

GETTING IT RIGHT FROM THE START

With significant experience in the design and development of new products, we have observed that the effect of change towards the end of product development is significantly greater than at the beginning. In this article, we talk candidly on how we go about ensuring successful concept development and share a few of the insights that we have learnt and adopted along the way.

We believe that developers should always attempt to minimise the risk of significant change occurring towards the end of any product development. To achieve this, we have developed our own philosophy to ensure that the correct product is developed from the very beginning in the shortest possible time. This approach minimises development risk, cost and time, whilst maximising the product's chance of success in the market place. Despite the range of products that we get involved with, the same four principles are adhered to: Understand, Analyse, Create and Refine. Typically, concept creation only costs 5% of the total product development budget, but the concept created will fix over 80% of the final product cost. Therefore it is vitally important to get the correct concept developed from the very start.



The first activity is to **understand** all aspects of the required product. This ranges from who will buy it and who will use it, which may not be the same, through to manufacturing strategy and production volumes. We divide these requirements into categories so that they can be structured and easily understood. At this stage we like to observe who purchases the product in their own 'natural environment' so that we can completely understand their purchasing motivation. To give an example, one product that we developed was a lawnmower. When you buy one, you never cut grass with it, instead you have to go by the look and feel of the product. This insight showed us what we would need to incorporate into the product to ensure sales success.

Once we have an understanding of the requirements we **analyse** them to establish which are hard to achieve and could pose risk. We address these issues first to mitigate risk and prevent significant change occurring later. Our preferred method of analysis is to look for the 'conflicts'. We systematically look through the list of requirements and identify which pairs are hard to achieve together. For example, if a product has to be strong but light how can this be achieved? By looking for these conflicts and addressing them first, new and novel approaches are often found which can lead to breakthrough products.

Depending on the particular product, certain technologies may be involved and we will want to analyse their feasibility before we proceed further with the development. Choosing a company, such as Cambridge Consultants, with a breadth of technology experience, allows you to quickly establish the feasibility of a range of technologies.

By taking the time to understand and analyse what the objectives of the product are, you negate any misunderstandings later on, which could create rework that is best avoided. We find that it is well worth spending time at this stage to reduce risk, otherwise more time and money will need to be spent later on in the project.

It is only once we have a full understanding of the product requirements that we start to **create** concepts. We have a positive approach to creation. Firstly, we prioritise and focus on the conflicts that have been identified. We then work on the product life cycle, creating ideas for the product from initial use to end of life. By taking the whole product lifecycle into account, we make sure that we do not forget important issues such as the opening of packaging and recycling.

We combine all of these ideas into product concepts and part of our approach is to consider all ideas from evolutionary to revolutionary, as it should be remembered that the best product is the one that is the most profitable, not the one that uses technology just for the sake of it. A wide choice at this stage allows all of the options to be explored.

So far we have understood the requirements and created concepts. What we do next is to compare those concepts against the requirements to see which is the best concept to develop. We assign scores for how well each concept fits the requirements. There are a number of ways of doing this but the important principle is to make sure that your scoring system encourages excellence. For example, if you average the scores you produce numbers that are close to one another making the differences between the concepts hard to understand. Instead we multiply the scores together to exaggerate the differences between the concepts and allow the preferred option to be selected for further development.

Once we have selected concepts, the last stage is **refinement**. This is important as it allows more detail to be added to the concept, such as considering manufacturing tolerances for critical areas and how the product architecture will be defined. If appropriate, we will return to our list of requirements to see if this added input has improved the concept or if other approaches should be tried. Communication is key at this stage and the Computer Aided Design systems that we use can produce realistic images and animations to convey the final concept to the client.

We can **summarise** our approach to good product design as understanding what is needed, creating concepts according to our understanding and then checking that the proposed concept actually meets what is required. This approach of revisiting the requirements and getting it right from the start, minimises the risk that the product fails to meet expectations and ensures the maximum chance of success for our clients. **Simon.Smith@CambridgeConsultants.com**