

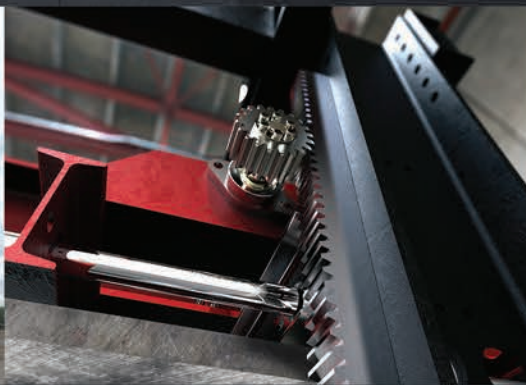


HOW TO GUIDE

PRODUCT DEVELOPMENT - 7 STEPS TO SUCCESS

CALIBER DESIGN

ENGINEERING | ANALYSIS | MECHANICAL DESIGN



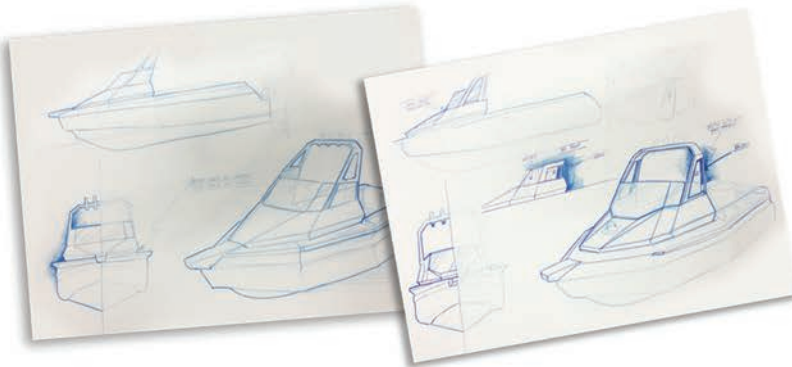
PRODUCT DEVELOPMENT - 7 STEPS TO SUCCESS | INTRODUCTION

The product development process is tough to get right.

Many companies would like to develop a new product but often underestimate what it takes to develop a successful one, the right way to go about it, or the real costs associated with it.

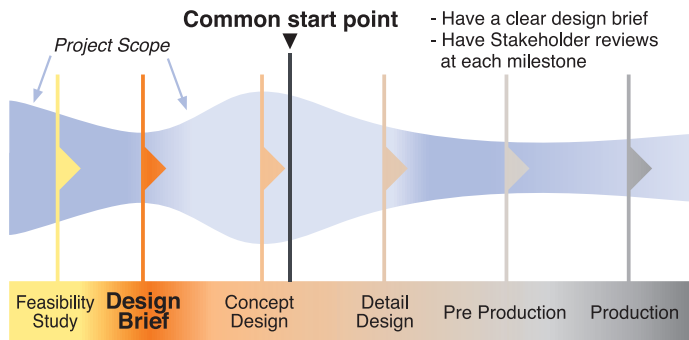
At Caliber Design, we're experts in this process and we team with other experts in the field of product design, intellectual property, and commercialisation to provide robust solutions for successful product development.

We're sharing this with you because it's a subject we are extremely passionate about: business development, process, sustainable design. Our collective experience stems from years of working with great design and engineering companies, including: Stabicraft, Fonterra, Trimble, Shotover Camera Systems, Sanitarium, Scott Technology, Babcocks, AIM Altitude, to name a few. We're currently working on innovative projects across multiple industries, including aerospace, materials and food handling, packaging, marine, agriculture, and medical.



1 Do you have a development process? If not, implement one!

Standard Stage Gate Process



Why follow a product development process?

- Improve your ability to innovate and engineer your product
- Help you clearly identify your customer's key requirements
- Reduce your development costs
- Reduce the time it takes to get your product to market
- De-risk your project

Where do you start?

Implementing a development process isn't that hard. One simple process to follow is the 'Stage Gate' process. Following this process is the key!

A couple of important concepts to consider:

Embed a team of key stakeholders from both inside and outside your company to review your project based on key deliverables at set times (stages) throughout the program.

Create a design brief that outlines key project requirements and differentiators prior to launching into product design.

2 Have you done your homework? Research is critical.

Designing a revolutionary product requires an investment in research

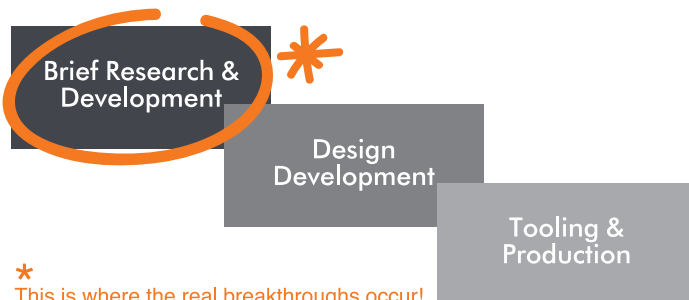
Research is critical to ensure that you understand your customers requirements and uncover their unmet or 'latent' needs.

Know thy customer!

If you clearly understand your customers needs, then you have the information you need to differentiate your product in the market and ensure its success.

You can learn more about your customer by:

- Running 'voice of the customer' surveys
- Developing key customer personas
- Doing a 'day in their life' study
- Simple good old-fashioned observation:
Get out of your chair!! Go and visit your customers and watch their frustrations. Get in and do it yourself. Learn the 'real world' short fallings of current products out in the market—including yours!





3 Who is in your value chain? Have you covered your bases?

KNOW all the links in your value chain

Your product's value chain includes everyone with a vested interest in your product ... from your widget suppliers through to internal staff, distributors, sales, specifiers, end users ... and everyone in between!

ENGAGE all the links in your value chain

A chain is only as strong as its weakest link so make sure you've met the needs of ALL the stakeholders/members of the chain. Miss one and the whole development program could come crashing down! The most effective way to do this is to ensure you establish and maintain cross-functional teams.

UNDERSTAND all the links in your value chain

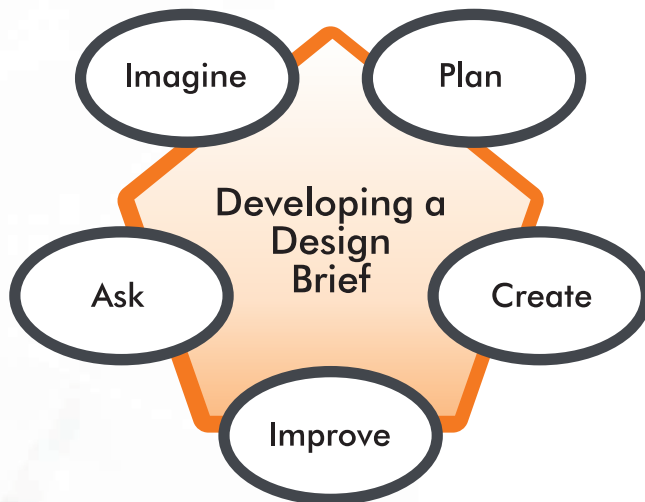
Ask questions! And REALLY listen! Your little gem might not come from the 'end user' ... it might come from a key supplier with an ingenious way to make a new component ... or, someone on the production line with a faster or simpler way to assemble your product ... or the receptionist who is sick of dealing with the same customer complaints.



You need to incorporate the perspectives from your entire 'value chain' to ensure real product success and what better way to do that than to incorporate representatives of each 'link' in your team at appropriate times throughout the project.

4

Are your product requirements understood and clearly documented?



Develop a clear and concise design brief

A design brief (or product specification) is an absolutely critical document to ensure project success and minimize the likelihood of failure. An effective design brief will:

- Ensure all parties know what is being designed and why
- Prevent the project from going off track
- Keep the development team focused
- Help ensure the project is well researched, understood, and relevant to the market need.
- Ensure you get 'buy-in' from key stakeholders

It is imperative that you get sign-off from the key stakeholders at each stage. Actually, 'sign-off' is not enough ... you must ensure you get buy-in and SUPPORT from the stakeholders to ensure you are all pulling in the same direction.

5

Do you foster innovation within your team?

Develop and nurture a positive culture

A culture of innovation is critical to ensure your team is as powerful as it can be. The best way to do this to ensure team equality and create an environment that is safe for everyone to suggest ideas.

There are egos in design. Everyone thinks their idea is the best. Emotion and hierarchy need to be removed and objectivity embedded.



Meeting rules

- Everyone has equal status within the team
- Leave ego at the door
- Every idea is listened to
- Don't rubbish people's ideas
- Respect other team members
- Don't interrupt
- Quantity of ideas is just as important as quality
- Make it fun!

At Caliber, our meetings are governed by these rules. You never know who and where the best ideas come from! Create a safe environment and watch the ideas flow!

6 Are you leveraging technology to your best advantage?

3D CAD systems are your friend

It never ceases to amaze us how many companies don't utilise 3D CAD systems, and technology in general. Not only do these tools provide the ability to develop your models faster and more accurately, the downstream advantages are incredible:

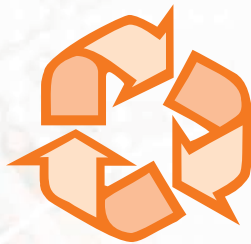
One downside is that the costs of setup (human resources, hardware, software, and other technology) can be prohibitive. The team at Caliber can reduce those expenses by providing specialist support as and when required.

- You can take a **modular design approach**, whereby you use your pre-existing components/subassemblies, but also those of external suppliers. There are literally hundreds of thousands of components online that can be used in your modelling to avoid redesigning the wheel.
- You can use **stress analysis tools** to understand loads/forces early on in your development program, de-risk your design and ensure the product is fit for purpose—right from the outset.
- You can develop **jigs and fixtures** concurrently with your product ... saving you time and money down the track.
- You can output life-like **renderings** before your product has even hit manufacturing ... great for funding or patent applications, marketing, service manuals, and other documentation and promotional materials.
- You can start **priming sales**, and getting customers really excited, before your product is even made!
- You can undertake **machining and rapid prototyping** of complex geometries and components with ease.

7 Have you taken a sustainable approach to your product design?

Sustainability isn't just great for the environment ... it makes great business sense!

When you produce a product, you need to design it with the end in mind. How will your product impact the world? It is our collective responsibility to create products sustainably and leave little waste.



Sustainable product development comes down to three Rs:

REDUCE is about reducing components numbers, sizes, weights, assembly processes, material families. This ties in directly with lean principles and leads to significant cost savings—both in production and the product itself.

REUSE is about enabling your product to stay in the market for longer and keeping it out of the waste stream. This involves a modular design approach to use existing components and a clever maintenance parts program so your product can be refitted to enable an extended life. This improves the perception of your products quality and can ensure ongoing revenue streams from parts/spares supplies.

RECYCLE is as it sounds: this includes using “pre-loved” materials as well as using materials that are, or can be, recycled. In order to recycle, considerations need to be made to finishes and assembly techniques and use of similar material families. That way, appropriate materials can be chosen, and fast and effective disassembly techniques can be used.

Quick summary

Here's a summary of seven key questions to ask before you head down the product development path.

- 1 Do you have a product development process?** Decide on a product development process to use and follow it. A solid process will improve the design of your product, ensure it meets market needs and requirements, and reduce the time and cost of development.
- 2 Have you done your homework?** You must understand your customer - know their requirements inside out before you start the design phase. Then, you will have the information you need to differentiate your product in the market, extend it's life, and command higher margins.
- 3 Who is in your value chain?** Define everyone who has a vested interest in your product and get to know them ... engage with them, understand them. They may hold the key you need for a revolutionary product!
- 4 Are the product requirements documented?** A clear, concise design brief (or product specification) will ensure all stakeholders are pulling in the same direction: it helps ensure the goals are clear, keeps the program on track, and the team focussed.
- 5 Are you fostering innovation?** Developing and maintaining a positive team environment will foster innovation.
- 6 Are you leveraging technology?** Make the most of the technology and experts available to you. It's not always practical to have the tools and expertise in house - consider outsourcing and benefit from the technology and Caliber experts without incurring high overhead costs!
- 7 Are you taking a sustainable approach?** Think about how your product will impact on the environment throughout its life cycle and plan to leave the smallest footprint possible.

Acknowledgements

Front Cover - *Left to Right*
Fresco
Superior Doors
Sanitarium

Page 2
Stabicraft

Page 4 - *Left to Right*
Automac
Superior Doors
Sanitarium

Page 5
Stabicraft

This page - *Left to Right*
VRM Structure
Fresco
Automac

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"The basic economic resource – the means of production – is no longer capital, nor natural resources, nor labour. It is and will be knowledge."

Peter Drucker | 1909 - 2005
Austrian-born American management consultant

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ABOUT US

Our team of 50+ mechanical engineers work on secondment with clients around New Zealand on a project-by-project basis.

We have a diverse range of skills and experience, from machine design, product design, and FEA to project engineering on large industrial sites.

Our engineers are seconded to work on your site, collaborating with your team and working under your guidance.

Find out more at www.caliberdesign.co.nz



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of New Zealand's most
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