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Solutions Manual for Project Management in the Construction Industry 1st Mubarak

SOLUTIONS MANUAL SAMPLE PREVIEW

PUBLISHER

Wiley

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2024

RESOURCE TYPE

Solutions Manual

ISBN

9781394225217

Solutions Manual for Project Management in the Construction Industry 1st Edition by Mubarak

ISBN: 9781394225217

Project Management in The Construction Industry: From Concept to Completion

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1st edition, 2024

Solution Manual

Chapter 1: Introduction to Construction Project Management

Exercises:

1. Define a project and give an example.
   <u>Answer:</u> A project is a temporary endeavor undertaken to create a unique product, service, or result. An example is a construction of a house, building, or a road. The scope is defined, and the cost and timeframe are also defined within certain assumptions and contractual agreements.

2. Give an example of a program that contains projects.
   <u>Answer:</u> A city municipality may have a program to develop a certain area of the city. This program may include demolition of old existing buildings, infrastructure work, new construction (residential and commercial), renovation projects, a new library, school, park, and other common service projects.

3. Can taking care of your garden be considered as a project? Mention two cases where one answer is yes and the other is no.
   <u>Answer:</u> It can be considered as a project if it is a one-time event, with a defined scope of work. It may include activities such as clearing weeds, cutting and trimming branches, planting new plants, adding soil and fertilizer, and cleaning up after work is completed.
   However, if it is routine work, such as mowing the loan on a regular basis, it cannot be considered as a project, unless you consider each event as a project.

4. You are thinking of converting part of your house attic to an office. How can you make this idea as a project?
   <u>Answer:</u> Check the attic: area, shape, and condition. Make a design, envisioning the final product. Get professional help if you need it. Check if you need a permit from the local authority. Create a work plan with activities, along with their materials needed and their cost and duration. Set the project's budget and schedule. If you are going to contract with a professional to do the work, you may get a few quotes and choose the contractor that you believe will do the best job and give you the best value for your money.
   It is important, when doing such project, to gear the project towards your needs, such as:
   - Perhaps your house is too tight for your family, so you need an extra bedroom for your teenage son or daughter,
   - You need an office to work in,
   - You need more space for storage.
   - You just want to increase the value of your home before selling it.

5. Do you consider the following as projects (with the description as is)? If not, modify to make it qualify as a project.
   a. Improving your education
   b. Changing a flat tire

c. Losing weight
d. Building a 20’ by 25’ expansion for your house
e. Cleaning the gutters of your house periodically.
f. Maintaining your house garden in good shape
g. Organizing your garage
h. Going on a fun trip for a week
i. Doing a birthday party to your younger sister.

Answer:

a. Improving your education: You need to define the scope, for example obtaining an MBA degree. You may also need to set some constraints such as the geographic location of the school (unless it is online), the accreditation of the school, the cost, and timeframe (depends on whether you will go to school full- or part-time.)
b. Changing a flat tire: Yes, it is a “project” even though it is a small one that can be also considered as an activity.
c. Losing weight: You need to define how much weight you plan to lose, at least approximately. You may also define the method, cost, and timeframe. Doing so, will allow you to monitor your progress.
d. Building a 20’ by 25’ expansion for your house. Yes, this is a project. You need to define the design and requirements such a permit, which may require the approval of a P.E. Later, you need to define the cost, and timeframe. You may do the work yourself, if qualified, or seek the services of a trusted contractor.
e. Cleaning the gutters of your house periodically. Same as in the answer to question No. 3, if this is a one-time major work, it can be considered as a project. If it is a routine work, then it is not.
f. Maintaining your house garden in good shape. No, it is not a project. The keyword here is maintain, which implies continuous work.
g. Organizing your garage. Yes, this is a project. Preferably, you have a design on how you will organize it, such as adding new shelves or cabinets.
h. Going on a fun trip for a week. This can be a project if you define it well, stating items such as: who will be going with you, where are you going to go, for how long, what are the activities you plan to do (which will allow you to define the items you need such as hiking requirements), and the budget.
i. Doing a birthday party to your younger sister. Yes, this is a project but, again you need to define the scope and requirements. In many cases, you start with the available budget, which will allow you to know what is feasible for you.

6. How does the owner’s “project” differ from the contractor’s “project”?
Answer: The owner’s project starts once the decision to carry out the project is taken. It may include items such as planning, acquiring the land, financing, design and permitting, bidding (or negotiation) and awarding the project, and construction. The contractor’s project starts when

signing the contract. Both, owner's and contractor's project and when the project is physically completed and transferred to the owner, and all financial issues are settled.

7. Why must an owner do feasibility study before approving or making a final decision on the project? What are the main objectives of this feasibility study?
   Answer: Feasibility studies are very important for the owner as they provide valuable information early enough to make the best decision. Feasibility studies may result in abandoning the project completely such as if the expected return (MARR) is insufficient, the cost is beyond the available resources, or there is a legal restriction that prevents such project or limit it to the point of becoming undesirable. Feasibility studies also provide information to the owner leading to best solutions and methods. For example, the level of risk may direct the owner to the suitable type of contract. It may also point out to potential trouble spots and the items that need early planning.

8. Mention the main stakeholders in a private project.
   Answer: The main stakeholders in a private project are:
   - The owner of the project,
   - The designer of the project,
   - The general contractor,
   - The professional construction manager if it is a 3rd party.
   - If the owner contracted with subcontractor directly, then every subcontractor who has a contract with the owner is a main stakeholder.

9. Mention the main stakeholders in a public project.
   Answer: The main stakeholders in a public project are all those mentioned in question No. 8, plus:
   - The public around the project (as defined by local law),
   - The taxpayers for that public agency,
   - Other public agencies that have jurisdiction over the project, such as the EPA,
   - Any entity that financially contributes to the project,

10. In what aspects do public and private projects differ?
    Answer:
    1. Project initiation process, justification, and contracting guidelines.
    2. Authority and the decision-making process.
    3. Stakeholders.
    4. Source(s) of funding and restrictions.
    5. Transparency.

11. What is a capital improvement project?
    Answer: A capital improvement project is any major improvement to facilities and infrastructure. Projects may include construction and renovation of roads and streets, bridges,

intersections, traffic systems, recreation centers, libraries, parks, automobile parking garages, water and wastewater treatment facilities, solid waste and recycling plants, and power stations. It may also include the purchase of new fleet vehicles and IT networks.

12. What are the types of owners for a project?
    Answer:

    1. Public (government): This includes all levels and types of government agencies.
    2. Private corporations owned by shareholders, as well as non-profit organizations. These corporations usually have a board of directors (or trustees) that oversees the running of operations as well as major decisions.
    3. Private individuals or corporations / businesses owned entirely by an individual or group of individuals.
    4. Public Private Partnership (PPP).
    5. International or multi-national organizations

13. What benefits does certification in construction management, or one of its specialties, bring to the bearer of the certificate, to the employer, and the client?
    Answer: Certification simply means that the person who holds this certificate meets the minimum level of knowledge in the field. It also helps standardize concepts and practices for the profession. It does not, however, guarantee good performance. In the authors' opinion, certification is more important and meaningful for a young person with little experience. It assures the potential employer that the candidate knows the "ins and outs" in his/her field. For a senior professional with lots of proven experience, the certification is less meaningful, although it still a "feather in his/her cap."

14. What is a PMO? Why would an organization have a PMO as a part of its structure?
    Answer: Project Management Office is a management structure that standardizes the project-related governance processes and facilitates the sharing of resources, methodologies, tools, and techniques. PMO is usually a permanent part of the organization that can go up and down in size, depending on the organization's need.
    An owner's organization that frequently executes construction projects, may have its own PMO. It provides services in both the planning and execution phases, such as preliminary design which helps define the approximate budget and timeframe. Also, it helps in the acquisition of a designer and contractor and in project management, from the owner's side.
    Of course, the role of the owner in construction project management differs from the contractor's role. Consequently, the PMO in an owner's organization will differ in structure and roles from the contractor's PMO.

15. For the same construction project, the contractor has a project manager, and the owner may have a project manager. What are the major differences in their roles?
Answer: Both the contractor's and owner's project manager monitor the work progress and report to their parties, but the contractor's project manager has the authority and responsibility over the work crews and subcontractors. He/she can direct work onsite and make decisions regarding the site. The owner's representative, under normal circumstances, cannot interfere with the work nor issue orders or directions to the work crews and subcontractors. Basically, the contractor "owns" the project while under construction until the point of hand over to the owner.

16. Mention two types of each category:
    a. Vertical construction
    b. Horizontal construction

Answer: Horizontal projects include Highways / roads, bridges, tunnels, and mass transit, railways, airports. Vertical projects include all types of buildings, residential, commercial, and other.

17. What are the main two types of project organization? How do they differ? What is the project organization that is in-between the two types?
Answer: Basically, there are two structures:

    A. Functional project organization where all or most of the PM's team members belong and report to their functional managers in the main office.

    B. Pure project (projectized) organization where the PM's team is almost autonomous. The PM acts like the CEO of his/her own organization.

The Matrix project organization is a hybrid between the above two opposites structures, with varying degrees of leaning towards one of them. The matrix structure closer to the functional organization is considered "weak matrix." Conversely, the matrix structure closer to the projectized organization is considered "strong matrix."