Humanitarian Engineering: Garden Filter

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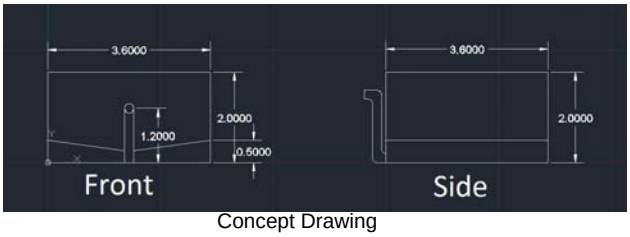
Design a product or process to address a developing world problem including, but not limited to: water supply, sanitation, infrastructure development, agriculture, energy and lighting devices, cooking stoves, etc.

Idea Generation → Market Research → Prototyping



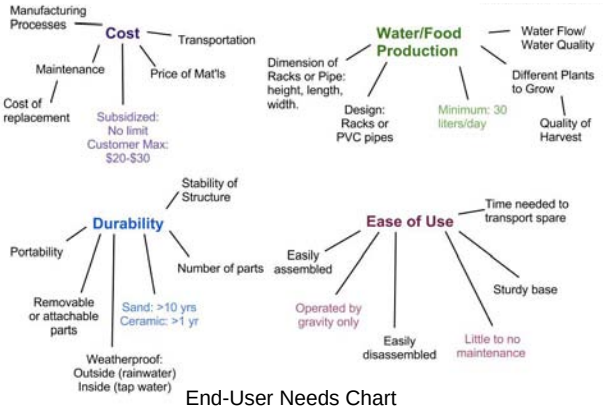
Concept Drawing

Idea Generation

- Researched current solutions on the market for ideas
  - Concentrating on developing communities
- Utilized random pairs generating technique
- Narrowed down our ideas based on feasibility

Market Research

- Existing problems and needs in developing communities
- Anthropological research
  - Gardening concept
- Current products and solutions
  - Lifestraw®
- End-user needs
  - Defining our customers



End-User Needs Chart


Small-Scale Prototypes


Test Without Soil or Sand

Small-Scale Prototyping

- Layering: soil, sand, and gravel structured levels
- Effect of soil layer on:
  - Water Flow: water input vs. water output
  - Water Quality: filtration of water
- Plants: produce growth and adaptability
  - Effect of contaminated water on plants

Reflections – Failing Often and Cheaply

- Idea generating most challenging part
- Technology exists and well-researched
- Most problems come from implementation
  - Garden Filter combines two necessities
- Prototypes rarely run smoothly the first time

Future Work

- Perfect water flow in small scale prototype
- Perform water quality tests
- Design and build a mid and full sized prototype
- Study the effects of vegetation

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