Introduction of Engineering Project

PBL Workbook

PROBLEM 0
Understand and participate in a PBL class

The students João, Fernando and Roberta began to study a discipline that uses a learning methodology called Problem Based Learning. Right in the first class, John was chosen to play the leader role and Roberta the secretary.

In this first class, the teacher made a quick explanation about the PBL session operation. The first session was called pre-discussion, when the students, after a detailed reading of the problem, determined the learning objectives and formulated a list of questions about the problem of that class. During the formulation of the questions, André, who is a very shy student, hardly participated in the discussions about the questions and John did not know what to do to make him participate more actively in the discussions.

Shortly after the pre-discussion session, Roberta, who was the secretary of the group, formatted the questions list developed by the class and sent it to the teacher.

In the following days, João, Fernando and Roberta (as well as the other students of that discipline) elaborated answers to **all** the questions formulated by the class. Thereunto, they made use of the recommended bibliography, besides conducting research in other informations source.

In the next class, following the teacher's directions, the students discussed the answers of each question that each student developed in the days between the pre-discussion and the post-discussion. João, who would act as leader of the post-discussion, was missing that day and the group will have to solve the best solution for the new leader choice.

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YouTube tutorial videos.

PROBLEM 1
Basic concepts of project management

Joana is an IME student of the Cartographic Engineering course who is working in an engineering projects company. Soon in her first function, she was in charge of assisting her boss, Marcos, who is a PMP, in the Management of a Mapping Project aiming at the security activities for a big sporting event, in which he is the Project Manager.

Marcos determined that Joana should start studying the processes of the project life cycle planning phase, as these processes would be needed at this early stage, because the processes of the initiation phase (according to the PMBOK practices) were almost completed. Another Marcos' determination was that Joana should study to have an overview of the processes groups and the areas of knowledge of the PMBOK. In this study, Joana should also analyze the complexity of the Project according to different models of complexity evaluation.

During a meeting that she participated, with the presence of Marcos' boss, Project Sponsor, he highlighted the importance of making it clear how to determine whether the project was a success or not. Joana was very confused because she thought that it would be enough to deliver the products on time so that the Project was considered a success, but Marcos clarified to her that it is not so simple. Joana was very excited about applying project management methods and volunteered herself to organize the routine of company employees using PMBOK knowledge. Marcos replied:

- I'm happy with your enthusiasm, but rather understand the concept of design and project management.

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PROBLEM 2
Integration Management

After Marcos's recommendations that she study the concepts of project design and management, Joana began to assimilate the terms she heard at the meeting and also the subsequent comments from the participants. A comment from Marcos drew her attention: he said he found the Project Opening Term (POT) too long, with too detailed information. Joana thought that the POT should contain information on everything that should be done, with all estimates of costs and deadlines and the respective baselines, and did not understand the manager's criticism of the document presented at the meeting.

Joana then spent more time researching the initial project documentation and the PMBOK, trying to understand why Marcos made that comment. In this research process, she realized that there was indeed redundant information between POT and other documents, especially the items commented by the manager.

Another point that drew Joana's attention was Marcos's concern with the changes that would occur throughout the execution. According to him, the experience of previous projects indicated that there was always a lot of wear and tear during the execution, caused by frequent changes of deadlines and scope. Marcos pointed out that project management would be closely linked to the defined change control rules.

Discussing this later with Marcos and other company employees, Joana identified that it was really a feature of him being very faithful to the definitions made in the project documents. He always cited management plans, deliverables, performance indicators, resource schedules, baselines, and other terms that she had not always known before. When she mentioned this characteristic of him, the reaction of everyone in the "wheel" was in the sense that this was not personal, but rather a necessity for the good management of the project. Marcos agreed with the general remark, adding:

- The manager needs to be very clear about what defines the success of the project. Remember our conversation at the first meeting? The project only ends with customer acceptance. And we also need to learn from the mistakes that always exist during a project. "Lessons Learned", Joan ...

She replied:

"But where do I document this acceptance of the term and the lessons?"

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CARVALHO, M. M.; RABECHINI Jr, R. Fundamentos em Gestão de Projetos: Construindo Competências para Gerenciar Projetos. São Paulo: Editora Atlas, 4ª edição, 2015. Chapter 4

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PROBLEM 3
Project Scope Management

In one of many meetings Marcos and Joana, it was necessary to discuss the definition and documentation of the Project Scope Statement. Marcos explained to the young student that in order to define what will be planned and executed in the project, it will be necessary to collect the project requirements with the client. The complexity of this task will depend on the nature of the project. But it needs to be done carefully and often with iterations with the client.

Marcos also highlighted the importance of the Work Breakdown Structure (WBS) to support the project scope planning. He also said that she, as an IME student and as a future engineer, had to know how to build a WBS, including using specific software, and understand the meaning of all its component parts. Another advantage of the WBS is the possibility of supporting the discussion of the scope with the diverse stakeholders of the project.

Joana was very curious to read and know about this management tool of the scope of the project but she had some doubts:

- Marcos, when we are working with a very technical engineering project (eg the construction of a building) where will enter the details of the structures, plans, executive project etc? What contribution will they make to the scope of the project?

- Another thing: how should we handle the scope changes that are common during project execution?

Marcos heard Joan's questions and commented happily:

- I can see that you are beginning to realize the importance and difficulties of good project management.

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CARVALHO, M. M.; RABECHINI Jr, R. Fundamentos em Gestão de Projetos: Construindo Competências para Gerenciar Projetos. São Paulo: Editora Atlas, 4ª edição, 2015. Chapter. 5.

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PROBLEM 4
Project Time Management

After studying and discussing a lot with Marcos about the concepts of Project Management, Joana was very excited about the opportunity to put these concepts into practice. After the preparation of the WBS, Marcos determined that Joana should devote herself to the planning of the Project schedule, especially in the estimation of the miletones associated to deliveries.

Joana began researching how to sequence the tasks of the Project, but she had a question about the Project's representation, and asked Marcos:

- What is the best way to represent the Project?

Marcos looked at Joana and smile.

"There is no single right answer to this question. Each form has its advantages and shortcomings. You should prepare those you deem necessary for the good understanding of the Project.

Realizing that Joana seemed to be bothered by this, Marcos added:

- I see you are interested in better representing your Project, and this is great for a good understanding of it, both for you and for the Stakeholders, but do not forget that the most important for the planning of Time Management is the elaboration of the project schedule. But to do this, you need to follow a few steps in sequence.

Joana then began to study many techniques to help the elaboration of the Schedule and decided that she would use those that are more widespread, especially the Gantt Chart, since it always appeared in the Project Management software used by her.

After seeing the whole planning of Joana, Marcos commented:

"I see you'd be careful to match all delivery milestones to the Project Opening Term restrictions, but I see that you have not determined the Critical Path of the Project."

Bibliography:

CARVALHO, M. M.; RABECHINI Jr, R. Fundamentos em Gestão de Projetos: Construindo Competências para Gerenciar Projetos. São Paulo: Editora Atlas, 4ª edição, 2015. Chapter 6

CARVALHO, M. M.; AMARAL D. Classes 7 and 8 of Project Management Course. Available in: http://veduca.org/p/gestao-de-projetos.

PROBLEM 5
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PROBLEM 6
Communications Management

Joana is increasingly understanding the complexities of project management. But so far it is not clear to her how to manage project progress information so that all stakeholder needs are met. Joana seeked for her boss to ask about this.

Marcos underlined the importance of semantics and political power in the relationship with clients, collaborators and sponsors. Still on the subject, he listed a number of concerns that the project manager must have. It is very important to make good stakeholder management. For this, knowing how to listen will be of great value not only for teamwork but also to meet the clients' expectations. He added that when dealing with people it is very common that there are incompatibilities between them and therefore, it is necessary that the manager is quite skilled. It may be of great value to develop a communications plan for the company as well as to develop and preserve an environment of trust. Marcos stressed the care we should take in using technical words when talking to clients and staff members about other areas of training. Finally, he emphasized that we should seek to eliminate the barriers to communication and create a collective mind in everyone involved.

Joana looked at the impressed boss:

"Will I really be able to deal with all this?"

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PROBLEM 7
How to avoid barriers to communication?

Joana, when deepening in the importance of the communications, was faced with the existence of environmental and personal factors that represent barriers to the communication in the organizations: reactions of environment, verbal, interpersonal and emotional. She also realized that there are other barriers to communication that transcend the organizational dimension and should be addressed within the individual.

In her daily work, she also observed the existence of many media used in organizations, for example: face to face, e-mail, telephone contact, etc. What would be the richest channels for good communication? She thought.

Marcos felt that the manager needs to have communication skills and know very well the ways of communication of his organization: plans, reports, policies, procedures, meetings, minutes of meetings, etc. What are the others? Joana thought. And what should we do to enable a message to be truly conveyed and understood?

Joana realized that the establishment of a premise would be the initial tool indicated for good communication. She also researched the importance of the project's communications plan and realized, if necessary, the schedule of project meetings. What should be included in this meeting schedule and what does it allow? Joana thought.

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