



Management of Technology Series 28



Lean Product Development

A manager's guide

Colin Mynott

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Lean Product Development

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Preface

A manager's guide to organising, running and controlling the business process of developing products

Our job is to give the customer, on time and on cost, not what they want, but what they never dreamed they wanted; so that when they get it, they recognise it as something they had always wanted – Sir Denys Lasdun

This book is about how you manage the business process of developing products from strategy through design, to testing and service feedback. You can apply it to manufactured and service products, whether completely new or just a minor change.

It's not an instruction manual on tools and techniques. These are explained in *Chapter 11*; *Chapter 12* gives references on their detail.

The book is set out in the order of the tasks you need to tackle. The map (next page) enables easy reference once you've read it. The book can be folded flat open and stored in your A4 files.

'Lean' applied to development

There are few business problems that can not be fixed by introducing good new products – Carlos Ghosn, Renault/Nissan

The word 'Lean' was coined to mean Toyota Production System (TPS) methodology, developed to identify and eliminate manufacturing waste.

In Toyota, Ohno and Shingo defined the following seven principal manufacturing wastes. You can think of equivalents in developing products:

1. **Overproduction:** over-complex solutions from poor concepts; chopping up the task and letting each department duplicate what others are doing.
2. **Waiting:** for other departments to process tasks, for unnecessary high-level approval; queuing to use an overloaded facility or specialist staff time.
3. **Transporting:** moving bits of product development task to separate departments and then having to fetch them back, analyse and collate their input.
4. **Over-processing:** requiring too many approvals; preparing reports that aren't used; creating features the customer doesn't want.

5. **Inventory:** poorly organized projects that take too long to complete; working on projects that are not commercially viable.
6. **Wasted motion:** searching for information that has not been captured or logically pigeon-holed, often across departmental boundaries.
7. **Rework and defects:** changes to the product, or the way it is to be manufactured, from not considering potential problems early enough.

80% of business failures can be traced to the way in which products are developed. But it doesn't depend just on the process manual; company culture is equally important. One doesn't work without the other.

But that's not the whole story; some product development (PD) wastes don't have an exact equivalent.

The main problem is that while you can see manufacturing waste, most PD waste is invisible. It sits in hard drives and (overworked) engineers' brains. The most common wastes are not developing what the customer wants and not offering a sufficiently appealing product. And most companies repeat costly mistakes and take far too long because of expensive rework loops.

Unfortunately, value stream mapping doesn't reveal this until you've already wasted the time and cost. And removing waste from a lousy process won't produce a good one. And it certainly won't create Toyota's learning-based approach or the culture of its development environment.

If Toyota's success was the result only of replicable techniques and methods, many more companies would be as successful. But they're not.

Toyota's PD success is based on their continuous development of culture, knowledge and hardware. Their store of thoroughly developed background knowledge enables them to apply it rapidly to new products. This is discussed at the close of phase 4.

The book explains how you can avoid waste and revise your culture.

Success lies not only in the grand plan but principally in the detail. And only support from the CEO will generate and enforce the culture. It's your culture that governs how you operate, not your procedure manual!

About the author

Dr Colin Mynott is a Chartered Engineer, a European Engineer, and a past Fellow of the Institute of Directors. A materials technologist by training, he graduated from the London Imperial College of Science and Technology and, for his doctorate, from Cambridge University in 1963.

He has extensive hands-on experience of manufacturing systems and of developing products, from devising strategy through to manufacturing engineering and start-up.

He worked in and managed manufacturing companies that developed their own products. His career started in the automotive industry in manufacturing systems' engineering at the British Motor Corporation; he then became The Materials Engineer for Chrysler UK. Then followed a 5-year spell in international management consultancy. Following that, from 1976, he successively ran medium-sized manufacturing companies in the automotive sector. In a 3-year sabbatical from industry, in 1990 he was asked to organise the UK Design Council's services to manufacturing industry as Industry Director, primarily to improve UK manufacturers' product development capability.

As part of his manufacturing career, he started his own manufacturing firm with two partners in 1973, initially as non-executive chairman and, from 1987, as joint chief executive until its sale in 1989. It continues today as a market leader in its field.

He formed his present company in 1994 to disseminate best practice to industry on all aspects of product development, how it should be organised, its financial impact and management. He is joint author of a number of publications on product development and continuously researches best practice.

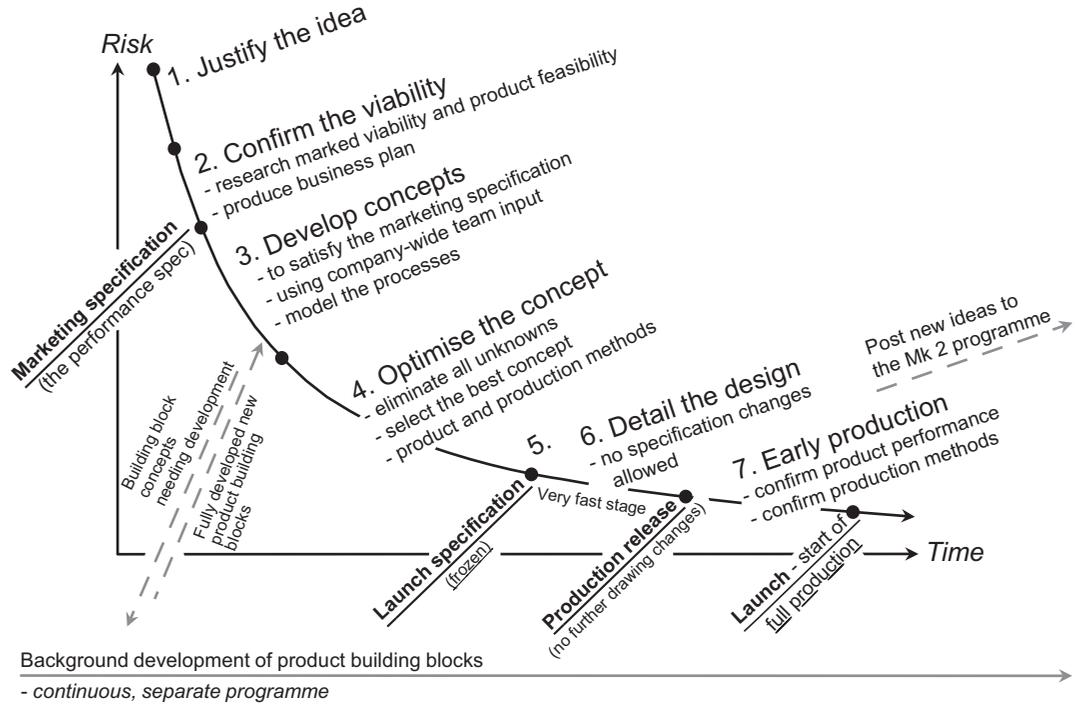
When requested, he organises and runs workshops, seminars and conferences on product development to show companies how, through their own efforts, they can improve their performance. And in national programmes with UK institutions, for example with the Royal Academy of Engineering in a UK-wide programme to improve the product development capability of UK manufacturers; and running workshops with the Institute of Mechanical Engineers.

He helps companies with their product development strategy and its operation; for example, with a leading Japanese car-maker in a 3-year programme to help improve the product development effectiveness of their European first-tier suppliers.

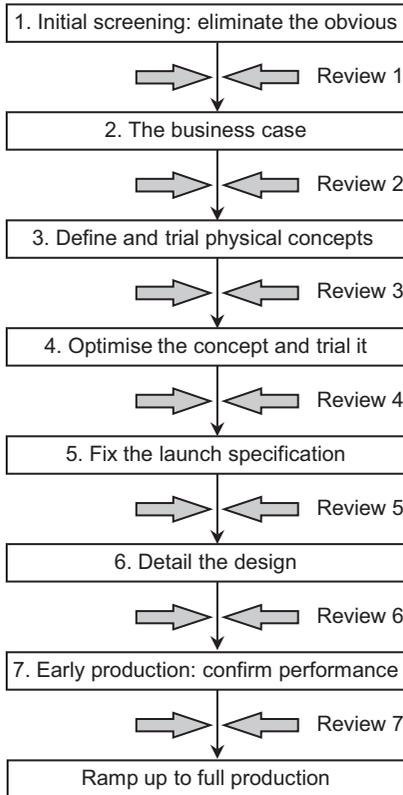
In-house workshops

When asked (his contact detail is pd@mynott.com), he works with and facilitates companies, at board and senior management level. The aim is to enable companies to develop products with greater customer appeal in the least time and cost by enhancing their product development culture and process. His in-house workshops have enabled a number of US and UK companies to revolutionise their product development performance and capability. This book sets out the basis; workshops put the culture and process firmly in place across the whole management team.

Progressively reducing the risk - in developing the product



The 7 phases and reviews:



Phase 1. Screen the potential project's viability: the initiator passes it to a Board-level project champion; using internal company knowledge, they do a fast assessment of fit to company strategy, risk, apparent technical, market and financial viability; Board approves to proceed to Phase 2 or kill.

Review 1. Is the idea worth even considering?

Phase 2. Research customer requirements, technical feasibility and costs in detail: appoint the project manager (and first team members); the team does detail market research; estimates costs, potential financial return and risk; generate **the marketing specification** and the **project business plan**.

Review 2. Is there a quantifiable business case?

Phase 3. Expand the team (from all functions) to generate several concepts: evaluate technology, production and design feasibility of each against the marketing specification, their risk and cost. Generate models; trial and quantify unproven elements. Send potentially good but unproven building blocks and ideas to the long-term programme for future products.

Review 3. Are there enough feasible concepts?

Phase 4. Generate a better concept from the best features of each: evaluate how the features of each concept satisfy the marketing specification; combine the best features to produce a better concept; simulate and make test models; debug interface problems; trial performance; generate a draft launch specification and production engineering specification for the production process.

Phase 4. Is there a suitable optimum concept?

Phase 5. Freeze and prepare the detail launch specification and production process specification.

Review 5. Is the launch specification correct?

Phase 6. Detail the design; install and commission the plant: issue production release drawings (instructions); install and commission the plant.

Review 6. Are the detail designs complete; is the plant commissioned?

Phase 7. Start-up and run the plant; trial early production: run early production off production tools; confirm performance and cost against the launch specification; use early products for approval and legislative tests; use the trials to rectify final concerns whether product or process. Check production supplies are organised.

Review 7. Are confirmation trials complete; is all ready for production?