

Engineering Glossary

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[NOTE: As with any compendium of public knowledge this document is under constant revision. Don't be surprised to find something changed from the last time you read it. And don't be hesitant about making improvements as you come across better ideas.]

Architecture

The base, irreducible, and immutable set of rules defining how a system works. These are the rules you will have to live with for the lifetime of the system, so choose them well.

Design

The application of knowledge, understanding, and technology to solve a system. A system may be solved many different ways. Design is the process of finding the best match of current technology to the system domain while meeting budget and other considerations.

Implementation

The science of putting design into practice. Just as there may be multiple designs to solve a system, there are multiple ways to instantiate a design. Implementation is about seeking the best match of specific technology to design, all within the limitations imposed by the Real World.

Requirements

A collection of unambiguous statements defining characteristics and behavior that must be reflected in the final product.

Requirements are generally separated into two categories: compulsory criteria (those required to meet the Critical Success Factor); and constrained criteria (those whose limits are set by considerations other than the Critical Success Factor).

Compulsory requirements are those which are vital to the core of the product and will not change, ever. These are the criteria that are used to create the architecture of the system, since these factors never change. A change in compulsory criteria means a new product.

Constrained requirements are those which may be reasonably changed. They may be determined on the fly during discovery, or altered to reflect a shift in marketing approach, or changed for any other reason. Typically constrained criteria affect things like the limits of performance or supplementary features. These factors can change without affecting the *architecture*, although even small changes can sometimes drastically affect the *design*.

Critical Success Factor

A buzz phrase referring to the single most important aspect of operation for the product. If the product fails to accomplish this one facet of operation then it is a failure, regardless of how well it may do any number of other things.

This term is used during the requirements phase to ascertain what requirements will be set in stone. Once the Critical Success Factor has been set, that's it – no more changes.

This term is also used throughout the development cycle in analyzing the completion of design and implementation stages. Any component of design or implementation can be analyzed for Critical Success Factor to determine if it is actually discharging the correct duties and doing so properly.

Product Domain

The environment in which the product will have an impact. An engine control for a four cylinder, gasoline, pushrod-actuated valve, passenger car engine has a completely different working environment than that for a ten cylinder, diesel, overhead cam, tractor-trailer van engine. While

both of these engines provide motive power, they do so by totally different means and to completely different ends. Their controls must be created to fit those environments.