Establish the Need

1 Definition

The need drives everything else of the project. It explains the problem from each stakeholder's point of view. Normally, the need will not change much during the life of a project.

2 Heilmeier Catechism

The Heilmeier Catechism refers to a set of questions that George Heilmeier, a former director of the Defense Advanced Research Projects Agency (DARPA), would ask anyone proposing a research project. The idea is that by answering these questions, one could ensure their research was worthwhile and feasible.

Here are the questions:

1. What are you trying to do? Articulate your objectives using absolutely no jargon.

2. How is it done today, and what are the limits of current practice?

3. What's new in your approach and why do you think it will be successful?

4. Who cares? If you're successful, what difference will it make?

5. What are the risks and the payoffs?

6. How much will it cost? How long will it take?

7. What are the midterm and final "exams" to check for success?

In other words, these could be expressed by the scope elements:

1. Need

2. Goal

3. Objective

4. Mission or business case

5. Assumptions

6. Constraints

7. Authority and Responsibility

3 Concept of Operations (ConOps)

3.1 Overview

ConOps is a description of how the system will be operated in order to meet stakeholder expectations. The importance include:

1. Provides an operational perspective

2. Stimulates requirements development related to the user

3. Reveals requirements and design functions as different "use cases" are considered (e.g., Shuttle)

4. Serves as the basis for key operations documents later

3.1.1 Typical Information

1. Typically a drawing with associated callouts

2. Description of the major phases of operation

3. Include all critical events

4. Operation timelines

5. All elements of the system (lander, orbiter, launch vehicle...)

6. End-to-end communications strategy, Command and data architecture

7. Operational facilities (e.g., mission control, science data center)

8. Integrated logistics support (resupply, maintenance, and assembly)

9. Operational scenarios and/or design reference missions

10. For human exploration missions, multiple DRMs make up a ConOps