



The Beginners Guide to Developing a New Product

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Index

Introduction	Page 3
Step 1 – <i>has it been done?</i>	Page 4
Step 2 – <i>can it be done?</i>	Page 5
Step 3 – <i>can you do it?</i>	Page 6
Step 4 – <i>what do people want?</i>	Page 7
Step 5 – <i>getting it on paper</i>	Page 8
Step 6 – <i>show me the money!</i>	Page 10
Step 7 – <i>is your idea worth protecting?</i>	Page 11
Step 8 – <i>who will make my prototype?</i>	Page 12
Step 9 – <i>do I sell direct?</i>	Page 14
Step 10 – <i>testing times</i>	Page 15
Step 11 – <i>the final product</i>	Page 16
Appendix – <i>Non-disclosure Agreement Example</i>	Page 17

Introduction

Developing any new product can be costly both in time and finance. This document aims to minimise both these costs by ensuring that the right steps are done in the correct order.

For the sake of clarity this document is targeted at individuals/companies developing a new product, but it is also relevant to the re-development of an existing product.

This document uses many internet links to companies and organisations that provide complimentary advice and services. The use of internet links should not be taken as an endorsement of the web site and any associated company; buyer beware.

Anyone wishing to learn about exploiting their inventiveness or generally finding out more about developing ideas into successful products should visit the following links:

<http://www.blwy.co.uk>

<http://www.kingstoninnovation.com>

<http://www.ideas21.co.uk>

<http://www.wrti.org.uk>

<http://www.inventorsdigest.com>

Business Link West Yorkshire

Kingstone innovation centre

Ideas21 helps entrepreneurs

Inventors information

Inventors Digest

Step 1 – *has it been done?*

So you have an idea and wish to develop it into a product, how do you begin? The first golden rule is **not** to disclose the idea to anyone (this includes friends) without some signed agreement. This document is called a non-disclosure agreement and should provide some protection when disclosing your ideas to individuals.

You need to ensure your idea hasn't already been thought of. A good starting place is to search the Internet. Once again use different keywords and phrases to ensure you search as much of the market as possible. It is worth trying different search engines as these may yield different results for the same parameters.

Sometimes products can be too specialised to appear on general web sites but may be advertised in specialist publications so try subscribing to these.

Some useful links to assist:

<http://www.google.com>

Google internet search engine

<http://www.altavista.com>

AltaVista internet search engine

<http://www.farnellinone.co.uk>

Farnell In One online product catalogue

Step 2 – can it be done?

You need to ensure that your idea is feasible. It is pointless continuing any further if your idea cannot be realised using present technology.

If your product doesn't exist on the internet; ask yourself why? It could be that there are legal or commercial reasons. Conversely if there are similar products on the internet; would yours be better or cheaper?

You will need to speak to some electronic design companies and find out if your product is feasible and practical. They normally don't charge to discuss your needs and are often able to modify your ideas or even make additional suggestions and enhancements.

You should not be expected to pay for a feasibility study unless your idea is more research than development. In this case it is advisable to speak to the appropriate department at your local university; they may be able to use your idea for an undergraduate research project.

Some useful contacts:

<http://www.eldon.co.uk>
<http://www.biodigital.co.uk>
<http://www.eng.hull.ac.uk>

Eldon Technology Limited
BioDigital Limited
The University of Hull

Step 3 – *can you do it?*

The next step is to ensure that someone hasn't already had a similar idea and patented it. A good place to start is the Patent Office web site which allows you to search both UK and world patents using keywords. This will enable you to see if your idea would not be infringing a previous idea or product. It is important to try many different keywords and ensure your search is as broad as possible. Be prepared to spend many hours searching and reading patents, it may be tedious but it could save you a lot of time and money later on.

If you do discover any patents that your idea could infringe, don't panic! Not all patents are enforced and they do become invalid after a certain time period or if the annual fees are not paid. The Patent Office web site has a facility to check patent status.

Some links:

<http://www.patent.gov.uk>

<http://www.uspto.gov>

<http://ep.espacenet.com>

<http://www.bpmllegal.com/howtopat.html>

<http://www.bl.uk/pdf/patspec.pdf>

The UK Patent office

The US patent office

Patent search engine

How to read a US patent

How to read a UK patent

Step 4 – what do people want?

Once you have completed a patent check (this should be an on going task) and are happy that no other individuals have a legal claim to your idea you will need to look at the commerciality of your idea.

Many similar products could mean there is a high demand or that the market is already saturated. The next step is to do some market research.

A good product will only sell if there is a demand; likewise a bad product will only sell if there is nothing else. There have been many books written on the subject of marketing but in a nutshell; if you can deliver a good quality product that meets customers' needs at a reasonable price, the product will sell. These three parameters are closely coupled but initially it is best to focus on customer needs.

It is a common fault to give customers what you think they need or to provide features simply because other products do. Go back to basics and find out how customers would use your product and what kind of features they would like. This form of market research costs little yet is a very powerful tool, use it often and more importantly; learn from it.

It is important not to fall into the trap of trying to meet ALL your customers needs; this can lead to very expensive products with many features that are only required by a handful of users. Go for the most common features and try to produce the most generic product possible; you can always produce 'specials' at a higher cost.

Keep a scrapbook and stick in it pictures of similar products or aspects of other products you wish to include in yours. This will also act as a good point of reference when explaining your requirements in later steps.

Ultimately cost will come into the equations so you will need to find out how much people would be prepared to pay for your product and what sort of volumes you could expect to sell. Using business reports can be very useful to get a feel for the growth and potential of a particular industry.

Some useful links:

<http://www.shrewdd.com>

<http://www.business.barclays.co.uk>

Shrewdd Ltd

Barclays business reports

Step 5 – getting it on paper

At some point you will need to document your idea in the form of a product specification. In the same way a business plan forces you to examine every aspect of starting a new business, a product specification forces you to clarify your idea. This document should enable anyone to understand the application and requirements of your product. The document should follow the structure;

Introduction

This should introduce the market sector your product is aimed at and how your product will fit into this sector. This may include problems your product solves for the users; such as legislative or convenience. Remember that people reading the document may not be familiar with your industrial sector so it is important that they fully understand what you are trying to achieve.

Product

This should fully describe your proposed product and how it benefits its' users. Use pictures and diagrams to further clarify your ideas. It is often a good idea to include similar existing products stating how your product will differ. By the end of this section the reader should have a clear understanding of what you want to achieve and why.

Features

This section should be a clear list of bullet points highlighting aspects of the product that you believe to be critical to its' success. These may include, by way of an example;

- Battery life of at least 4 hours
- 2 movement sensors
- 1 alarm output

Operation

This section adds 'meat to the bones' by describing in more detail some important aspects of the operation, this clarifies how the key components of the device work together. An example of this could be;
'if either movement sensor detects movement then turn on the alarm for 10 seconds'

Wish list

This final section is optional. It allows you to suggest additional features which would be nice to see in your product but are not essential. This enables developers to comment on the associated technical and cost implications. This can assist in deciding if these features will be included in the product or left for future versions. An example might be;
'Send a text message when an alarm is activated'

Finally you should include some idea of predicted sales figures. This is important as it can influence the way the product is designed. If a product is believed to sell in high volume (more than 1000 per year) it will be important to focus on reducing manufacturing costs (every £1 saved is £1000 more profit). This may be achieved by the use of custom mouldings or electronics, while

this will increase the development costs it will be quickly recouped during production.

Step 6 – *show me the money!*

Getting from your initial idea to production will require considerable investment. While prices vary depending on complexity even a simple product could cost as much as £10k to get to market. There are many avenues to explore when attempting to finance the development of a product.

Personal finance

It is always best to try and fund projects yourself if you can afford it. This involves more risk on your part but you do not have to contend with high interest rates or detailed business plans.

Government funding and local grants

Contra to some myths; grants are not pots of gold which are yours for the taking. Most funding is only available to cover material costs or consultants fees during product development. In some cases it is matched funding so you will be expected to pay some way towards the costs.

The availability of funding will depend on the possible application of your product. Funding may favour particular industries such as waste management or anti-terrorism. Local grants may only be available within certain geographical locations spotlighted for investment.

There can be considerable paperwork required to be eligible for funding so it may not be economical to invest the time if you only require a relatively small amount of funds. There are many organisations and consultants who can assist in applying for the appropriate funding, see the internet links.

Banks and lenders

These will want to see a solid business plan and cash flow forecasts. If they decide to lend any money it will probably be matched funding, so you will be expected to provide some funds yourself. You will have to pay interest on the money you borrow but once the amount has been paid back they are no longer involved.

Venture capitalists (business angels)

These tend to be successful individuals looking to invest in high-risk ventures for high rates of return. They may well demand equity or a sizable share of any profit; however they will also provide sound business advice.

Some useful links:

<http://www.wyventures.co.uk>

<http://www.syif.com>

<http://www.partnershipif.co.uk>

<http://www.blwy.co.uk>

West Yorkshire Ventures
South Yorkshire Investment Fund
Partnership Investment Finance
Business Link West Yorkshire

Step 7 – *is your idea worth protecting?*

By now we will assume you have a good idea for a product that may have changed based on feedback. If you are still convinced your idea is unique it maybe worth patenting it. A detailed description of the patenting process is beyond the scope of this document so we will simply summarise the process. More detail on the patenting process can be found on the Patent Office web site.

A patent is a legal document that provides protection of an idea in return for disclosing the idea. The process starts by disclosing your idea to a patent solicitor who will write a patent application which highlights similar existing ideas, explains what aspects of your idea are inventive and so what aspects of the idea you wish to stake claim to. This document is then submitted to the Patent Office at which time you will receive confirmation of your idea and when you thought of it, this is known as patent pending. The cost of drafting a patent application can vary tremendously depending on the technology, but a general guide is between £1000 and £2000. The cost of filling a patent is about £200; the costs are explained on the Patent Office web site.

If, after 12 to 24 months, there have been no objections from any third parties, the Patent Office will decide if they think the patent is inventive and either approve or reject the application. If a patent is awarded it is then down to the inventor to decide in which countries the patent should be enforced. There is an additional annual charge for each country a patent is enforced in, so a world-wide patent can be very expensive (and not always necessary). It is also advisable to take out patent insurance; this will pay your legal expenses should you need to defend your patent in court.

Some useful links:

<http://www.patent.gov.uk>

<http://www.bl.uk/pdf/patspec.pdf>

<http://www.hgfip.com>

The UK Patent office

How to read a UK patent

Harrison Goddard Foote Solicitors

Step 8 – who will make my prototype?

Turning your idea into a living prototype is an essential step in product development. Even if you are planning to sell the idea to a third party you will still need something physical to enable potential investors to buy into your idea.

A prototype can also enable you to highlight issues that may not have been thought of. It is better to discover problems at this early stage than during the initial production run. Prototypes can also provide customer feedback, which can be used to better tailor the product to your market.

The design and the application will dictate who you seek to produce your prototype. If the design requires custom mouldings or its' appearance is very important (this is mostly applicable to consumer products) you may wish to approach product designers. If the product is primarily an electronics product and the packaging only needs to be a simple enclosure it is probably best speaking to electronics design houses. The two disciplines do overlap, and will sub-contract each other's services, but their knowledge is specific to their field. If in doubt speak to both product and electronics designers.

You should speak to a minimum of three design companies to ensure you get a good spread of feedback and quotes (don't forget your NDA). Here is a list of things to look for when speaking to designers:

- Ensure you get complete ownership of ALL documentation and intellectual property (IP) on completion of the project. Some design companies make an additional charge for this and without it you don't have the product.
- Make sure you like the company. This may seem irrelevant but you could be spending a lot of time talking and discussing the project during its' life so make sure you feel you could get on with the company.
- Have they fully understood your requirements; do you feel they could take your idea and deliver above and beyond what you want.
- Ensure they quote both project duration and cost. Anyone who simply quotes an hourly rate might as well be asking for a blank cheque.
- Find out what experience they have and ask them about similar projects they have handled. If need be ask for references from existing clients.

It is worth noting that the first bullet point is the most important, yet most often overlooked. Ownership of the final product and any subsequent technology generated as a result should be considered. Any banks or individuals investing in a project will want to know who has ownership, as without ownership there is no asset. Ownership also enables you to shop around when looking for quotes for manufacture.

In the case of large design projects it may be worth discuss the possibility of breaking the project down into stages with associated payments. This will help every ones cash flow and will enable you to keep track of progress. Do not take this to the extreme and demand in-depth progress reports or project time charts; this will only draw work away from your prototype.

Do not base your decision on which design company to use purely based on the lowest quote or quickest delivery time; often you get what you pay for. Weigh up all the factors and go for the company that you feel will deliver a good service and a quality prototype.

Some useful links:

<http://www.ame-design.co.uk>
<http://www.ame-prototypes.com>
<http://www.biodigital.co.uk>
<http://www.eldon.co.uk>
<http://www.ergodesign.co.uk>
<http://www.glenelqdesign.com>
<http://www.wylie3d.com>

Creative designers
Rapid prototyping
Electronics design
Electronics design
Industrial design
Product design
Product design

Step 9 – do I sell direct?

Now you need to decide how you are going to make money from your product. There are many solutions which will provide a return proportional to the work required. Promoting any new product will be hard work but there are rewards for those who persist.

Sell the entire product.

This is the 'easiest' solution and provides the fastest return on investment. Any company buying your product may have to modify it to fit in with their product range and they will have to market the item. This option is only viable if you have legal protection on your product such as a patent and thus some IP to sell.

Licence the product.

This option provides you with an income in exchange for the rights to sell your product. Any company looking to licence your product will want exclusivity so be specific as to what sector of the market they will get exclusivity. Licences either provide an income for a set period (say per year) or as a percentage of NET sales.

Use a distributor

This is a popular solution as you maintain control of your product while hanging on the tail coat of a distributor who will already have the image, customers, and sales infrastructure to promote your product to its maximum. However a distributor will want a discount and may want exclusivity. It is also worth mentioning that the better margin a distributor makes on a product the harder they will promote it.

Sell direct

This is the hardest option but with the most potential. The internet has vastly reduced the cost of selling direct while opening up a massive market. However, there are many hidden costs;

- setting up and maintaining a web site
- product support
- advertising & promotion
- packaging, postage, manuals, etc
- product liability insurance
- carrying stock

Some of these costs can be minimised by the use of a good e-commerce web site with an abundance of support material, trouble-shooting guides, user manuals.

If you decide to sell, licence, or use a distributor remember; you will seldom get your asking price and may have to go head to head with professional negotiators. Always get a contract in place and use a solicitor.

Step 10 – testing times

If you plan to sell your product within the European Union it must conform to European Standards and carry the CE mark. There are many directives which cover a host of standards most of which will not be applicable to your product. Some of these standards cover safety issues for children's toys, pressure equipment, and moving machinery.

If your product contains any electronics it will need to be tested for Electro-Magnetic Conformity (EMC). The specific tests carried out will depend on the application but generally this testing ensures your product will not produce and/or be susceptible to electronic noise and that it operates in a safe and predictable manner. Contra to popular myth this testing must be carried out by an independent and certified test house on a sample of the product that is representative of a production item. The cost of EMC testing varies considerably but generally takes 2 to 3 days and costs between £2000 and £4000.

The RoSH (Restriction of Hazardous Substances) has been introduced in an attempt to reduce the use of certain substances classed as hazardous and thus reduce their impact on the environmental. This is predominantly a manufacturing issue and affects such things lead contained within components and solder. Most electronics manufacturers have adopted lead-free manufacture, but it is still worth specifying.

The WEEE (Waste Electrical and Electronic Equipment) directive forces manufacturers to take responsibility for their products at the end of their useful life. An example may be to provide an exchange service for replacement batteries.

For more information on legislation and companies who can assist in testing your products see the links below:

<http://www.ktl.com>

KTL EMC test house

<http://www.yorkemc.co.uk>

York EMC Services Ltd

<http://www.eco3.co.uk>

ECO3 Consultancy

<http://www.rohs.gov.uk>

National Weights & Measures Lab

<http://www.era.co.uk/services/rohs.asp>

Era Technology

http://www.ec.europa.eu/environment/waste/weee_index.htm

WEEE

<http://www.dti.gov.uk/innovation/sustainability/rohs/page29048.html>

DTI

Step 11 – *the final product*

If you wish to maintain control of your product you will need to get involved in its' production. The most common route (and most cost effective) is to sub-contract the production. This has many advantages over attempting to do it all yourself:

- Manufacturers quality control systems
- Specialist knowledge and equipment
- Reduce your overheads
- Focus your resources on marketing and customer support.

A common 'knee jerk' response it to sub-contract any electronics manufacture to Asia. Whilst this can reduce your material costs it can also have many hidden costs;

- Import paperwork
- High volume minimum requirements
- Up-front payment
- Quality control
- Language & time zone issues
- Copying & counterfeiting
- Technical support
- Legislative conformity

In recent years UK manufacturers have invested heavily in automation in an attempt to compete with Asia. In most instances UK companies can provide;

- Quality control; product test & inspection
- Flexible delivery on call-off quantities
- Technical support and advice
- Flexible credit terms
- Accountability

It is always a good policy to work closely with your sub-contractors; they can often assist in resolving problems, reducing costs, and suggesting future enhancements.

There are numerous sub-contract manufacturers some of which are:

<http://www.calrec-ems.com>
<http://www.biodigital.co.uk>
<http://www.e-es.co.uk>

Calrec Electronic Manufacturing
BioDigital Electronic Manufacture
Electronic & Engraving Services

Appendix – Non-disclosure Agreement Example

NON DISCLOSURE AGREEMENT

This AGREEMENT is made and entered into by and between:

BioDigital Limited
Unit 19 Royds Enterprise Park,
Future Fields,
Bradford,
West Yorkshire.
BD6 3EW

AND

Basis of Agreement

1. On the understanding that both parties are interested in meeting to consider possible collaboration in developments arising from intellectual property including any patents it is agreed that the information, documents and material supplied in the course and as a result of so meeting shall be treated as confidential.
2. This confidentiality applies to both technical and commercial information which either party may communicate to the others.
3. Except from this understanding of confidentiality is any information in the public domain or which the receiving party can show already in the possession prior to its disclosure.
4. Either party to this Agreement shall on request from the other return any documents or items connected with the disclosure and shall not retain any unauthorised copies or likenesses.
5. After three years from the date hereof each party shall be relieved of all obligations under this agreement.

For and on behalf of

For and on behalf of

BIODIGITAL LIMITED

Signature:

Signature:

Name:

Name:

Title:

Title:

Date:

Date: