How to Scope a Project (Phase Zero)

Overview. This document explains how to explore a project idea in depth and breadth to reveal whether or not to proceed with the project. The discussion is tailored to Engineering Capstone Design. A useful tool for managing phase zero is the Initial Project Summary (IPS).

Purpose

• Phase zero brings to the surface the important factors (both depth & breadth) that need to be considered for a project.
• Phase zero provides a time effective way to select best project ideas while eliminating ineffective ideas

Who?

• Phase zero is initiated by a project champion (faculty member or client). Phase zero is completed by a project team (students).
• Phase zero involves the key stakeholders (client, project team, faculty advisor, capstone instructors, etc.).

When?

• Phase zero is initiated before the project is launched
• Phase zero is completed rapidly

Inputs, Outputs, and Scope

• Input. Phase zero begins when a potential client or sponsor has been identified by the Capstone Leadership Team
• Output. Phase zero ends when four results have been accomplished by the project team:
  • The team has established that there are good reasons for doing the project. These reasons cause team members and stakeholders to feel excitement, commitment, and ownership.
  • The team has established a preliminary list of outcomes from the project
  • The team has explored key background information in depth and breadth
  • The team has completed the first client interview
• Scope. Phase zero is done rapidly. The time required is:
  • Faculty Champion who structures the project: 4 hours
  • Client: 2 to 3 hours
  • Faculty Member who will advise the Team: 1 to 2 hours
  • Team Members: 10 hours each with this time spread out over about 2 weeks of calendar time
Methodology (how the Capstone community scopes projects in Engineering Capstone)

STAGE I: PROJECT SETUP--the faculty champion and capstone leadership team collaborate will clients to develop a project that fits into the Capstone experience.

1. Advisor and client develop mindshare on information in the Capstone Sponsor packet.
2. Client develops a 1-2 page project description e-document.
3. Advisor, working collaboratively with the client, drafts an initial project summary (IPS).
4. Capstone leadership team:
   a. prioritizes and select projects.
   b. Assigns team members and advisors to each project.

Deliverables from Stage I: Project e-documentation comprised of a draft IPS and client project description.

STAGE II: PROJECT EXPLORATION--Deliverables from Stage I are handed off to the project team.

1. Team gathers preliminary information & creates a first draft IPS. Team creates a project website and posts the draft IPS on their website.
2. Team plans a 10 minute phone interview of the client. Team conduct this interview. Team improves the IPS.
3. Team meets with their capstone instructor, presents their IPS, and receives feedback.
4. Team conduct the client interview (site visit) and document their findings in the IPS. As appropriate, the team revises the IPS so that it is at the right level of professional quality.
5. Team assesses their performance during phase zero
6. Phase zero sign-off followed by posting of the final IPS on the team website.
   a. each team member commits (signs off) on the project.
   b. capstone advisor commits (signs off).
   c. faculty advisor commits (signs off)

END OF PHASE ZERO--The end of phase zero is marked by three milestones:
   • the project team has produced the four key results described in the previous section
   • key stakeholders have signed off to indicate commitment.
   • the capstone community has inventoried lessons learned (this will be done during class)
1. PROJECT OVERVIEW

1. Stake Holders:

In the space below, list people who are impacted either directly or indirectly by this project. Examples:

- customers--people who will use results of the project after the project is completed
- sponsor--organization sponsoring the project
- client--person who provides the funding or has responsibility for the funding
- advisor--faculty member who will meet with & advise the project team on a regular basis
- capstone instructor--faculty member who will grade the project team
- mentor--graduate student(s) who will provide guidance to the project team
- consultant--consultant who will provide technical expertise on an as-needed basis
- staff--professional staff members from the UI who will provide services to the project team in the areas of technician support, machine shop services, office support, etc.
- other--people who are indirectly impacted by the project

2. Project Background:

In three to five sentences, summarize the project.

3. Deliverables:

List the tangible items such as reports and hardware that will be given to the client at the completion of the project.

2. JUSTIFY THE PROJECT

2.1. Why? (Needs):

Explain why this project should be done. How will the project benefit the end users (i.e. customers) of the project? What problems will completion of this project solve? How will completion of this project make the world a better place?

2.2. Benefits:

List the financial and non-financial benefits. Examples:

- societal benefits--How will this project make the world a better place? How does this project align with professional ethics?
- customer benefits--how will this project benefit people who will use the final results?
- sponsor/client--what is the financial return? What other benefits accrue to the sponsor or client?
- entrepreneurship--what new products might arise, what new markets might be opened, what types of IP might be produced?
- Capstone program--how will the project benefit the capstone instructors, advisors, and program?
- UI--how will this project benefit people, departments, and colleges at the University of Idaho?
- team members--how will this project benefit members of the project team?
2.3. Investments & Costs:
   List the projected investments and costs:
   • Investments:
     • Financial contribution of the client.
     • Other contributions.
   • Costs
     • Hardware and Supplies. Materials, supplies, travel, instruments, photocopying, posters,
     • Engineering Time: Student time @ $50 per hour, faculty time @ $150 per hour, mentor time @ $100 per hour
     • Facilities: Shop time @ $25 per hour

2.4. Return on Investment (ROI):
   Figure out why this project is justified based on the benefits exceeding the costs and document your findings.

3. TEAM FORMATION

   As a team, discuss issues relevant to strong team performance and document your discussion. Examples of important topics:
   • goal--what is your team goal? Is each person committed to the goal?
   • expectations--what does each team member want out this project? what does each team member expect from their team members?
   • accountability--how will each team member hold them selves accountable? how will each team member hold their peers accountable?
   • roles--what roles will be needed to reach the project goals? who will fill each role?
   • assessment--how you will apply assessment to elevate team member performance?
   • rules--what rules will elevate your team performance?

4. EXPLORING THE PROJECT

4.1. Client and Stakeholder Interview Questions:
   In the space below, identify and questions that need to be discussed with the client & others. Organize these questions into meaningful categories. Examples:
   • People--questions in this category involve roles, priorities, customers, etc.
   • Needs--questions in this category address why the project is being done. That is, what are the gaps between the present state (right now) and the of the project.
   • Constraints--questions in this category involve stricture on topics such as space, power, interfaces, etc.
   • Functions--questions in this category identify the key things that the final design needs to do.
   • Scope--questions in this category involve the depth or extent of the project. How much time, cost, etc.
• Existing knowledge--questions in this category involves knowledge that may be known by the client or others.
• Expectations--questions in this category involve expectations of the team and expectations of the client.

4.2. Research & Learning Needs:

In the space below, identify key knowledge areas that your team needs to explore.
Organize these knowledge areas into categories. Examples:
• Technical Knowledge
• Interdisciplinary Topics--Topics in other fields such as biology, that you need to learn about
• Codes and Standards--Learning about the codes and standards that are relevant to your product
• Product Knowledge--Topics such as interferometer and about the type of product

5. Capstone Instructor Sign Off

Before your team conducts your client interview, schedule a meeting and review this IPS draft with your capstone instructor. In the space below, document this meeting & include the date.

6. Client Interview

In the space below, document your findings from the client meeting.

7. Assessment of Phase Zero

In the space below, assess your performance during phase zero. Typical categories:
• Strengths--What specifically did you do that was effective? How did you attain this element of performance? Why was this element of performance important?
• Improvements--What will you do in the future projects to enhance your performance? What are the specific steps you will take?
• Insights--What gems of knowledge did you uncover? How will these gems be effective in terms of improving your future performance?
8. Phase Zero Signoff

Obtain approvals to proceed with Phase 1 of the Design Process. An approval means that you have satisfactory results on Phase Zero. After you have obtained approval, write the name & date of each approval. Note--you do not need a signature.

Capstone Instructor: (name & date here)

________________________________________

Faculty Advisor: (name & date here)

________________________________________

Design Team:

(member 1 name & date here)

(member 2 name & date here)

(member N name & here)

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