

Lecture 2

Jan 13, 2015

- 1. Discussion of Projects**
- 2. Discussion of Teams**
- 3. Breakout Team Rules**
- 4. HW for Next Tuesday at noon**
 - 1. Signed Team Rules**
 - 2. Mission Statement**
 - 3. Begin Secondary and Primary Research. Report Results**

Problems with Problems

- 1. Problem understood?**
- 2. Importance/Impact?**
- 3. Doable in 2 months?**
- 4. Prior work?**
- 5. Time for Full Implementation?**

Problems with Problems

6. Are the problems vague?

7. Are the problems new?

8. Nature of attempts to solve in the past?

9. Did they “work”?

10. What is “work”?

11. Why/why not?

12. What would satisfy you?

The problems you have seen

- **Are not new**
- **For previous attempts, why did they fail or . . .**
- **What has happened that has enabled a new solution?**
 - **Need**
 - **Technology**
 - **Market**
 - **Distribution**

Continuing an “old” Approach

Advantages

- Can build on established knowledge
- Learning from past attempt (s)
- Problem definition
- Previous people as mentors
- Possible identified customers
- Iteration as a path to “wisdom”
- Challenge: make your “step” of sufficient length

Questions to ask of an “old” approach

- **What were the barriers to success?**
 - Incorporate into your “problem statement”
- **Are they surmountable?**
- **Can you surmount them?**
- **You will have to make a “best guess” based on insufficient information**

Dumbest thing you can do

- Bet on a football play on television**
- Lose**
- Bet on the instant replay**

A New Project

- **Life is often learning when to “kill” stuff**
 - **Good not to beat a dead horse**
- **Can apply a totally different approach to an old problem**
- **Problems themselves change as the world changes**

Remember

- **We want the project to be do-able in one quarter**
- **We want *something* to demonstrate at end of Quarter**
- **Can be Phase 1**
- **Concept of Minimally Viable Product**

Iteration

- **We will learn together in this class**
- **Pivots, Restarts are fine**
- **Sometimes assumptions do not withstand research**
- **Put in the form of hypotheses which can change with time and more information**

A Word on Teams

Why are products developed by teams?

Everyone has worked on Teams before

Then, in your experience

•What worked- what were the best things that happened?

•Setting a schedule/timeline

•Good communication

•Delegation

•Clear expectations/roles

•Regular meetings

•Having a project leader

•Consistent feedback

•Understanding personal strengths

•Getting input from everyone

•Proper documentation of progress

•Passion

What didn't work?

- **Conflict due to mismatched expectations**
- **Allowing freeloaders**
- **Losing focus during meetings**
- **Cascading effect when people miss deadlines**
- **Pushing things to the last minute and panicking**

Why are products developed by teams?

- **Complexity**
 - Skill specialization
 - Diversity
- **Parallel Processing**
 - Workload
 - Speed
- **Insight**
 - $1+1=3$
 - self-correcting

**What are some of the
negatives?**

What are some of the negatives?

- **Complexity**
 - Many interactions amongst people require some effort to “manage”
 - Communications
- **Teams can break down**
- **Possibility of “Groupthink” overwhelming the lone independent thinker**
- **Possibility of Dictatorship**

What are some of the characteristics of a good team process?

- **Clear delineation of responsibilities**
- **Generate many ideas**
- **Writing down clear goals**
- **Effective communication of progress, and challenges**
- **Deadlines**
- **Clear meeting dates and times, good attendance**

Some Characteristics of Successful Teams

Some Characteristics of Successful Teams

- **Leadership**
- **Commitment**
- **Integrity**
- **Common purpose**
- **Behaviors**
 - respect
 - pitch in
 - delegate
- **What else?**

Some guidelines for discussion. . .

- **Decide on your objective**
 - Why are you here?
- **Choose roles**
 - Who does what on team
 - **Suggestions:**
 - Time keeper
 - Scribe
 - Leader (Define)
- **Choose means of communication**
 - e.g. e-mail, phone, file sharing/online hosting or web-site, face-to-face

Some guidelines (Hard but Important)

- **Write down agreements and disagreements**
- **Write down actions and plans for resolution**
- **Write down all “action items” (what, who, when)**
- **Review action items beginning each meeting**
- **Try and invent new ways of interacting**

Guidelines (cont.)

For meetings

Show up

Show up on time

Take process breaks periodically

Do you *have* an agenda?

Are you sticking to an agenda or are you wandering off the subject?

Is everybody contributing?

Rules

- **Write down your “rules”.**
- **Everybody signs**

Test of team effectiveness

- **After First and Second week**
 - **Ask yourselves**
 1. **What are you doing really well**
 2. **What are the emerging issues?**
 3. **Have you addressed them?**

My experience at Caltech (n=48)

- **Best teams- *commitment, respect and integrity* (most important!)**
- **A product that people believe in (helps but less important)**
- **Similar backgrounds (least important)**

Class Exercise

- your first meeting

- **Introduce yourselves again if necessary**
- **Decide on ground rules**
- **What you will do**
 - **When a team member is not participating?**
 - **When you are having trouble agreeing?**
 - **When the goals are seen as not-reachable?**
 - **Other Issues?**

1. A team member is having difficulty participating?

- Team leader should talk to them**
- Don't gang up**

2. You are having trouble agreeing?

- **Vote**
- **Weigh the pros and cons systematically**
- **Be willing to accept when you lose a vote**

3. If the Team goals are seen as not reachable?

- **Be prepared to change goals, but your goals should still be a stretch**

4. What other problems do you
Anticipate?

Assignment for next (Wed/ Thursday)

- Write down your Team's rules.
Everybody signs**

Mission Statement

- **Brief (one sentence) description of the product**
- **Key business goals**
- **Target market for the product**
 - **Primary**
 - **Secondary**
- **Assumptions that constrain design**
- **Stakeholders**

Mission Statement

- **Submit next Tuesday**

Example

Grain Thresher: Mission Statement

**Kenneth Fisher, Amit Gandhi,
John Gardener, Vicky Mosquera**

Product Description

- **Device for threshing and separating harvested grains in a semi-automatic way.**

Key Business Goals

- Provide a service life of 1-2 years**
- Cycle time: less than a week**
- Selling on an family or communal basis**
- Product should be cheap to manufacture**
- Offer financing**

Target Market

- **Primary Market: Rural subsistence farmers or farming collectives, probably of rice**
- **Secondary Markets:**
 - Larger farms
 - Mill owners
 - Other countries that produce grains

Assumptions

- **There is a market for this product.**
- **Materials are available in Guatemala.**
- **There are local shops that can assemble and maintain the product.**
- **Villagers are mainly threshing by hand or with a threshing flail.**
- **Access to a mill.**

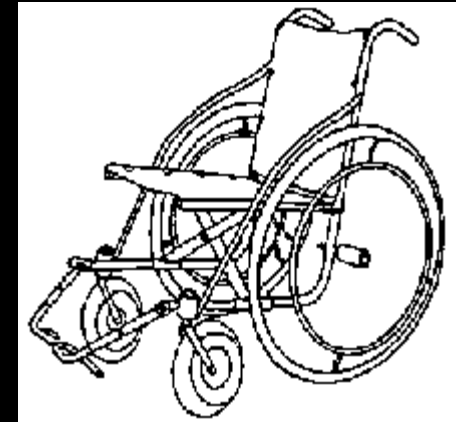
Constraints

- **Threshing of wheat, barley, and oats.**
- **The product should be able to fit in the bed of a pickup truck.**
- **In-situ assembly or assembly at a local bike shop.**
- **Process the same amount of grain per day as currently processed.**

Stakeholders

- **Rice farmers, both subsistence and larger scale**
- **Mill owners**
- **Bike repair/machine shops**
- **Government organizations**
- **Ken Pickar, Jeff Kranski**
- **us**

Example 2



ITM:

Independence Through Mobility in the Third World

Ben Sexson, Mike Easler,
Cindy Ko, Rudy Roy,
Alejandra Antonucci

Mission Statement

- **Our mission is to provide an improved means of transportation to every disabled person in the developing areas of Guatemala, one which can handle the conditions they face every day, leading to maximum personal independence and integration into society.**

Product Description

- **Bolt-on to existing transportation**
- **Easily assembled from bike and wheelbarrow parts found in-country**
- **Built by people there**
- **Inexpensive**
- **Reliable**
- **Partner with NGO**

Primary Market

- **Guatemalan rural disabled poor**
- **NGO's like UNICEF**

Secondary Market

- **Other developing countries**
- **Urban Guatemala**
- **Guatemalan government?**

Assumptions

- **Need for better disabled transportation in third world countries**
- **This product will improve mobility and thus quality of life of the end users**
- **NGO's like UNICEF working in the third world would be interested in this product**
- **Lower production costs make this more feasible than building/shipping entire wheelchairs.**

Constraints

- **Extreme poverty of the end user**
- **Rough terrain**
- **Non uniformity of existing disabled transportation**
- **Distance between designers and market**
- **Language Barrier**

Stakeholders

- **The ITM team**
- **Professor**
- **Disabled people in Guatemala and around the World**
- **Assemblers**
- **UNICEF**
- **NGOs**

For Design for the Disabled Secondary Research on your project

- **Internet**
- **Proceedings of Meetings**
- **Consultant Reports**
- **Non-profits**

- **What are present solutions?**
- **What are some of the issues?**
- **What new Technology is available?**
- **Changes in distribution?**

Primary Research

- **Interview potential customers**
 - Disabled
 - Elderly
- **Interview**
 - Insurance companies
 - Non-profits
 - Manufacturers
 - Distributers
 - FDA compliance

Summary of HW

- **Write and sign Team Rules**
- **Name Team Leader, Time Keeper, Scribe
(can rotate roles amongs Team)**
- **Write Mission Statement**
- **Give your Team a name**
- **Show early results of Primary (schedule
some inteviews?) and Secondary
research**

HW Submission and presentation

- Alex will assign a Team for each Lecture.**
- Present in 8 minutes with 2 minutes for questions- all team members present**
- Present that weeks assignment**
- E-mail all HW from all Teams on Tuesday by noon to Alex and myself**
- Pdf of ppt for presenters/word for non-presenters**

I'm pleased to announce the next call for proposals for the Caltech Innovation Initiative (CI2) fund, created to support ideas with the potential to produce disruptive, commercializable technologies. The CI2 Innovation Program shall fund the proposals that most clearly articulate the milestones intended to be reached with the CI2 funding and how reaching such milestones will position the technology to be readily commercialized at the end of the project.

A selection committee consisting of internal members from Caltech (faculty, Provost Office, Office of Technology Transfer and Corporate Partnerships) and external representation, will oversee this program. In evaluating the projects, the selection committee will use the evaluation rubric found on the CI2 website: <http://www.ott.caltech.edu/content/ci2>. Additional weight will be given to the commercializability of the technology. Funding for each proposal will be approximately \$75,000-125,000 for one year (direct costs), renewable for one additional year upon achievement of milestones or promising results. Faculty participation is limited to one proposal per faculty member per year.

The application deadline for this year is February 26th, 2015. Award decisions will be made by the end of April 2015. Proposals should be sent in PDF format by email to CI2@caltech.edu. Applications must follow the format for submission available on the CI2 website. For the CI2 application format, see <http://www.ott.caltech.edu/content/ci2>.

Questions regarding the preparation of proposals or the CI2 program in general should be directed to CI2@caltech.edu.

For further information on CI2 and Grubstake Programs, see innovation.caltech.edu/content/funding-opportunities.