SysEng 6104 Project Task I

Scoping the Customer Need as a System

1. Provide a need statement of the system of your choice around 200 words.

There is a need to determine the optimal method for transporting raw materials in space back to Earth, as it can serve as a cost-effective way of supplementing Earth's limited resources. The system must be able to sufficiently decrease the velocity in a large inert mass such that the masss can be transported safely, timely, and cost-effectively back to Earth, isolate the useful raw materials of the mass in a place and way conducive to mining, and maintain the composition of the large inert mass(es), asteroid(s), so as to preserve the economic value of the raw materials when extracted. The system should be able to use correlated asteroid composition and trajectory data to forecast how the functioning model will slow down an asteroid enough to capture the mass for safe, economic, and timely transport back to Earth, such that the valuable raw materials retain their properties enough to make extraction possible and worthwhile. The system shall integrate with a system on Earth to support extraction of the asteroid(s)' raw materials. The prototype design must be completed by December 6th, 2019.

2. Using the concepts discussed in details in chapter 2 of System Architecture book by Crawley, Cameron and Selva answer the flowing questions.
    a. What is the capability of your system?

The capability of my system is to handle asteroids.

    b. What are the functions of your system? How many basic functions are designed into the system?

The functions of my asteroid mining system include: captures asteroid, slows asteroid, transports asteroid, preserves asteroid, and configures asteroid for mining, My system has 6 basic functions.

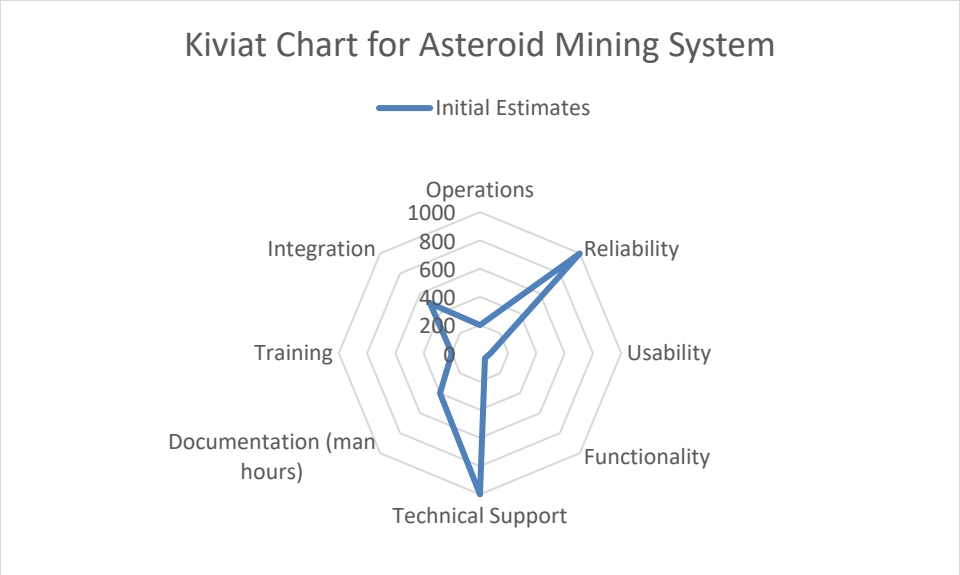
    c. What are the relationships between functions and capability of your system?

The functions of my system describe what the system does by its intended design. The capability of my system describes the ability of the system to produce its desirable functions. For example, capturing an asteroid would be a function and the capability, if I were to pick one right now, would be along the lines of "Operations". It's a higher-up abstract term that could be considered the parent of functions.

    d. What are the key performance attributes of your system?

The key performance attributes of my system include material availability, operational availability, reliability, total ownership cost, and documentation.

    e. Adapt the below Kiviat chart to the key performance attributes of your system


Kiviat Chart for Asteroid Mining System
Initial Estimates
Operations
1000
800
600
400
200
0
Reliability
Usability
Functionality
Technical Support
Documentation (man hours)
Training
Integration