05. Project Planning
NASA ESMD Capstone Design

Where in the Process?

Pre-Phase A: Design Problem Analysis
Project Tools Covered

◆ Project Plan
  – Put together a year long general plan with a specific plan for the near term. The plan will be updated as you go with more accurate tasks and timings. Both the original plan and the final plan at the end of each phase are of interest. A brief note that explains the differences should accompany these plans.

◆ Design Project Proposal
  – This is used to obtain approval for carrying out the plans using the design approach outlined in Project Analysis Statement

◆ Project Concept Review
  – A review to affirm the project need and examine the proposed project’s objectives and the concept for meeting those objectives
Project Plan - Gantt Chart

- Includes all tasks plus
  - Who
  - When
  - What resources are needed
  - Precedence information in detailed task list
- Can do costing right off of it for development if it is done well (detailed and accurate)
- Update, clarify, specify as you go
- This is your roadmap

05. Project Planning

(Lumsdaine et al., 2006)
What now?

◆ A Gantt chart can only be cursory at this point
  – Basically the design process
  – Sponsor interactions
  – Class milestones
  – Deliverables
◆ To be significantly updated as tasks get nearer and clearer
◆ To be used in progress reports

Design Project Proposal

◆ Used to obtain approval for carrying out the plans using the design approach outlined in Project Analysis Statement
◆ Many other stakeholders may be interested in potential of the project and approach to be taken, so the proposal must be written in wide variety of technical levels of understanding and expertise
Tips for the Written Project Proposal

- Write a formal cover letter to the instructor, advisor, and sponsor (discussed in the next slides)
- Ask that the sponsor review the proposal and approve it in writing (or request directions on changes that should be made before the team can proceed with the project)
Dear Mr. Doe:

Attached please find the proposal for our design project, “Motion Sensor/Deterrent for Woodpeckers.” It incorporates your problem information and design constraints, as well as our investigation into the context of the problem, customer survey results, design objectives, and the project plan. From our analysis, we have synthesized a problem definition statement that will guide our future work on the project.
Guidelines for a Cover Letter

Please confirm that our understanding and direction of the project agrees with your expectations, so that we can proceed with the next design steps. By the end of the first semester, we expect to have developed a “best” concept and will be ready for prototyping and testing during the second semester. A syllabus of the milestones and topics covered in our course is attached for your information.

Unless there are significant changes requested in the direction or constraints of the project, you can expect an initial progress report by the end of October and an end-of-term report by mid-December, with the final project presentation and report to be completed by 24 April 2008.

Sincerely,

[Signature]
Jack Foreman
Leader of Team #16, The Innovators
(906) 487-0041
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Encl.: Project Proposal, Syllabus

Executive Summary

- It is a condensed version of the essentials of an entire report, usually within one page - it is not a listing of contents discussed in the report.
- This is the most important part of the report—thus write it last and very carefully! It must be able to stand alone and be understood without the reader having to leaf through the report.
- Many more people will read the executive summary than the entire report - only a few will take time to read the entire document.
Executive Summary

Proposal to Design a Pedestrian Bridge over Freedom Boulevard at Morningside Avenue
Pumpkin Center, North Carolina

The firm of Acey Engineers and Designers proposes to design the subject pedestrian bridge at the request of the design sponsor, the City of Pumpkin Center and the North Carolina Department of Transportation. The need for the bridge arises from these sources:

- Numerous citizen requests to the city council for a pedestrian route which directly the average 3-mile walk to the regional hospital across Freedom Boulevard.
- Several fatalities in the past two years occurred when pedestrians attempted to cross Freedom Boulevard between intersections.
- An independent random survey of 250 citizens of Pumpkin Center by ACMF engineers showed that 78% would support a modest tax levy to build this bridge.

Acey Engineers’ initial concept for this bridge addresses the constraints imposed by the City of Pumpkin Center and the NC Department of Transportation, including:

- Accommodation of pedestrian traffic only.
- Channel for alternative pedestrian pathway on bridge.
- Design must meet all applicable codes and standards.

Acey’s survey of 250 Pumpkin Center citizens and two focus groups of potential users have identified the following design objectives listed in order of importance to these users:

- Safety in entrance and exit areas as well as on bridge pathway.
- Clear visibility of users within a safety context.
- Accessibility of emergency and exit areas to connecting sidewalks.
- Attractiveness of structure.
- Low cost.
- Low maintenance costs to maintain safe and attractive structure.
- Low susceptibility to vandalism and graffiti.

Our initial design concept, an attractive suspension style structure, addresses each of these objectives while meeting the constraints imposed. Our proposal is to explore this and other creative concepts to develop a design that optimally satisfies all of these objectives. The design will be evaluated with computer simulations of 100-year wind loads and earthquake levels. Models of the alternative concepts will be constructed for evaluation by focus groups for attractiveness and acceptability prior to selection of final concept. The design will be prepared for presentation to interested and final reports, including the final drawings.

Design Project Proposal
Format Guidelines for Oral Presentation

General: This is an oral presentation for reviewing design project sponsors and potential representatives from the design, engineering, and administration of the design and engineering contracts. Each design project will be reviewed in terms of its design features, costs, and overall project plans for the purpose of obtaining approval to proceed with the project.

Media: Overhead transparencies or projected computer image.

Time Constraint: Typically 10 to 30 minutes depending on the scope of the project and audience needs, plus 30 minutes for questions and discussions (for student presentations, 15 minutes with 5 minutes for questions).

Elements of Presentation: Each of the following major elements should be presented with a separate slide and discussed correspondingly:

1. Title: Title of project, sponsor, design team, design sponsor, affiliations, sponsors, and site.
   - Introduction of project and design sponsor.
   - Acknowledgment of design team and affiliations, and design sponsor.
   - State the purpose of the presentation in audience terms.
   - Acknowledge the team and sponsors of the audience.

2. Introduction:
   - Introduce the major phases of the project and features envisioned in the project which will be elaborated in the presentation. (Note: this is not simply talking off the slides presented in a table of contents—this phase defines the main selling points of the design or project to be reviewed.)
   - Summarize the constraints imposed on the design by the sponsors.
   - Present background on the design team’s experience, qualifications, and interests.
   - Preview the organization of the remainder of the presentation.

3. Design Problem Analysis: Summarize the main points of concern in Project 5. This may require several slides:
   - Design concept (include horizontal concept sketches)
   - Design constraints
   - User profile
   - Design objectives
   - Design problem statement

4. Design Evaluation: Describe how you will check the performance of your design against your design objectives.

5. Project Plan: Present and discuss a chart or similar graphic plan.

6. Summary of Main Points: Summarize the main selling points of the project or product.
   (Again, do not give a mere listing of presentation topics.)
Project Concept Review

- It affirms the project need and examines the proposed mission's objectives and the concept for meeting those objectives
- It is an internal review that should be completed prior to entering the conceptual design stage


Results of the review
- A successful PCR supports the determination that the proposed projects meets the customer need

Why 30 Seconds Or Less

- Memos and letters of request are too long
- Time has become compressed: people are often in a hurry, and we have “instant messaging”
- The attention span of the average person is 30 seconds
- Doctors listen to their patents for an average of only 19 seconds (from research at Michigan State University)

- Television commercials do a good job of getting their message across in 30 seconds
- TV news “sound bites” are 30 seconds long, or they don’t get air time
- If you can’t say it in 30 seconds, you are likely not thinking about your message clearly
Applications

- Telephone requests and conversations
- Answering machines; text messages
- Messages left with a staff person
- Memos and fax messages
- Letters and thank-you notes; e-mail
- Abstracts of technical papers and proposals
- Formal presentations at meetings
- Interviews
- Sales pitch or complaint
- Social situations with superiors
- Chance meetings; giving a toast

Preparation

- Objective
  - What do you want to achieve, and why?
- Audience
  - Who is the target of your message?
- Strategy
  - How can you get what you want?
Message Content

- Hook
  - How can you get the audience’s attention?
- Subject
  - Are you providing all necessary details?
- Close
  - Are you asking for a specific action or reaction?

Tips for Coming Up with a Killer Hook

- Use the first statement as a hook to get attention
- Relate the hook to your objective, audience, and approach
- Your hook can be a dramatic or humorous question or statement
- Your entire message can be a hook
- The hook can be non-verbal (action, mime, picture, or object)
- Keep a “hook book” of ideas and quotes
**Tips for Preparing a Memorable Message**

- Answer who, what, where, when, why, and how as they relate to the objective
- Be brief, be clear, touch the heart
- Use imagery so the message will be remembered
- If you don’t know the primary thinking preference of the audience, try to communicate in all four quadrants

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**Traits of a Four-Quadrant Message**

- Clarity
  - Concise facts for Quadrant A
- Action Plan
  - Well-organized implementation for Quadrant B
- Imagery
  - Creative word pictures for Quadrant D
- Emotional Appeal
  - Building relationships, sharing emotions and personal stories for Quadrant C
**Tips for an Effective Close**

- You must ask for what you want
- Demand action within a specific time frame
- Or ask for a reaction through the power of suggestion or example
- A message without a specific close or bottom-line is a wasted opportunity

**Speaking Versus Writing**

**Speaking**
- Highly sequential
- Allows for immediate feedback
- One-shot delivery
- Carefully targeted to specific audience

**Writing**
- High reader expectations
- Writer must anticipate misunderstandings and prevent ambiguity
- A carefully crafted message can address the needs of different audiences
Verbal Delivery

- **Style**
  - What non-verbal message are you giving?
  - Monitor your body language
- **Appearance**
  - Are you well-groomed?
- **Speaking**
  - Learn to modulate your voice
  - Use pauses
  - Be animated; use gestures
- **Acting**
  - Smile
  - Use eye contact
  - Transmit a positive, friendly attitude

Written Message

- Write legibly and neatly
- Use good grammar and correct spelling
- Where appropriate, also pay attention to a pleasing layout
- Be positive and friendly, or polite and formal, as required by the situation
- For important messages, proof-read and edit, then double-check again
EXAMPLE: Abraham Lincoln’s Gettysburg Address

- **Hook**
  - First three sentences, forming a bridge connecting the past vision to the present experience of the audience
  - Four score and seven years ago, our fathers brought forth upon this continent a new nation: conceived in liberty, and dedicated to the proposition that “all men are created equal.” Now we are engaged in a great civil war, testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battlefield of that war.

EXAMPLE 2: Abraham Lincoln’s Gettysburg Address

- **Message**
  - Five sentences, dedicating the cemetery and honoring the sacrifice and bravery of the soldiers
  - We have come to dedicate a portion of it as a final resting place for those who here gave their lives that the nation might live. It is altogether fitting and proper that we should do this. But, in a larger sense, we cannot dedicate—we cannot consecrate—we cannot hallow this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our poor power to add or detract. The world will little note, nor long remember, what we say here, but it can never forget what they did here.
**EXAMPLE 2: Abraham Lincoln’s Gettysburg Address**

- **Close**
  - Two sentences, calling for the living to dedicate themselves to the work of the nation - a government of the people, for the people, by the people
  - It is for us, the living, rather to be dedicated here to the unfinished work which they who fought here have, thus far, so nobly carried on. It is rather for us to be here dedicated to the great task remaining before us - that from these honored dead we take increased devotion to that cause for which they gave the last full measure of devotion - that we here highly resolve that these dead shall not have died in vain; that this nation, under God, shall have a new birth of freedom, and that government of the people, for the people, shall not perish from the earth.

**Thinking Quadrants Addressed by Abraham Lincoln**

- Facts and time span mentioned in the “hook” (sentences 1-3)
- “Proper” cemetery dedication and action (sentences 4-5)
- Personal commitment demanded and emotion expressed (sentences 9-10 - close)
- Grand concept of “one nation … with freedom for all” (expressed and implied in both the first and last sentence)