raised issues due to these differences, besides the frequently changed circumstances.

According to Nicholas [1], leadership style can generally divided between the two extremes of task-oriented and relations-oriented. Task-oriented leaders show high concern for the goal and the work and tend to behave in a more autocratic fashion.

Relations-oriented managers show greater concern for people and tend to exercise a more democratic kind of leadership.

It is agreed by most management theorists that effective style depends upon characteristics of the leader, the follower, the leader's interpersonal relationship with followers, and the nature and environment of the task. To apply this so-called contingency approach to the EMP context, it seems that a more relation-oriented, participating management style is better responded by the team members than a kind of task-oriented style.

A secret in an EMP team project is that the project leader may not necessarily be smarter and more skillful than his/her team members but just more enthusiastic, effective, efficient and, perhaps, more hard-working than others. Being aware of this, the project leader should know he/she has to depend on the team members who may have better ideas and perform the tasks better. He/she should try explore every team members' potentials as possible as he/she could. A participating decision-making and delegating management will be very good to convey unbiased, wiser decisions and better project performance.

However, when the team is trapped by disputes, the project leader should pull it out. When the other team members have no good idea, the project leader has to have at least a working idea, if not an excellent one. Also, depending on the situation, task-oriented style may be the key for that specific situation.

In the two-person team project, Project 1, the two team members take the leader's role in turn. A close relationship between the two persons conveys good communication and understanding of each other. Decisions are made through extensive consideration and negotiation.

In Project 2, the project leader adopted a strong relations-oriented leadership style.

In Project 3, as mentioned before, the team is divided into case group and term project group. The case group leader N adopts a strong relations-oriented leadership style that is well responded by the case group. The term project group leader M adopted a task-oriented style at the beginning. However this style was not well responded by the group. Later, this group leader changed the style as more relations-oriented.

- ***Communication and Team Building***

As mentioned before, EMP is a project-oriented program. Every EMP class has team projects assignment. When a team is formed, it may be usual that some team members had been in a same team before. However, seldom is a former team exactly "reproduced" itself again. It is a better idea to try to work with different people in different teams rather than always to team with the same persons. Because always working with different group of people who have different specialties, experience and cultural background is a valuable learning source in EMP classes. Generally, each EMP project team is a new team upon its formation.

The major tasks of a new team are to develop a plan for working together and to build good working relationships and a good working environment. New teams have the advantage of not having established bad habits or poor working relationships. On the other hand, team building is essential.

The key for a team's success and high performance is building up group cohesiveness. Still this is the toughest and most valuable job in managing an EMP team project. It may be found hard for the team members (they might be so different) to get familiar with and get well along with one another, within as short as two months and with limited energy. As in a common sense, the toughest thing may be the most valuable when it is finally achieved.

Team building is especially costly when the potential team problems are serious and most of the team members are unaware of team building approach and even unaware of the idea of team building.

In Project 2, team members C and G had studied an EMP class on communication and team building before. They try to apply team building approach in this team. The others didn't take this class before. Even though project leader E and team member D were aware of team building, they felt the approaches C and G introduced were a little annoying. They didn't quite like the strict meeting time control, the precise agenda etc. As to F, he always tended to have different ideas with other team members. C felt frustrated with F. F was also not happy with the feeling that he himself is "isolated". Project leader E knew every one was speaking for the project but just have different minds. Soon, C and G gave up applying their techniques. E could see and valued each member's effort on the team project but didn't successfully mediate the dissension. Even after the project, C had a bad feeling about F and seemed not willing to work with F again. This is a major failure aspect of Project 2. The project leader E should do more on it.

For an EMP project team, usually the team doesn't have a common working environment. Team members meet each other in the class. However, to complete the project, meeting in the class is no way enough for a team. Not only is it highly recommended that a project team have a regular weekly meeting other than meeting in the class, but also it is necessary for the team members have frequent, multi-channel communication. E-mail is fundamental. Telephone and fax should be used as necessary.

In both Project 1 and 2, a team member couldn't communicate with others using email. This had been a frustration when communicating with him especially when the team members needed to transfer documents between one another. This teammate was not familiar with PC. Other teammates spent some time to teach him but the achievement is low.

- ***Topic 6 – Authority and Responsibility of a Team Project Leader***

  - ***Authority and Responsibility of a Team Project Leader***

Formal authority never matches the responsibility of a project manager. This is exactly true for an EMP project leader.

It was shown in Figure 1 that the EMP project organization is kind of a "matrix". The vertical lines may include not only the other departments besides EMP, but also the companies from which the part-time students come, and even other OCATE institutes like OGI and OSU etc. Also, besides his/her own jobs, a student may have multiple classes and consequently multiple team projects in different classes. All these are saying that a team member is far from being dedicated to a class and a team project.

Often in a team project, the project leader is elected from the team and later then the instructor acknowledges him/her and labels his/her name on the class roster. That's all the formal authority a project leader can get. Obviously, the project leader needs different skills and approaches rather than that of a functional manager in his/her company.

It is already claimed previously in this report that an EMP team project leader has little formal authority. Part of the reason is that the only reward power held by a project leader is just praises and respect that do not differ a lot from the praises given by another team member. A good project leader tends to rely upon knowledge, experience, and personal relationships for influence on his/her team.

The project leader has a variety of hats within a team project, the hats of an integrator, communicator, decision-maker, motivator, and change agent. His/her responsibilities range from planning, organizing, interfacing (with the instructor and other teams), commanding, status monitoring, problem identifying and solving, to conflict

resolving. He/she has to contribute more of the time and energy into the project than other team members.

In our context, the project leader is at the same standing point as a student. Besides the more effort that he/she need to put on the project, he/she has to undertake the same level individual study work and typically the same level of task load in the team project. The extra rewards may include learning value, self-achievement sense, and acknowledgement from others.

- ***Topic 7 – Managing Conflict and Stress in Projects***

  - ***Conflict and Stress Issues in a Team Project***

The conflicts in an EMP team project may come into the following three different categories:

1. Team members working on the project may have different goals and expectations.
2. There is considerable uncertainty about who has the authority to make decisions.
3. There are interpersonal conflicts between team members.

Depending on their personal interests and individual plans, the team members may have different expectations and goals with respect to the specific team project. Some members may have stronger interest than other member as a result higher priority of the team project within their own activities. These persons can serve as project leader or backbones of the project. As explained by expectation theory of conflict [2], when the team members who give lower priority on that team project may violate the expectations of another, a negative reaction evolves into conflicts. If the team talk about this at the

very beginning of the project, some considerations can be made on tasks assigning, such as that the lower-priority person may be assigned to do less important jobs like editing.

Because there is little formal authority given on the project leader. At the beginning of a project, how much informal authority the project leader can gain is still uncertain. However, many decisions need to be made and many jobs need to be done soon. Naturally, some team members may volunteer to do a few jobs and the leader role evolves along the project life cycle. If the project leader do not gain a necessary level of informal authority, he/she then may lose control on the project and some one else will take his/her place.

Democratic atmosphere is essential and healthy for the project. But if a team is just keep discussing and disputing on every trivial or important issues and no decision is made by anybody, any heated argument risks on getting distorted out of proportion. Consequently, schedule overrun and cost overrun (here "cost" is mainly the time and efforts that the team put into the project) as well as low performance are inevitable

As stated before, there is a great deal of variability among the EMP students. Different specialties, experience, cultural background and even only different ages bring with themselves different minds, belief, value system, styles, knowledge and skills. Some differences may become sources of interpersonal conflicts. In a team with team members having international backgrounds, the cultural difference may become a big issue. Also important problem may stem from personality conflict.

In Project 2, the interpersonal conflict between C and F may be seen as partly coming from cultural differences. C is from Asia and F is from Europe. The oriental culture prioritizes collective spirit higher and to some degree encourages restraining individual opinion when or after a team decision is made. Meanwhile the western culture sees individual freedom in thinking and acting as natural and as a result may sometimes inappropriately stick out individual opinion when the issues are not really important.

However, always being subject to collective spirit and restraining individual opinion may not be good. In the middle of the project, C has a potentially better idea about an important technical aspect of the project. C mentioned it to E, the leader. But at that point E didn't quite understand his idea. C didn't elaborate and insist on his opinion even though he thought that could be a better idea. Later in the final phase, E thought about an technical alternative of the original scheme. And that idea was exactly the idea that C came up with in the middle of the project. But it is too late to change the whole scheme.

To resolve these conflicts, problem confrontation and negotiation are highly recommended. Frankly and patiently communicating with one another is most helpful to the team. There is much that a project leader can do with. The rewards are enormous while the work is effort-consuming.

The stresses in an EMP team project stem from two sources: the internal stressors and the environmental stressors. Internal stress is created by the person himslef. Internal stressors predominate in Type A people – people who are aggressive, work-aholic, and competitive. As I observed, most EMP students including myself are Type A. The environment stressors include as aspects of the job and of the family and life events.

Typically, the stress piled up before the finals. Project 1, 2, and 3 are all in this case. A careful planning for the whole project and keeping up with the schedule is recommended to relieve it. On the other hand, a degree of stress is observed to be beneficial for the project, which approves management theory. Also, Building up sound work relationships and sharing emotional support are good ideas to manage the stress.

- ***Topic 8 – Project Evaluation***

- ***What Is a Successful Team Project***

There are 5 criteria against which an EMP team project can be measured:

1. The quality of the deliverables of the team projects, including term project reports, case study reports, presentations and other teamwork products;
2. The overall level of skills and experiences that the team members gained from the project.
3. The cohesiveness of the project team.
4. The work relationships between the team members. Does basically every team member share a pleasant experience with others?
5. Does this project cost too much effort of the team members so as to seriously hinder their performance on other jobs?

It'll be a valuable thing for a team to get together after they finish a term's work, exchange each other's feeling and share the lessons learned from the project. On one hand, this can be greatly helpful to resolve the remaining negative reactions between one another and maintain good relationships after the project. On the other hand, this is a good opportunity to explore more from the past experience.

Measured against the above 5 criteria, Project 1 is satisfactory on criterion 1 and good on criterion 2, 3, 4 and 5. Its overall performance is good. Project 2 is good on criterion 1, 2 and 3, weak on criterion 4 and satisfactory on criterion 5. Its overall performance is satisfactory. Project 3 is not yet finished and not convenient to judge at this point.

III. Conclusions

An EMP student has very good reasons to learn how to successfully or more successfully perform in or manage an EMP team project:

1. Most of the core courses or elective courses have team project assignments. Team project is a core experience in an EMP class.
2. Projects are what the companies live and grow upon. By "simulating" an industrial project, an EMP team project provides excellent opportunity to gain insights on real practices.
3. The objective and motivation for an EMP student is to enter into Engineering Management career. And project management is a key stage right on his/her career path.
4. In working together with the classmates within a team to achieve sound project performance, the EMP students can make friends with each other. This cross-area temporary working relationships and friendships may be beneficial in his/her professional career.

Collectively, an EMP student working on a Master degree has to spend at least 95% of his/her study efforts on different team projects. Team project is one of the most important vehicles for an EMP student to educate himself/herself in this program. And the skills and knowledge obtained from the team projects are fundamentally beneficial for he/she to successfully perform in the companies.

However, it'll be hard for a student to fully explore the benefits from the team projects until he can effectively and properly employ project management philosophy and skills before he/she learn about project management.

Even though some project management skills, such as network scheduling or project budgeting, may not be cost-effective (complicated and too time-consuming) or applicable, most of the skills and philosophies are valuable for an EMP team project management. The approaches and philosophies like system approach, project team building, conflicts resolving, stress management and project controlling are all applicable. If the specific technique is too costly, using the idea and philosophy is highly recommended.

IV. Recommendations

- ***For a student***

It'll be wise to take the two course "Project Management" and "Communication and Team Building" as early as possible. Because team project is the "melody" of EMP study, learning the basic philosophies and skills in project management and teamwork early will be optimal for the whole EMP study.

- ***For a Team Project Leader***

A project leader's responsibilities are many. The most important thing to do is building up the cohesiveness of the team. The success of any team member in the teamwork is the success of the project leader. Much more effort should be put on fully communication and fully understanding among the team.

- ***For a Team Member***

The motivation for any EMP student is to work in Engineering Management. Even though one may not be the unique person – project leader in this team, he/she should still strive to explore his/her contribution to the project and project management. If the project leader is weak, this is essential for that team project.

- ***For an EMP Instructor***

It might be a good idea that a grading policy that the project leader can gain higher weight on grade than other team members with respect to that team project's

performance, is explicitly adopted in each EMP class. The team members' evaluation on their project leader may be collected to be a reference. It might be expected that this policy would further improve the quality of the EMP team projects.

- ***For Future Research***

Still, many other issues are not covered in this report. They provide opportunities of study on the same (general) topic.

A quantitative study on EMP projects and project management may be more beneficial to help improve the quality of EMP projects and project management of EMP projects.

V. References

[1] J. Nicholas, *Managing Business & Engineering Projects*. New Jersey: Prentice Hall, 1990.

[2] W. Dyer, *Team Building: Issues and Alternatives*, Mass.: Addison- Wesley, 1987