Southern New Hampshire University

CS 230 Design Constraints

Overview

Potential design constraints may arise when creating a product for a client. Specifically, you must consider and identify any design constraints that apply when creating software. Simply put, how can you address constraints, whether technical or imposed on your team by a client, in order to deliver the best possible final result?

To address any design constraints, you must first understand how to identify the requirements outlined by a client and translate those requirements into the types of constraints you may encounter.

Requirements

A requirement is a statement of what the system must do or what characteristics the system must have. You may get the requirements up front from the client, possibly documented as a specifications document, Request for Proposal (RFP), or notes from an interview with the client. This is a good starting point for understanding your client's needs, but you may also need to elicit more information from the client.

Technical Constraints

Technical constraints are fixed technical design decisions that typically cannot be changed. While the client may outline specific constraints at the very start of a project, programmers may also establish constraints within their team in order to streamline any internal processes. Knowing this, what are some standard technical constraints associated with distributed environments and operating systems?

What programming language will you be expected to use?

Which operating system does the client require their software to be used on? Do they need it to be used on multiple platforms? Creating software that does not satisfy the platform constraint means you have failed to design a software system that satisfies your client's main specifications.

Who is hosting the cloud environment? Some questions to consider include the following: If it is an outside source, are they going to limit the amount of data used, and what is that limit? Once that limit is reached, do they throttle the speed, change additional fees, or simply turn it off until the next month?

Do you have to use a specific library or framework during the design process? Sometimes a client may require the use of a particular in-house library, while another company may expect you to always use a specific open-source library or work from an approved list instead.

What are the hardware requirements? Specifically, consider the differences in hardware availability between various operating systems and how they may impact your testing requirements. Also consider the minimum versus the recommended: what it takes to run the software at its lowest level compared to what's necessary to run it smoothly, with better graphics, sound, and so on.

Is there a minimum internet connection speed required to be able to run the software? If so, this is another constraint to keep in mind as you continue to evolve software to include other operating systems and platforms.

Business Constraints

Now that we've covered some conceivable technical constraints, we must also consider business constraints you might encounter during the development process.

Is your client on a schedule? If so, all projects and any milestones must adhere to that schedule. You do not want to be the reason why the software is not ready for distribution by the deadline they provided at the outset of the project.

What kind of budget has your client given you? In some cases you might be able to increase the budget, but often budgets, whether fixed through contract or expectations, become constraints on the project and the team building the software.

Team composition and make-up: In some cases, there may be requirements that specific personnel be used or not used during project. For example, someone may be unavailable or already committed to another project, or you may be required to include specific individuals, perhaps for training purposes.

Are there any specific software licensing restrictions or requirements? Does your client own any specific software components? Are there any legal considerations to be taken into account? These are things that should be discussed with the client during any initial project meetings.

What items will be done in-house and what by an outside vendor? For example, if there is any 3D modeling to be done, will an internal art department take care of it or will they be hiring someone? Does the client have the ability to create sound for the software or will they contract this to another company as well?

Reference

Keeling, M. (October 22, 2014). Reflections on software engineering. Retrieved from

https://www.neverletdown.net/2014/10/dealing-with-constraints-in-software-

architecture.html