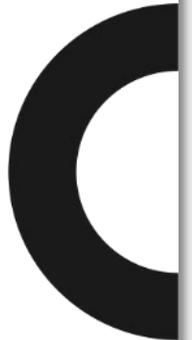




# **Successful product development:** a management guide

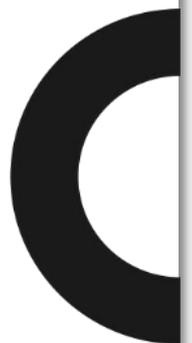




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# Introduction

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*A goal without a plan  
is just a wish*

Antoine de Saint-Exupery

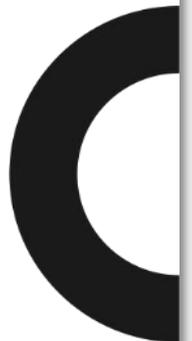
This guide reveals how to improve the commercial performance of product development projects through effective planning and management. It is designed to give you simple, practical steps to make your next product development project more organised, more fun, more successful and much more profitable.

It is a subject that is often written about, but in our opinion, it is usually overcomplicated. We believe that successful results can easily be achieved by following a few key principles.

This practical guide is based on over 25 years experience of product development and focuses on two main areas - project planning and project management. It includes straightforward ideas and helpful suggestions, clearly expressed and illustrated with real examples.

The ideas we've included are all supported by a source that you may be familiar with, but might not have taken too seriously before, British Standards BS7000/2. It's a surprisingly helpful document that with the approval of British Standards, we have edited down to a useful management summary. We've included the relevant sections in this guide to support our suggestions on how to plan and manage a product development project.

We hope you find it useful!





## Your product development team

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Successful product development depends on excellent teamwork

There's always one!

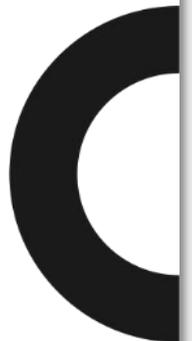
Over the last 25 years we have worked on a huge variety of product development projects and one thing has become really clear: **The most successful product development projects are those carried out by a well-organised and multi-disciplined team of people from every area involved in the process.**

It may sound obvious, but most product development projects are run by small groups and often by individuals who only involve others when they feel it is absolutely necessary – at which point it is often too late. The importance of a well organised and multi-disciplinary project team cannot be overstated. Without this you are guaranteed to experience unwanted delays, a compromised outcome, and all too often in our experience, disastrous results.

### **So, how should it be done?**

First, list all the areas of your business that should be involved in the development of your new product. The absolute essential list will be made up of - technical development (mechanical, electronic, etc), marketing, sales (and yes, these should be separate functions), production, financial control and any after sales or maintenance staff. We'd also like to point out that good product design consultants are essential!

Next, nominate or request at least one person from each area to be a member of your product development project team.





Finally - very important this one - do not allow the team members to share their project responsibilities with their colleagues or you will end up constantly going over old ground at meetings. **Individual accountability is absolutely critical.** Barring civil unrest or medical emergencies, the nominated team members must attend every meeting.

What BS7000/2 says:

Selecting the design team

In the early stages of a project, a small number of staff might undertake preliminary work on an informal or part-time basis. Once the project is sanctioned, a design team with appropriate expertise should be formally established and their specific roles in the project documented. For continuity, those involved in the preliminary work will almost certainly form part of the project team.

It is important that the project team is chosen so that collectively they have a good understanding of the scientific principles inherent in the proposed new product, and sufficient up-to-date knowledge of the relevant technologies and applicable standards. The team should also include staff with the necessary commercial and marketing awareness.

This may be achieved by bringing in expertise from elsewhere in the organisation, using subcontractors, or training by existing staff.

In larger project teams, it may be helpful to separate the role of project manager from that of technical leader. This can be done by nominating both a project manager to oversee the day-to-day management of the project, and a technical authority/chief designer, to be the “keeper of the design” and take responsibility for technical aspects.





### **The key to successful project management**

Regular, scheduled meetings are essential. In the early stages of the project you will probably want to meet every week or two, but the frequency may drop as the project progresses. Attendance of all members of the project team is vital. Don't fall into the trap of thinking 'we don't need marketing this week, there's nothing they can contribute at the moment'. In the first place, you need to keep everyone informed to make the process work. Secondly, colleagues from different areas of the business often have useful insights that you don't want to miss out on. The meetings don't have to be long, and the time spent is worthwhile!

The first meeting should agree the product specification (which we'll look at in more detail on page 9 and the critical deadlines as discussed on page 13. Future agendas will be based on items being worked on from the project specification document. Each meeting should start with chasing up actions from the last meeting, followed by very brief reports from each of the primary areas such as technical development and marketing.

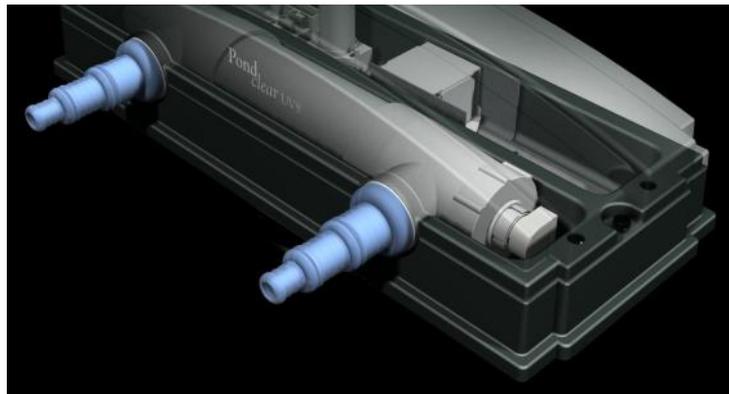
After each meeting, notes and new actions (with individual responsibilities and deadlines) should be circulated amongst all team members. Again, this should be the one person's responsibility – the project manager's (see page 16).



## Case study 1: Effective teamwork

### Tropical Marine Centre Ltd

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Tropical Marine Centre Ltd asked Crucible to help design a new treatment unit for garden ponds that would clarify the water using ultraviolet light.

One of the most crucial factors in the success of the project was the excellent management of the programme by the TMC team. Each meeting considered all the technical, marketing and product launch issues, resulting in problems being identified and dealt with before they became an issue. This is what enabled the new product to be launched in time for the new garden season which resulted in the doubling of sales.

Crucible's new design of the PondClear was an immense success. Pondclear had wanted to reduce assembly time and by creating a vacuum formed casing, Crucible reduced Tropical Marine's manufacturing costs by 26%, and sales doubled in the first season.

Richard Sankey, the founder of Tropical Marine Centre, comments,

*“Crucible's design moved the PondClear product from a piece of engineering to a unique professional consumer product. Their focus on delivering a design with unique features produced a low cost solution that remained successful on the market for at least ten years. Their professional, but easy going approach and their understanding of our limitations made them incredibly easy to work with.”*



### What BS7000/2 says:

#### Maintaining good communication

It is the project manager's responsibility to ensure that the team is well informed about all aspects of the project, and have up-to-date information to work with.

Design team meetings should be organised to facilitate open communication. Ideally, attendance should be limited to less than ten members in order to enhance communication and efficiency. All members should be given an equal opportunity to contribute. If differences of opinion (or conflict) arise between members, the project manager should have ultimate responsibility for taking decisions.

#### Reporting on project progress

The project manager should issue regular written reports on the progress of the project. The frequency, content and format of these progress reports should be agreed with all interested parties at the start of the project.

These progress reports need to highlight the actual or potential deviations from the project plan and the reasons for such deviations.

The project manager should be responsible for ensuring that corrective action is taken to resolve problems.





## Getting started: your product specification

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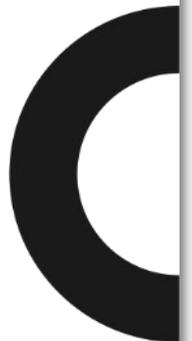
The first action of any new product development team should be to agree the specification for the product. It serves two critical functions: to make sure that no requirements are missed (if you forget that your product needs to be drop tested it could wreck your sales forecasts) and to make sure that deadlines are correctly identified.

Some of the details, which need to be included in your product specification, will be obvious, whilst others will not.

Each activity should be allocated to an appropriate team member, but it's important to discuss each of them as a project team. This allows all areas of the company to understand the challenges faced by their colleagues, and to make positive contributions where they can. For example, a salesperson might be able to pass on comments from customers that will affect access for maintenance or product durability.

A good specification will give equal weight to all aspects of the project (technical requirements and customer needs, for example), and make sure that you take absolutely everything into consideration, like critical exhibition dates.

Page 11 has a checklist of the issues that you should consider.



## Case study 2: An accurate specification OXIS Batteries



Since 2005 OXIS Energy (OXIS) has been developing batteries based on Polymer Lithium Sulfur. This cutting edge technology is rechargeable, significantly lighter than conventional batteries and recyclable.

Crucible has worked with OXIS on the development of several products that demonstrate the new technology.

As OXIS had no prior experience of product development, one of the most important parts of the job was helping them define exactly what they wanted to achieve, over what timeframe and at what cost. This then led to the development of a clear design brief and critical milestones and deadlines.

The project resulted in prototype bicycle power packs (above) and solar storage batteries - on time and on budget.

Dr Mark Crittenden, Business Development Manager, OXIS Energy explains:

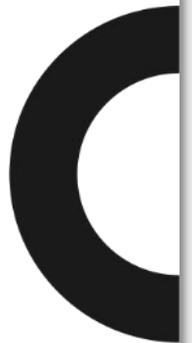
*“Crucible’s experience and guidance was essential to the entire process. They were very professional and hand-held us every step of the way to ensure there was a clear brief and that we met our deadline.”*



## A product specification checklist

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- Names of people responsible for different areas
- Primary objective of the project
- Description of the product
- Position of product in existing or new ranges
- Brand values to be embodied
- Detailed profiles of buyers and users (if separate)
- Operating environment and user needs
- Market areas and price
- Competitive analysis
- Intellectual property protection
- Critical milestones/deadlines
- Risk analysis (technical, market, legal, timescales, etc)
- Approach to prototyping and testing
- Technical requirements (drop tests, IP ratings, etc)
- Appearance issues (branding, graphics, etc)
- Target production costs
- Batch sizes and annual volumes
- Life of product range
- Preferred processes and materials
- Approvals needed and tests required
- Packaging and shipping issues
- Instructions and customer assistance
- Environmental and end of product life issues





## Project planning - help or hindrance?

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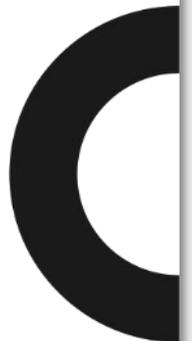
We've all done it. Created a detailed timeline plan at the start of a project with clearly defined targets, deadlines and dates. It looks reassuring at first, doesn't it? But how long does it remain accurate? More to the point, how many of us revisit it to update progress and modify deadlines?

In all too many cases, the detailed project plan is created, filed and forgotten. This can usually be attributed to one of two reasons, a) planning is seen as a one-off action at the start of the project and b) the initial plans are so detailed they become out of date immediately, and it can seem pointless to update them (as the same thing is going to happen again).

### **Focus on critical deadlines**

The answer is to make the whole process much simpler and to focus on a series of critical deadlines. Once these are entered into the diaries of the people responsible for delivering them, the rest is down to individual professional competence and effective project management. Sure, the dates may change as the project progresses, but the point is to focus on the critical deadlines and not get bogged down in the micro-management of every action along the way.

Critical deadlines will vary according to the project, but these are usually a good place to start:

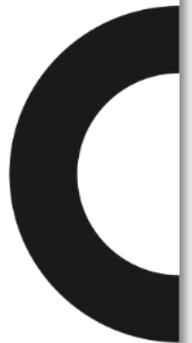




## Examples of critical deadlines



- Briefing the design team
- Choosing the most appropriate design concept
- Finalising the CAD layout of the detailed design
- Obtaining budget costings
- Approving financial projections
- Building and testing prototypes
- Obtaining any necessary approvals
- Signing off the design for production
- Receiving first sample parts
- Reviewing samples and making any necessary changes
- Product launch and sales





## What BS7000/2 says:

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### Planning the project

In order to plan the project, the project manager needs to identify all work elements necessary to establish requirements and undertake the design and put it into manufacture.

The exact nature of all the tasks and their interdependence should be established, so that the critical path can be mapped out. When possible, tasks should be undertaken in parallel.

Planning requires inputs from all relevant departments. Those with an interest in the project should be informed of all matters that affect their work. This is likely to encompass marketing, sales, finance, personnel, purchasing, manufacturing and technical functions such as quality assurance and project management. Where appropriate, planning might also include suppliers and customers.

### The five phases of product development

The standard summarises the phases of a product development project as follows:

Phase 1 commences with the "trigger" which prompts the exploitation of an idea, and then goes on to investigate commercial viability and feasibility of the proposed project.

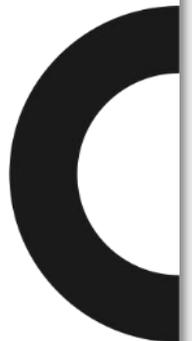
Phase 2 establishes the overall product requirements, selects the preferred concept and generates the product specification.

Phase 3 transforms the specification into a detailed design, while managing risks arising from innovative ideas or technology.

Phase 4 moves the design into manufacture, and puts the product on sale.

Phase 5 supports the product, and eventually considers withdrawal and disposal of the product.

The project manager should be responsible for ensuring that corrective action is taken to resolve problems.





## Case study 3: A plan that came together Oxford Instruments

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The MQC bench top analyser from Oxford Instruments is used in food, drug and petrochemical industries to identify specific properties of materials.

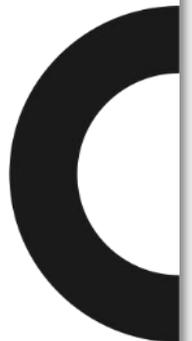
The client had strong technical and marketing teams that worked well together, basing their actions on clear, highly accurate planning charts that were reviewed at every meeting.

This approach generated tremendous benefits for the company, allowing lead times to be minimised, technical issues dealt with and a set of demonstration products built for a very successful launch event in the USA.

Mike Ayre, Managing Director of Crucible Industrial Design Ltd comments:

“ *Common sense would suggest that all product development projects are well managed, particularly when you consider the investment costs involved, but it is often not the case.*

*Projects like the MQC show how it should be done, with everyone involved and every issue considered. Not only does this approach reduce risk, it also saves time and money.*





## The project manager's responsibilities

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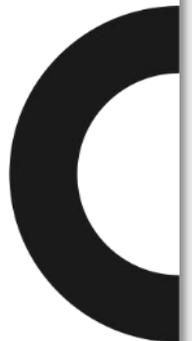
Product development is a series of interdependent actions that often conflict with one another - development time versus cost, testing programmes versus launch dates, etc, - so the management of the process is not a trivial task. However it is one of the most vital roles, as without effective management the project will either fail or be late - both of which will be commercially disastrous.

### **Who should do it?**

The project manager of a product development programme clearly needs to be a senior member of staff (in order to accept the considerable responsibility of the role) and ideally needs to be someone who can communicate well with all departments. A technical person with no interest in marketing (or vice versa) may not make a great project manager.

### **What are their main responsibilities?**

The primary role of the project manager is to keep control of the product development process, and the progress of the various team members. The fundamental part of this role is in holding team members to account for actions agreed at project meetings. The key to this is ensuring that everyone understands their individual roles and responsibilities at the outset, and cannot point at someone - or something - else when they are being held to account.





“

*Quick. Cheap. Good.  
Please choose two.*

*Anonymous project manager*

The second main area of responsibility is in balancing the different - and often competing - requirements of the project (The quote on the left is actually quite accurate - it is almost impossible to have all three).

The most important part of this responsibility is to maintain good communication between all team members.

Costs need to be assessed at every progress meeting and compared to budget estimates.

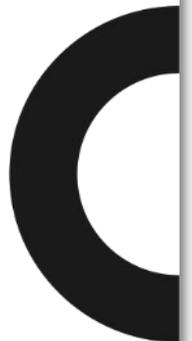
Timescales need to be checked and critical milestones reviewed to make sure there is still time to do everything necessary.

If the quality of the project is being affected by time pressure or budget limits, the project manager has to decide whether to live with this or request additional time and/or money. The sooner these issues are identified and addressed, the less they will impact on the results of the project.

What BS7000/2 says:

Balancing project drivers

Whilst the early stages of the design process might incur only modest cost, it is here that the key decisions are made that commit the project to particular technologies or solutions, timescales and costs. A balance needs to be achieved between the three key drivers: the specification, timescale and resources to be committed (implying cost). Establishing and maintaining awareness of risks to this balance during the project will define the chances of a successful outcome.



## Case study 4: successful management Albany seating

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A leading landscape architecture practice asked Crucible to design, build and install three illuminated benches in the courtyard of a new restaurant and housing complex in Liverpool.

The project involved working closely with the landscape architects, site contractors, health and safety officers and several manufacturing companies that made the different parts.

In addition to the design and development work, Crucible acted as the project managers for the whole programme, and coordinated the different suppliers and agencies - and also installed the finished units.

Peter O'Donnell, Director the main contractors, Gerrard O'Donnell Ltd, commented:

*“Crucible were great to work with on this project. They were totally reliable and accommodating. They gave us complete confidence in their ability to deliver on time and on budget through regular updates and visual. They provided a superb service and a first class result”*



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### What BS7000/2 says:

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#### Checklist for project managers:

Understand customer requirements, always undertaking market research as part of the design process

***NOTE: the main cause of failure of a product to gain market acceptance is that of not understanding customer requirements.***

- Make changes during the relatively low-cost early stages of the design process
- Consider areas for concurrent working at the start of the project and assemble a multi-disciplinary team that includes all relevant specialisms
- Review the design process at regular intervals against the design brief and specifications; control costs through continuous review against the budget, using techniques such as earned value analysis
- Control the configuration of the product from the generation of the specification through to final disposal (see BS ISO 10007 for guidance on configuration management)
- Evaluate the project and deliverables on completion of the design activity, with a view to making improvements in the future
- Identify any areas for improvement in management processes during the periodic reviews, audits and final evaluation, making changes as required for the benefit of future projects
- Retain control over the design project at all times

For more information on BS7000-2, please contact the British Standards Institute (BSI):

BSI  
389 Chiswick High Road  
London  
W4 4AL  
United Kingdom  
For all enquiries  
Telephone: +44 (0)20 8996 9001  
Fax: +44 (0)20 8996 7001  
Email: [cservices@bsigroup.com](mailto:cservices@bsigroup.com)



## Need a complete review? - do an audit

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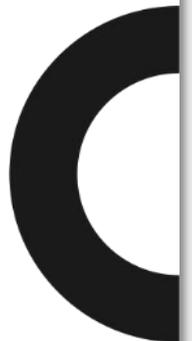


If our product development guide has left you with questions or wanting more information, we can help!

Working with documents originally developed by Cambridge University and Imperial College, we have created a very detailed 'product development audit' process that analyses every aspect of how your company designs and develops new products. The audit looks at company culture; the design process; case studies based on your existing products; and opportunities for future development. It would require representation from a project team as described in this document and would take up to one day to complete.

What you would get as a result would be a very detailed look at how your company currently develops products and how well your team works so you can identify areas for improvement.

We have developed it as a twelve page document that can be completed with or without our assistance. The audit is free, but it is too detailed to include in this guide, so please contact Mike Ayre if you would like us to send you a copy.





## Summary

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Good project management is vital to the successful development of a product, and particularly essential if you want to minimise lead times and problems. However, most companies muddle through, treating it as an optional extra to the process of product development, or as a chore on the level of filling in a weekly timesheet.

There are two key 'take home' points from this guide:

- **Make sure your project has a clear specification that covers everything (requirements, deadlines, risks, the lot)**
- **Build a good product development team that consists of people from every relevant department. This means sales, marketing, production, maintenance, technical, design and finance. More importantly, meet frequently, particularly during the early stages of the project, and make sure the same people come to each meeting to maintain continuity.**

If you haven't tried this approach before, you may be amazed at how efficient, rapid and enjoyable the process can be!

