Project Management for Scientists

Proposal Organization

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Outline

- Proposal as a Project
- Successful Proposals
- Proposal is Marketing

Scientific project Life Cycle

- 3 phases, each can be treated as a project
  - Pre-proposal project (exploratory work, makes proposal believable
  - Proposal project (largely definition and coarse planning)
  - Actual project (largely detailed planning, execution, control, closure)

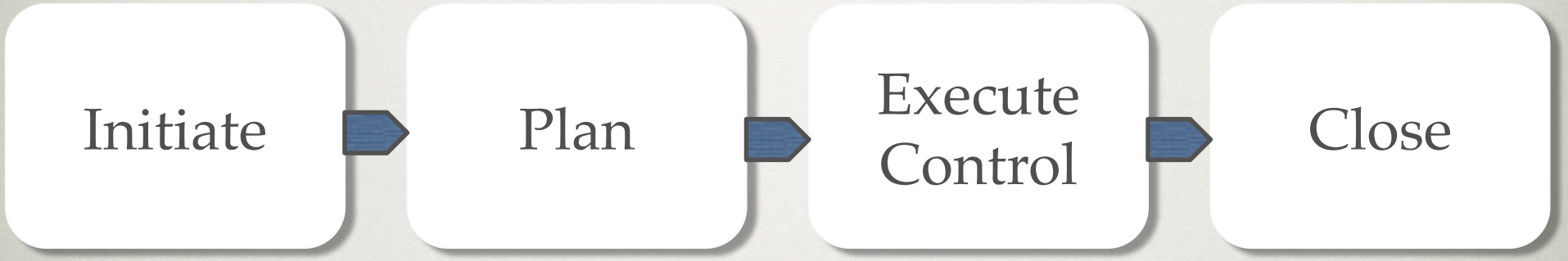
Space Project Lifecycle

- Pre-Phase A: Conceptual Study
- Phase A: Preliminary Analysis
- Phase B: Definition
- Phase C/D: Design and Development
- Phase E: Operations Phase

Proposal as a Project

- One-time effort (if successful)
- Beginning and very clear end (deadline)
- Unique product (the proposal)
- Rapid response required (weeks to months between announcement of opportunity and deadline)

Proposal (Project) Life Cycle



- Linear progression with decision points at boundaries
- Each box has a given set of inputs and outputs

Initiate Proposal (Project)

What is the problem?

- Input: science vision, idea, initial requirements; Request for Proposal (RFP)
  - Top-down → vision, strategic goal, project
  - Bottom-up → collection of smaller ideas/projects
- Activities:
  - Determine key players and their roles and responsibilities in the proposal phase
  - Establish proposal document system (e.g. Word)
- Output: proposal charter

Plan Proposal

How are we going to get it done?

- Input: proposal charter
- Activities:
  - Review RFP (Request for Proposals)
  - Clarify roles and responsibilities of writers
  - Proposal kick-off meeting
  - Detailed proposal writing plan (table of content, schedule, outside reviews, authorizations)
  - Learn from successful proposal to similar RFPs
- Output: proposal writing plan

Execute & Control Proposal

Are we on track?

- Input: Project Plan
- Activities:
  - Manage scientific ideas, requirements
  - Communicate writing status
  - Manage writing, schedule including reviews, authorizations
  - Control proposal content changes
  - Manage team
- Output: Proposal

Close Proposal

- **How did we do? What did we learn?**
- Input: Proposal
- Activities:
  - Submit
  - Learn from reviewers' comments
  - Celebrate if successful
- Output: happy team ready to do next proposal

Successful Proposers

- Are outstanding leaders
- Have vision
- Motivate
- Bring people together
- Know that proposal is fundable
- Know/influence the funding politics
- Write well

Successful Proposals

- Are received before the deadline
- Are written within the allocated resource limits
- Fulfill RFP (Request for Proposals) requirements

Successful Proposals

1. Agreement among proposing team on the goals of the proposal
   - Clear scientific goals
   - Fuzzy goals lead to fuzzy proposals
   - Ensures that everybody wants the same thing
   - Well documented origin and/or motivation of scientific goals

Successful Proposals

2. Proposal writing plan that shows an overall path to submission with clear responsibilities that can be used to measure the progress of the project
   - Proposal is unique, requires unique plan
   - Shows who is responsible for what and when
   - Shows what is possible
   - Details of resource estimates
   - Early warning system for resources and schedule

Successful Proposals

3. Constant, effective communication among everyone involved in the proposal
   - Plans and charts do not write proposals
   - Proposals written by people who agree on goals and how to meet them
   - Success comes from
     - Coming to agreements
     - Coordinating actions
     - Recognizing and solving problems
     - Reacting to changes

Successful Proposals

4. A controlled scope
   - With (often) fixed resources and schedule (submission deadline), scope is most likely to change
   - Changes in proposal scope and their impact must be understood and agreed upon by everybody

Successful Proposals

5. Management support
   - Proposals are embedded in larger entities (e.g. programs)
   - Larger entity provides people, equipment, buildings, policies, etc.
   - Larger entity often has to sign off on proposal (authorization, resource committment)
   - Impossible to write proposals without some help from larger entity

Successful Proposals

- Five key factors can all be achieved through project management
- Arts such as political and interpersonal skills, creative ideas, intuition, writing skills etc. should not be underestimated
- Science of project management is a prerequisite to practicing the art of successful proposal writing

Proposal Planning

- Plan like a project
- Budget: about 1% of money asked
- Schedule: plan backwards from deadline, don't forget reviews and authorization
- Scope: typically given by Request for Proposal (RFP)

Proposal is Marketing

- Proposal advertises scientific idea(s)
- Audience: reviewers, funding agencies
- Some proposals rejected because they contain bad ideas
- Most proposals rejected because they contain good ideas but are poorly organized and written

Proposal Challenges

- Every proposal has different personnel needs
- Cost and schedule estimates are difficult
- Organizational charts define authority for processes, but not for projects
- Time frame of process control is too slow for project control

Proposal Organization Checklist

Check for

- clear, unambiguous requirements
- verifiable requirements
- consistency among requirements
- gaps in requirements
- requirements from beyond project lifetime
- unnecessary requirements (design restrictions)
- traceable requirements (identification of underlying assumptions)
- unique identifier for every requirements