Examples--Phase Zero

1. Lessons Learned Document

2. A Complete IPS (this is from the last iteration cycle; the IPS tool has been updated for 2005/06 project cycle).

3. Interview Questions (2 sets)
Lessons Learned from Client Relationship

I see my project has having two critical dimensions: technical performance (i.e., delivering results) and interaction management (i.e., managing relationships). My client’s satisfaction with my technical performance is a result of how well I do my job. My client’s satisfaction with my interaction management is a result of how well I relate to the client and addresses his professional and personal needs. My professionalism, listening skills, availability, responsiveness, reliability, etc. are all factored into my client’s level of satisfaction.

In assessing my performance level in the area of client relationship, I believe I committed a cardinal sin of client relationship right from the customer interview. Expectations are at the center of all relationships, but they’re especially important when it comes to me and my client, because if I don’t know exactly what my client is expecting – or worse, assume I do – I could be on the road to disappointment. Through this last semester, I have learned what I call the “Law of Expectations”:

*Unexpected expectations are planned resentments.*

The primary reason my team and client got into trouble is we didn’t take the time to clearly spell out what we expected from each other, especially roles and responsibilities. To avoid this problem both the client and the team must have a sparkling clear understanding of what each other’s expectations are right from the start. Both must now the other’s expectations; you can’t guess at what these expectations are or assume them – when they’re not on the table, resentment is sure to follow.

Me or the client felt the answers are somewhat obvious but conflict is inevitable when the team thinks it has responsibility for things the client doesn’t think he have, or visa versa. I now know that just saying, “Team will produce the data acquisition system and show client how to operate it” or “Client will approve copy”
won’t cut it. As a member of the team, I’ve got to hammer out exactly what the team *expects* from the client and what the client *expects* from the team. Then review it on a regular schedule, every other week at least in some sense, and I’ll have a way to measure and validate how the relationship is going.

This is why our team decided to craft a “Relationship Mission Statement” with our client. This is something which clearly describes what the relationship is designed to accomplish and how. In other words, what exactly the expectations are. These are the questions me and my client cooperated on answering:

- **What is the collaborative purpose of our relationship? In the end, what should our efforts together yield?**
- **What does the client value in the relationship? What’s most important to them? Why is it important?**
- **What does the team value? Why?**
- **How exactly will we work together? What’s the relationship look like when it’s functioning optimally?**
- **What are our respective roles? What are the reasons for these roles?**
- **How, specifically, will we know if the relationship is working – how will we measure our success?**
- **What will we do together to ensure that the relationship is continually improving?**
- **What will we do if it starts to falter? What are the “deal breakers”?**
- **How often will we review our relationship and how?**

By describing the relationship dynamics, my team and I have a written “constitution” for the account that will serve for the semester year to come to keep those pernicious ‘resentments’ at bay.
Direct Solutions Initial Project Summary

Stake Holders:
- Sponsor: NIATT
- Client: Karen DenBraven
- Customer: UI CSC 2005-2006 Team
- Technical Consultant: Nathan Bradbury
- Design Team: Nathan Wasankari, Justin Lanier

Background:
Traditional transfer of power from the engine to the track involved multiple systems including centrifugal clutches, belts, chains, drive shafts, etc. The Clean Snowmobile Challenge strives to produce a snowmobile that is quiet, clean, efficient and has low environmental impact. The CSC 05-06 team has decided to focus on increasing drive efficiency between the engine and the track. To achieve this goal they have contracted us to design, test and implement a drive unit designed to meet their specifications.

Need:
Design a gear reduction transfer case using helical gears to transmit power form the secondary clutch to the track. Use of pre-bought gears is preferred to reduce cost. Design a system for measuring the efficiency of the drive system compared to the traditional jack shaft, commercial gear drive and our new gear drive design.

Benefits:
- Publicity for UI program
- Attractive Product to Industry
- Competition Placement
- Research/Design knowledge => technical paper
- Experience in design
- Experience in research
- Experience in manufacturing
- Experience in professional communication
- Experience in project management
- Experience in Long-term team dynamics

Deliverables: (give timeframe for each of these)
- Design Documentation
- Research Documentation
- Presentation Materials
- Team Updates/Minutes
- Product and Installation
Costs: (need to quantify these in client interview)
  Money:  
  Time:  
  Technical Consultant:  
  Space to Work:  
  Machines:  
  Mentors/Advisors

Interview Questions:

I Function
  1. What is the required overall gear reduction? 
  2. What is the minimum life cycle? 
  3. What general maintenance can be expected from the operator? 
  4. What type of manual or product info do we need to provide for maintenance? 
  5. Can we change the current state of the sled chassis for heat dissipation? 
  6. Should the testing results be actual or comparison, do we have to use the engine or can we simulate loading with an electric motor? 
  7. What is the max weight and ideal weight of the final product?

II Space
  1. To what extent can we modify chassis? 
  2. Will we have a designated work space and or shop space? 
  3. Will we have access to the dyno room for testing if needed? 
  4. Can we have network space to store files such as drawings and project research? 

III Appearance
  1. Do the final product aesthetics matter? 
  2. What material finishes are expectable for the final product? 

IV Time
  1. State the drop dead date for instillation. 
  2. Establish testing date for each system. 
  3. Establish testing components manufacturing dates. 
  4. Define research dates for all aspects (gears, heat, electric system). 
  5. Schedule periodic design reviews. 
  6. When will the final design review be conducted? 

V Cost
  1. What is the overall budget we can work with? 
  2. Will we be able to purchase new gears? 
  3. Will the testing budget be separate from the gear drive budget, or all inclusive? 
  4. Establish a purchasing procedure, reimbursement, card?

VI Manufacturing
  1. Are there any limitations for the material we can use? 
  2. Will we be free to schedule shop time with russ and our mentor? 
  3. Could we contract out machine time for the housing? 
  4. Could we contract out machine time for the gear grinding, if needed?
Research:
Subjects:
- Power Transmission “gears,belts,chains,shafts”
- Materials “gear/case”
- Cooling
- Lubrication
- Product Life
- Analysis of Loading
- Electric systems for dyno testing
- UI purchased gear analysis program
Sources:
- Shigley/ Mischke Mechanical Engineering Design
- Web pages
- Technical Advisors “Karen, Dr. Odom, Nathan”
- Published Papers
- Previous Senior Design Team published research

Management:
The sponsor will maintain the budget as agreed upon and inform all involved parties of changes.

The client will inform the design team of changes to the specifications, additional work that may impact the design, and maintain an updated schedule of events.

The customer will provide recorded progress feedback during design reviews and they will familiarize themselves with the required maintenance and perform it.

The technical consultant will inform the design team of changes and foreseen limitations that may arise throughout the project.

The design team members will be responsible for maintaining updates with the CSC team, the sponsor NIATT, our client Karen Den Braven, and our technical consultant Nathan Bradbury.

Approval:
I have read and understand the above project summary. By signing I agree to the content and initial direction of Direct Solutions, in solving the 05-06 CSC design requirements for a direct gear drive system and accept my roles as outlined above.

Sponsor: NIATT
Client: Karen Den Braven
Customer: UI CSC 2005-2006 Team captain
Technical Consultant: Nathan Bradbury
Design Team: Justin Lanier
Nathan Wasankari
1. Contact information: Adam2241@uidaho.edu : Ryan Adams, Grad Student

2. What is the purpose of the Microwave experiment you are developing?

3. What are the steps in the anticipated test procedure?

4. How many degrees of freedom are needed?

The key consideration in the design of both test fixtures is the availability of enough degrees of freedom to assure that the feed antenna face and UUT face are parallel and that the two antennas are axially aligned (bore sight). As depicted in the figure above the x and x' axes are parallel as are the y and y' axes; the z and z' axes share a common line. The face of the UUT rotates about the y-axes (azimuth) and about the z-axis (roll); the axes of the feed antenna rotates about the z' axes (polarization). Precise mechanical positioning of the axes is accommodated by the test fixtures.
5. Does the device need to lock once it is positioned? How?

6. Are any materials incompatible with the experiment?

7. What are possible sources of interference in the measurements?

8. What aesthetic considerations should be incorporated in the design? Look, feel, and finish of final components?

9. What tolerance/precision of movement is required? What is alignment is needed? How course/fine does the adjustment need to be?

10. Horn sizes? Interchangeable parts? Weight?

11. How much space is available for our fixture? What are the overall dimensions of the test chamber?

12. How many fixtures do you need?
13. How is the fixture going to be attached?

14. What level of maintenance is acceptable?

15. What is the budget? What is the protocol for purchasing?

16. Who will be using this apparatus? What training/background will they have?

17. How will the calibrator be mounted to the horn/base/wall?

18. What intermediate deliverables are required and in what timeframe should these be produced?

19. Do both fixtures need to accommodate various horn sizes?

20. Can the horn be mounted during laser alignment?
MAT Interview Questions

**Business Case:**
What market need is addressed by this product?

How does this technology fit into the MAT suite of products?

What existing products are used for applications like this?
Who manufactures these? What are their benefits/liabilities?

How could results of this project enhance a future small business development proposal?

Who are the customers for this product? What special end user needs should be considered in the design?

**Function:**
What measurement methods work best to calibrate the machine?

What is the background/profile of those who will be calibrating the machine?

Is there any restriction on materials used? Amount, type?

Is there an acceptable range for the precision of the adjuster?

What maximum and minimum amount of travel is required?

What is the operating temperature range of the component? Is thermal expansion an issue?

How is the mirror mounted on the interferometer?

Is there a need for coarse and fine adjustment?

How quickly must we be able to adjust/tune the mechanism?

What are possible failure modes?

What are the allowable forces in the device and how are they transmitted?

How does the current adjustment lock affect the mirror?
Cost:
  What is the anticipated/allowed development cost?
  What is the protocol for purchasing?

Space:
  What are the size limitations associated with the fixture?

Appearance:
  Are there any special aesthetic considerations?

Time:
  When is the part needed by MAT?
  What intermediate deliverables throughout the summer/fall should be considered?

Manufacturing:
  Where will final products be fabricated/assembled?
  Are there any machining operations that are desireable/undesireable?
  How easily must this component be manufactured?
  How do you plan to manufacture the component?

Research:
  What pictures/schematics/hardware are available for our use at the university?
  Are there similar technologies that could be adapted to this application?
  Are there any other adjustment methods for this application?
  What are the advantages and disadvantages of these current methods?
  What things have been done already in an attempt to fix the problem?
  What adjustment methods have been previously explored by Manning Applied Technologies?
  Is a screw the only option you would like us to explore?