

Project Deliverable B: Need Identification and Problem Statement

GNG 1103 – Engineering Design

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On the 22nd of January 2020, we met with the client, Monique Manatch, to discuss the construction of a greenhouse. We engaged Monique with relevant questions, and appropriate notes were taken to understand what was needed to be implemented to yield a proper design. The greenhouse hydroponic system is to be built for the Algonquins of Barriere Lake community. The community is facing an inadequate food supply alongside a lack of proper water supply and electricity. Moreover, the population lives in houses that occupy ten to fifteen people per house.

After meeting with our client, we discovered how our customer wants the product to perform. However, Customer Needs are non-technical, and they reflect the customers' perception of the product, not the actual design specifications. This Deliverable will provide relevant information required to provide our customers with a suitable design.

Our two primary goals are:

1. To keep the product focused on customer needs.
2. To identify not just the specific needs of the customer, but also the latent needs.

These customer requirements should be independent of any particular product or potential solution. After all, it is after identifying customer needs that we can begin the project.

1. Gather raw data from customers
2. Interpret the data in terms of customer needs
3. Organize the needs
4. Establish relative importance of needs
5. Reflect on the Process

Without the customers' input, it would be impossible to identify their needs. The goal is to elicit an honest expression of needs, not to convince the customers of what they need but to use the data we collect to serve as guidelines for product development.

During the interview, we discovered that last year, the customers did not like the decorative lights that were incorporated in the structure, so this year, we would put that into consideration when putting together our design.

A list of Interpreted Needs from the customer are listed below:

NUMBER	CUSTOMER STATEMENT	INTERPRETED NEEDS	IMPORTANCE (numerical ranking)

1	There is no electricity available to power the community as they survive on generators.	The greenhouse should be highly sustainable. For example, wind and solar energy would be used.	5
2	There is no availability for the nutrients needed to feed the plants.	The greenhouse hydroponic system should be able to supply nutrients to itself. i.e. self-sufficient.	3
3	Average temperature ranges from -33°C to 4.1°C	The greenhouse hydroponic system should have its own heating system.	4
4	There is a shortage of water supply available in the community.	The greenhouse should have its own water filtration system.	5
5	Dimensions should be between 4x8 inches or 6x6 inches.	The greenhouse should be compact in size.	4
6	The community is far from the building site (university), so it needs to be disassembled when its transported.	The greenhouse should be easy to assemble and disassemble easily when transported.	3
7	The community is entitled to very basic equipment.	The greenhouse hydroponic system should be easy to maintain.	2
8	Animals in the area can damage the plants.	The greenhouse should have a barrier.	1

In conclusion, Customer Needs Identification defines the problem that we engineers need to solve. The most significant defect a product can have is not satisfying the customer. We are going to build a system that would meet the specifications of the customer, and any extra features that do not contribute

to the customer's appreciation of the product would be avoided. Time spent working on those features is the time taken away from the critically important ones, and even assuming that we meet all of the requirements, adding the extra features takes time and money that could be put to other uses. However, it is our duty to anticipate essential needs that the customer might not have recognized, but not frivolous features.

Problem statement:

The need exists for members of the Algonquin of Barriere Lake community to increase their food supply with the use of an efficient, sustainable greenhouse hydroponic system that is easy to control, compact in size, insulated, affordable, and able to provide warmth all year for growing plants.