

**HW 2 -- Frameworks**

**Due Date:** 17 June, 8:30AM EST

**Deliverable:** Team written assignment (about four pages per team).

**Time allotment:** You should expect to spend 5 hours on this homework.

**Grading:** 5% of your course grade. Every team member earns the same grade.

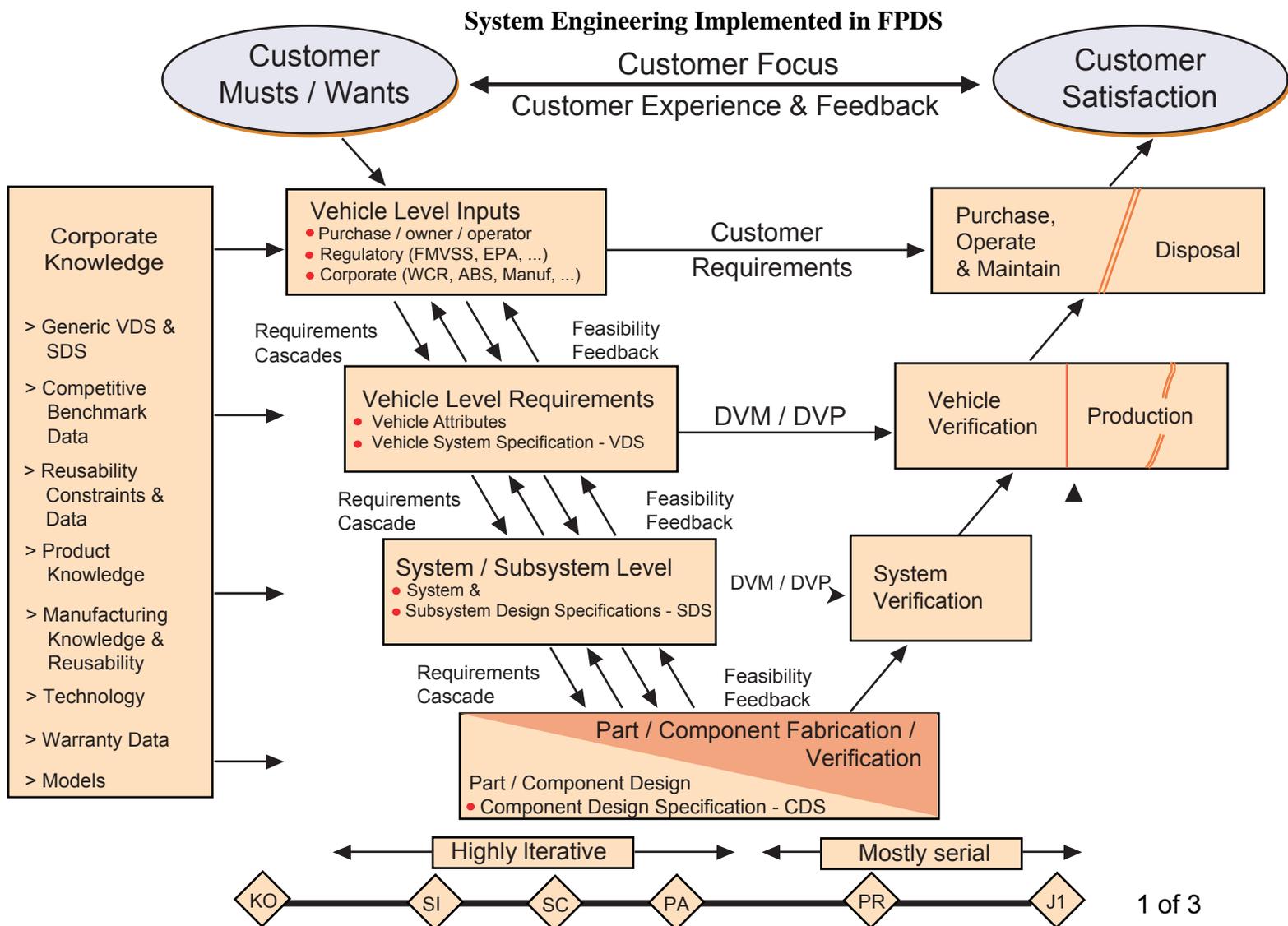
**Objectives:**

This assignment is primarily aligned with the first two objectives of the course – the ability to plan the SE process and to judge the applicability of processes.

**Assignment:**

Self select into teams of 2 to 4 people. It will be best for you to form teams within a single company or perhaps a single industry.

1. Don Clausing articulated a framework in which Requirements, Concepts, and Improvement (RCI) are the backbone of Systems Engineering. To explore this framework, please do the following:

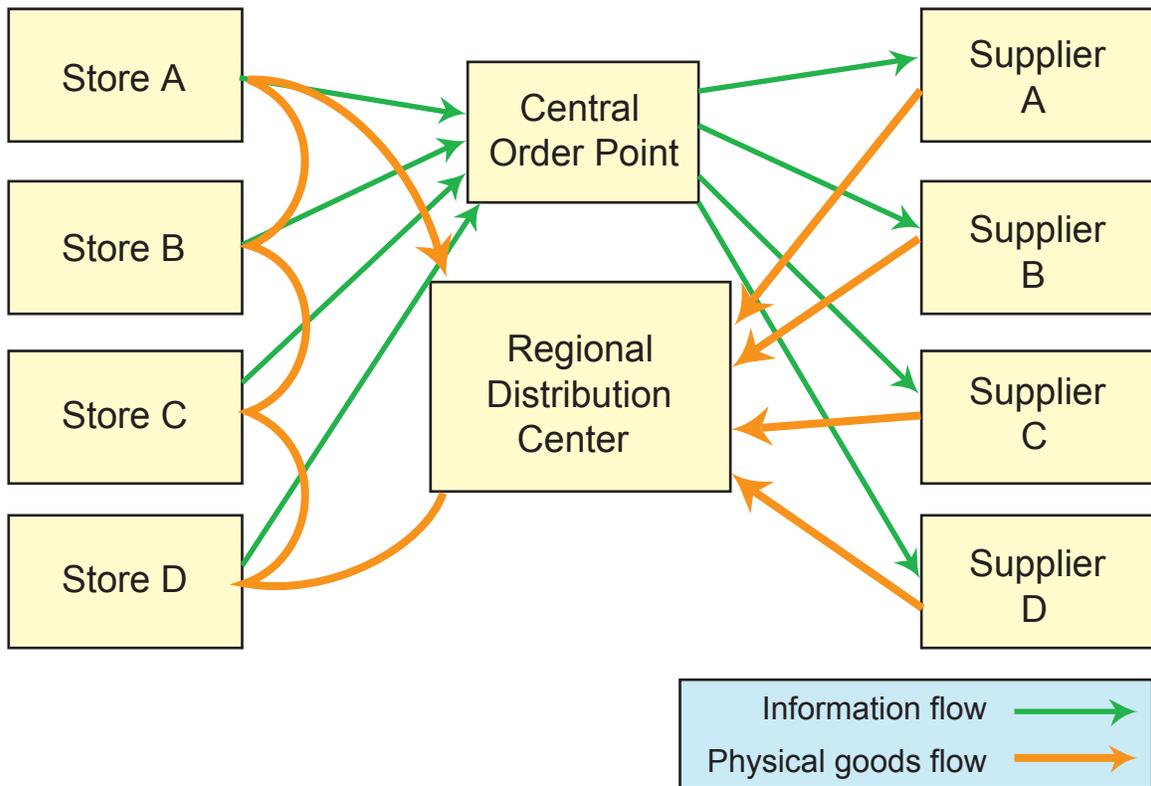


- a) Select an organization that develops products or systems (preferably choose an organization that you have worked for). State which organization you selected and briefly describe the organization and its products or services.
- b) Determine what tools/processes the organization actually employs (if any) to deal with each aspect of systems engineering (R, C, & I). Ideally, you can show some graphics from their documented product development process or training materials. An example of such a graphic (from the Ford Motor Company) is shown to the right. Comment on the effectiveness of each process based on your personal experience.
- c) Excellent performance in product development is often catalyzed by technical leaders who ask good questions. Select an example system at the organization you have chosen. Imagine a design review for that system (which phase of review is your choice). Write a typical question that a project leader might ask at a design review and then propose an even better question on the same topic. Try to develop such a pair of questions (typical question / better question) for all three key aspects of Systems Engineering that Clausing emphasized (RCI).

2. A key aspect of lean thinking is “value stream mapping.”

a) Select any value creating process of moderate complexity and sketch its value stream map. You don’t need to use any specialized symbology. Just represent processes and flows in some easily comprehensible way. An example from Womak’s *Lean Thinking* is depicted below.

b) Describe at least one example of “muda” within the value stream.



Tesco Reorder System. Adapted from Womak.

3. Ward used the simple example of scheduling a meeting to demonstrate the benefits of a set-based approach. Find another task from engineering, business, or everyday life and describe how a set-based approach can be used to carry out the task. Explain, using this example, how the set-based process results in good or bad outcomes (as the specific case dictates).