



# Carrying out a product development audit: a management guide

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## Introduction

Product development is a complex series of inter-reactions between marketing requirements, engineering challenges and production constraints. Success depends on the management of these factors to get the best possible result. The purpose of this document is to allow you to examine how projects are managed and implemented at the moment, and identify ways of improving your approach in the future.

**You should ideally set aside a morning to work through this document with colleagues from marketing, sales, technical development, production and maintenance. Basically, anyone who is involved in the process of developing, producing and selling your product.**

**The first stage** of the process is to 'benchmark' where your design management is now, based on four levels of performance (from poor to high quality). The process involves selecting one of four statements and deciding, as honestly as possible, which one represents your current approach, and which one you aspire to. It is best if the members of your management team agree on a consensus for each of these issues (which may be an interesting exercise in its own right!), but the audit documents can also be filled in individually and collated later. This stage concludes with a summary page where you can note down opportunities to improve performance to take it to the level you would like it to reach.

**The second stage** uses a similar approach to look at the design of one of your products under several different headings. Each statement about the product has four options, from poor to great performance, and again, it is best if it is completed as a 'consensus exercise' by you and your team. This stage concludes with a summary of each section, a table that allows you to note down major areas for improvement, and a time planner to identify short, medium and long term opportunities for action. The findings and actions from this stage will inform future product development projects and help you achieve the best possible return from your investment.

**The third stage** of the process looks at opportunities for product diversification within your company. Diversification is one of the most efficient and profitable ways of improving revenue, particularly if your company has technology or know-how that can be directly applied to other markets. Many companies have this opportunity without ever looking at it! Like the other sections, this stage asks your team to rank statements in one of four categories. It concludes with a table that allows you to list opportunities for diversification in seven different categories.

The actions in this guide will take some time and effort, but the potential benefits are significant in terms of management efficiency, development lead times and fundamental profitability. We hope you find it useful!

# 1. Design management

Please fill in your current level in each category (be honest!) and also the level you would like to be at...

Project generation						
Activity	Level 1: none	Level 2: partial	Level 3: medium	Level 4: high	Current level (1-4)	Desired level (1-4)
Product strategy	No strategy	A strategy exists but no-one knows where it is...	Strategy exists but is short to medium term	Company shared vision of long term strategy		
Creative company culture and environment	Creativity discouraged – no 'playing' at all	Creativity kept 'under the desk'	Some time set aside for creativity	Creativity expected and rewarded		
Project selection	Happens by accident	Whoever shouts the loudest	Thorough business case made	Detailed analysis of all the issues by product development team		
Project management						
Activity	Level 1: none	Level 2: partial	Level 3: medium	Level 4: high	Current level (1-4)	Desired level (1-4)
Product development process	No process	A process exists, but no one knows where it is...	Process used and understood	Continuous process review and improvement		
Risk management	Press on regardless	Aware of most technical risks	Formal risk management	Proactively manage risks		
Design reviews	No design reviews	Design reviews when there is a crisis	Periodic formal reviews	Regular formal and informal reviews		
Management of design targets	No targets	Targets – but goal posts keep on moving	Targets set and partially managed	Targets regularly reviewed and adjusted		
Teamwork	Rivalry	Informal groups	Teams within departments	Clearly defined project teams with clear leadership		
Specialist design involvement	Not used	Specialists come in to 'tart up' existing designs	Early input by specialists	Strategic specialist input from beginning of projects		

Market knowledge						
Activity	Level 1: none	Level 2: partial	Level 3: medium	Level 4: high	Current level (1-4)	Desired level (1-4)
Competitive analysis	Little up to date competitive information	Look at competitors brochures	Good understanding of competitors	Deep understanding of competitors		
Investigating user needs	Rely on anecdote and opinion	User opinions sometimes sought	'Voice of customer' is a standard process	Customer clinics and formal analysis		
Ongoing user involvement	Users rarely involved	Users sometimes involved at the start of projects	Users involved at testing stage	Relevant stakeholders involved throughout		
Product specification	A poorly defined wish list	Technical spec only	Technical and market spec	Comprehensive spec – technical, marketing, design, etc		
Concept design						
Activity	Level 1: none	Level 2: partial	Level 3: medium	Level 4: high	Current level (1-4)	Desired level (1-4)
Concept generation	Go with the first idea that comes up	Engineering led concept generation	Engineering and styling ideas examined	Radical ideas encouraged		
Aesthetic design	Looks don't matter, only performance	Technology sometimes 'styled'	Aesthetics important for product differentiation	Design leaders in our industry		
Ergonomic design	Little consideration of usability	Engineers design user interface	Early specialist involvement	Total 'user experience' design		
Product architecture	Evolves ad-hoc	Intuitively consider modularity	Formal consideration of whole system	Product strategy based on integrated system		
Concept evaluation and selection	There is only one concept	"Chosen by the Chairman's wife"	Detailed team involvement	Team involvement supported by external specialists		
Technical development						
Activity	Level 1: none	Level 2: partial	Level 3: medium	Level 4: high	Current level (1-4)	Desired level (1-4)
Design for manufacture and assembly	Give out the drawings and hope for the best	Some involvement from producers	Regular reviews with manufacturing	Formal use of DfM and DfA approaches		
Prototyping to reduce market risks	"Trust me, it will sell"	Occasional user testing	Always test with users	Detailed tests with customer clinics		
Prototyping to reduce technical risks	"Trust me, it will work"	Pre-production prototypes built	Prototype and test all risky parts and assemblies	Detailed tests with clear performance criteria		
Evaluation	Customers do the Q and A testing	Minimal evaluation – no time or plan	Engineering evaluation – to a plan	On-going review of product performance		

Design management: opportunities for action

Issues	Opportunities
Project generation	
Project management	
Market knowledge	
Concept design	
Technical development	

## 2. Product analysis

In this section of the audit, we will look at a representative product from your company to examine the design of that product and look at ways in which it – and your future products – may be improved. As with the Design Management analysis, the emphasis is on finding improvements, not faults. Choose the most accurate score in each category. If a particular topic is not relevant to your product, simply put a mark in the NA (not applicable) column.

Product name:

Product function:

### Product rationale

Issue	Poor performance	Score (1-4)				NA	Great performance
<b>Do I need it?</b>	Why would I need it? Not obvious what benefits the target audience would gain from using it.	1	2	3	4		Will save time, money or effort and is clearly useful.
<b>Functionality</b>	Too much or too little functionality to be really useful	1	2	3	4		Appropriate level of functionality – does what it says on the tin
<b>Alternatives</b>	A lot of alternative solutions that perform just as well or better	1	2	3	4		There are no alternatives to this product which have the same capabilities
<b>Value</b>	Would buy it if really necessary, but not out of choice	1	2	3	4		Would happily pay a premium even if it wasn't needed
<b>Overall</b>		1	2	3	4		

### Engineering quality

Issue	Poor performance	Score (1-4)				NA	Great performance
<b>Performance</b>	Over promises and under performs	1	2	3	4		Performance exceeds expectations
<b>Reliability</b>	Unreliable – regularly fails to work correctly	1	2	3	4		A work horse – 100% reliable
<b>Build quality</b>	Poor build quality – looks and feels cheap	1	2	3	4		Solidly built and well-engineered
<b>Durability</b>	Poor durability – likely to break or stop working	1	2	3	4		100% reliable – will outlast the competition
<b>Overall</b>		1	2	3	4		

### Ease of use

Issue	Poor performance	Score (1-4)				NA	Great performance
<b>First impressions</b>	Poor packaging – difficult to get into, waste of materials	1	2	3	4		Good packaging – easy to access, well designed and clear
	Not intuitive – hard to work out how to use it	1	2	3	4		Training not needed or well provided
	Handbook and instructions useless	1	2	3	4		Supporting documentation clear and useful
<b>Clarity of the interface</b>	User interface ignores accepted rules and conventions	1	2	3	4		Interface follows or improves on rules and conventions

	Little prioritisation of functions	1	2	3	4		The most important functions are clearly marked and accessible
	Little or no feedback between action and result	1	2	3	4		Clear and obvious feedback lets you know when actions are performed
	Few built in constraints to guide actions or prevent errors	1	2	3	4		Clear constraints built in to guide actions and prevent errors
	Interface is unlikely to be understood by most of the target populations	1	2	3	4		Interface will be understood by both the target and the wider population
<b>Physical usability</b>	Physical elements have the wrong size and shape to be used easily	1	2	3	4		All elements are the right size, shape and arrangement to be used easily
	Product cannot be adjusted to suit different users in target population	1	2	3	4		All necessary adjustments well catered for
<b>Maintenance and cleaning</b>	Difficult to service, maintain and repair	1	2	3	4		Easy to maintain and repair without specialist assistance
	Difficult to clean – hard to access many areas and/or easy to damage	1	2	3	4		Easy to clean without damage or harm to cleaner
<b>Overall</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>		

## Attractiveness

Issue	Poor performance	Score (1-4)				NA	Great performance
<b>Aesthetics</b>	No visual novelty – looks like all other similar products	1	2	3	4		Novel appearance gives it a strong identity – visually differentiated
	Not enough or too much contrast between visual elements – tone, shape, colour, etc	1	2	3	4		Just the right amount of contrast
	No sense of order to the design – a collection of bits	1	2	3	4		High sense of order – pleasing combination of shapes, materials, etc
	Appearance is inappropriate – it just looks 'wrong'!	1	2	3	4		Appearance makes sense – it just looks 'right'!
<b>Symbolism and status</b>	Ownership has no (or a detrimental) impact on 'status' amongst the target market	1	2	3	4		Ownership improves 'status' amongst the target market
	It does not represent the tastes or values of its target market	1	2	3	4		It accurately symbolises the tastes and values of its target market
	Appearance is inappropriate for the context or user environment	1	2	3	4		Appearance is appropriate for the context and user environment
<b>Visual clarity</b>	No clear brand identity or coherence across the product range	1	2	3	4		Design reinforces and reflects the company's brand values and identity
	Appearance is inconsistent with expected values (tough, precious, fun, etc)	1	2	3	4		Design expresses and reinforces expected values
	Confusing appearance which gives few clues to describe the purpose of the product	1	2	3	4		Appearance helps to indicate the intended purpose of the product
<b>All senses</b>	Product feels, smells or sounds horrible – little sensory pleasure	1	2	3	4		Feels, sounds and smells as good as it looks
<b>Pride</b>	Little pride of ownership – design is just functional and gets hidden away when not in use	1	2	3	4		Design inspires pride of ownership – it may even go on display when not being used
<b>Emotional response</b>	Product produces a negative emotional response – creates anger, frustration, etc	1	2	3	4		Product produces a positive emotional response – creates happiness, satisfaction, etc
<b>Overall</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>		

## Ease of production

Issue	Poor performance	Score (1-4)				NA	Great performance
<b>Component manufacture</b>	Too complex and too many parts	1	2	3	4		Optimum number of parts for function
	Several critical components that are hard to produce – high scrap rates	1	2	3	4		Components simple to produce – low scrap rates
<b>Assembly and test</b>	Assembly requires highly skilled staff – a 'black art'	1	2	3	4		Simple assembly with minimum training
	Extensive testing required	1	2	3	4		Designed to minimise the need for testing during assembly
	Too many fastener sizes	1	2	3	4		Fasteners well rationalised with minimum of different sizes
	Specialist tools needed	1	2	3	4		No specialist tools needed
	Assembly from many directions with poor access for inserting and fitting parts	1	2	3	4		Simple assembly from a single direction with open access
	Several parts which are difficult to handle (very large, heavy, etc)	1	2	3	4		All parts easy to handle
	A confusing mess of wires and pipes	1	2	3	4		Cables and pipes minimised and organised well
	A lot of adjustments needed before completion	1	2	3	4		Designed to minimise adjustments
<b>Platform strategy</b>	No product platform strategy – each product uses different parts and production methods	1	2	3	4		Defined platforms with high level of modular parts, sub-assemblies and common components
<b>Overall</b>		1	2	3	4		

## Profitability

Issue	Poor performance	Score (1-4)				NA	Great performance
<b>Income</b>	Lower income than planned	1	2	3	4		Income exceeds expectations
<b>Production costs</b>	Unit cost too high	1	2	3	4		Unit cost lower than expected
<b>Material costs</b>	Costs far too high	1	2	3	4		Costs within budget
<b>Assembly time</b>	Takes too long	1	2	3	4		Costs within budget
<b>Selling and support costs</b>	Sales and support costs too high	1	2	3	4		Costs within budget
<b>Profit per unit</b>	Margins are too low	1	2	3	4		Margins exceed expectations
<b>Market conditions</b>	Shrinking market	1	2	3	4		Growing market
<b>Market share</b>	Small share	1	2	3	4		Good share
<b>Overall</b>		1	2	3	4		

Differentiation							
Issue	Poor performance	Score (1-4)				NA	Great performance
Functions and features	'Me-too' product – standard features at a standard price	1	2	3	4		Radical solution that addresses the market need in a new and interesting way
Technology	Old technology – yesterday's product	1	2	3	4		Disruptive technology – innovative and will change the market
Technical quality	Engineering quality offers no differentiator	1	2	3	4		Engineering quality is a key differentiator – robustness, etc
Aesthetics	Visually average	1	2	3	4		Novel appearance
Ease of use	Standard interface and controls	1	2	3	4		Novel solution that offers high degree of ease of use
Brand	Low brand equity	1	2	3	4		Strong and original brand
After sales support	Training, service and support average	1	2	3	4		Training, service and support a key differentiator
Finance and warranty	No differentiation	1	2	3	4		Novel finance or warranty offers high degree of differentiation
Delivery	No differentiation	1	2	3	4		Delivery options offer high degree of differentiation
Overall		1	2	3	4		

Environmental issues							
Issue	Poor performance	Score (1-4)				NA	Great performance
Materials used	No idea where they come from or what working conditions are involved	1	2	3	4		Ethically sourced from well managed suppliers
Processes used	Energy intensive and polluting	1	2	3	4		As efficient and low energy as possible
Product life	Designed to fail shortly after warranty expires	1	2	3	4		Designed for long life and ease of repair
Packaging	Wasteful bubble packaging that takes up space	1	2	3	4		Simple, compact card packaging that is easy to recycle
Instructions	Long text based instructions printed in many languages	1	2	3	4		Simple, brief, illustrated instructions
Design for disassembly	Product is impossible to dismantle at end of life	1	2	3	4		Product is easy to dismantle and sort the parts for recycling, etc
Design for ease of repair	Impossible for the owner to work on – no access to spare parts	1	2	3	4		Easy for the owner to repair – good access to spare parts
Knowledge of WEEE/ROHS directives	No knowledge	1	2	3	4		Detailed knowledge within company and clear strategy
Energy use of product	No idea how much energy is used	1	2	3	4		Product designed carefully to minimise energy use
Overall		1	2	3	4		

## Product analysis: summary

Issue	Poor performance	Score (1-4)				NA	Great performance
<b>Product rationale</b>	Poor justification	1	2	3	4		Strong justification
<b>Engineering quality</b>	Low quality	1	2	3	4		High quality
<b>Ease of use</b>	Poor ease of use	1	2	3	4		Very simple ease of use
<b>Attractiveness</b>	Unattractive	1	2	3	4		Very desirable
<b>Ease of production</b>	Hard to make	1	2	3	4		Easy to make
<b>Profitability</b>	Unprofitable	1	2	3	4		Very profitable
<b>Differentiation</b>	Just like all other products in this market	1	2	3	4		Highly differentiated
<b>Environmental</b>	Wasteful, polluting and unethically sourced	1	2	3	4		Ethically planned, with minimum waste and pollution
<b>Overall</b>		1	2	3	4		

## Product analysis: primary areas of improvement

Issue	Area of improvement
<b>Product rationale</b>	
<b>Engineering quality</b>	
<b>Ease of use</b>	
<b>Attractiveness</b>	
<b>Ease of production</b>	
<b>Profitability</b>	
<b>Differentiation</b>	
<b>Environmental</b>	

# Product analysis: opportunities for action

Timescale	Opportunities for action
Short term: 1-3 months	
Medium term: 3-9 months	
Long term 9-18 months	

## 3. Diversification

In this section of the audit, we will look at the potential for your company to diversify its product range through innovation, transferring your skills and experience to new markets and responding to new market opportunities and threats.

### Company culture

Issue	Poor performance	Score (1-4)				NA	Great performance
<b>Attitudes to change</b>	"We've always done it this way"	1	2	3	4		Continually looking for new ways of doing things and new opportunities
<b>Design</b>	Not represented at board level	1	2	3	4		Considered at every level of the company
<b>Suggestions and new ideas</b>	Not encouraged	1	2	3	4		Challenges to the status quo actively encouraged
<b>Stability</b>	Operating in a rapidly changing market with significant challenges	1	2	3	4		Stable market with little need to change
<b>Overall</b>		1	2	3	4		

### Technical issues

Issue	Poor performance	Score (1-4)				NA	Great performance
<b>Potential for product diversification</b>	Specialised market – no room for manoeuvre	1	2	3	4		Product technology could be applied to a wide range of other markets
<b>Core skills</b>	Specialised skills – could not be used for other products	1	2	3	4		General skills – could be applied to a wide range of other products
<b>Innovation</b>	Product range fully developed – no potential to innovate to create new opportunities	1	2	3	4		Potential to introduce new technologies and ideas to take existing market in new direction
<b>New technologies</b>	Don't offer options	1	2	3	4		Offer new possibilities
<b>Overall</b>		1	2	3	4		

### Market issues

Issue	Poor performance	Score (1-4)				NA	Great performance
<b>Market position</b>	Seen as a commodity supplier – no close links	1	2	3	4		Good relationship with key customers – seen as a trusted partner
<b>Other needs</b>	No possibility of moving into other products needed by current customers	1	2	3	4		Potential to shift production to new product areas for same customers
<b>Flexibility</b>	Only service current customer needs – no ability to look at new markets	1	2	3	4		Proactive and positive sales approach that could be applied to new market opportunities
<b>Changes</b>	Market static – no new opportunities for change or growth	1	2	3	4		Rapidly changing market that offers opportunities for new products
<b>Overall</b>		1	2	3	4		

Diversification: opportunities

Area	Possible opportunity
Use existing technologies in new products	
Produce products with similar technologies	
Use production resources to move into new product areas	
Create radical new products in existing market	
Produce new products for existing customers (move sideways)	
Adopt new technologies to adapt to changing market conditions	
Use marketing strengths to completely reconfigure offering	