

Product Development

Notes

Specification Documents

When a new electronic product is to be developed, it is of paramount importance to generate specification documents prior to commencing the design. These documents will define the project milestones and deliverables and serve as indisputable evidence for all parties to clearly understand the scope of the finished product, and the project path to develop it.

Up to three specification documents are usually required. Firstly, a marketing specification, followed by a product specification and finally a technical specification. Lastly a contract is required. This must specify the requirements to be met with milestones and deliverables.

Marketing Specification

When an idea or concept is to be developed into a product, the first requirement from the marketing department is the preparation of a marketing specification. The document outlines the product's functions and features from a marketer's point of view. It should be non technical in nature, easy to understand and must include all the features required from the product.

Consider a product such as a television, which we'll be using as our example in this article. A marketing specification will list features such as "must be capable of receiving all VHF and UHF channels" or "must have volume, brightness, contrast and sharpness controls" or other similar requirements. The specification defines the features and benefits the marketing department requires, but does not outline technical requirements, nor does it stipulate how the marketing requirements will be achieved. Effectively, it is a list of requirements, some of which are mandatory and others which are wishes.

The intended audience of a marketing specification is middle and senior management of the company, and the R&D Department.

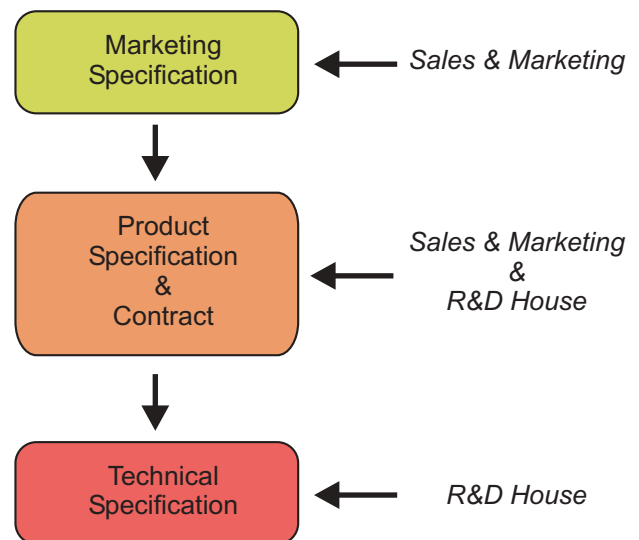


Figure 1: Specification Documents and Responsibilities For Generating Them

Product Specification

A product specification takes the marketing



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specification and fine tunes it. It is more specific about the requirements of the product, and defines features, benefits and functionality. It translates the loose requirements of a marketing specification into something more specific. A product specification can also include references to other standards such as ISO9000, electricity standards, Australian Standards or any other standards deemed relevant, which need to be met by the product.

The product specification is the document that will be forwarded to the R&D Department so they can understand the requirements of the product, and subsequently go about developing it. The document however, is also intended for anyone else who is interested in understanding the product that is to be developed.

The preparation of a product specification, forces all parties to carefully consider the features and benefits of the product and thus impossible requirements are usually dispensed with at this point. Lots of consultation and discussion occurs, and this is usually supported by market research to define the makeup of the product. Careful consideration is given to features and benefits. Consultation with the R&D department is required to determine if the features that are to be specified, are realizable within the development budget and unit price of the product.

Preparing a product specification can involve any department in the company, however Sales and Marketing and R&D are the departments that have the most influence in it's preparation.

Technical Specification

A technical specification details how the product specification requirements will be met. It provides the technical details the R&D department must meet in order for the product to satisfy the requirements outlined in the product specification. It is the document the R&D department will use as the basis of

designing the product.

A technical specification is generated by the R&D department and is required for a variety of reasons.

A product specification is technically vague. A technical specification removes the vagueness by being specific about technical details, but still allows an R&D engineer freedom to explore various options when designing the product - all of which must meet the technical specification.

The specification must be thorough, carefully considered and carefully worded, otherwise misunderstandings will occur, and products will be designed which do not perform as required. For instance, if we use the television example introduced previously, a technical specification may state "it must operate at 240V AC plus or minus 10%". This ensures the product will be tested at these voltage limits at the completion of the design process and hence must meet this requirement. If the specification stated "it must work when connected to any power point in Australia", it makes it impossible to specify a test criteria in other words how do you determine if you have met this requirement - do you test it in every power point in Australia? Probably not, as this is impractical. By specifying a worst case mains voltage limit, it effectively guarantees it will work with every power point in Australia because this is the worst case voltage limit the electricity authorities guarantee.

Other relevant technical specifications such as Australian Standards, ISO9002 etc that are relevant to the product, must also be cited in the technical specification including their issue date and revision number. The technical specification should clearly state what standards the product must meet, and where possible how testing will be undertaken.

Specifications When Using a 3rd Party R&D House

The specification documents we have

discussed above, are equally applicable for companies with in house or external R&D departments. There are however some differences that need to be considered when the R&D department is an external 3rd party.

A company developing a new product with the intention of using a 3rd party R&D House, will still require a marketing specification and a product specification. In most cases, the marketing specification will be very simple and informal, usually consisting of a few pages of requirements.

Product Specification

The product specification will usually be prepared with minimal interaction from an R&D House. The company developing the product (the client) must be careful not to allow a prospective R&D house to impart excessive influence on the specification to benefit it's own interests, at the expense of the client. An exception to this rule is when the R&D house is an existing supplier to the company and both organisations have a very good working relationship. In this case, the R&D house will become heavily involved and work closely with the client, to generate a good specification that is accurate and practically realisable. It is in the best interests of all parties to generate a specification that is very specific and very clear. Lack of details and vagueness must be avoided at all costs, as it will result in a product that does not meet the requirements of the company which is funding the development, and hence a

product that is likely to fail in the marketplace.

The biggest difference in preparing a product specification when using an external R&D house versus possessing an internal R&D capability is the restricted ability to make changes "on the fly". If a company has an internal R&D capability, it can change the product specification quickly with minimal negotiation and the R&D department can implement the changes. When using an external R&D House the changes are more difficult to implement, especially if they impact on product cost, and hence have to be negotiated and cost variations need to be calculated.

Technical Specification

The technical specification is unaffected by the nature of the R&D department. A technical specification's audience, is entirely the 3rd party R&D House. The audience are the engineers who will design the product and the document will not usually appear in any contracts or agreements between the client and the R&D House.

In summary, the principal document defining the product and the project between the client and the R&D House is the product specification. Along with a contract, it defines what needs to be done and what requirements the product must meet.