How to Write Target Specifications (Phase One)

Overview. This document explains how to translate the desires of the customer into measurable targets known as specifications. The tool for this task is the Specs Tool.

Specifications. A set of specifications is a translation from customer needs (qualitative) to numerical values that describe what a product will do. A set of specifications is comprised of many individual statements. Each single specification (e.g., time to assemble < 75 s) consists of a metric (e.g., time to assemble) and a target (e.g., < 75 s). Each spec describes an end result, not a method for achieving this result. Note that spec(s) and specification(s) are used synonymously.

Purpose
- Specifications provide clear targets so that
  - during phase one, the team and client can develop shared understanding of the goals of the design project
  - at the end of the project, the team and the client can have the same understanding of whether or not the goals were achieved
- The process of writing specs transforms needs statements (qualitative) into measurable goals

Who?
- The design team writes specs, modifies these to match client perspectives, communicates final specifications, and then validates the final design against the specifications.
- Clients review specification, give input on how specs need to be modified, and they sign off on final specifications.

When?
- Target specs are written during project definition (phase 1). Final specs are completed during system integration (phase 3) and communicated in the project proposal.
- During validation (phase 6), the performance of the “as-built design” is measured and compared to the final specs. If specs are not met, the design is modified until the specs are met.

Inputs, Outputs, and Scope
- Input. The needs analysis documentation is nearly completed.
- Output. Target specification document (at end of phase 1). Final specs stated in project proposal (at end of phase 3). Validation that is documented in the final report (at end of phase 6).
- Scope. A typical time to develop target specifications for a capstone project is 4 hours.
Specs Tool

[This tool is used by project teams to create the target specifications document. As you use this tool, document your work. When you complete this task, post (a) the target specifications document, and (b) the specs tool.]

Stage 1: Learning & Planning

1. Learn the main ideas
   [Have each team member read chapter 4 and the article entitled “how to write specs” and document their work in your logbook.]

2. Define key concepts: spec, target spec., final spec, metric, target, validation.
   [As a team, discuss concepts and summarize each key concept below].

3. Establish motivation to learn
   [As a team, list reasons, as many as you can, why learning about specs will help you on this project and on future projects. Identify your three top reasons.]

4. Define a goal for the specifications task.
   [As a team, develop a S.M.A.R.T goal that describes your teams outcomes on the specs task. Part of the goal should focus on results and part on learning. A goal is SMART when it is specific, measurable, attainable, a result (not a method), and time bound.]

5. Establish a plan for completing this task.
   [As a team, list ideas, as many as you can, that will help you to complete this specs task with high performance while maximizing learning by team members. Select your best ideas and write down a step-by-step plan for using this tool and completing the task.]

Stage 2: Creating the Target Specs Document

1. Prepare a list of metrics.
   [see p. 75--write findings below].

2. Gather benchmarking information.
   [see p. 70. Research and collect information so that you understand what values to select for targets--write findings below].

3. Set ideal (challenging) and acceptable target values
   [see p. 79. Set target values that your can hit if you perform superbly. Set a lower set that reflect what is acceptable--document findings below ]

4. Align specs with customer needs.
   [complete a needs-metrics matrix as shown on p. 77 and make sure that meeting specs ensures
that customer needs are met. See findings below]

5. Complete the target specs document.
   [see p. 84]

   [provide target spec doc to client; hold a brief conversation to ensure that you are on track; keep it simple because specs are not locked until the end of phase 3. Record your findings below].

7. Iterate
   [iterate back to steps 1 to 6 as needed.]

Stage 3: Assess Performance & Complete This Task

1. Assess Team Performance
   a. Identify strengths in performance

   [Think back to your performance as you engaged in writing target specs and list 3-4 strengths. Write about each strength using the format below
   • What. List the specific things you did to achieve strong performance.
   • Why? Explain why this strength impacted performance.
   • How? Describe the specific steps you took that resulted in strong performance.]

   b. Identify improvements in future performance.

   [Think back to your performance as you engaged in writing target specs and list 2-3 ways that you will improve your performance in the future. Think about this project and about future projects. Write about each improvement using the format below
   • Recommendation. Give a specific recommendation about how to improve future performance.
   • Action Plan? Explain why this strength impacted performance]

   c. List insights.

2. Complete documentation.
   a. Post the target specs document (step 5 of stage 2) on your website.
   b. Post the specs tool document on your website.

3. Notify your capstone instructor that you have completed this task & that all documents are posted.