

DESIGN GUIDE: PRODUCT BUSINESS

A PRACTICAL GUIDE FOR ENTREPRENEURS DESIGNING AND DEVELOPING
ARTISAN, CRAFT-BASED, AND MANUFACTURED PRODUCTS

PLANNING

DESIGN

DEVELOPMENT & LAUNCH
COMPLIANCE &
PROTECTION

SCALING UP

DESIGN GUIDE: PRODUCT BUSINESS

A PRACTICAL GUIDE FOR ENTREPRENEURS DESIGNING AND DEVELOPING
ARTISAN, CRAFT-BASED, AND MANUFACTURED PRODUCTS



Table of Contents

12-25



SECTION 1

INTRODUCTION

- 15 Product Businesses
- 16 Start Where You Are
- 23 Design Decisions

26-53



SECTION 2

PLANNING

- 28 Starting With "Why"
- 29 Engaging Your Customer In The Design Process
- 31 Common Challenges By Industry
- 32 Business Models & Plans
- 38 Budgets & Costs
- 41 Protecting Your Work
- 42 Who Can Help You
- 43 Building Your Network
- 45 Setting Up Your Project

54-71



SECTION 3

DESIGN

- 57 What A Product Designer Can Do For You
- 58 Choosing the Right Designer
- 61 The Design Process
- 63 Inclusive Design & Development
- 64 Documentation
- 65 Discovery & Synthesis
- 68 Ideation
- 70 Prototyping

72-89



SECTION 4

DEVELOPMENT & LAUNCH

74 Refining Your Design 76 Choosing Your
Manufacturer 80 Finalizing Costs & Pricing 82 Test
Marketing 84 Distribution & Fulfillment 87 Ramping
Up Production 88 Launching Your Product

90-103



SECTION 5

COMPLIANCE & PROTECTION

93 How IP Protection Works 93 Who Can Help You 94 What Is
Your Idea Worth 94 Assessing the IP Landscape 95 Preparing
Your Idea 95 Selling & Licensing Your Idea

96 Product Liability
99 Advertising Compliance

104-111



SECTION 6

SCALING UP

106 Product Strategy
108 Scaling Business Models
109 Scaling Production
110 Scaling Distribution

112-131



SECTION 7

CASE STUDIES

- 114 Accessories by GG Mari
- 116 Byrd
- 116 A New Life Prosthetics & Orthotics
- 118 Christine Bossler
- 122 LIVAQ
- 124 Mottoform Design
- 126 Rove Soapsheets
- 128 Scarlet Crane
- 130 Studio Variously

132-148



SECTION 8

CONCLUSION

- 133 Glossary
- 139 Resources
- 146 Templates & Tools
- 147 Acknowledgements
- 148 Contributors

IN DETROIT, WE DESIGN AND BUILD WHAT'S NEXT

Startups. Makers. Iconic Brands. Global Manufacturers.

As the original home of mass production and world-changing technologies, Detroit is a great place to develop new products. Well-designed products solve problems, bring people together, and power businesses.

Design Core Detroit believes strongly in an inclusive design process to build great products. Whether you're designing consumer products, digital applications, medical devices, fashion, or furniture, one truth remains constant: product development is a team sport and the consumers of your future product are key players.

This **Design Guide: Product Business** covers a wide range of issues relevant to building a product and running a product-focused business. It contains advice, tips, worksheets, and case studies developed to give product businesses insight into the design and development process, and ultimately establish themselves in the market..



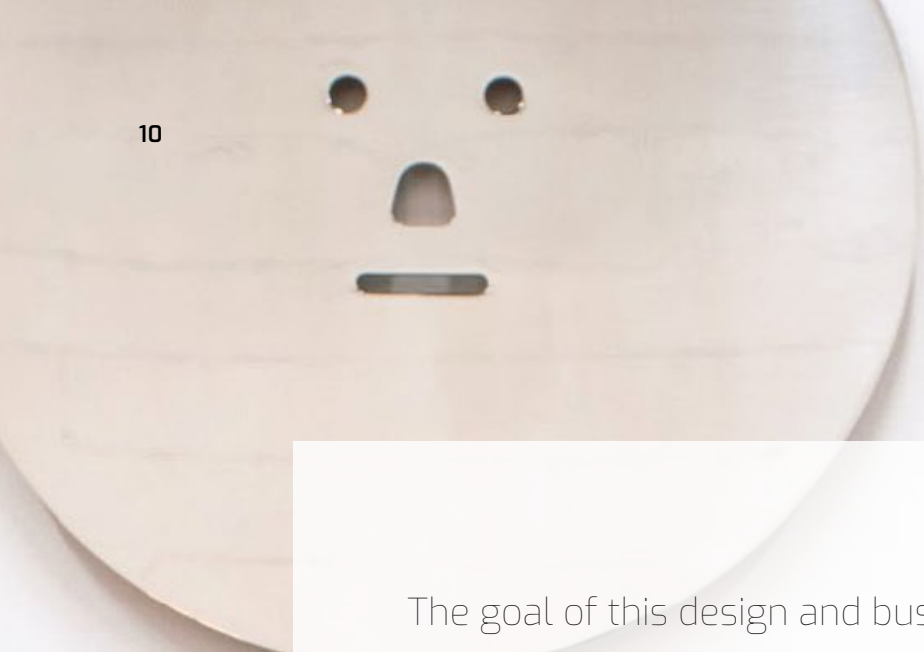
Product designers and entrepreneurs are everywhere.

From parents with innovative concepts for educational toys, to young adults pioneering novel last-mile transportation solutions, industry veterans revolutionizing 3D metal printing, and amputees creating adaptive outdoor equipment, product developers are just as diverse as the products they envision.

Regardless of their backgrounds, all product developers share a common need: to comprehend the processes, best practices, and hurdles inherent in the journey from concept to market-ready product. Traditionally, this essential knowledge has been limited to college degrees or established corporate environments.

Design Guide: Product Business is a pivotal step toward dismantling these historic knowledge barriers and fostering more equitable opportunities. Its comprehensive framework equips designers and entrepreneurs of all experience levels with a holistic understanding of the product development process, demystifies industry terminology, and distills best practices, empowering more product entrepreneurs to realize their aspirations.

— Andrew Dahlgren, Co-Director, Urban Manufacturing Alliance



The goal of this design and business resource guide is to empower and inspire product-based entrepreneurs and business owners to practice an inclusive design process in the development of their goods. The information, exercises, and case studies within will demonstrate how thoughtful, human-centered product design improves and expands the use and adoption of both manufactured and handcrafted commercial products.

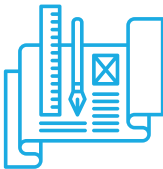
Use this guide to gain understanding of product development, appreciation for the value of design in the process, and the confidence needed to engage in mutually beneficial conversations or contracts with professional designers of all varieties.



THIS GUIDE AIMS TO:



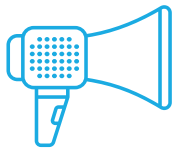
Demonstrate the value of an inclusive design process for product-based businesses and encourage more innovative, user-centered product design and development.



Help product entrepreneurs integrate a comprehensive design development strategy into their annual business plans and budgets.



Grow the market for local design professionals, including makers and product entrepreneurs.



Amplify public awareness and engagement with great design.



Inspire and empower Detroit's product entrepreneurs to achieve lasting success in their businesses through product innovation and human-centered designs.



Section 1

Introduction

UNDERSTANDING YOUR OPTIONS

15 Product Businesses

16 Start Where You Are

23 Design Decisions

When you're done with this chapter, you will:

1. Learn some of the terms used throughout the guide.
2. Understand the importance of inclusive design in product development.
3. Recognize the types of design services that help product businesses thrive.
4. Understand where you are in the process and what you need to do next.

Phases of the Product Design Journey



I want to create a product!



Self Assessment



Key Concepts and Ideas



Special Topics

Intellectual Property

Branding & Marketing

Supply Chain



Scaling Up



Launch!

Product Businesses

Artist. Maker. Craftsman. Inventor. Producer.
Entrepreneur. Small Business Owner.
Small-Scale Manufacturer. Designer.

Which are you?

If you have an idea for a product or are growing a product-based business, this guide is for you. While "product" can apply to digital services and software, here we will focus on 2- and 3-dimensional physical products and small businesses that primarily develop and sell physical products.

This group may include artists, designers, makers, manufacturers, or entrepreneurs. Often, they are either aspiring home-based creatives with ideas for new crafts or consumer goods, or technology or hardware-based entrepreneurs with ideas for small appliances, athletic equipment, medical devices, and more.

Creating and commercializing new products is an iterative process of designing, prototyping, testing, re-designing, re-testing, and so on. It can be challenging and expensive. If you're new to the process, it's best to seek resources and advice early on, to avoid costly mistakes. This workbook is meant to be an introduction and a tool to help you succeed, rather than an encyclopedia of product design.

Throughout these pages, you will gain insight and inspiration by deepening your understanding of the product development process and how the life cycle of your product may change as your business grows. We'll start by exploring options for what you can do with your innovative product idea. The self assessment in this section will help you to determine what best matches your interests, resources, and capabilities.

Start Where You Are

Who am I and what do I want?

So, you have an idea for a new product or an improvement on something already out there. Now what?

To help determine which path you will take with your product idea or business, it's useful to ask yourself some questions about what you want to do or accomplish with this product.

If you love coming up with new ideas, but don't care much for negotiating with vendors or managing finances, you may not want to run your own business. In that case, you might consider selling or licensing your ideas to someone who has experience running the operations side of things.

ENTREPRENEURSHIP SELF-ASSESSMENT

Why are you personally interested in this product?

What do you hope to gain from bringing this product to the world?

What are you good at?

What do you struggle with?

How do you like to spend your time?

How much time do you spend on your product or business now?

How much time do you plan to spend on your product or business per week?

What resources do you have to devote to this?

Do you want to manage people or work alone?

Would you prefer a set work schedule with limited hours or do you like to work for small bursts around the clock?

What Do I Need Now?

The next set of questions will help determine what stage your idea or business is in currently, so you can decide what you need to move ahead. We have included suggestions for which chapters in this guide are most relevant to you. It is important to note that while we have arranged topics in a particular order here, they are often overlapping and concurrent functions in real life. Product design and development is not linear, but rather an iterative process, with various functions often ebbing and flowing or intersecting, much like entrepreneurship itself.

Please choose the statement that best describes you:

I have been making products and now people are asking me if they can buy them for themselves or other or are telling me I should start a business.

I have an idea for a new product or an improvement on an existing product and I want to develop the idea and launch a business to make and sell it myself.

I have an idea for a new product and would like to build my own business, but I don't have a design yet.

I have an early design for my product and would like to develop it.

I have created a product and have a working prototype or trial samples. I would like to learn more about how to get it produced and take it to market.

I have an idea, but would like to sell or license it to someone else and keep my day job, rather than building a new product or business myself.

I am selling my product at a small scale and would like to grow my business.

I need advice on who to contact for help with a specific challenge.



p27

p55

p73

p91

p105

p133

Scaling Up

Glossary
& Resources

Artisan or Craft-Based Entrepreneur vs. Industrial Manufacturer

According to Nest's State of the Handworker Economy here are few key terms that will help differentiate specific roles within the handmaker economy:



Artisan / Craftsperson / Maker: An individual making things completely by hand or with the use of hand tools, where the person's work is still the most important part of the finished product.

For our purposes, we define maker exclusively as an individual working on the creation of products made completely by hand or with the help of hand tools, and therefore do not include those working in the fields of robotics, 3D printing, or other mechanical or computerized trades.

NOTE: While this is how Nest defines "maker," it's important to acknowledge that others suggest a maker can be anyone that makes or produces something, usually on a small scale by themselves. Today, many makers do use tools like 3D printers, laser cutters, or even lathes and milling machines.



Maker / Artisan-Entrepreneur: A maker-entrepreneur is someone who also owns and manages their own business entity that sells the products they make. They can also be referred to as an artisan-entrepreneur.



Handcrafted: Drawing our definition from UNESCO, we define handcrafted as a product or object for which the direct, manual contribution of an artisan or a maker remains the most substantial component of the finished product.

WHERE AM I IN THE PROCESS AND WHAT DO I NEED?

Answers to these questions will help assess where you are in your product design and development journey, and determine your next steps. Answering these questions in advance of an appointment with any business support organization will help save time and keep the conversation focused on your goals.

It's okay if you don't know the answers to some of the questions. That helps determine where you are in the process and what resources or information are needed for the next steps.

If you aren't ready to answer the questions on intellectual property and patent rights, for example, you will want to do a little research on the pros and cons of protecting your idea. You can find more information and resources to help with many of these questions in other sections of this guide.

Market Analysis

Have you considered who needs your product?	Yes	No	N/A
Have you looked for products like yours that are already on the market or products that will be direct competitors to yours? Check local stores, specialty stores, big box stores, and online.	Yes	No	N/A

Design

Do you have sketches or prints of your product?	Yes	No	N/A
Do you have a complete design?	Yes	No	N/A

Prototyping Your Idea

Do you have a mock-up or prototype?	Yes	No	N/A
Do you want help with a prototype?	Yes	No	N/A
Is your prototype a working model?	Yes	No	N/A

Production

How will you create your product?	Yes	No	N/A
Where will you source raw materials or components?	Yes	No	N/A
Do you have a manufacturable pattern?	Yes	No	N/A
Is the product one that can be assembled from existing parts, or will they require fabrication?	Yes	No	N/A
How will you handle reception and delivery of parts and products? (Supply chain logistics)	Yes	No	N/A
Once you have the parts, how are they assembled? In what order?	Yes	No	N/A
Have you tested your product for proper function?	Yes	No	N/A
Do you want to manufacture it yourself? If so, you'll need to consider how to secure and pay for manufacturing space, equipment, patterns, and labor.	Yes	No	N/A
Would you prefer to hire a third party contract manufacturer? If so, you'll need to identify a domestic or international partner, draft legal contracts, supply patterns, tools, or molds.	Yes	No	N/A
Do you know how will you maintain quality control and quality assurance?	Yes	No	N/A

Intellectual Property

Do you need or want a patent? And if so, do you prefer to use it exclusively or license those rights to others? Do you know how much a patent costs?	Yes	No	N/A
I already have a patent	Yes	No	N/A
I just want a patent	Yes	No	N/A
I don't know if I need a patent or not	Yes	No	N/A
I want to sell my patent rights	Yes	No	N/A
I want to license my patent rights	Yes	No	N/A
I don't know if I should get a trademark or copyright	Yes	No	N/A
I'm unsure what direction to pursue	Yes	No	N/A

IMPORTANT THINGS TO THINK ABOUT



Who will manufacture your product and how?



What is the cost to manufacture your product?



What is the selling price?



What kind of packaging will you need?



How much does the packaging cost?



What are your shipping costs?



Do you know who your target customer is?



Do you have a business plan?



What additional assistance or guidance do you need?

Design Decisions

Design plays many important roles in the development, production, and sale of products. Whether you are an artisan or craftsperson creating products either entirely by hand or with the use of hand tools, or a small batch manufacturer using machines and technology, you will have to make a number of design decisions throughout the process.

How will customers interact with your product(s)?	What is the order of assembly for maximum efficiency and durability?	
What are the costs of materials and labor? How will you package and ship the product? For example, consider how the materials you choose impact the product's weight and how the weight impacts shipping costs.	What colors and materials will you use?	What parts are needed?
	What features will your product have?	

These are questions professional product designers and consultants are trained to help you answer, when needed. In fact, from product development to sales and marketing, there are several types of design that can positively impact all aspects of your product-based business.



Photo by Paul Taylor Films, 2021 Detroit Month of Design.

Industrial Product Design

For the purpose of this guide, industrial product design refers to the process, patterns, tools, and prototypes used to take products from concepts to production with machines or technology, as opposed to products or objects handcrafted by an artisan or maker.

An Industrial Designer can help a business owner:

- Identify and select appropriate parts and materials

- Advise on industry and consumer trends related to colors, features, and price points

- Make the patterns necessary for production or assembly

- Save money and time by foreseeing issues in advance



Image courtesy of Design Core Detroit.

Package Design

Depending on your product, your packaging may require a few different types of designers. Package designers and engineers, for example, may be needed for packaging that requires molded plastic or other customizations. Testing may be required also, especially if your product contains chemicals or liquids that could leak or break down the package.

Where and how the product will be sold could impact the package design too. Some retailers might require that the package hang, for example. At the very least, working with a graphic designer to ensure the graphics, messaging, and shelf placement options are consistent with your brand is always a good idea.



Image courtesy of The Detroit Month of Design. Photo by Steve Koss.

Visual & Communication Designers

Experts who specialize in branding, websites, storytelling, and content creation are critical to the success and sustainability of any product business.

A visual or communication designer can help a business owner:

1. Develop a brand strategy

Mission, Vision, Values

Visual assets, i.e. Logo

* You can find more information about designing your brand in Design Guide: Neighborhood Business, which is listed in the resources section.

2. Market your business and sell your products

Website

Storytelling

Content Creation

Photography

Videography



Image courtesy of The Detroit Month of Design. Photo by Noah Elliott Morrison.

Inclusive Design

There are many definitions and perspectives on inclusive design, but essentially it means inviting a wide range of end users to contribute their ideas, expertise, and experiences to the design process from the start, and throughout every iteration or phase of the process. So, you are essentially co-creating products that best meet your customers' needs.

The best outcomes are not typically achieved by a one-and-done focus group with end users trying out your prototype. The highest level of success comes from taking an inclusive approach throughout the development process. Product designers trained in the practice of inclusive design can help facilitate this process, if brought in to do so from the beginning.

Inclusive design leads to the development of products that appeal to and work for more people, and helps product developers avoid finding out later that a particular feature they spent extra money and time on wasn't needed or wanted, or that they missed a potential new market by failing to consider a feature those users would have wanted or needed and paid for.

Adaptive product design, as an example, means collaborating with people from the disability community at every stage of the design and development process to create products easier and more effective for them to use. This allows the product to be purchased and used by a wider range of customers. In short, inclusive design is good for business.



Section 2

Planning

STARTING YOUR PRODUCT DESIGN JOURNEY

28 Starting With “Why”

29 Engaging Your Customer
In The Design Process

31 Common Challenges By
Industry

32 Business Models & Plans

33 Budgets & Costs

41 Protecting Your Work

42 Who Can Help You

43 Building Your Network

45 Setting Up Your Project

When you're done with this chapter, you will:

1. Understand who your target customer is and how you can involve them in the design process.
2. Learn about common challenges affecting various industries.
3. Develop a business model and business plan.
4. Understand your costs and set your budget.
5. Identify the many partners you may need and establish a team that can help you create your product.
6. Set your product up for success by creating a detailed scope of work and achievable development timeline.

Starting With “Why”

So, you have a great idea for a new product. Now what? Where do you start? While it's tempting to dive into designing concepts and building prototypes, this is actually a great time to pause and outline your plan and product story. Like a good investigative journalist, start by sketching or noting the key facts and assumptions. Answers to these questions will help create a roadmap and guide your decisions.

WHY

Why should this new product exist? Does the world need this product? Do they need it now? How do you know? Why are you the right person to create this product—what skills and experiences do you bring to the product or business? What values are guiding you?

It's important to base these answers on actual, quantitative facts, as opposed to assumptions. You may believe everyone wants this, but if you can't prove it, you could end up spending a lot of money to develop a product that won't sell.

WHO

Who does this product benefit? Who does it impact beyond the user? What are the unique needs of your users, including those with lived experiences that are different from yours? Can everyone use your product regardless of age, cultural background, or physical ability? Who will help you bring this product to the world? Who will help you fund the product or business? Who are your capital partners? Who will supply materials? Who will you need to hire? Who will train and manage your staff?

WHAT

What does the product do uniquely well? Does it already exist somewhere else? What needs to be true for the product to succeed?

When, Where, and How is the product created, packaged, shipped, sold, used, and recycled? What is the timeline for key events in your business plan, i.e. developing a working prototype, launching your product, hiring staff, breaking even, achieving profitability? Starting with raw materials, a product goes through an entire life cycle until it is (ideally) recycled into another useful form. What are the main steps in the journey, based on what you know? How will you pay for materials, equipment, labor, operations, etc?

“Before manufacturing, stop and go backward:
what are you really trying to accomplish?
What is your Idea vs. idea? Big I vs. small i?”

Richard Choi, Michigan Small Business Development Center

Engaging Your Customer in the Design Process

There are several possible ways to engage your customer in the design process for a better, more inclusive, and user-centric product. These examples can be used alone or in combination to inform your product design and ensure adoption by your target audience.

Understanding Your Customer

Develop Ideal Customer Persona(s)

Engage future end users individually or in small focus groups to gather information about what they want or need from your product. The main goal of this exercise is to hear directly from your future customers about their needs and desires, their daily experiences, etc. Ask for direct input about what to consider in the design process. What challenges or goals do they have? What do they want? How would they use this product?

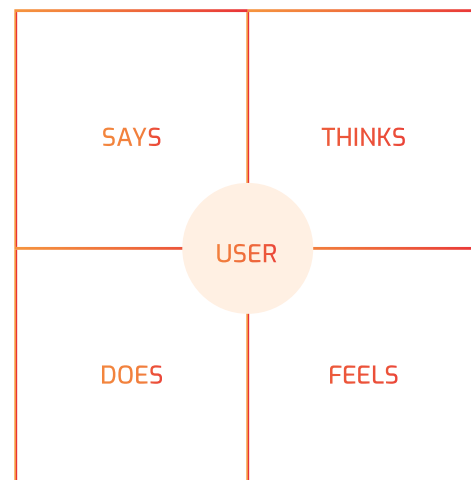
Later activities and engagement will focus on form and function, so for now, start with gathering insights, experiences, emotions, and other input from as many of your potential customers as you can. Be sure you select users with diverse backgrounds and perspectives, so you get a holistic and wide view of their circumstances and needs.

When you have clear ideas about each of your potential user groups, draft customer personas for each. Include as much of the information they shared with you as possible, so you can focus your designs and solutions on addressing their challenges and desires.

Create an Empathy Map

Once you've developed an understanding of your future end users, use this information to complete an Empathy Map (shown to the right), based on what you know. Then, go back to the users and ask clarifying questions to confirm you're on the right track about what they say, think, do, and feel.

Share the map and ask everyone on your team to contribute, based on their interactions with end users. Add notes and comments to organize your thoughts.



Draft a Customer Timeline

Learn about the life of your end-user from morning to night. Interview people to create a timeline of their day. Focus your questions and the conversation on the persona and activities that relate to your product(s).

Document the responses and use them to inform your product features, functionality, colors, materials, and more. By including your customers in this research and discovery process, you're gaining valuable insight into who will or will not use your product, what problem it solves for them, and more.



Now for a little homework!

Set aside a bit of quality time to think about your product idea and complete the Intuit Quickbooks Business Plan Template. You can use this information to keep yourself focused and to help others to understand your idea. Keep in mind that it is okay to not have all the answers right now. The most important thing is to clarify your vision and what facts you are assuming. You will test and improve these ideas later, likely many times over.



Business Plan Template

Follow this template to construct a business plan that's tailored to your goals, objectives, and needs.



Common Challenges By Industry

Product design and development can follow different paths and have different labeling, safety, testing, and compliance requirements depending on the industry. An early understanding of the unique realities of your industry can help you make important decisions about the design of your product. Learning more about nuances specific to your industry, like lead times, material sourcing, profit margins, inventory management, returns, seasonality, perishability, government regulations, and other challenges and constraints, will help you make appropriate, timely, and cost effective decisions.

A few examples of industry specific challenges to consider:

Apparel	Food and Beverage	Botanicals and Cosmetics	Sports Equipment
Long lead times, material sourcing, high margin requirements at retail, inventory/ stock, customer returns, etc.	Nutrition labeling, food safety regulations, testing and compliance, co-packing, aligning with retail resets, perishability, etc.	Food and Drug Administration requirements, shelf life, inventory turnover, packaging, etc.	Regulation and safety requirements, industry standards for competition, product liability insurance, etc.



Craft Candles makes artisanal scented candles and small handmade household items. They produce their product locally with a small manufacturing site and regularly drop new items online as limited-edition batches. To maintain a sustainable business and focus on the quality their customers love, they price their products much higher than similar items sold in a big-box retail store. Selling through an online storefront helps to keep their business close to their customers and allows them to control their brand.

For Craft Candles, it would probably not make sense to develop a low-priced item that competes with the big-box retail store products directly.

Craft Candles should also carefully consider if it's wise to even attempt to sell their product at the big-box store. The business model of a big-box store is quite different from a quality-focused, artisanal company. Big-box stores typically demand a large share of a product's profit, and expensive up-front investment in inventory in order to list an item. In some cases, they might also become your competitor by developing a lower-priced copy of your product.

There are always trade-offs involved in business, and it's important to be very clear about your assumptions and your goals. A product that works in one business model may not work at all in another.

Business Models & Plans

The essential differences between your business model and your business plan are that the business model details how your business will create and deliver value to your customers and generate a profit, including your market position and pricing strategy. Your business plan outlines your goals and the strategies, operations, and financial projections that will help you achieve them. It's important to note that both of these work together to guide decision making, and both should be revisited and revised periodically to adapt to changing goals, available resources, or market conditions.

Business Models

A new product can be useful, usable, and desirable, but ultimately not be profitable for the business, which threatens its longevity. Attention to your business model, which is essentially how you plan to make money, includes a clear understanding of all sources of revenue and expenses, who your target market is, and how your product delivers value to that customer. This is a critical part of the planning process for any business, but especially for those embarking on product development.

In order for the business and product to last, you have to generate enough revenue per sale to cover all expenses, including materials, labor, overhead, and more, and still make a profit. There is no single "right answer" for how to do this, but the business approach must fit your product and your sector in order to succeed over time.

You'll have a lot of decisions to make throughout the design process, but now is the time to clarify your goals as a business. There are many ways to create value from your ideas. You could sell your product in the form of Intellectual Property (IP) without creating a business to produce it. You could develop a key component and find a partner to create the finished product. You could even build a manufacturing company that combines making and selling under one roof. Who you are selling to and how you will market your product are equally important factors. It's a lot to think about, but documenting your assumptions and getting feedback from your network early is the best, and, in the end, least expensive approach.

Keep in mind that the costs of the product development process can be significant on their own. Experts, research, prototypes, initial production runs, and marketing all cost money. Building this into your business model is essential for success.



Now for a little homework!

Take a moment to write down or sketch out your assumptions on this business model template. If you are early in the process, many of the questions likely won't have a clear answer. The key is to start the conversation about how your business might work now, which will help you make decisions later.

THE BUSINESS MODEL CANVAS

Company Name

Date

Key Partners Who are our key partners? Who are our key suppliers? Which key resources are we acquiring from partners? Which key activities do partners perform for us?	Key Activities What key activities do our value propositions require? Our distribution channels? Customer relationships? Revenue streams?	Value Proposition What value do we deliver to the customer? Which customer problems are we helping to solve? Which job are we helping the customer get done? Which customer needs are we satisfying? What bundles of products and services are we offering to each customer segment?
Customer Relationships What type of relationship does each of our customer segments expect us to establish and maintain with them? How costly are these relationships? How are they integrated with the rest of our business model?	Customer Segments Who are we creating value for? Who are our most important customers?	Key Resources What key resources do our value propositions require? Our distribution channels? Customer relationships? Revenue streams?
Channels Which channels do our customer segments want to be reached through? How are we reaching them now? How are our channels integrated? Which ones work best? Which channels are the most cost efficient? How are we integrating our channels with customer routines?	Cost Structure What are the most important costs inherent in our business model? Which key resources are most expensive? Which key activities are most expensive?	Revenue Streams What are our customers truly willing to pay for? How do customers prefer to pay? How much does each revenue stream contribute to overall revenues?



Image courtesy of The Detroit Month of Design®. Photo by Cydni Elledge.

Distribution & Sales

Distribution channels are how you store and transport inventory to the end consumer that can be through direct, indirect, or hybrid channels. Type of product, price, brand advertising, and product positioning should be considered when selecting a distribution channel.

While many product entrepreneurs start out handling distribution themselves, at some point the time and resources required outweigh the cost savings. See more information about evaluating the need for a third party distribution partner in Section 6 Scaling Up.

Sales channels are where a product or service is sold to target specific customers. Examples include direct channels like a company retail store or website, or indirect channels such as affiliate marketing and third-party marketplaces. You might find your customers require you to have a mix of sales channels. Having the right sales channel strategy helps you efficiently get your product to your customers. Consider the operating costs of each sales channel when deciding which ones to start, stop, or continue using by continuously evaluating what it takes to operate each one. For example, does it take more or less time, money, or resources to sell your product online versus at an in-person trade show versus a brick and mortar location? Consistently review where your customers are buying and where they are not in order to make any necessary changes in your sales channel strategy.

If you are selling directly to a retail shop owner, then developing personal relationships will be crucial. Retailers have countless options of where to source product from and the relationship you build with them over time will help you and your product stand out from the others. Building a network of buyers will be necessary in order to cultivate robust sales. Encourage your prospective and existing retail clients to make appointments with you during trade shows to make sure they know they will have dedicated time and attention with you.

If you hire a sales representative to pitch and sell your product to retailers, it gives you more time to design. Sales representatives usually have a proven customer base, which could impact your sales differently than if you were to handle the selling yourself. A sales representative could result in the sales for your product to start quickly, remain steady for a long period of time, or even both. Keep in mind that the cost of you not having to sell the product yourself is typically a 10-15% commission for the sales representative. Be sure to factor that commission into the price of your product.

Are You Ready for Wholesale?

Selling your product wholesale requires that you have systems in place for consistent communication to help manage the relationships with each distributor throughout the sales and production process. You may need:

- Branded line sheets for each product
- Purchase orders
- ☒ Goods priced higher than your costs in order to make a profit and make sure to cover business expenses Be careful about undercutting, which is when a competitor offers a product at a lower price than another business to capture sales. Undercutting happens regularly between retailers, however, be careful not to offer lower prices on your own website than your retailers (if you sell via these channels).

Pros

- ✓ Eliminate sales tax burden
- ✓ Make money from volume sales vs. requiring more direct sales
- ✓ Production volume shift from one-of-a-kind to limited edition
- ✓ Potential to offer sales incentives to sales representatives

Cons

- Potentially reduces profit (put back into business to grow)
- Less control or no connection with end user, resulting in loss of direct feedback
- Increased production needed to meet higher inventory levels
- More administration work including managing logistics, manufacturing, and production schedules
- Different production schedules based on client needs (seasonality)
- More capital might be needed in order to hire production staff to meet necessary production volume.



Image courtesy of Design Core Detroit.



Image courtesy of The Detroit Month of Design®. Photo by Cydni Elledge.



Image courtesy of Design Core Detroit.



Advice from a Small, Independent Retailer

According to Rachel Lutz of The Peacock Room, if you want to have strong partnerships with retail partners who can sell your products, here are a few things you can do:

Have stock photos of your products available, so they can use them for marketing and promotion of the products in their advertisements, etc.

Offer displays to help set the retailer up for success with your products.

Offer price protection. Do not sell for less on Amazon, or your own site, or offer a lower price to a competitive retailer. Small, locally-based retail businesses cannot compete with lowball prices and won't carry your products if they won't sell based on price.

Understand the difference between wholesale and retail. Boutique retailers are not the middleman.



Advice from a Large Retailer

Meijer's Top Ten Factors When Selling to Large Retailers

Do your homework on the retailer. Know their locations, customer profiles, and company values.

Know your product and understand how it fits with this retailer.

Understand all cost implications in the contract, including Freight-On-Board (FOB) terms, packing and shipping requirements, and whether promotional discounts, liability insurance, or Electronic Data Interchange (EDI) are required.

Know minimum order and cost break requirements for the retailer and determine whether you can feasibly and profitably comply.

Consider the retailer's pallet configuration requirements for warehousing, shipping, and display.

Know their required or suggested Product Displayed Quickly (PDQ) guidelines for how your products will be displayed in the store. Will you have or need shelf space, an end cap, a counter top, or register display, etc? There are many design considerations, depending on the store requirements and customers.

Consider what you need to do to have your product packaged and ready for pallet shipping to the store or warehouse.

Ask about responsibilities and requirements for marketing, advertising, and signage in the store.

Know if in-store demonstrations are allowed and the legal and compliance requirements to conduct them.

Have a goal in mind and know what success looks like to you and your business.

How many units do you need to sell a month/quarter/year to maintain the account?

Shelf space is money to retailers. If your product sales do not meet their goals, they'll remove it from the shelf to make room for something that will.

Business Plans

There are many free business plan templates available from a variety of sources with a simple internet search. The Quickbooks Blog page, for example, includes a free 10-Part Business Plan and Downloadable Template, that's simple and easy to follow. The template is included on page 146 in the Conclusion section of this guide.

Ultimately, what is included in your business plan will depend on preference, but should contain some combination of the following:

EXECUTIVE SUMMARY



Typically one page or less, this is an overview of the plan contents and should be written last.

COMPANY DESCRIPTION



This includes a combination of your mission, vision, values, history, and key business objectives.

MARKET POTENTIAL



This includes research, data, and analysis about your target customers, their current purchasing behavior, and projected future sales.

THE COMPETITION



This includes information about other companies delivering the same or similar solutions and how your business and product compare. Again, this should be well researched and documented.

PRODUCT DESCRIPTION



Here is where you talk about your product, including how features will meet the needs of your customer or unmet demand in the market.

STRATEGY & IMPLEMENTATION



This includes information and plans for how to reach your customers, sell and deliver products, and the outcomes you expect to achieve.

FINANCIALS



A critical part of the plan, this includes real data and careful projections that provide a clear picture of the businesses financial position and performance.

THE TEAM



A description of the expertise and roles of management and any other key personnel, as well as any future positions needed to bring your plan to fruition.

FUNDING REQUEST



If you're using the business plan to attract investors or apply for funding, you'll need this section to frame that request. Be as clear as possible about what you're asking for and why.



If needed, you can attach any supplemental images or documents to further explain or demonstrate your business and product goals and plans.

Budgets & Costs

Can you afford it and will it make money? Every business faces the same questions when deciding whether to build a new product. Your selling price must cover the cost to produce, ship, and market the product and still leave a profit. Profits can then be distributed to owners, investors, and staff, or reinvested in the business to finance growth.

"70-90% of our ability to influence profit is determined by the design. Focus on reducing complexity and improving producibility."

Dan Radomski, Centrepolis Accelerator

Revisiting the cost analysis of your business model and your budget is often an important ongoing task for any entrepreneur or business owner. Whether you manage your finances yourself, or hire someone to help you, YOU need to have a clear understanding of all basic types of costs that impact your cash flow and profit, including fixed, variable, and non-recurring costs.

Fixed costs are relatively constant overhead costs that are independent of production volume and tend to be recurring, i.e. base salaries, rent, lease or loan payments, insurance, and various utilities and services.

Variable costs change with the scale of production and include expenses like additional labor, materials, and shipping. These costs can change based on quantity, sizes, weights, and shipping destination. Materials may change in price based on factors outside of your control, so it's important to consider commodity pricing trends when choosing what materials go into your product.

Non-recurring costs are one-time or infrequent expenses such as hiring professional services from designers or engineers. Initial investments in tools and equipment are also non-recurring costs. They are basic investments in building your new product.

Additionally, you may hear terms like direct costs or indirect costs. **Direct costs** include the costs of goods sold, which are directly related to the production and sale of your products. **Indirect costs**, sometimes referred to as your "overhead," are anything not 100% related to the production and sale of your goods.

In addition to having a clear understanding of your business and product costs, you need to establish a realistic budget for your product. A budget is different from costs.

"Cheaper is not always better. Sometimes users will pay more for a product that aligns with their values. It's a product developer's job to link what the product is, how it works, and how it is made to values that their users can connect with."

Andrew Dahlgren, Co-Director + Local Branding Initiative & Design Jam Program Manager, Urban Manufacturing Alliance

Setting a budget is an important step in the product development process. Designers can often help inform the cost of materials, production, and more to help you find ways to save money, if you engage them early in your product planning and research, and include them in these decisions.

One of the first things a designer, engineer, or manufacturer will ask you is if you have a set budget or funding sources. For many business owners, this can trigger distrust, as it can be easy to assume that the intent is to deliver a quote that uses every last penny of the budget. However, understanding your budget is a critical piece of information and can save everyone involved a lot of time, aggravation, and additional costs.

Ask Your Designer, Engineer, or Manufacturer

If fee will be hourly or based on deliverables

If they will be hired on retainer as a contract employee for a specific project or as an actual employee

Factors That Can Impact The Cost Of A Design Project

Existing assets or constraints

Time delays due to incomplete communication, indecision, lack of consensus, or perfectionism

Level of complexity

Being indecisive or making multiple revisions to things previously agreed on

Selected materials and finishes

Work closely with your designer, engineer, or manufacturer from the beginning to establish expectations and be as realistic as possible about how much time it will take your team to participate in the process and keep the project moving.

"Budget is what a business has set aside and cost is the price the design agency has quoted. A lot of the time the budget will be short of the true cost. It's important to budget enough from the beginning and find out what the true cost is by getting a couple different quotes from agencies months before beginning the design process."

Cristina Magaña, Modish Creative Co.

Cost of Goods Sold

Cost of Goods Sold (COGS) is an essential financial measure for any business, but is especially important for product businesses. Understanding how COGS works is critical to understanding your profitability and financial position.

COGS is the total of all costs directly related to the sale of your product. What goes into the calculation can vary based on the type of business or product, but generally includes all materials and labor. This includes anything you purchased for resale, raw materials, packaging, and labor or commissions paid that were directly related to the production or sale of your products.

COGS is the absolute lowest price you could sell your product for to break even, which is why it's vital that the number is calculated accurately and you have a solid understanding of what has gone into it. If you sell for less, you lose money; sell for more and you make a profit. The difference between your COGS and your selling price is your margin.

Calculating Cost of Goods for Physical Products



A costing analysis, which is different than COGS, is a term often used to describe a form of accounting or a process for determining the total fixed and variable costs involved in every step of the production process. This detailed analysis can be helpful in preparing quotes for customers, deciding whether to make or buy parts, identifying problem areas in your business, setting goals, measuring impact, reevaluating supplier contracts, identifying target customers, and more. To effectively perform a costing analysis, you will generally need input from those involved in your sales, design and engineering, accounting, operations, and production.

Understanding what goes into your COGS will help you manage your business by allowing you to understand your margins and discover places where you can reduce expenses to increase your gross profit. It also helps you understand other key numbers, like operating and overhead costs, and variable costs. For example, if you consistently notice that you're paying premium shipping fees to get your products delivered on time, you can take steps to correct that to reduce your COGS and increase your margin on those sales.

Protecting Your Work

Not all product design ideas will qualify for or even require a patent, but some do. If your idea has monetary value, it's a good idea to start thinking about how you can protect it from being stolen or copied early on. Intellectual property is a complex topic and it's best to get advice from a qualified legal advisor at some point, but you can save money on those services if you're well prepared for the conversation and have done some of your own research before engaging an attorney.

The U.S. Patent and Trademark Office is also a great resource for information and some general guidance. Additionally, there is more information on intellectual property in Section 5 Compliance & Protection.

Confidentiality is key.

If confidentiality matters, limit what you share with collaborators (designers, engineers, suppliers, etc.) unless there is a clear reason they need to know or you have a confidentiality agreement in place.

For a unique product or process establish non-disclosure and intellectual property agreements with anyone working with you. You can lose your rights if you share your idea with others without one of these agreements in place.

A Non-Disclosure Agreement (NDA) is a legal contract that creates a confidential relationship between someone with sensitive information and the person they are sharing that information with. It's not a guaranteed safeguard against theft, but can greatly strengthen your position in case you have to assert your rights in court.

Document your ideas.

Sketches, notes, and prototypes can help establish ownership of intellectual property.

Dating notes and keeping track of ideas in an organized way will help you prove ownership.

When you have a new idea, write down the date, names of anyone who worked with you, and any other details.

This will help you if you need to work with a legal advisor, want to replicate a design in the future, or simply document your business history for storytelling purposes.

Who Can Help You

A successful product business brings together the expertise and efforts of many unique people. Even with a relatively small product business, there can easily be over a dozen key contributors involved. In the case of large and complex products like cars, thousands of people are part of the development process.

Your network of collaborators is not static and will evolve throughout the course of the product development process.

In the beginning, you need to form a basic understanding of what everyone can do for you, and how you might collaborate. Problems in product development often start from not involving appropriate expertise soon enough: the right people weren't involved when they could have helped the most.

Think about who is in your network now and who else you will need to work with to get this product designed, produced, and into the market?

INVESTORS & LENDERS

Friends & Family
Crowdfunding Bank
or Credit Union Alter-
native / Micro

Lenders
Startup Hubs
Community Foundations
Government

LOCAL PERMITTING & REGULATORS

Local can mean city, state,
federal, or industry

SERVICE PROVIDERS

Web
Utilities
Logistics

EARLY ADOPTERS

Cultural Advisors Di-
verse User Advocates

LEGAL SUPPORT

Intellectual Property
Regulatory Contracts

COMMUNITY LEADERS

Elders
Organizers

DESIGNERS

3D Product
Digital Product
Brand
Graphic

DESIGN RESEARCHERS

Ethnography
User Testing

MATERIALS SUPPLIERS

Primary Source
Backup Source

DEVELOPERS & ENGINEERS

Hardware
Software
Prototyping
Manufacturing

ACCOUNTANTS & FINANCE EXPERTS

Capital
Pricing
Payroll

MARKETERS

Brand Development
Market Research
Pricing
Channel Marketing

MAKERS & MANUFACTURERS

Artisanal
Local
Overseas

BUSINESS & INDUSTRY ADVISORS

Trade Associations
Industry Experts

IT & DATA EXPERTS

Web Developer
User Experience Designer
Website Designer

MERCHANTS, MARKETPLACES, RETAILERS, & WHOLESALE/DIRECT

Local Stores Ecommerce Big Box

Building Your Network

As you can see, there are many different types of people, organizations, and partners involved in a successful product business. Managing both internal and external relationships well throughout the development of your product and your business is crucial to keep things moving smoothly.

Here are some examples of relationship situations that can impact your timing and or production outputs.	
A key designer is available only part of the time that you need, requiring you to work with different people.	A payment is due to your lender , but your biggest customer isn't paying on time, so you're struggling with cash flow.
Your main material supplier has a long lead time to source a key ingredient for your product, requiring you to order far in advance.	You have a public event or presentation coming up soon and want to ensure that your intellectual property is protected.
A supplier asks for a large up-front payment.	Your first prototype is not well-received by an important community stakeholder who was included in the process, but still does not feel heard.



Some relationships will take more time to set up than others and may require detailed contracts. At this early stage, it's important to begin building a strategic mindset about your network.

Key questions to keep in mind are:

Who are my most important stakeholders, and what is their impact?

Many people will start with the customer, or end user, as the top stakeholder. Defining who the customer is can often be a complex activity in itself!

Are you selling directly to consumers via retail or e-commerce? Or is your target customer government departments, wholesale distributors, or other businesses? The answer to these questions can impact whether even more partners are involved. If you're selling directly to consumers via a retail storefront versus an e-commerce platform, you might have a landlord or need to get an inspection from City Planning. If yours is a wholesale customer, you might need a warehousing or logistics partner to package and ship larger volumes of product.

Your partnership and personnel needs are going to be specific to your product, business model, and customers. It's important to think through the lifecycle of your product and understand who you need to engage, for what purpose, and when. The Business Model Canvas introduced earlier can help you think through and organize this information.

How will I manage those relationships? Informal relationships can be very important, but carry risks. As products become more complicated, you may work with a variety of people who have different values, timelines, and styles. Organizing and supervising collaborators eventually becomes a project in itself, and many businesses rely on a project manager or coordinator and use software workflow management tools to keep everything on-track.

When do I need to involve stakeholders/advisors/partners/vendors/designers? Waiting too long to consult with advisors can lead to costly delays and mistakes. It's okay to not know who your key stakeholders are at this stage, but keeping this question in mind can help you avoid common issues in product development.

These involve different needs in terms of frequency of communication, level of detail, formality, and other factors. It's always a good idea to establish clear expectations with all of your professional partners, including vendors, collaborators, and investors. Using a Memorandum of Understanding (MOU) or formal contract to govern the terms and conditions of the relationship is a good practice and can help you keep the relationship and project on track and protect you in the event of a disagreement or unmet requirements.

Setting Up Your Project

There are many ways to define the product design and development process and outline a plan for yourself. Many depend on the industry or type of product you're making—soft goods, machine parts, electronics, etc. But, all include some version of the following phases, which are circular and overlapping throughout.

Brainstorm

- ❑ **Proof of Concept / Prototype Development** — wrong assumptions on how to execute and build the product lead to it not working, having quality issues, or being too expensive to make
- Design
- Engineering / Patterning

Functional Prototype

Evaluation / Testing

Refinement / Improvements

Documentation (Bill of Materials, Descriptions, Renderings, and Patterns, including CAD)

Tooling

Debugging (Diagnosing Problems, Reducing Costs)

Manufacturing

"Spend time going through contracts. If you need a lawyer, get one. Or at least have non-disclosure agreements."

Anjali Purohit, Studio Variously

"Written and visual communication is necessary for all parties."

Elizabeth Salonen, Mottoform Design



Image courtesy of Botzen Design.

Developing a Project Brief

A Project Brief is a foundational document that outlines the essential information, goals, and constraints for a new product development project. It's often considered the blueprint for the project and serves as a reference throughout the process. Product design and development is a process that rewards good planning!

"A design brief helps the designer know what is important and what the priorities are for the product (special use, size, sustainability, etc.). Think through the idea and spend some time writing it down. This is the client's best form of communication. Once you start, you can see where the gaps are."

Eric Strebel, Botzen Design

Most designers will want to provide input on the Project Brief, and some will help you to create it as a part of their services. Your network of collaborators can also help you make your Project Brief stronger. Taking the time to answer questions up front will tighten your creative focus and help you get the most out of the time and money you're investing. A good Project Brief will include answers to the questions on the following page.

"A Project Brief is best thought of as the first creative activity that you do. The most successful teams invest the time to build richly detailed presentations on who the product is for, why it's needed, and how they plan to move forward. On the other hand, teams that view a Project Brief as a box-checking exercise tend to struggle in the long run."

Kevin Gilboe, Industrial Design Society of America, Detroit Chapter

YOUR PROJECT BRIEF

This worksheet will help you to organize your thoughts and prepare for conversations with designers, partners, and investors. Concepts discussed earlier in this section, such as Understanding Your Customer, Business Models & Plans, and Budget & Cost, can be helpful references as you think about these questions.

It's important to remember that completing the Project Brief is not a "one and done" activity. Design is a dynamic and creative process of learning. As you test out your ideas and discover new things, it is important to revisit your assumptions in the Project Brief and make updates. This will help to keep your partners, investors, and team members aligned on the direction of the project.

Who is your product for?

Include photos, articles, and information that you've learned from interviewing potential users.

Why does your product need to exist?

Explain what problem it solves and why others would buy it.

What is your initial idea for the product?

Don't worry if your idea isn't fully thought out—you have to start somewhere!

How do you plan to make money with the product?

What is your business model?

How do you expect to produce and bring your product to market?**What regulations and safety requirements will your product need to meet?****How will the product be branded and marketed?****Are there any known criteria or "wish-list" requirements for the product design?**

It's a good idea to clarify these assumptions up-front to speed up the process.

What is your budget and timeline?



© The Detroit Month of Design®. Photo by Noah Elliott Morrison.

Creating a Scope of Work (SOW)

While a Project Brief is like a blueprint that covers the entire project, a Scope of Work (SOW) is a specific request for a designer (or other collaborator) to do something. The SOW forms the basis of your contract with this person and clearly outlines the work activities, deliverables, and timeline for the project. A SOW can also help guide discussions or practices if disputes arise, and someday, they probably will.

It's important to set clear expectations regarding deliverables, timelines, and resources. This will help avoid misunderstandings and ensure that you and the designer know exactly what is expected. Ideally, you will create a contract that outlines costs, roles and expectations, timelines, milestones, specific deliverables, payment structure, liability releases, and who is responsible for insurance.

SCOPE OF WORK

A Scope of Work establishes clear expectations for a project, so all parties understand what work each party will perform and deliver, when it's due, and the agreed upon price.

Briefly describe your business products or product, including your brand and core values, if applicable:

Explain the project or challenge for which you are currently seeking design services:

Project Deliverable:

User Persona	Study	CAD data
Ethnographic Scan	UX wireframe	Functional Prototype
Initial Concept Sketches	Exploded View / Detailed Sketches	Packaging Mockup
Sketch Model / Volume	Looks-Like Prototype	Finished Specification / Bill of Materials

Desired Result or Goal:

Define Use Case / User Needs	Develop / Debug Design	
Explore Possible Solutions	Finalize Design for Manufacturing	
Prototype / Test Concept Feasibility		

Provide a brief description of of your project including existing challenges or constraints:

SCOPE OF WORK Cont'd

Provide a timeline for execution and completion of your project. Some details here will be specific to the type of project, however, most design projects will at least loosely follow these steps. Be sure to consider any upcoming holidays, product launches, or events that will impact your timing or deadlines.

PROJECT MILESTONES

Expected date for delivery of the following milestones:

_____ Scope of Work Completed

_____ Project Goals Set Budget

_____ Set First Draft Due Second

_____ Draft Due Final Draft Due

_____ Final Product Launched

What are your primary priorities for the project? Think about what you want your business to be exceptional at and let that guide your selection process. Number in order of importance.

_____ Economic (basing decisions primarily on price) Maintenance and Execution

_____ (timeless and/or easy to update or change yourself) Inclusive (adheres to

_____ inclusive and/or universal design principles) Aesthetic (striking and unique design)

_____ Sustainable (design that is good for the environment) Cooperative (created with

_____ designers you regularly work with) Unique (custom design that requires lots of

_____ research to create special solutions) Timeline/Urgency Accessibility Other

Do you know how much you can afford to spend for the services you're seeking? It can be a range, to leave room for discussion and negotiation, but should be realistic in terms of capacity and the scope of the project. Detail the amount below:

SCOPE OF WORK Cont'd

Describe how you would like designers to respond to your SOW. Be sure to indicate when it's due and how to submit it.

Be sure to indicate what you expect them to include. Consider requesting relevant case studies or prior experience, firm overview (mission/values), firm structure and key staff, anticipated consultants or contractors, fee proposal, and project timeline are included. Describe what you would like your designer to include in their proposal:

Be sure to include point of contact information for the project, so that interested designers know who to send their proposal to.

Name

Role

Email

Phone

Be prepared to share more information to help the designers understand what you're looking for. This could include attaching examples of existing marketing materials, collateral, your logo, a link to your website, your mission/values, social media handles, etc.



Photo by Noah Elliott Morrison, 2022 Design Jam.
Image courtesy of The Detroit Month of Design®.

Understanding Timing

Timing is everything. With so many moving parts, product-based businesses are heavily dependent on accurate timing. If you promise to deliver a large, handcrafted table by the week before 4th of July, but then find out you can't get the wood you need delivered until June 30, you're probably going to have a problem. Similarly, if your product is seasonal, like skis, you likely want to ensure they're ready for sale before the snow melts.

To make sure you and your product will be ready for sale in time to meet customer demand and take advantage of prime sales time, you need to know and carefully manage the schedules of all your key partners, the availability of materials, loan repayment dates, etc. Within the design process you will also be dependent on the timing of others. Engaging in negotiations and signing contracts up front can help manage this, but it's also a good idea to have a contingency plan, just in case things don't go according to plan. Chances are, at some point, they won't.

"How fast can it (the product or prototype) be returned for feedback? For samples and prototyping? Are there considerations for domestic and international vendors? When do you have to pay your debt back (if any)?"

Elizabeth Salonen, Mottoform Design



Photo by Noah Elliott Morrison, 2022 Design Jam.
Image courtesy of The Detroit Month of Design®.

Establishing a Timeline for Production and Launch

If it's imperative your product launch at a specific time to take advantage of seasonal sales, set that goal and then work backwards to establish your timeline and manage the milestones and deadlines for the project. How long will it take to produce X before the launch date? How much time before that is needed to create patterns, make molds, or otherwise prepare for production?

If payments to your funders or lenders start on a certain day, you can set that day as the goal and work backwards to ensure you've achieved enough sales by then to fulfill your obligations and protect your credit and reputation. How many pieces do you have to sell to secure enough gross profit to make your payments on time? How long will it take to produce that many? When do you need the materials in hand to be ready for production?

Consider the length of time each phase of the project will take. Going from raw materials to finished product takes some time, but then the product still has to be packaged, shipped, delivered, unboxed, and sold. Your manufacturer, distributor, and seller all need time to process things on their end, and your emergency is often not their biggest concern. So, if you're making beach balls, you don't want to wait until the tulips are coming up to get started.

In all cases, make sure the key deadlines and milestones are communicated clearly in your Project Brief and Scope of Work, and agreed upon with everyone you have a contract with. Having everyone on the project team agree with the timeline from the start will help you keep everyone on track throughout the process.



Section 3

Design

CREATING YOUR PRODUCT

57 What A Product Designer
Can Do For You

58 Choosing the Right
Designer

61 The Design Process

63 Inclusive Design &
Development

64 Documentation

65 Discovery & Synthesis

68 Ideation

70 Prototyping

1 When you're done with this chapter, you

will: Have the information and confidence needed to engage a designer.

2 Be able to assess if your process is inclusive.

3 Understand the phases and iterative nature of the design process.

4 Complete worksheets that will help you take your product through the first phases of product design.

Product design must include consideration of cost, function, aesthetics, manufacturability, and marketing. Each of these categories of decisions can be complex in and of themselves. And when aspects of these goals conflict, which they often do, it's a designers job to balance the adjustments and compromises to come up with the best possible result.

To avoid costly and time consuming mistakes in getting your new product to market, it's a good idea to bring a designer onboard as early as possible in the process. They can help you navigate these complex challenges and make effective decisions.

KEYWORDS**Prototype; Concept, Functional, Working****Test Prototype****Improvements****Test Again****Standards****Compliance****Value Your Concept****Protect Your Concept****Develop Your Concept****Packaging****Labeling****Sell Your Concept**



Photo by Paul Taylor Films, 2024 Design Jam.
© The Detroit Month of Design®.

What A Product Designer Can Do For You

A product designer will typically perform several roles throughout the process of developing a product. In large, complex product companies, design teams will often include more specialized professionals who focus on a single part of the process. Understanding the different roles that a designer can play will help you to make the most of this important partnership as you build your business. Some examples of product design roles include:

Conducting research with users to understand their needs, environment, behaviors, and how they use current solutions. Designers will often summarize what they learn in visual formats such as personas and storyboards.

Developing a diverse range of concepts for how to meet user needs. A product designer will often consider how services, software, hardware, materials, and brand identity can work together to create a valuable product.

Leading the process of translating initial ideas into a final product that can be made. This requires iteration, prototyping, and the application of principles such as Design for Manufacturability (DFM), Design for Durability, Design for Packaging, Design for Sustainability, and Design for Maintainability, to name a few.

- ☒ Collaborating closely with engineers, manufacturers, and suppliers to ensure that the intended design is actually delivered in the finished product. In large companies these activities are often supported by specialized designers with a deep understanding of tooling design and manufacturing processes.

Design



Photo by Lizz Cardwell, courtesy of The Detroit Month of Design®.

Choosing the Right Designer

In addition to different areas of focus, there are other factors to consider in evaluating whether a designer or design firm is a good fit for you. As you interview them, consider asking about:

Cultural perspective and experiences. How well do they understand your target market?

Values and priorities. Do they share your commitment to sustainability, accessibility, value, inclusion, etc?

Previous work and experience with similar projects. Does their portfolio demonstrate the capabilities and scale appropriate for your project?

Terms and conditions of their fees. Do you understand how you'll be billed and what deliverables you'll receive in return? Are their terms and fees reasonable for the agreed upon scope of work?

Communication style and preferences. How and when will they communicate with you throughout the process? How will your documents, drawings, patterns, or other deliverables be returned to you? Are the formats compatible with how you'll need to use them?

Years in business and size of their team. More is not always better, but you do sometimes get what you pay for. What experience or relationship are you looking for and what level of expertise and engagement do you need? What can or do you want to pay for?

"Vet your designers. Not every designer and client are a match. This is a relationship. The designer should be able to show 'this is a beautiful product and this was the process to get there.' Ask this during your vetting process for hiring a designer."

Tom Pavlak, POCO Labs

INTERVIEWING AND HIRING A DESIGNER

You and your designer are both responsible for working together to maintain a productive and beneficial relationship. The designer will guide you through the process of achieving your project goals, but you need to give them an informed starting point! Knowing the importance of establishing trust in this relationship, and understanding problems can result in increased project costs, it's critically important you select a designer right from the start who's right for you, your business, and your product.

General

Does this person listen to you?

Is the person you're talking to the person who will be working on your project?

Do you feel like this person understands your business and your vision for the project?

What are this designer's professional and technical qualifications?

Will you have a designated point of contact throughout the design project? Will you have ready access to that person, if you have questions or issues?

Do you get the sense you can trust this person to deliver what's promised within your time and budget constraints?

Will the designer meet you in person early in the process to fully understand your business and your customers?

"Before you sit down with a designer, do your research to save time and money. Same practice as with an accountant and lawyer. Know who your persona is before you start designing. Have that established before you meet with the designer. Or plan to add that pre-research phase to your budget."

Gina Adams, Wearology

Managing the Relationship

The importance of working with a designer to bring your product to life and to market is clear. But paying for the services and managing the relationship, as with any critical business partnership, can be a challenge.

Consider these pro tips for making the most of the experience.

One way or another, whether you're paying by the hour or not, you are paying for a professional's time, so be on time for every appointment, show up prepared, and be efficient. If you can, do some of the customer research yourself to avoid paying for more time. Public libraries are a great place to find market data and trends.

Communicate openly and honestly with your designer throughout the process, and expect the same from them. Be clear about what you want or don't want, and check for understanding, so that you're on the same page. If you're confused or overwhelmed by something they're saying, don't be afraid to ask for clarity. If you disagree with something, say so, and work towards a resolution.

Be flexible and willing to learn and adapt, even if that means giving up or changing some of the features of your product that you imagined. You have hired design expertise for a reason, so trust that they can add knowledge, experience, and value to the problem you are trying to solve, and hear them out. Again, if you disagree, be open to hearing them out and discussing options. You'll undoubtedly end up with a better, more marketable product in the long run.

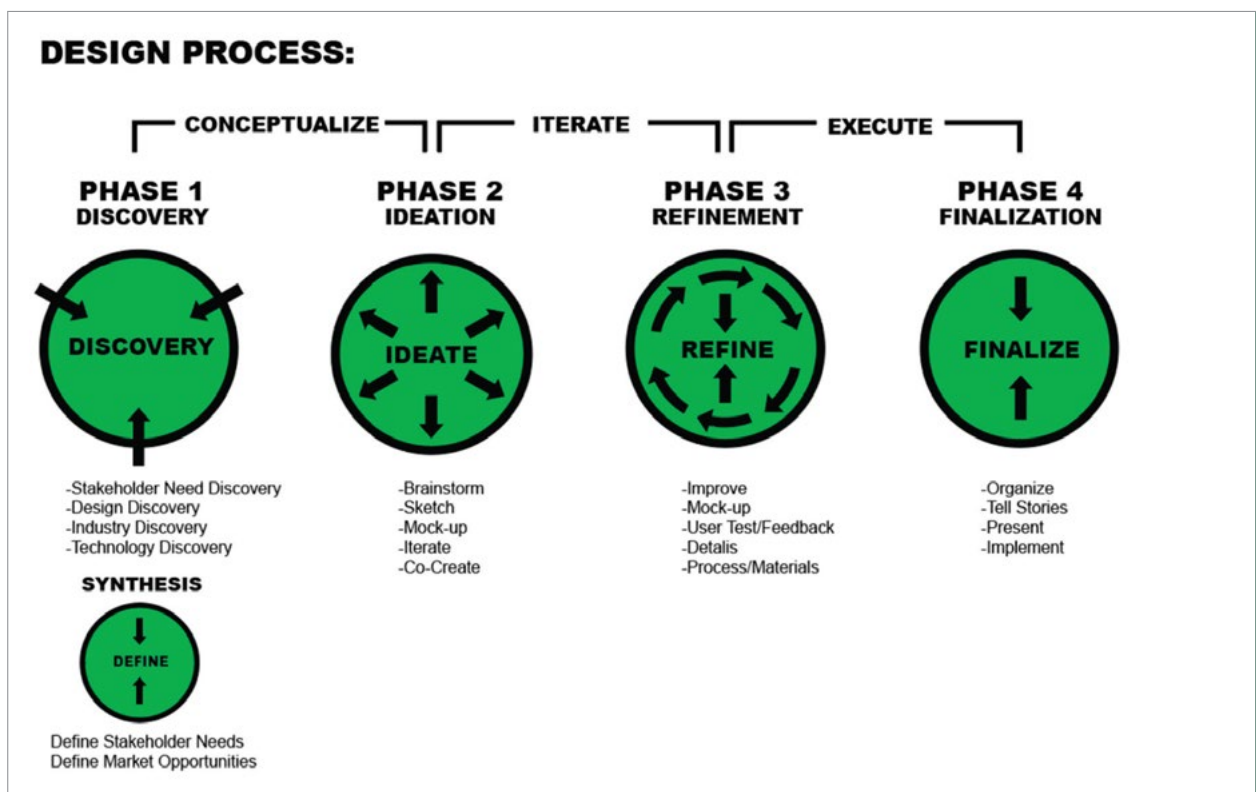
"Depending on the sophistication of the client, customer, or market, research may be the most difficult part to do independently or before design work starts. There are firms that just do design, there are firms that just do market/customer research, and there are firms that do both. It's important to note that the design process, including up front research, may lead to a very different product than what a client imagined on day one. The client should expect to be flexible...if not, then they're likely looking for a scribe (a rented pencil to bring their vision to life). Most designers I know do not do well as scribes."

Tom Pavlak, POCO Labs

The Design Process

There is no one-size-fits-all process in product design and development. So, "The" process is actually "Your" process—your journey will be unique! It's important to keep this in mind because failures in product development can often happen by assuming too much based on previous project experience. An overly rigid approach can make it easy to miss big-picture opportunities, or incorrectly assume that risks are the same across projects. Success comes from continually checking in to see if your assumptions still make sense and that you're learning the right lessons. It's a circular and overlapping process, rather than a linear one with a clear beginning and end.

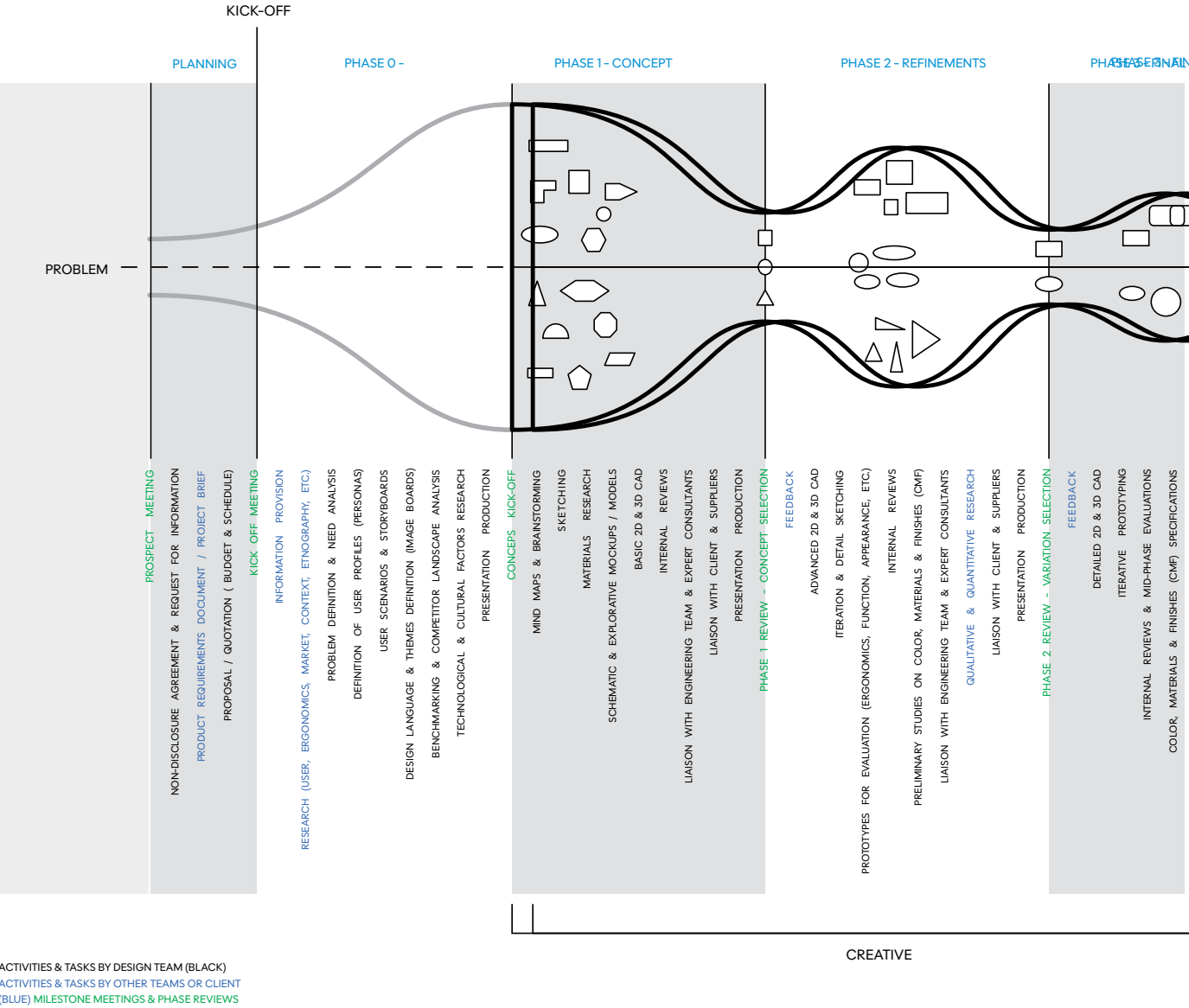
The graphic below and on the next spread illustrate varying degrees of complexity in the product design and development process.

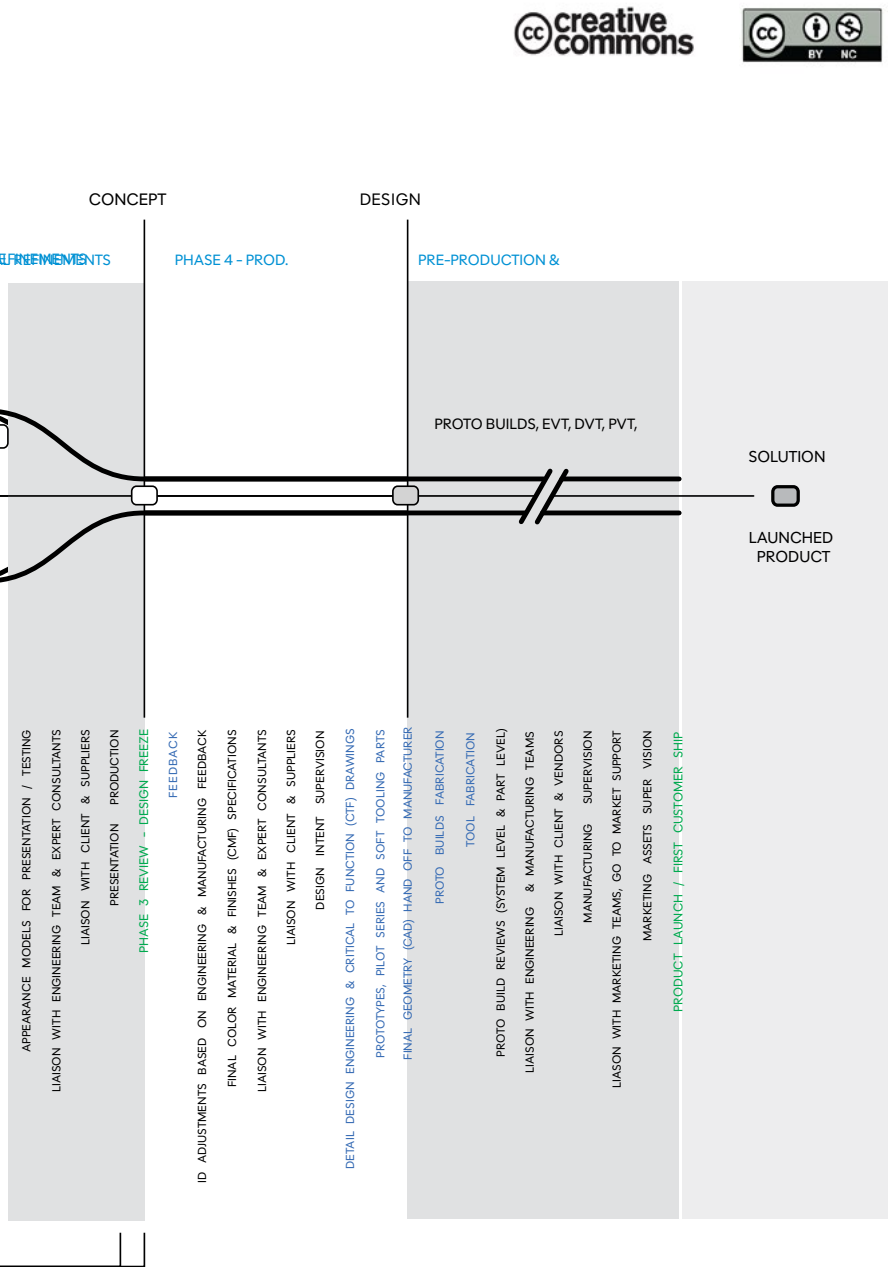


College for Creative Studies Product Design Department.

BY ALBERTO VILLARREAL

The Role of Designers in the Product Development Process





Inclusive Design & Development

Inclusion is a critical success factor in product design. Inclusive product design involves bringing in the right people to lend their perspective and allowing their contributions to inform your product design. When key customer or stakeholder voices are missing from the product development process, problems or misalignments may arise down the road. If yours is an adaptive product, for example, perhaps meant to provide greater access for people with disabilities, then individuals with disabilities should be part of your design and development process.

As we look at the product design processes outlined here, keep in mind that these are only basic maps. As discussed in the previous sections of this guide, you will play a key role in bringing everyone together to create success. As you go forward, work with your collaborator network to clarify their expectations and contributions for each phase.

Documentation

A common reality in early-stage business development is that the entrepreneur or small team is doing everything themselves. For the business or product to grow, however, other people will eventually need to be involved. So, it's critically important that founders learn how to document everything in a way that can be understood and followed by future employees, vendors, and partners.

Given the complexity of product design and manufacturing, it's especially important that designs, parts lists, assembly instructions, and more are recorded and shareable as demand for the product grows. Even before a design has been finalized, it's a good idea to capture the steps along the way. As noted in the planning section, this can help protect your intellectual property, but also provides a historical archive of decision making and business choices.

In addition to notes and drawings capturing the process, you will need to capture and be able to articulate a final design, a list of needed parts, and production and assembly instructions. Depending on the product, required documentation may also include a user manual for your customers.



The Design

Depending on the type of product or industry you're working with or in, the basis for your "design" can be a digital file, a chemical formula, a recipe, a pattern, or a handcrafted finished product.

Regardless of the form it takes, unless your product is a customized, bespoke, or one of a kind finished product, that file, formula, recipe, or pattern will need to include all parts and processes needed for production and assembly, so they can all be repeated in the manufacturing process.

You can create the patterns yourself, but it often requires a specific skill set. This is another area where a professional product designer can help.

When you approach a third party or contract manufacturer to get a quote or discuss the production of your product, they will likely first ask to see your pattern, so they understand the parts, materials, and assembly required to do the job. What you need to show them will depend on the type of product you've designed. Textile manufacturers, for example, require a Techpack. In hardware manufacturing, it's likely a CAD or computer aided drawing file that's needed. In some cases, the pattern might be a prototype, replica, or casting of the product that can be used to make any molds or tools needed for reproduction.

Discovery and Synthesis

You've made many assumptions in your product story, business model concept, and any design concepts that you've cooked up so far. While these ideas may make sense to you and you feel confident in your business, doing thorough research on your customer, competitors, market, and technologies affecting your product will help to prevent problems later on.

Your goal in this phase is to gather as much information as you can and create scenarios of possible futures. **A professional Design Researcher can help you to get the most out of this phase of the process.** Creating visual storyboards is a great way to organize and communicate what you're learning. They can also help to create an inspiring environment for the next phase: ideation.

Some topics to consider exploring include:

- Customer behaviors and voiced or unspoken needs
- Perspectives and realities of historically excluded people within your market
- Contemporary trends in design, culture, and markets
- Industry benchmarking, competitive analysis, and relevant topics in the crowdsourcing world
- Market segments and channels
- Accessibility needs and opportunities
- Pricing and costing (labor, materials, distribution)
- Technology discovery: trends in materials, software development, and manufacturing

An excellent source of customer and market information is the robust business and people database, **DemographicsNow**, which is available through any Michigan public library or the Michigan Electronic Library (Mel). Go to www.mel.org to learn more.

The end user is typically the primary focus during design and development. At the end of the day, the product needs to work well for who it's designed for. However, sometimes your customer—the person who is actually buying the product—is different from the end user. If you are designing a new medical device, your product will likely need to be approved by hospital leadership and doctors. They will only buy it if they believe it works, understand how to use it, and see that it can benefit their patients. In this situation, the needs of both the patient, or end user, and the purchasing customers are important to understand.



Image courtesy of David Medina, LIVAQ.

"Find the market. Then you know the

needs. The design process flows so much

David Medina, LIVAQ



Image courtesy of Design Core Detroit.



Photo by Paul Taylor Films, courtesy of The Detroit Month of Design®.

Moving Through The Design Process

The following Inclusive Design Exercises were adapted from content provided by Urban Manufacturing Alliance for Design Core Detroit's annual Design Jam on Adaptive Products.

Brainstorm

Once you are confident you have a clear idea of who your customers are, what they want and need, how they feel about yours or similar products, what their days are like, and more, you are ready to start brainstorming solutions. Invite your team, including your product designer, to share thoughts and reflections regarding the customer personas you've developed, and then broadly share thoughts and ideas on how to account for the information in your product design. Use the previously discussed tools, like the Project Brief and others to communicate your ideas.

Ask yourselves, "What if..." and allow ideas and creativity to flow freely. There is no right or wrong way to brainstorm, so come up with your own ways to share and generate new ideas.

Narrow Down Thinking + Developing

At this point, you should have a list of possible features and functions to meet the needs of your customer. Now is the time to start narrowing down the list and deciding what you can and should focus on.

What ideas or concepts are feasible and can be incorporated into your product at this time? You may have to make decisions based on financial and production resources and other constraints, like regulatory considerations, available materials, manufacturing capabilities, etc.



Image courtesy of The College for Creative Studies.

Once a concept is chosen, begin to iterate on different design details, depending on the type of product you're designing and producing. The list of questions can be endless, but some examples include:

- Are the buttons or features intuitive?
- How does someone put it on and take it off?
- Is it accessible to a wide range of my customers?
- What materials can it be made of?
- How will it be manufactured?
- Can it be customized to each user?
- How does it fit?
- Are any of the proposed features in conflict with my customer personas needs?

Create a Pitch Deck

Visual presentations that answer these and other questions about your product and company can be used to generate early sales, inspire investment, or secure partners for the next stages. Graphic designers can help translate the information you've collected from customers, the design decisions your team has made, and the market potential for your product into engaging visuals that attract more attention for your product or business.

Ideation

In this phase, whether working alone or with a designer, you will begin to create sketches and mockups of your idea. Typically, several rounds of sketches and mockups are required to fully explore and understand the range of possible design solutions. Throughout the process you should continuously ask yourself and your designer how each concept serves the requirements that you've outlined in the Project Brief, and how well it fits into your user's world.

Creating an Efficient, Easy to Use Product

Dan Radomski, Centropolis Accelerator

Good Design Principles:

- 1 Minimize the number of parts
- 2 Reduce custom designed parts
- 3 Minimize the number of process steps
- 4 Design out parts that commonly fail (springs, fasteners, belts)
- 5 Target multi-touch operations for process step reductions
- 6 Eliminate movements, adjustments, ergonomic problems, re-orientations
- 7 Design parts that are easy to locate
- 8 Design the parts to fixture themselves one to another — **Design for BOB**
- 9 Design the product for Poka-Yoke (Error Proof) — **Design for BOB**
- 10 Design out handling problems (think bulk packaging)
- 11 Use gravity, don't fight it
- 12 Question servicing and simplify or eliminate packaging
- 13 Teamwork — The difference between good and bad designs
-

DESIGN FOR BOB

It is essential for good engineers to communicate with people on the manufacturing floor in order to get a better understanding of how their designs are actually being put together.

It can be very easy for an engineer to perhaps overlook a part design that could be assembled upside down as well as right side up or left-handed versus righthanded. If the parts are put together incorrectly, it can create a manufacturing issue further down the assembly line where the operator would be forced to disassemble and go back, or perhaps scrap a part or even a whole assembly.

Parts assembled wrong can create a manufacturing defect that may escape undetected. This affects the quality of the product causing future warranty issues, thus reducing the company's overall profit.

Engineers designing parts must consider assembly and design, so parts can't physically be put together wrong. Remember that in all cases, the engineer or designer must consider designing for B.O.B. or a Blind One-armed Operator—essentially, a one armed robot. If your designs are not able to be put together by B.O.B., then you need to seriously rethink your design process.

READ MORE: <https://www.leandesign.com/Newsletters/munroreport008.html>

"Inventors of products or services can and should get as far as they can before hiring outside help to save costs. This starts with all of the ideation and mock ups. They should also consider things like branding, logos, colors, and textures. This can easily be done by asking themselves, if this was an outdoor brand, what brand would this be?"

Run through these questions...if this was a car, or footwear, what brand would this be? This helps you define the fit, look, and feel target right off the bat. There should always be hierarchy to colors, form, textures, and the like as well. Study the visual brand language of brands that are similar to your invention and apply it for a great starting point."

Todd Kauranen,
Industrial Product Designer



Photo by Lizz Cardwell, courtesy of The Detroit Month of Design®, © Design Core Detroit.

While it's human nature to look for positive feedback on your idea, (especially if it's yours!) it's smart to be a skeptic and look for issues. Every failure is a learning experience and there's a saying that "failing fast helps you succeed sooner." Your network of collaborators can help by challenging you with different perspectives. **This is an ideal time to ask for feedback from engineering, manufacturing, and marketing collaborators.** These roles will become increasingly more involved and important as you move forward.

"Think of a soup. Start with the basic ingredients, taste test, then add more until you get the flavor you're looking for. Continue to get customer feedback to come up with new ideas. It's all about iteration and improving."

Richard Choi, Choice Idea Works

When ideating and testing new ideas or products, it's often said entrepreneurs should fail and fail fast, meaning that it's important to try and test things early and often, and make necessary adjustments before you've invested too much time, money, and other resources to recover.

Early on it is important to talk to the people who will use your product AND to the companies that could make your product, to get as much information as possible.

Start your production small, then grow it as you learn. Make one (component or entire product)

Test it

Break it

Learn from it

☑ Make any necessary

adjustments Then, make another five (sample quantity can vary, it is simply important to make more)

Test them

Break them

Learn from them

Continue to tweak and make adjustments to the design as necessary

While the costs (financial and time) of testing can seem daunting, it will be less expensive to fail when making 10 than 10,000.

Do not work in a bubble. Your ideas will get better faster if you see everyone as a contributor to your idea, rather than someone poking holes in your work.



Photo by Lizz Cardwell, courtesy of The Detroit Month of Design © Design Core Detroit.

“Prototyping and testing go hand in hand. Consider all elements your product will come in contact with. You are always going to have to go through multiple iterations.”

Elizabeth Salonen, Mottoform Design



Photo by Paul Taylor Films, courtesy of The Detroit Month of Design © Design Core Detroit.

Prototyping

A professional designer can help you develop sketches into prototypes that can be tested with real users. Thanks to evolving technologies like 3D printing and Virtual Reality (VR), the range of prototyping options has exploded.

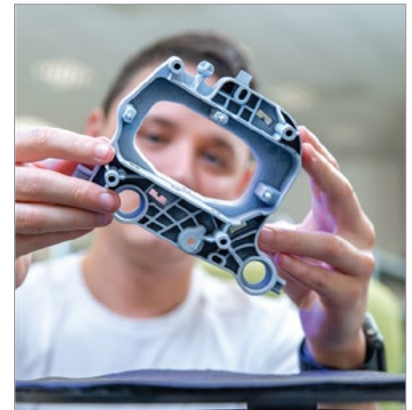
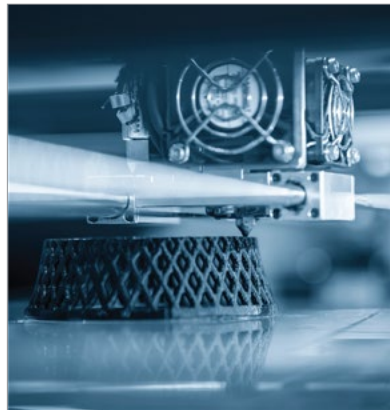
Depending on what you need to learn and test, you will likely have several options to create useful digital and physical prototypes. Digital prototyping typically offers the capability to demonstrate complex interfaces or even to edit the concept in real-time based on feedback. Physical prototyping allows you to assess the real world scale of your product—size, shape, weight, usability, etc. as well as how details like color, finish, and material should look. A physical prototype can also help set targets for engineers on how parts fit together and overall craftsmanship.

Some examples of prototypes you may use include:

- Foam Core Mockup
- VR Mockup
- 3D Animation
- App Demo for a Smart Device
- 3D Printed Working Prototype
- Usability Buck

"When you actually start (testing), it filters out a lot of things. What is available? What is in shortage? For example, droughts and floods are impacting the availability of organic linen and cotton. Only a few companies control these things. It is the way the system is. These are on-the-ground realities. Testing early on is important because it can save your peace of mind. Who are the real players in the market? It is different in each country. Testing can save a lot of time/money/energy."

Anjali Purohit, Studio Vicariously



Prototyping + Product Definition

Finally, you're ready to create an initial prototype or 3D representation of your product. At this stage, it does not have to be a working prototype, so go ahead and use temporary or scrap materials to modify an existing object or make something new that demonstrates the concept.

Next, define your product and develop an explanation about how it responds to the challenges experienced by your end users and is feasible within your resources and constraints.

What is your product?

How does it / will it work?

How does your design respond to the challenge(s) of your future customers?

How will it realistically be produced with the resources you have?

How is someone's life improved by using the product?



Section 4

DEVELOPMENT & LAUNCH

BRINGING YOUR PRODUCT TO MARKET

74 Refining Your Design

76 Choosing Your
Manufacturer

80 Finalizing Costs &
Pricing

81 Test Marketing

84 Distribution & Fulfillment

87 Ramping Up Production

88 Launching Your Product

When you're done with this chapter, you will:

1. Understand how to refine and produce your design.
2. Be able to choose the right manufacturer for your product type.
3. Understand all your costs and be able to set the right price for your product.
4. Be familiar with the different ways you can market your product.
5. Understand how to produce and launch your product to market.



Image courtesy of Design Core Detroit.

Refining Your Design

For many businesses, the next phase, Refinement, is a complex and high-risk part of the product development process. This is where doing the up-front work—creating your product story, developing your business model, and all other activities you completed in the Discovery phase—really counts. Businesses who did not invest this time and instead sped ahead with too many untested assumptions or without including the right people may find themselves wasting a lot of time and money now.

Resource-intensive workflows that happen within the Refinement phase can include:

Functional prototypes of the concept are created, which sometimes require custom prototype tooling to be engineered, built, and tested.

A preliminary Bill of Materials (BOM) is created and suppliers are evaluated for cost and quality. An example of a BOM can be found in the Choosing Your Manufacturer section.

Prototype packaging for the product is created. Sometimes, separate testing is done on the packaging concepts to refine graphics, messaging, and shelf placement.

High-quality (usually expensive) prototypes are reviewed with trade partners who will help to launch the product. In the case of startups, these prototypes are also reviewed with investors to secure funding to take the product to market.

The product's financial assumptions and commitments are firmed up to enable "go-no-go" investment decisions. If long lead time investments in tooling, facilities, or supply chain capabilities are needed, decisions are made about what is in-scope and out-of-scope.

Apps and software launch with test users at different levels of completion, commonly called "alpha" or "beta" builds. Dedicated debugging and test groups are often set up just to evaluate and refine the software.

Various marketing activities ramp up in scale. Development of launch campaign assets begin, which can influence the final form of the product.



Photo by Cydni Elledge, courtesy of The Detroit Month of Design®. © 2024 Design Core Detroit.

Each of these workflows will typically involve several collaborators in your network.

In a large company, hundreds of people may be working together in this phase. Development costs accelerate rapidly, and so do the cost of errors. This is a great time to check in with your stakeholders and ensure that all voices are included and heard. At this phase, high-quality prototypes will make it easy for everyone to understand the product. If there are concerns, it's far better to raise and resolve them now, before you've paid for production equipment and inventory!

Since the Refinement phase can be very complicated and challenging, it's helpful to break it down into a few sub-topics that will be your primary focus, including manufacturing, costs and pricing, test marketing, distribution and fulfillment, production, and product launch.

Though the general concepts in product design and development are universal, specific concepts or terminology may differ depending on the type of product or industry you're working in. For example, some industry-specific considerations for product design and development in the fashion sector include:

- Determining fit and sizes and assigning measurements (S,M,L or 2,4,6, etc)

- Pattern making and grading design into sizes

- Pattern marking to prepare pattern pieces for later in production

- Making samples to check for fit and adjust accordingly within size

- Shopping the samples when you sell them via runways, sales reps, tradeshow, showrooms, online, brick and mortar stores, wholesale into other stores, door-to-door, and via custom orders

- Creating "Immediates" for stores like Forever 21, where orders have to be ready in a month (can you meet those production demands with your existing resources?)

- Bundling or segmenting the work to consider how you are sending it down the line

"It's challenging to make 100,000 of anything with a craft method and equally hard to make bespoke or unique products with a manufactured, high-volume, and high-investment approach."

Tom Pavlak, POCO Labs

Choosing Your Manufacturer

You and a small team can likely produce artisanal products that are handcrafted or simply made in small batches on your own. However, if your goal is to create a large quantity of your product, it's likely you will need to partner with a manufacturer. Before even looking for a manufacturer, it's important to understand what you need.

Ask Yourself

- Are you looking for custom fabrication or large-scale production?
- What materials are needed to make your product?
- Are there any quality standards you need to meet?

Capability Statement

A Capability Statement is a marketing document that summarizes a company's products and services, and what it can do for potential clients. As a product creator it's important to have your own and know your manufacturer's. The five key areas included in a successful Capability Statement include:

1. Core competencies / capabilities
2. Differentiators, including facilities and equipment
3. Past performance
4. Corporate data including industry codes
5. Contact information

Make sure your manufacturer's capability statement shows they have the machinery, skilled labor, and experience to produce your product.

KEYWORDS

Manufacturing and
Production

Equipment

Machining / Tooling

Suppliers

Raw Materials

Production (Process, Flow,
Scheduling, Throughput)

Material Flow (Fabrication,
Assembly, Finishing)

Packaging and Labeling
Quality

Waste and Scrap

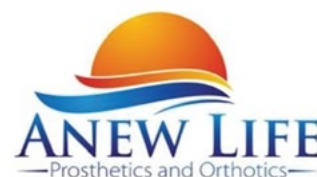
Inventory / Output

Workplace Organization
(Plant Layout and Material
Flow, Visual Controls, Safety,
Compliance)

LINKED RESOURCE

▢ [See How to
Write an Effective
Capability Statement](#)

ANEW LIFE PROSTHETIC AND ORTHOTICS MANUFACTURING CAPABILITIES STATEMENT



DIFFERENTIATORS

Anew Life is an independent Prosthetics and Orthotics practice that provides artificial limbs, braces, diabetic footwear, and custom orthotics, as well as mastectomy products.

On-site fabrication laboratory lets Anew Life customize products as needed for each patient.

3-D scanning technology also provides an innovative way for Anew Life to create many of its prosthetics and orthotics.

Anew Life educates and empowers their patients, so that they both understand how to fully utilize their device and get back to their activities of daily living.

PRODUCTS

Prosthetics (artificial limb care)
Orthotics (brace) care
In-house fabrication
Diabetic shoes and insoles
Custom and off-the-shelf devices
Compression garments
Clinic and home visits
Digital scanning, CAD/CAM,
3-D Scanning and Printing
Mastectomy products

AWARDS

2010: Rick Knas Lifetime Achievement Award for Chris Casteel
2015: NEIDEAS \$10K Challenge winner
2016: FedEx Small Business Grant Contest Top 100 Finalist
2016: Best of #MichBusiness Honor
2018: Best of #MichBusiness Honor
2019: Corp! Magazine's 2019 Michigan's Economic Bright Spots winner
2020: Motor City Restore recipient

CURRENT CUSTOMERS

Medicare
Medicaid
Blue Cross Blue Shield of Michigan
Meridian
Aetna
Cofinity
Humana
Multiplan
Priority Health
Veterans Administration
Northwood

CONTACT INFORMATION

Address:

6438 Woodward Ave.
Detroit, MI, 48202

Telephone: 313-870-9610

eFax: 313-202-8301

Email: info@anewlifepando.com

Website: www.AnewLifePandO.com

Facebook: [AnewLifeProstheticsAndOrthotics](https://www.facebook.com/AnewLifeProstheticsAndOrthotics)

Instagram: [@anewlifeprosthesis](https://www.instagram.com/anewlifeprosthesis)

NPI: 1932453594

NAICS: 339113, 423450, 446199

DUNS: 021820929

TAX ID: 27-4826466

To assess what manufacturer will best fit your needs, you need to clearly document what goes into your product.

For physical products, a product designer and a mechanical engineer with relevant experience can help you to develop these details. In the case of software, a User Experience (UX) designer and developers typically help to specify functional requirements.

Documentation that manufacturers need will often include:

Product Specification Sheet:

This outlines key details about the product like dimensions, materials, colors, and quality standards.

Bill of Materials (BOM):

A list of all of the materials, components, and sub-assemblies needed to manufacture the product including quantities, specifications, and any preferred suppliers.

Technical Drawings and CAD Files:

These show a 360 degree view of the design of the product and include precise measurements.

Sample or Prototype:

This helps a manufacturer to understand the intended look and feel of the product, and can help you to communicate any complex features.

Assembly Instructions:

If the product requires assembly, provide detailed instructions including diagrams and steps.

Packaging Specifications:

How the product should be packaged, including packaging materials, dimensions, and labeling requirements.

EXAMPLE OF CAD IMAGE:



Wing Thing, from Morgenstein Tool. Image courtesy of Botzen Design.

Eric Strebel of Botzen Design designed this tool for Morgenstein Tool. It is used to adjust wing nuts on drum kits. Made 100% in the USA, this product is machined from aluminum in Oregon and then shipped back to Detroit where it is hardcoat anodized. After the finishing process, the logos are laser etched and the product is shipped out to customers. It's ecofriendly, sustainable, recyclable, and durable. Currently only available in finer drum stores in the U.S., but expected to be sold in Guitar Centers and Sweetwater stores worldwide in 2025.

Getting detailed quotes from multiple potential manufacturers can help you to understand how to fine-tune your product's design. It's also a good time to evaluate the quality and reliability of manufacturers. Sometimes choosing the cheapest option is not the best. If a manufacturer is more reliable, sustainable, or produces higher-quality goods, it might be worth it to pay a bit more.

"I think introducing the concept of the Bill of Materials to a product entrepreneur early is important. It's less important for a craft item, such as a leather bag, but much more important for a mass production item. Changing from a two part assumed design to a three part design could have huge implications for the investment needed and the entire business model."

Tom Pavlak, Poco Labs

Bill of Materials (BOM)



Every part matters. Count them up!

PART	MATERIAL	#	SUPPLIER	COST	TOTAL
Lens	Polycarbonate	2	Lens Co.	\$0.10	\$0.20
Nose Piece	Soft-Durometer Plastics	1	Plastic Co.	\$0.02	\$0.02
Frame	Polypropylene	1	Plastic Co.	\$0.90	\$0.90
Decorative Insert	PUD-Coated Styrene	2	Plastic Co.	\$0.005	\$0.01
Screw	Stainless Steel	2	Grainger	\$0.10	\$0.20
Ear Pads	Soft-Durometer Plastics	2	Plastic Co.	\$0.005	\$0.01
Arm	Polycarbonate	2	Plastic Co.	\$0.40	\$0.80

Finalizing Costs & Pricing

Understanding Your Costs

What it costs to make your product is not just the materials that go into it, it's everything else. The costs you have will be unique to your product and your team, but may include:

Manufacturing: The cost of producing your product, including raw materials, labor, packaging, and equipment. Higher production volumes may reduce costs per unit, depending on how your product is made.

Research and Development Overhead: The cost of professional services like design or engineering, along with the software, hardware, and supplies that they use.

Regulatory Certification: The cost of securing permits, licenses, and approvals for your product to be sold from relevant government agencies. Most products require some form of labeling with information about contents, country-of-origin, and instructions for use and safety.

Legal Support: The cost of filing for intellectual property, creating contracts, and managing disputes.

Prototyping: The cost of creating prototypes to test and refine the design before final production.

Tooling and Equipment: The cost of specialized tools or equipment needed for production, such as molds or machinery.

Quality Control: Every manufacturing process has an error rate, and there are costs involved to test and inspect for quality.

Inventory: The cost of storing your finished inventory, including consideration for reducing your inventory if storage costs are too high.

Packaging and Shipping: The cost of preparing your products for shipping and physically delivering them to customers.

Marketing and Advertising: The cost of promoting and selling your product, including advertising, public relations, and marketing.

"Before you start with fabric and sketches, determine who you are and what your price point is. That's part of your identity. Also, think about the pattern and production in pricing your product; labels and packaging, fabric, and details in design, i.e. seams, pleats, pockets. All of these things contribute to cost and should be reflected in your price"

Michigan Fashion Proto

Setting the Right Price

Just like costs, developing a pricing strategy is a bit more complicated than simply stating how much you will sell your product for. Customers tend to form a strong impression of your product's value based on your price, and it's not easy to change your price, especially upwards, once it is set.

Understanding your costs will help you choose a pricing strategy that aligns with your brand, target audience, and market conditions. It's often beneficial to combine elements of different strategies and be flexible in adapting your approach.

Different ways to think about pricing include:

Cost-Plus Pricing	You add a markup to the cost of producing the product. It's straightforward, but doesn't always take into account what customers are willing to pay. They may value your product far more than its cost.
Competitive Pricing	You set the price based on what competitors are charging for similar products. This strategy can help you to position your product effectively in an established market.
Value-Based Pricing:	Set prices based on how much value customers perceive in your product. If your product offers something truly unique with benefits that customers love, you may be able to charge far more than competitors.
Psychological Pricing	Set prices in a way that appeals to a customer's emotions. A common example is setting prices just below a round number, like \$9.99 instead of \$10.
Discount Pricing	Offering discounts can attract more customers. However, it's important to use this strategy carefully to avoid devaluing your brand or destroying your profitability.
Bundle Pricing	You can sell multiple products together at a lower price than if purchased separately. This can encourage customers to spend more and can be especially effective if you are offering multiple products.
Penetration Pricing	When launching a product, you set a low initial price to quickly attract customers and gain market share. Free trial periods also fall into this category.
Skimming Pricing	You set a high initial price for your new product, then lower it over time. Often used for seasonal or fashion-oriented items.
Dynamic Pricing	This involves adjusting prices in real time based on market demand, competition, and other factors. This strategy requires a data-intensive approach and may be more suitable for companies with advanced analytics capabilities.

However you choose to approach pricing, your strategy needs to support enough sales revenue to meaningfully offset your costs. If building cash flow scenarios isn't your thing, this is a good time to work with financially-minded collaborators in your network. It is well worth the effort! Spending the time to work out your cost and pricing strategy will help you to understand what you can afford, negotiate with investors, and refine the details of your product.

KEYWORDS**Identifying Market Need****Pricing****Packaging****Marketing Medium (Direct Marketing, Web, Television, Print)****Merchandising (Tv, Radio, Billboards, Search Marketing)****Market Research (Customers and Competitors)****Distribution Channel****Distribution Incentives****Incentive Strategy****Channel Design****Web Development****Creative Design****Branding****Promotion****Public Relations****Advertising****Internet Marketing (Website, Email, Social Media)****Customer Satisfaction****Test (Validate) Your Prototype****Value Your Product Concept****Sell Your Product Concept****Comply With Requirements For Your Product****Benchmark Your Product Design****Acquire Your Raw Materials****Comply With Requirements For Raw Materials****Benchmark Your Finished Product****Test Marketing**

There are many ways to go to market, and it's important to evaluate if your product can succeed in your chosen marketplace. The product story and business model you created outlined your initial assumptions. After Discovery and Ideation, you should have a much clearer understanding of how your final product will take shape. Before you make a large investment in production, test marketing can help you to assess if the product, pricing, promotion, and place of sale are connecting with your target customers.

Marketing can be complicated, and if you don't have a background in marketing, you may want to consult with an expert in your network. Like hiring a designer, investment in professional marketing expertise will go a long way towards saving time and setting you up for success.

That said, starting out with test marketing is a good way to understand if you have a clear path to success. Test marketing can be thought of as a focused research project where you produce a limited quantity of your product and offer it for sale to your target customers. In the world of software development, the beta testing phase fills a similar role. Key areas of your marketing strategy to test and prove out will include:

Product & Packaging: Do your customers see value in your product and actually want to buy it? Some companies will test multiple packaging concepts in case a poor packaging design is not selling the product effectively.

Place: Are your customers able to find the product in places that they normally would shop? If you are selling in a brick-and-mortar store, are you in the right location and is your product visible on the shelf? If you're selling online, is your product linked to the right search terms? If your product isn't being seen by enough people, it will be difficult to sell.

Price: How you present your price is just as important as the pricing strategy. Psychology plays a huge role, and it's difficult to understand pricing dynamics without simulating an actual selling process. In a test marketing project, multiple price points can be evaluated.

Promotion: A product is only one component of an overall marketing campaign. This can include advertising, social media posts, in-store displays, and other marketing communications. Effective promotion can boost an average product, and poor promotion can sink a great product. Test marketing can help you understand if everything is working together or not.

People: While it may seem like a given, many different people have to

work together effectively for a product to succeed. You, employees, customers, trade partners, and suppliers are some of the most important players. Think of test marketing as a "dress rehearsal" to confirm that the key relationships are working.

In an increasingly connected world, who you work with to sell your product is usually a make-or-break relationship. Often called a "trade partner" or "channel," these organizations have unique values, business models, and ways of working that you will need to understand. While a great channel relationship can be a win-win for everyone involved, it must be managed with care and attention to avoid issues. Connecting with experienced channel marketers and salespeople who have worked successfully with your intended channel can help you.

How To Go To Market

Selling Direct: You are the main channel partner and sell directly to customers yourself. This can take multiple forms like a physical store, pop-up store, mobile store, your website, or a booth at a local market. Selling direct maximizes your contact with customers, gives you full ownership of your brand experience, and helps you stay on top of changing market dynamics.

Wholesalers & Distributors: Basically the opposite of selling direct. You sell your product in bulk to another company that handles marketing, sales, and fulfillment for you. This model suits companies who want to focus mainly on high-volume components. A common pitfall of working with distributors is a weak relationship between a product maker and their end customer.

E-Commerce Platforms: Selling your products online through large marketplaces like Etsy or Amazon can be thought of as a hybrid of selling direct and working with a retailer. On one hand, you can typically set up your own online storefront and interact with customers directly. On the other hand, some E-Commerce platforms have been known to aggressively market competitors alongside you and influence pricing.

Retailers: This category can include everything from national big-box chains to a local "mom and pop shop." A key point to keep in mind is that in nearly all cases, the retailer will put the needs of their business first. Big box retailers are well-known for being very involved in the development of products sold in their stores. Buyers can effectively dictate product design, packaging, pricing, and promotions with a very deep understanding of shopper analytics. A retailer may ask a competitor to copy your product in order to replace you, or increase their leverage on price. There is potential for great success in working with a retailer, but these are often the most challenging channel relationships to maintain.

Specialty Marketing Strategies: You might also consider having your products included in a local or regional subscription box or working with a social media influencer, who can help draw attention to your products. Designers may also suggest brand-specific strategies to launch your product.



Distribution & Fulfillment

Once orders start coming in, you'll need to deliver the products to your customers. If you are selling directly to your customers, this can be as simple as handing it to them in person. If you're selling through retail partners, you will ship products to those partners, who in turn handle the final sale to customers. Many retailers are often more sensitive to holding inventory than a distributor, and may require a continuous, lowlead-time approach, which you'll have to manage. You may also be asked to create unique packaging that fits the inventory system and equipment in the retailer's warehouse or showroom.

As your business grows, distribution tends to become more complicated. You will need a way to package your product for shipping, monitor your inventory, physically move products to your customer, and manage returns. This may also include a need for labeling, kitting, assembly, tracking, and more.

When first starting out, many small businesses will store inventory on-site, pack orders, and handle shipping and returns themselves with carriers like FedEx, UPS, or USPS. At a small scale, it may make sense to ship orders one-by-one or in batches, depending on the customer.

At some point, however, as the business grows and sales volumes are higher, or if the product or customer demands a faster turnaround time than you alone can deliver, it might be more efficient and cost-effective to outsource these services. Often referred to as 3PL or Third-Party Logistics, these partners can handle the warehousing, assembly, kitting, packaging, labeling, shipping, tracking, returns, and customer service.

If you sell your product on Amazon, for example, you could use Fulfillment by Amazon (FBA) and then services such as storage, packing, shipping, customer service, and returns would be handled by them. You could also choose a local or regional fulfillment vendor. In the Detroit area, for example, Evans Distribution Systems, Michigan Box Company, and Thumbprint Fulfillment all provide these services to varying degrees. Digital shipping platforms may also work for your business. Some, like Shopify, ShipStation, or WooCommerce, often integrate various carriers and streamline the shipping process for you. See the resources section at the back of this guide for more information on these vendors.

Kitting describes the process of bundling multiple items together to be sold and tracked as one unit with a single tracking number. If you sell and ship a table that needs to be assembled, for example, kitting would involve making sure every box had all the parts and pieces, including nuts and bolts. Prior to receiving and shipping orders, you may require your fulfillment partner to pre-assemble these kits, so they are ready when the orders roll in.



Photo by Dan Cristian Pădureț via Pexels.



Some partners may include package design, prototyping, and box testing, in addition to assembly, fulfillment, and warehousing. Others may only handle logistics, like storage, shipping, and returns.

Selecting a partner who understands your vision and can deliver your desired brand experience is critical. To do that, requires you have and are able to clearly articulate a strong brand identity and brand guidelines, and that you consider and periodically review how these are conveyed to your customer. Consider the end-to-end supply chain. If your 3PL is handling them, for example, how will you get them the inserts, labels, and other things they need to execute your orders and package and ship your products on time?

Another important consideration in contracting with a 3PL is the agreed upon scope of work and pricing structure that adequately reflects your desired outcomes.

What is it that you need them to do and how much will it cost? For example, do you want them to include a catalog or promotional materials? Do you want a specific color of tissue or wrapping? What language or images are on the box or bag? By consistently following your design vision, your fulfillment partner helps with your marketing, future sales, and customer support functions, so you want to make sure you're on the same page.

Altogether, the expense of distribution and fulfillment is part of your cost of goods sold.

When working with your partners to establish an agreed upon scope of work, consider what percentage of the total retail or sale price you can realistically afford to allocate to these functions and negotiate accordingly. You want to balance the services you're paying for, with the cost of having to store parts and products, package and label orders yourself, and so on. What is your time worth?

The cost of these services may also impact how you offer your products. Is it more profitable, for example, to sell a single product or a case of products? How does that impact your price and shipping costs?

Check out Templates and Tools available on page 146 for additional information on when and why outsourcing your fulfillment can be beneficial.



Questions to Ask Your 3PL

- How long have you been in business?
- How many people are on staff?
- What is your revenue?
- What similar customers do you currently work with?
- Can you handle the specific requirements of my products?
- Where do you intend to store my products? What can you tell me about that location or the facility?
- What other services do you provide?
- Who services my account? Who are the key contacts?
- What are the payment terms and what types of payment are accepted?
- Can you give me a few scenarios on how your rates would be applied?
- How do I send orders to you? Email, phone or online?
- What type of warehouse management systems or other software systems do you use?
- What systems can you integrate with?
- Is there an online portal where I can track my inventory? What does that look like?
- Do you have in-house IT support or do you outsource it?
- What type of data can you provide me? Do you provide reports? Can you track "x"?
- What cadence will we have? How should I communicate changes or issues?
- What is the lead time for orders? What is your daily cutoff for getting orders out?
- What are your receiving hours and how do I schedule a drop off?
- What is your insurance coverage and lien, in case of an emergency?
- What is your policy for handling damaged product?
- What type of emergency plan do you have in place? (IT, cybercrime, disaster, accident, etc.)

As a 3PL customer, you should feel comfortable about the answers to all of these questions. A 3PL partnership is a critical component of your supply chain, and you want to be sure that your products are in the hands of people you can trust. Take your time when evaluating your next 3PL.

Interested in setting up a visit? Call Evans Distribution Systems at 1-800-OKEVANS or [request a quote](#).

Ramping Up Production

At this phase of the process, you will have already spent significant time with your manufacturing partners and evaluated early production runs. You've likely done some form of test-marketing and are seeing a good response from your customers. While every product is unique and you will follow your own path, there are common issues that product developers face in ramping up production. Here are few tips based on real-world experience:

Top Ten Tips For Production Ramp-Up

- 1 Professional project management can help to synchronize your supply chain timing with your product launch. Companies that launch a product, but don't actually have it ready for customers to take home won't make anyone happy.
- 2 Create scenarios for low, average, and high demand. How will you respond if the product does better than expected? Customers can quickly tire of continuous "out of stock" signs and move on.
- 3 Have a game plan if it suddenly becomes a "bad time" to launch. World events like pandemics, wars, and other market disruptions have a nasty habit of appearing out of nowhere. What flexibility do you have to delay production or adjust volumes to fit a new reality?
- 4 Aggressively monitor product quality—ideally in-person—as production ramps up. This will strengthen expectations with your suppliers and fix "bad habits" in production before they turn into standard procedure.
- 5 Watch for material variations. In small initial production runs, variations in color, finish, and other characteristics might not be obvious. In larger runs, you may see a need to adjust your material specifications to account for variances.
- 6 Plan for packaging changes. A last-minute material substitution or country-of-origin change as you ramp up production can force you to re-label the product. Have a plan for how this happens.
- 7 It's normal for tooling and equipment to need adjustment, which requires a budget. While a lot of bugs are sorted out in initial prototype runs during the refinement phase, a manufacturing process usually takes multiple full-scale runs to optimize.
- 8 Keep your options open on shipping. Scaling up production will likely be the first large-scale test of your distribution network. Assume that issues will happen, such as promised capacity not being available or transit taking longer than expected.
- 9 In overseas sourcing situations, clarify customs formalities well in advance. Large production orders will typically receive much more scrutiny than small initial prototype runs. Delays and costs can be substantial if planning is not done ahead of time.
- 10 There's no substitute for a "go and see" approach. The quality of team relationships play a big role in how fast issues can be resolved. Spending quality time on-site during production ramp-up helps to create understanding and an inclusive problemsolving culture.



Launching Your Product

Launch Day is an exciting moment and a time to recognize the efforts of everyone involved in building your new product. By now it should be obvious that product design and development is a team sport. Your network of collaborators will be playing key roles to ensure that everything comes together. At this point in the process, it's helpful to balance your excitement to keep things moving with a strong risk-management mindset.

It's a good practice to build a Launch Readiness Checklist together with your team. Different professional backgrounds will see the project from different angles and help to identify risks that need to be addressed for launch. Examples of Launch Readiness Checklists can easily be found online, and you may wish to use a version that is integrated into product management software.

Ask Yourself

Launch Readiness Key Questions

Product Design Integrity: Does the manufactured product work and look as intended?

Manufacturing Process Maturity: Can you make the product reliably with consistent quality at the intended cost?

Customers: Are you confident that your customers will understand and want to buy your product? Do you know who your "early adopters" are that can help you build interest in your product?

Product Safety: Have you tested your product for possible misuse and addressed any safety concerns?

Regulatory Compliance: Have all regulatory requirements been met, including proper labeling?

Legal and Intellectual Property: Have you filed for the appropriate patents, copyrights, trademarks, and secured appropriate contracts with partners?

Marketing Launch Plan: Are your marketing plans and assets ready and aligned with your trade partners? Are launch events ready for prime time? Is an appropriate budget in place to support the launch?

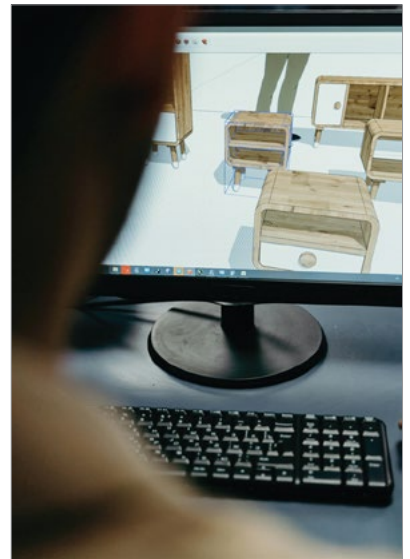
Sales Support: Are the right people in place and trained to help you sell your products and manage relationships with trade partners? Are sales objectives clearly defined?

Distribution Plan: Are you confident that you can package and ship the product to your customer on time and at full volume?

Customer Service: Are you able to respond quickly to customer feedback and questions?

People Plan: Do you have a plan for how your organization and network needs to evolve as it transitions from "development" to "growth mode?"

Risk Management: Have you worked with your team to build game plans in case things don't go according to plan?





Section 5

Compliance & Protection

UNDERSTANDING INTELLECTUAL PROPERTY, LIABILITY,
AND ADVERTISING CLAIMS

93 How IP Protection Works

93 Who Can Help You

94 What is Your Idea Worth?

94 Assessing the IP
Landscape

95 Preparing Your Idea

95 Selling & Licensing Your
Idea

96 Product Liability

99 Advertising Compliance

When you're done with this chapter, you will:

1. Understand how to protect or sell your idea and who can help you do so.
2. Be able to set a price for your idea by analyzing its market value.
3. Know the definition and importance of product liability protection.
4. Know the importance of both general and industry-specific regulations and compliance requirements.
5. Understand there are legal guidelines for making Made in the USA claims.

Image (left): Photo by Lizz Cardwell. © 2023 Detroit Month of Design®.



While this section is by no means exhaustive of the legal, compliance, and insurance information product entrepreneurs need to understand and account for throughout the lifecycle of their business, it does introduce 3 key subjects product designers and makers need to consider from the start:

intellectual property protection, liability, and advertising claims.

Intellectual Property (IP) refers to creations of the mind or imagination that are used in commerce. Examples include product and business names, images, and symbols, as well as literary and artistic works, inventions, and designs. You can protect your intellectual property and discourage other people and businesses from taking and profiting from your ideas through the acquisition of patents, copyrights, and trademarks.

How IP Protection Works

There are many different kinds of protection for intellectual property. Utility patents, design patents, copyrights, trademarks, and trade secrets are all different forms of intellectual property. To make things more complicated, IP laws vary around the world. If you are sourcing a key part of your product from another country, you may wish to secure protection for your idea there as well. Here's a basic overview of the different kinds of intellectual property:

Utility Patents: You share how your idea works with the public—as a published patent—in exchange for the exclusive right to sell that idea for a set length of time. If you file for a patent before other inventors, it prevents others from legally making, using, or selling your product without your permission for a fixed period of time.

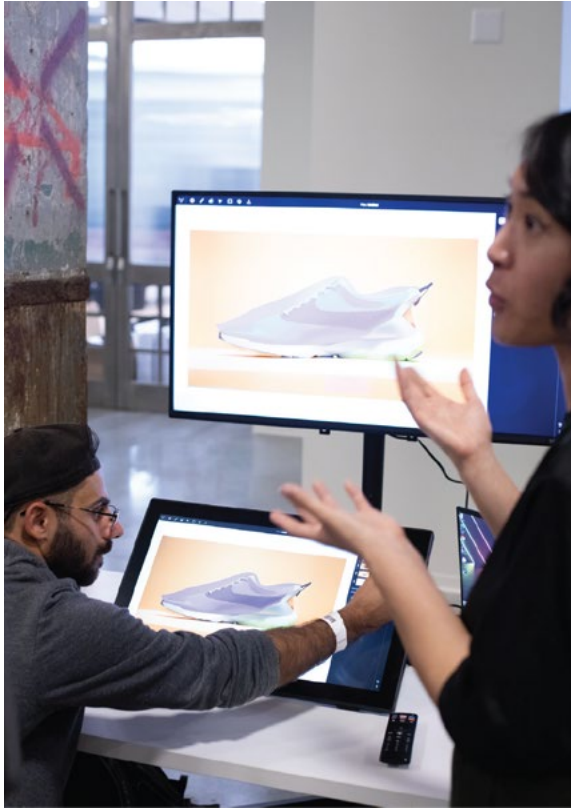
Design Patents: This is similar to a Utility Patent, but it only covers a unique look or configuration of a product, so a small design change may allow others to create something similar. These are generally less expensive than a Utility Patent.

Copyright and Trademarks: These have traditionally been used for creative works like books, pictures, and movies, but increasingly they are being applied to software, user experience (UX), and brand strategy. Registering a copyright for a published work can be done online at copyright.gov. Companies with a sophisticated and long-term (in other words, very expensive) legal strategy can sometimes create nearly permanent ownership of a product design through trademark strategy.

Trade Secrets: You don't publish how you make your product. Recipes for popular foods and beverages often fall into this category. It's important that you take steps to protect access to this information, such as non-disclosure agreements with those who need to know the trade secret.

Who Can Help You

Intellectual property is a complicated field. If you're planning to sell or license your idea, it's best to get qualified advice early. Startup accelerator programs like TechTown and Centrepolis Accelerator can help to connect you to the right experts. A key point to keep in mind is that there is a difference between the advice of a qualified legal professional, like a patent attorney, and an experienced entrepreneur. The real-world experience of other founders is very valuable, however, it is not a substitute for an attorney's legal advice. Attorneys will typically require a fee to work with you, but are certified to provide legal advice on securing your intellectual property. For any serious IP-focused business, an IP attorney will play a key role.



What is Your Idea Worth?

An IP attorney will help you understand how well your idea can be secured as intellectual property, but they generally can't tell you how valuable your idea is. There are many examples of patents that have little to no market value. Technologies or product ideas can be obsolete, but still be covered by an enforceable patent. Sometimes, patents are filed for ideas that are technically feasible, but totally unworkable as an actual product.

An experienced product marketer, startup accelerator coach, or venture capitalist can help you assess the value of your idea. Some of the key questions that they will explore with you first include:

What research have you done to understand who would benefit from your product idea, how large the market is, and how others would implement your idea? (e.g. cost, timing, capabilities)

Is your idea unique and novel enough to be covered by a patent? How difficult is it to duplicate the idea's functionality with another approach? Having a patent filed on your idea is often an early requirement for working with a venture capitalist or marketer.

Do you have a Minimum Viable Product (MVP) or prototype to demonstrate that your idea works in the real world? What testing have you done to validate your idea?

Assessing the IP Landscape

You may have a great new idea to solve a problem, but it's likely not the only way to do so. Intellectual property typically incorporates and builds on existing ideas, which are called "prior art" in legal terminology. As you are building your product idea, it's important to carefully document existing solutions and show how your idea is unique. Take a look at the claims section of published patents on similar ideas to get a sense of what you'll need to think about. Documenting prior art is an important step in working with an IP attorney, so the more work that you do to get organized, the more efficient the process will be.



Preparing Your Idea

In the world of IP, it's important to plan ahead, since timelines often include many steps and progress slowly. While a qualified IP attorney can help you understand the needs specific to your idea, here is an overview of common steps to patent a new invention:

- 1 **File a provisional patent.** The U.S. Patent and Trade Office (USPTO) offers a lower-cost and faster option than a full patent application to establish your filing date. Your filing date is important if you expect competitors to try to file a patent for the same idea. Typically the patent office will grant a patent to the earliest filer.
- 2 **Review and document existing similar inventions (prior art).** You can start this process as you are researching and building your idea, but a qualified IP attorney will formally conduct a prior art search with you and determine what should be included in the patent application.
- 3 **Define what you're claiming as a new invention.** Be prepared to spend some time revising this. The goal is to carefully word your claim statements to include all possible variations of your idea.
- 4 **Prepare patent drawings.** Patents use a unique style guide to signify what is being claimed versus prior art. This is a specialized task that will require an expert known as a drafter. The USPTO or a patent attorney can usually make referrals to trusted drafters.
- 5 **Write the formal patent application and get sign-offs from all inventors.** Usually, more than one inventor is listed on a patent. Your co-inventors will need to agree to the contents of the application. A dispute later on between co-inventors could result in the patent being ruled invalid.
- 6 **Submit the application, pay the fee, and correspond with the Patent Investigator at the USPTO as needed.** You may receive a notification with questions that you will need to respond to quickly to continue moving forward.

Selling & Licensing Your Idea

There are many ways to make money from your idea. Startup accelerators will have experts on-staff who can work with you to design a strategy that fits your business. In some cases, it may make sense to sell your idea totally. If you have a patented idea for a product that you have no interest in building, you could agree on a price with a prospective buyer and assign all rights to them. Alternatively, you could create a licensing agreement to allow others to use your idea for a fee (often called a royalty). For example, a manufacturer can make and sell your patented product idea, and pay you a percentage of their sales.

Free licensing agreements also exist, where you allow others to use your idea without payment. Typically these agreements require that credit is publicly given to the inventor. Free licensing is a similar concept to open-source licensing and appears most often in the software industry.

As you consider how to sell and license your idea, it pays to proceed carefully and ask several experts a lot of questions. It's possible to start making money faster if you are licensing a great idea to a manufacturing company that already has the ability to scale production, but you may also be closing off options that you might want later. Your great idea might be a lot more valuable in the end if you build your own business, versus selling it off early. Take your time and consider possible futures for you and your business.

"Product liability is the legal burden that designers, manufacturers, distributors, and business owners can have if a product causes harm to customers."

Reference: A Guide to Product Liability for Business Owners, by Shopify Staff, published December 1, 2022 <https://www.shopify.com/nz/blog/what-is-product-liability>

Product Liability

Anyone involved in the manufacturing or distribution of a product can be sued by a consumer who is injured. This may include the owner, designer, manufacturer, distributor, or retailer of the product. In a product liability lawsuit, the person bringing the suit must prove the product was defective and that their injuries were caused by that defect. A judge could rule that the defendant is responsible, even if the defect was unintentional or they had no knowledge of the defect. Personal exposure or responsibility for individuals can depend on the legal structure of your business entity.

Some examples of product defects include:

Manufacturing defects: The product was made incorrectly.

Design defects: The product or features are unsafe, or there were safer alternatives.

Marketing defects: The product's risks were not adequately warned about.

Breach of warranty: The product did not meet an express or implied warranty.

Damages that can be awarded in a product liability case include:

Pain and suffering

Mental anguish and emotional distress

Loss of enjoyment of life

Fear of future illness

Loss of consortium, which is a claim made by a spouse or child of the injured person

Because there is so much potential exposure for a product business, it is critical that you consider insurance protections and work with a product liability insurer in the early stages of planning to understand your risks and prepare yourself.

Product Liability Insurance

Be sure to include a licensed insurance agent early in your product development journey. Help the agent to understand your short-term and long-term exposures. Securing a quote for commercial liability and property insurance is a detailed process. Be prepared to share your business plans with your agent.

Liability Insurance

Consider an individual's personal liability exposure. Their risks arise largely from personal activities and ownership of property, such as driving and owning motor vehicles, occupying and/or owning a home, and conducting personal and recreational activities.

In contrast, business liability exposures may arise from far more sources:

- Operations at its premises and other locations
- Activities of its owners, managers, employees, and volunteers
- Activities of the public at its locations
- Ownership, maintenance, and use of owned and nonowned motor vehicles and equipment
- Liability for the property of others held in its care, custody, or control
- Liability for its advertising
- Injuries to its employees
- Ownership and/or occupancy of real property
- Ownership and/or use of business personal property
- Use of customer personal information

This list is by no means exhaustive and serves to illustrate the fundamental exposures an average business might face in a single day.

Commercial General Liability Insurance

Businesses face a number of liability exposures relating to their operations, and protection against the resulting liability claims is most frequently provided by a Commercial General Liability policy.

The possibility of being legally liable for injury or damage at the insured's place of business is the Premises Exposure.

Possible liability arising out of doing work away from the insured's place of business is the Operations Exposure.

After the insured performs services or work at these off-premises locations and leaves the job site, possible liability for defective workmanship is the Completed Operations Exposure.

After the insured sells goods or merchandise and the goods leave the premises, claims relating to defective goods or improper warnings represent the Products Exposure.

Coverage is not provided if the insured's product is recalled because of a defect—this is known as the Sistership Exclusion.

Businesses may also have Contractual Liability for actions or failures to act per the language of a contract or agreement. Injuries to employees or their relatives arising out of the employee's work duties is covered by Workers' Compensation and Employers Liability policies.

Building and Personal Property Coverage

Building and Personal Property Coverage is coverage applying to buildings, business personal property, and the personal property of others. The insured may choose which of these coverages applies to their policy. Building coverage includes the described building, completed additions, outdoor fixtures, permanently installed machinery, and personal property used to service the insured buildings.

Business personal property coverage includes furniture and fixtures, stock, and tenants' improvements or betterments. Personal property must be in or on the described building, or within 100 feet of the premises, including in the open or in a vehicle.

Property not covered by the Building and Personal Property Coverage includes accounts, money, animals, autos held for sale, paved structures, underground pipes, growing crops, and outside fences and antennas.



Advertising Compliance

Advertising Claims

Before declaring your product is Made in the USA, American Made, or any similar claim, like "green" or "organic," you need to determine whether you meet the compliance requirements of the Federal Trade Commission. From a legal perspective, there is a difference between Made in the USA, Assembled in the USA, and Designed in the USA.

As with all complex business and legal considerations, there are a lot of factors to consider in determining whether the ability to make these marketing claims is important to your business. If you're unsure about whether or not your product qualifies under the law, it is advisable to seek legal counsel.

TOP ADVERTISING LAW ISSUES

What is Made in the USA

There are various standards and regulations governing "Made in USA" claims, including the primary Federal Trade Commission (FTC) standard, as well as other important federal requirements under the Buy American Act and Inflation Reduction Act.

FTC Standard

Other Standards:

Buy American Act

Inflation Reduction Act

Express and Implied Claims

Clear and Conspicuous Disclosure

An unqualified "Made in USA" claim means that the product meets the FTC's strict "all or virtually all" standard, indicating that all significant parts and processing originated in the United States. These claims can appear as simple statements like "Made in USA" or "American-made" without any qualifying language. The product must contain only negligible foreign content, and its final substantial transformation must occur within the United States.

A qualified "Made in USA" claim includes additional explanatory language that indicates the product is not entirely of domestic origin. Examples include "Assembled in USA from foreign parts," "Made in USA with imported materials," or "60% U.S. content." These qualified claims are appropriate when products contain significant foreign content or processing, but still have a legitimate claim to some U.S. manufacturing or assembly. The qualification must be clear, conspicuous, and accurately reflect the nature and extent of U.S. manufacturing or processing.

Key differences:

Unqualified claims require meeting the stringent "all or virtually all" standard

Qualified claims allow for significant foreign content, but require specific disclosure

Unqualified claims can use simple "Made in USA" statements

Qualified claims must include clear explanatory language about foreign content

Unqualified claims face stricter FTC scrutiny and enforcement

Qualified claims offer more flexibility, but require precise qualifying language

UNQUALIFIED CLAIMS

Made in the USA

Manufactured in the USA

Assembled in the USA

Designed in the USA

QUALIFIED CLAIMS

Made in the USA with _____

Manufactured in the USA with _____

Assembled in the USA from _____

Designed in the USA with _____

Providing Evidence for Your Claim

To claim that your product is made or partially made in the USA, you may need to provide:

Manufacturing Records

- Bills of materials detailing origin of all components and parts
- Manufacturing process documentation showing where production occurs
- Cost breakdowns showing percentage of domestic vs. foreign costs
- Supply chain records tracking component sourcing
- Quality control documentation from U.S. facilities
- Records of substantial transformation activities in U.S.

Supply Chain Documentation

- Supplier certifications verifying component origins
- Purchase orders and invoices showing material sources
- Transportation and customs records for imported components
- Documentation of supplier audits and verifications
- Records of changes in component sourcing

Compliance Documentation

- Evidence supporting compliance with FTC's "all or virtually all" standard
- Documentation of qualified claims if using "Assembled in USA" or similar
- Records showing final assembly location
- Proof of substantial U.S. manufacturing operations
- Regular compliance audit results
- Documentation of any deviations from original manufacturing claims

Product-Specific Records

- Technical specifications showing where parts are manufactured
- Assembly process documentation
- Testing and quality control records
- Packaging and labeling approval records
- Cost analysis for total manufacturing costs
- Documentation of substantial transformation processes

Ongoing Maintenance

- Updated supplier certifications
- Regular manufacturing process reviews
- Periodic compliance audits
- Records of any changes in manufacturing locations
- Documentation of quality control measures
- Evidence of continued compliance with FTC standards

What is a Green Claim?

This includes environmental marketing claims, including specific terminology like "eco-friendly" and "sustainable." Green Advertising can be any communication (text, imagery, logos, labels) stating or implying that a product or business has a positive or no impact on the environment, is less damaging to the environment than other products or businesses, or has improved their impact over time.

Key terms include

Eco-friendly
Green
Earth-smart
Sustainable

Substantiating Your Claim

You must provide evidence to support your marketing claims, sometimes even before the claim is made (called pre-claim substantiation.) This includes handling multiple interpretations and establishing a reasonable basis for claims.

Before making your claim

- If there is more than one reasonable interpretation, you must have substantiation for each interpretation
- You must have a "reasonable basis" for any express or implied claims
- You must base green claims on the full lifecycle of the product (unless clearly stated otherwise)
- You must make information that you cannot easily fit in an ad easily available to consumers (e.g. via QR code, clear link to website, etc.)

Broad Claims Should Be Qualified

- Identify the specific attribute to which the claim refers
- Use clean and prominent qualifying language such as "Bottle uses 25% less plastic than before" vs. "Eco-friendly package"
- Claims are based on what a reasonable consumer can understand, not your intent as the advertiser

Aspirational Claims

- Tie it to measurable outcomes
- Have a plan in place to achieve the outcome

Recycling Claims

- It is considered deceptive if a product cannot be "collected, separated, or otherwise recovered from the waste stream through an established recycling program for reuse or use in manufacturing or assembling another item"
- Use clean and prominent qualifying language
- Must be qualified to avoid deception on the availability of recycling programs for consumers
- Don't misconstrue increased recyclability (e.g. claiming a product is 50% more recyclable because recyclability went from 1% to 1.5%)
- If product is made of recycled material, but cannot be recycled, then it cannot have a recycling claim

Legal Considerations When Working With Influencers

Working with influencers can help your product reach your target customer. However, before working with them, make sure you understand what qualifies as an "endorser" and "endorsement," who can be liable for noncompliance, and how to clearly and conspicuously disclose material connections between the influencer and your brand. Disclosures must be "difficult to miss (i.e., easily noticeable)" and "easily understandable by ordinary consumers" and "unavoidable" when made on social media or in other interactive digital content.

Subscriptions

There are also specific requirements for subscription-based services, including disclosure obligations, consent requirements, cancellation procedures, and notification requirements for free trials and renewals. It's important to stay up to date with evolving regulations in this area.

Brands that offer recurring subscriptions should:

- Clearly and conspicuously disclose material recurring subscription terms

- Obtain consumers' express consent to the full subscription terms (and plan for the likely "double opt-in" consent as proposed in the FTC's rule)

- Provide simple and easy cancellation methods

- Send a reminder notice before free trials convert to a paid subscription and before paid subscriptions automatically renew (as currently required by certain jurisdictions and proposed in the FTC's rule)

- Stay current on changing laws and enforcement trends in this area





Section 6

Scaling Up

TAKING YOUR PRODUCT BUSINESS TO THE NEXT LEVEL

106 Product Strategy

108 Scaling Business Models

109 Scaling Production

110 Scaling Distribution

When you're done with this chapter, you will:

1. Be able to plan for success as you scale your product.
2. Ask yourself key questions about how and when to scale.
3. Understand common challenges businesses face as they scale production.

It's normal for new challenges to arise as you scale up your business. An approach that works well enough when you're just starting out may not be appropriate for higher sales volumes and larger channel relationships.

The good news is that you are not alone: many have already faced similar challenges and can help you find solutions. Leaning on your network and resources in this guide can help you. In this section we'll take a look at a few common topics that product businesses face while scaling up.

Product Strategy

At the end of the day, product design and development are really all about relationships. When everything is going well, the user of your product trusts that they will be getting a consistent and satisfying experience. Ideally, your user loves the product and is happy to recommend it to their friends, extending the relationship further.

It's always a challenge to design, develop, and launch a product. The effort involved can be exhausting, and it is tempting to consider the project "done" and want to move on to something else. To build a successful long-term relationship with your customers, it's helpful to anticipate this natural mindset and have a plan.

Stories From The Real World: Launch And Abandon

There is such a thing as getting a bit too good at developing and launching new products. Fast Products is a fictional name for a real company with decades of experience in cranking out new solutions. Fast has a large laboratory with world-class experts in various product categories. They're able to develop interesting products before anyone else, and create manufacturing processes that few competitors can copy.

But all is not well at Fast. Their enthusiasm to develop new products isn't matched by an interest to invest in marketing and channel development over time. Fast's products would often grab a small initial share of the market with early adopters, but never really scale to anything truly large. Like bottle rockets, these products would launch and quickly fizzle out. The technology-focused culture at Fast, always distracted by the next new thing, didn't see value in building long-term relationships. As a result, the market share of Fast's products remained relatively low.



The most successful product companies are effective at accelerating past the initial product launch. Much of this ability starts with people and culture. Teams that are great "builders" are often quite different from those that are good at growing a business and maintaining customer loyalty. An inclusive culture that values different contributors will tend to outperform companies where only one kind of team is dominant.

As you think about the future, here are a few questions that you can explore with your team:

What would make our product obsolete, or disrupt our business?

Businesses that challenge themselves to see past their current success are in a better position to take action than those which simply hope for the best.

How can we best preserve what we've learned in the product design and development process?

It is unfortunately very common for development teams to disband after a product launch. Creating a new product is intense, and burnout is common. Planning ahead early for this natural reality will help to avoid the loss of important knowledge.

How can we build our product into a platform or product family?

Nearly all of the most successful product companies have built a full range of products on top of their first success. Beyond the functionality of the product, what they are really selling is a trustworthy relationship with their brand.

Scaling Business Models

The success of a business model and a product are closely linked. A product can be thought of as a set of choices about cost, quality, and content. As a business grows, it is very normal to rethink these choices. Selling your product with an established retailer can offer visibility to huge markets and an opportunity for large sales orders. But a big opportunity often comes at a steep cost as retailers will typically require agreements that impact the profitability of your business model or expose you to aggressive competition. Consider these helpful questions:

How do your costs scale? Selling more products will certainly require more materials, equipment, and people. Costs typically do not scale in a smooth way: there may be large investments required to step up to a higher level of production.

What drives your pricing? Pricing decisions naturally have a bigger impact in larger businesses. Scaling up a business tends to lead to more complexity in setting the price of your product. Think through scenarios on pricing versus competition at different sales levels.

What are your non-negotiables? Some businesses deliberately choose to avoid any scale-up that would require a compromise in product quality. In other cases, a business may choose to expand production slowly in order to protect a closely-held trade secret. Having clarity on what truly drives the value of your product is essential.

How strong is your competitive advantage? All businesses attract competition as they scale up. Good intellectual property, coverage can help to ensure the success of your business model for a few years, but ultimately long-term success depends on customer loyalty. Great brands think through how they remain valuable next to the inevitable copycats.

A startup accelerator is a great place to connect with experienced entrepreneurs who can advise you on scaling up business models. While every opportunity is different, a clear view on the key questions above will help you to successfully grow.



Detroit Designer Ali Evans at a 2024 Drinks x Design showcase. Photo by Cydni Elledge, © 2024 Design Core Detroit.

Scaling Production

In the physical products world, scaling production has a direct impact on costs, timing, and complexity. Higher sales is great news for an entrepreneur, but it often brings challenges as well. Let's look at a few examples:

You've been selling a few hundred units a year of your hand-crafted product online, when it's profiled unexpectedly by a major celebrity. Demand goes through the roof and you have orders for over 100,000 units. A retailer calls and is interested in a line of your products. What do you do?

To be successful in your market, you need to offer a wider range of colors and styles for your product. Making all of the colors and holding them in inventory would be very expensive. What do you do?

You've been selling your product through a retail store and a competing chain has expressed interest in carrying your product. They insist on an exclusive line with unique product sizes, labels, and content. The opportunity for sales is large, but you will need to make many investments to take on the added complexity. What do you do?

Your supplier is not willing to make the investments needed to make more products and back-orders are starting to pile up. Another supplier looks promising, but their equipment is slightly different and will require changes to your product. What do you do?



Photo by Paul Taylor Films, courtesy of © 2023 The Detroit Month of Design®.



Image courtesy of Design Core Detroit.

Scaling Distribution

At some point in your company's growth, you may need to consider securing a fulfillment partner to manage the distribution of your products. The following questions from Evans Distribution Systems, a 90-year old third-party logistics company in Michigan, will help you make that decision.

When Should I Outsource my Fulfillment?

This is an important question to ask yourself. As difficult as it may be to walk through the steps to determine the right answer, it is essential that every product business entertains this idea. Evans has created a list of questions to ask yourself in order to determine when you should outsource your fulfillment:


1

What are my sales goals?

Is your goal to grow your business by focusing on sales? If so, this is the number one thing to consider when looking to outsource fulfillment. If you are able to focus on sales and marketing, and rely on your fulfillment partner to handle all of your orders, you are more likely to succeed at growing your business.

2

What volume of orders am I processing?

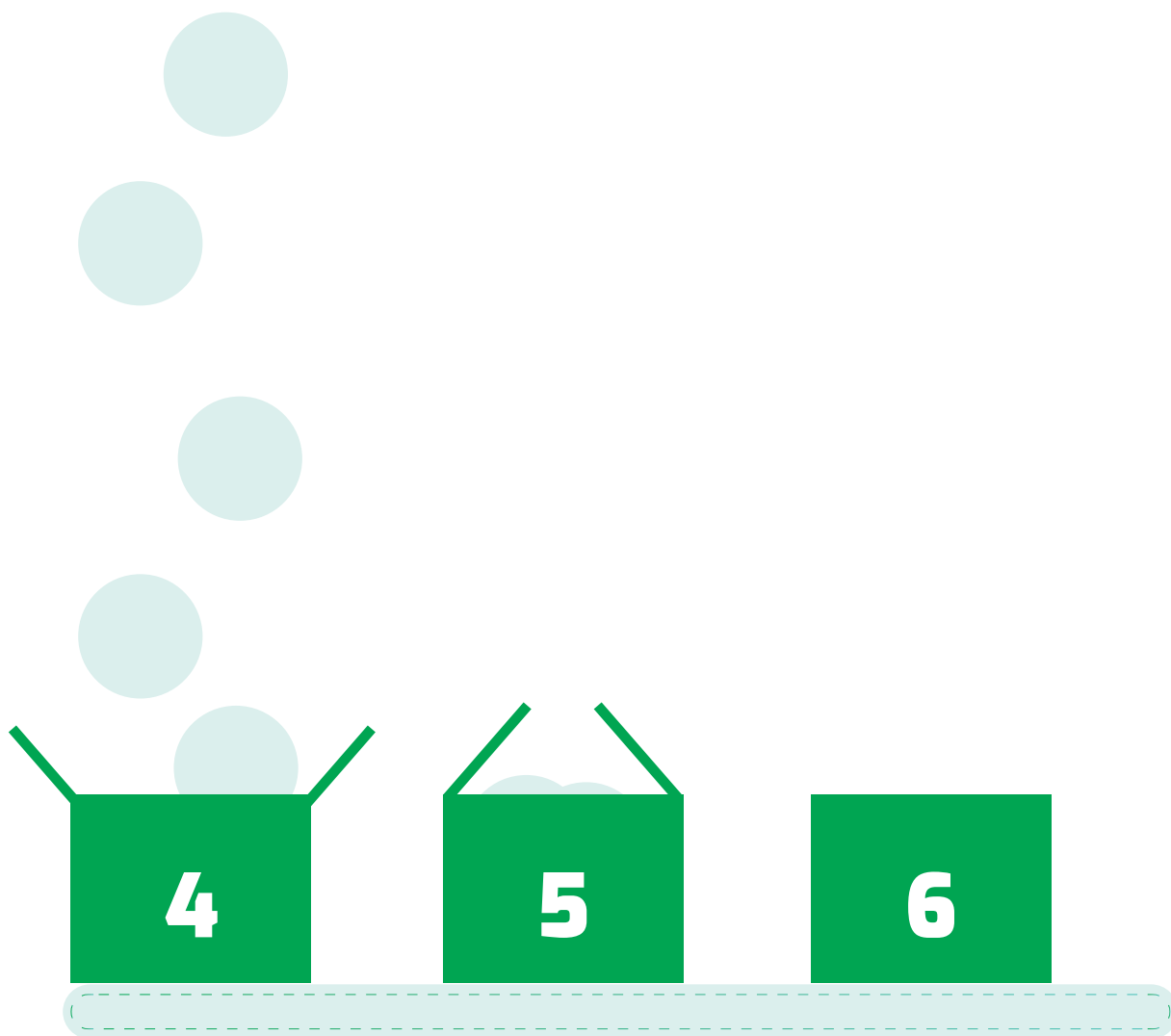
If processing orders is taking up significant time that you or your team could otherwise spend on generating sales, this is a good time to look into outsourcing your fulfillment.

Depending on the complexity, this can take a little bit of time. It's best to look into this as a part of your growth strategy, as opposed to a way to repair a broken system.

3

How much is my fulfillment currently costing me?

This is pretty simple to calculate. Take the time you and your team spend on processing orders, packaging, shipping, and divide that by the average wage between your team. That will give you a cost per hour. From there, you can take it one step further by taking the average orders per day and dividing it by the calculated cost per hour, then multiplying by eight for number of hours in a day.



Are my orders accurate and ontime?

Order accuracy is a tough task. Especially if you are not operationally set-up and experienced in this area. The larger the orders, and the higher the quantity of orders, the more difficult this can be. Some e-commerce platforms can help you maintain order accuracy by having verification processes and printed packing slips. Keep in mind, your customers expect 100% order accuracy.

Are my products right for fulfillment?

There are some products that may be difficult or not necessary to fulfill with an outsourced fulfillment center. Perishable goods with a shelf-life under 14 days are a difficult product to warehouse anywhere but at the manufacturer. Another example is any product that may have a very low velocity (rate of sale). There is no need to pay storage on items that only sell once per quarter. Of course, there are circumstances that may be an exception based on your storage capacity.

What is your experience and operational capacity?

Focus on selling, and let the fulfillment center focus on what they do best. Unless you have previous fulfillment experience and are prepared to take on the operational tasks necessary to have a stable, profitable internal fulfillment department, there is no need to burden your bank account with this task. You may be able to save money on your footprint too, which helps reduce your operating costs.



Section 7

Case Studies

LESSONS LEARNED FROM SUCCESSFUL PRODUCT ENTREPRENEURS
IN METRO DETROIT

114 Accessories by GG
Mari Byrd

116 Anew Life Prosthetics
& Orthotics

118 Christine Bossler
122 LIVAQ

Mottoform Design

126 Rove Soapsheets

128 Scarlet Crane

130 Studio Variously

When you're done with this chapter, you will:

1. Be able to identify common challenges and opportunities encountered by product entrepreneurs and businesses, and learn from your peers.
2. Be inspired to design, develop, and launch your own product business.



Images courtesy of Accessories by GG Mari Byrd.

ACCESSORIES BY GG MARI BYRD

Biggest Challenge: The biggest design challenge is designing as I go and figuring out the must-haves along the way. Learning the difference between a prototype and a sample, and not being formally trained in the fashion industry.

Biggest Hurdles in Manufacturing: Finding the best country to manufacture our signature handbag with the best hardware and high-end accessories. It was challenging to find a partner who spoke English and could understand our needs. It was also difficult to navigate our different time zones.

From Idea to Manufacturing: It took over 6 years and we have worked with six different manufacturers in four different countries.

What Went Well: Because of our dedication and persistence, we finally found an Italian manufacturer who works with Gucci, LV, Ferragamo, and Balenciaga to manufacture our handbags.

In pre-launch phase at the time of publication.

Product Category:
Fashion and Accessories

Annual Production Volume:
Estimated 250-1,000 (2025)
and 500-1,500 (2026)

Batch Production Volume:
250 – 1,000

Sales Channel(s):
Wholesale, our website-e-commerce store, mobile app, Instagram, fashion influencers on YouTube for unboxing with link to purchase, TikTok, Facebook, Pinterest, QVC, HSN, upscale department stores, boutiques, and B2B

Target Audience:
Women age 25-60 who are fashionistas and fashion forward



Images courtesy of Accessories by GG Mari Byrd.

The favorable reaction of our customers to our signature handbag was pleasing and reassured us that our work has not been in vain. We were granted our first United States patent on December 20, 2022.

What is Your Price Point?: \$500 and up

What Would You Do Differently? Surprisingly, my answer is I wouldn't change a thing. It was all a learning experience and a part of the process. Divine order.

PRO TIPS

Think of the customer first. My product evolved over time. As a woman, I wanted my bag to stand up. Through trial and error, we added different features like tassels to recycle material and minimize waste, and dyed leather. Certain materials did not stand up, so we had to change those.

- ☒ What level of skill set is the manufacturer able to produce? Handmade or machine-made? I have

worked with vendors in multiple countries. Really know what you are asking for. Understand your internal and external materials, as well as hardware. It can take years like it has for me. It can also be costly. What capacity are they able to produce? How long will it take? Your price changes depending on quantity. How many will fit in a box, in a pallet, or in a shipping container? What shipper are you using? Who can do your packaging? Do you need someone else to do it? Where will you store all of the product? Who will be assembling those packages? Hire a quality control person. What is your fulfillment and distribution plan? Marketing? You need to be able to answer all these questions and more. Know your Minimum Order Quantity (MOQ) and Return On Investment (ROI). Know your break-even or what you need to price it at to make money. You might have to walk away from deals.



Images courtesy of ANew Life Prosthetics and Orthotics.

ANew LIFE PROSTHETICS AND ORTHOTICS

Process: Patient-specific human interface geometry is captured. CAD/CAM or manual modeling is used for model creation. Parts are fabricated using 3DP, Thermoform, and/or carbon fiber lamination. Part finishing includes grinding, drilling, sewing, riveting, adhesives, and/or metal forming. Final assembly is completed using 3rd party purchased components such as computerized prosthetic knees, ankles, hands, fingers, and protective skins.

Biggest Challenge: Unknowns, the last thing you could think of that causes the biggest problem. Job-specific resources are needed such as stock, tooling, fixtures, equipment, interface software or technology, and qualified employees.

Biggest Hurdles in Manufacturing: Work-arounds for costly production processes.

Product Category: Healthcare, Fashion and Accessories, Mobility

Annual Production Volume: Approximately 3000

Batch Production Volume: Each is unique to each individual

Sales Channel(s): Our services are primarily B2C but some B2B

Target Audience: All of our sales are direct to disabled people

Specialization: medical appliance design, manufacturing, fitting, and repair

Website: anewlifepando.com



Images courtesy of ANew Life Prosthetics and Orthotics.

From Idea to Manufacturing: It takes 3 months to create one of our products. A detailed evaluation of the specific needs required and uses desired are compiled. Depending on the specific needs, a 3rd party may be hired to consult or provide unique professional services. Sometimes additional information is required to meet intake requirements.

What Went Well: The mold design went really well from digital to scan to model creation.

What is Your Price Point?: \$500 and above

What Would You Do Differently? Involve the designer earlier in the design process.

PRO TIPS

Always use an NDA with clients, CAD programs, and business associate agreements (protects third party/patient information/HIPAA). Sometimes an agreement will ask us to destroy all copies of design.

We can pull photographs and wrap them on a device. We will do that as an upsell via cash sale, so we do not have to deal with insurance. The contract to build the product is with the medical company.

Get quotes from various sources.

Understand what you need to tell customers. We have to review the entire cleaning process with the customer, because some of the items need to be cleaned regularly. If they don't do so properly it might void the warranty.

Think hard about whether you can finance your business yourself. I thought I would start this practice and it would go really smoothly. I learned it costs more, and takes longer than I expected. In retrospect, I would have used someone else's money.

Seek knowledge and inspiration everywhere. Research or bring on expert help when working on or with unfamiliar technologies or products. Stay current with government regulation, industry news, and best practices. Collaborate with trusted peers. Seek a SCORE or other mentor to help you find and improve your weaknesses and challenge you. Use technology to help transform old techniques, so you stay current with trends. Allow interns to help you by asking questions from a new perspective and challenge your ability to teach in a conversational format.



Images courtesy of Christine Bossler.

CHRISTINE BOSSLER

Specialization: Jeweler and metalsmith focused on high quality handmade pieces from recycled precious metals and ethically sourced gems. All pieces are handmade and small batch or custom-made.

Process: I design and fabricate all pieces in-house, each and every time, without casts or molds. I occasionally contract out engraving and other industry services. I communicate with customers mostly through email, though sometimes in person, by sharing drawings or photos of similar products.

What problem(s) are/were you trying to solve with this product? There are a number of individuals who would like to wear a ring, but can't get one over their knuckle due to various health issues. I created an answer for this situation: a hinged ring that can go around the finger instead of over it. I have been making these rings for a number of years at this point. Ideally 5 to 10mm wide in either silver or gold, although I advertise that they are available in any of the precious metals.

Pricing Strategy: I price items based on testimony and tools used. For instance, my own hourly rate, how many drill bits I break, how much material costs, etc.

Product Category: Fashion and Accessories

Annual Production Volume: 200-500

Batch Production Volume: 1-10

Sales channel(s): Etsy

Target Audience: The original target client for my platinum hinged ring was someone who had an enlarged knuckle due to injury, arthritis, birth defect, disease, etc.

Website: etsy.com/shop/christinebossler

Biggest Challenge: The biggest design challenge for me is finding the time to grow. This statement doesn't only apply to growing as a business, but also growing as a designer and manufacturer. Setting aside time and resources to develop new designs and learn new skills to employ is expensive and easy to overlook when you have a thriving production line that could always use time for part making, finishing, and expansion of the line. In short, what happens when the work you used to struggle to make is no longer a challenge? What happens when your clients say "I love what you make, but what is coming down the pipeline?" This is a hurdle that I have been contemplating and working to cross. I don't have it all figured out, but have been looking at several approaches and trying to incorporate them where possible. These include:

1. Designate a percentage of my material orders to new design work. Don't just buy what is needed for the custom project and the materials needed to get to x step in the production line, designate a budget for buying "aspirational goal materials."
2. Some designers are great at shutting down shop for a couple of weeks or a month for in-house design time or heading out to a retreat. This approach sounds great, but has yet to manifest in my schedule. What has been working for me is creating a physical production schedule. I have a white board that is laid out on a desk marked off with days of the week. Each day there are notes for what needs to happen that day, things that do not have to be finished, but need to get to the next step, and aspirational pieces in progress that I should work on if it is the same production step or if I have extra time. For instance, Monday may read pack work for shipping, respond to new requests, finish custom wedding band, drill center hole in 30 sets of cufflink swivels, try to get to soldering 18k ear backs to setting, and walk dogs. This box would also have the wedding ring in progress on it, a silver rod for swivels, a small cup with 18k ear backs, settings, gems, and ear nuts. This has really helped me move forward with starting down the line of new things.
3. Seek out opportunities to take some measured risk or as I see it forced growth. I receive all manner of custom requests. Some that fall exactly in my wheelhouse and just need a tweak, some that are asking to push the limits of what I do, and some that

are asking to marry my knowledge of materials, skills, and designs in unforeseen ways. After having one or two custom failures in the beginning, I became much more cautious with what I said yes too. Recently, I have gone back to saying yes quite a bit more. There are two reasons for this. Previously, I was fresh out of school, looking for experience, and was only considering some of the variables when considering ambitious custom work. I was only valuing portfolio building and the skills necessary to make the piece. Time, cost, experience, and design quirks were really not thought out, and I didn't have a backup to bail me out. Now, I have many more years of experience and a better idea of what is appropriate to say yes to, and what is definitely not going to happen. I have also developed professional relationships with other craftspeople in my field. Some that have many more years of experience and can teach the rest of us when we get stuck, need help with a skillset that isn't in the toolbelt yet, or provide a service for a skill we would prefer to source out.

For example, a short time ago, I received a request to create a custom hinged ring for a client. The hinged rings at this point are a comfortable design to make, but the client was hoping for a dark gray metal. This is a hard request in precious metals, as most dark colored precious metal that you see online is either rhodium plated or a patina, and neither are great for everyday wear or for moving parts. I shared a precious metals color chart and the decision was to go with platinum, a metal that I have a good amount of experience working with, but had not used for this design. The client and I agreed on a price and timeline, and so work began. Everything was going great, possibly even better than I had imagined, until two thirds of the way through the project the ring broke in half. What happened? Materials, skills, and design. I was familiar with the material, I had the skills to execute both the material and the design, but I had not fully thought out how the three may interact with each other. As it turned out, the process I was using, which worked with silver and gold, would not work with platinum. As a result I needed to redesign the process for creating the ring and reach out to a production partner to cast a couple of elements that could not be fabricated as most of the rings are.



Images courtesy of Christine Bossler.

I was able to explain the situation to the production partner and they worked diligently with me to keep me in the time frame to complete their component for the job, so I could stay on schedule. All and all it was a win. The client was happy, I learned a lot, and I now have the production down for that ring design in platinum. Yes, I am out some dollars for material and some extra time in redesigning the process to complete this ring. Yes, forced growth is a thing! This was a valuable learning experience that I am now confident in and am well positioned moving forward.

Biggest Hurdles in Manufacturing: At this point in time, it's delegating to others. I like doing it all in house by myself, I really do! I love process and thinking about the individuals that I am making the work for, and with production work I have time to really get into a meditative rhythm, which is a delight in its own. I also love education, and educating and helping others along the path, so I don't know why it's been so hard to hire a production assistant, but this is where I am at. It really is time to let someone else in to help, so that I can free up time for design and growth. Maybe it's the intrusion into my meditative space, maybe it's training a helper, and maybe clients might expect it's just my two hands.

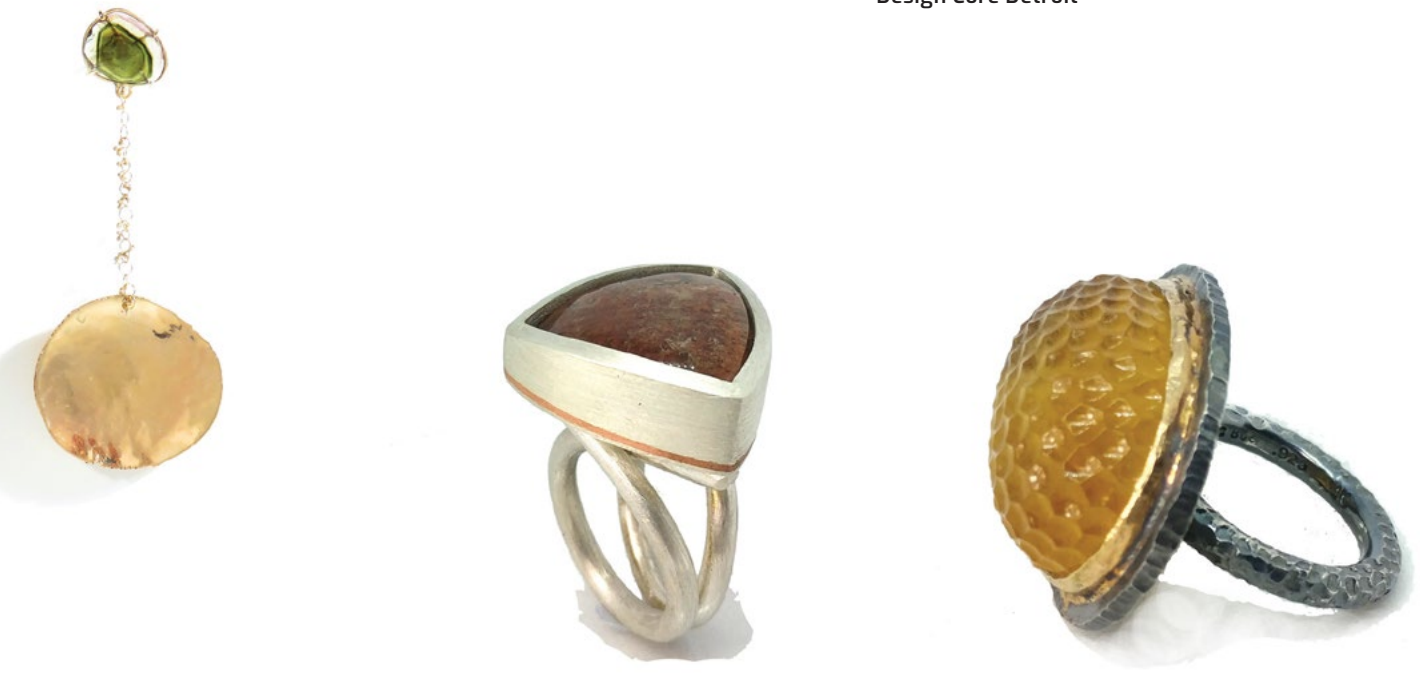
So, this is my manufacturing hurdle. I have had people reach out and offer to cast items in bulk for me, but I know this is not my answer. That would be mass manufacturing. I don't want to design one and do the finishing work for 100. I like how I hand craft each one of these.

From Idea to Manufacturing: 4 weeks

What Went Well: Being creative and flexible. I once heard a story that used ginger rhizomes (more or less the root) as an analogy. An artist is like a ginger rhizome, successful artists have multiple nodes that extend from the main rhizome. Each of these nodes should be fostered and nourished as they feed the overall rhizome. While I imagine these nodes may vary greatly among individual artists, I have found success thinking this way. My business feeds my creativity, invention, problem solving, opportunity, social connection, and financial needs.

What is Your Price Point?: \$500 and above

What Would You Do Differently? Doing what you can in-house, up to the end of your current skill level is the right move.



Images courtesy of Christine Bossler.

Using contractors outside of that is great, and knowing a few people who have different specialties is helpful. Seeking more education and opportunities to practice and raise your skill sets is the best way to grow.

PRO TIPS

Minimize overhead. I do 90% in-house. I keep track of all costs in Excel spreadsheets for reference. I also count my time spent doing this to document that information.

I use solid materials that are known to be good for the skin and natural gemstones. Occasionally my customers will have allergies, so I try to be as forthcoming as possible.

Factor care and cleaning into the design of the product.

You can choose what is best for you. I pick my own 80 hours to work. I do not like doing 100s in short runs. Doing 15 on a schedule with a wholesale account is preferred.

Learn where you can. Art school did not really prepare me to run a business. I worked in a lot of small businesses that helped me. Having a mentor in the industry would have been really nice.

Track the price history of gems (since that changes all the time). Also, buy materials in large quantities if you can, since prices change all the time.

Within my industry, I feel that free design services are part of the business model. If you are designing for a client and working within your current product range, design should be quick and easy. Build it into the rest of the jobs that need to be done and fall under the business time.

Understand how to budget for production design services. I believe the current mantra is 40% production time to 60% everything else. I try to make sure my studio time is much closer to 60%. Work made in this period is priced not only on materials and time, but also studio costs and administrative costs that include design and documentation.

Ask lots of questions during customer intake. I approach small-batch and custom requests the same. I do it all online, so we can all work on our own time and everything is documented vs. communicating in-person.



Images courtesy of LIVAQ.

LIVAQ

Target Audience: Government agencies, such as the Department of Natural Resources (DNR), which prioritize safety and performance for their fleets. Businesses, including tourism operators and dealerships, who seek innovative, reliable, and eco-friendly off-road solutions. End consumers, such as outdoor enthusiasts and early adopters of electric vehicles, who value high performance and sustainability.

Sales channels: We use a multi-phase approach:

Direct Sales to Governments: Partnering directly with agencies to meet fleet needs.

B2B Partnerships: Collaborating with tourism businesses and dealerships to expand access to LIVAQ products.

D2C (Direct-to-Consumer) Sales: An e-commerce platform and select retail partnerships for broad consumer reach.

Specialization: All-Electric All-Terrain Vehicle (ATV)

Production: We contract/partner with companies to do everything from manufacturing to assembly of our units

Product Category: Mobility

Annual Production Volume: About to produce 7 units

Batch Production Volume: 2

Website:
livaq.co



Images courtesy of LIVAQ.

What problem(s) are/were you trying to solve with this product? LIVAQ addresses critical issues in the off-road vehicle market, including:

Safety Concerns: By designing vehicles that are 87% safer than traditional options.

Environmental Impact: Offering pollution-free electric powertrains to replace gas-powered alternatives.

Fuel Inefficiency: Delivering up to 4x the range efficiency of gas-powered vehicles.

Fleet Management Challenges: Enabling advanced software-controlled systems for better reliability and ease of use.

Biggest Challenge: Human errors. In the process many things can be left to interpretations. Also, knowing what features to get rid of, and what to keep.

Biggest Hurdles in Manufacturing: There were a few first-time mistakes when we were starting out. Now, on the third iteration, we have faced less friction.

From Idea to Manufacturing: Two years

What Went Well: That we moved, action is key. From there, everything else was chaos.

What is Your Price Point?: \$20,000

What Would You Do Differently? I would focus more on members of the team. I also would invest more time on revisions prior to production, and I wouldn't make quick decisions just because of constraints on the timeline.

PRO TIP

Use AI to streamline the concept development process. The more specific you get when working with AI, the closer it will be to your idea.



Images courtesy of Mottoform Design.

MOTTOFORM DESIGN

Specialization: Mottoform is a multidisciplinary design studio working on client projects and commissions, as well as self-produced limited edition products. Our work spans product design and consulting, bespoke homewares and artwork, ceramics, textiles, lighting, color, and material, as well as designing spaces and immersive experiences.

Process: Mottoform is a professional design studio. We are continuously exploring work in different materials, production techniques, and applications, working with engineers and other professionals according to project need. Many Mottoform designs are manufactured and marketed by other brands and producers. For example, some products manufactured in Finland include lighting designs produced by Fosto, textile designs for fashion label Vimma Company, and textiles for the home for Vallila Interior.

Product Category: Housewares, Textiles, Ceramics, Furniture, Lighting, Interiors

Annual Production Volume: This varies year-to-year depending on what the studio is working on

Batch Production Volume: As mentioned, a lot of products are designed by Mottoform and manufactured by other brands / producers. Our self-produced products, such as ceramics, tend to be more craft-based and created in limited runs.

Sales channel(s): Shopify, Instagram, word of mouth, and events

Website:
mottoform.com

Target Audience for Ceramics and Artwork:

Individuals who value intentional living and see art as a way to enrich their daily lives. These are people who invest in objects that bring them joy and that align with their sense of how spaces and surroundings influence their emotions. They appreciate the role of art and design in shaping their environments and enhancing their sense of well-being.

Target Audience for Design Work: Homeware, furniture, and lighting brands seeking collaboration with a friendly, independent design studio. They are drawn to a Nordic perspective, a poetic approach to form and material, and a deep appreciation for craftsmanship.

What problem(s) are/were you trying to solve with this product? This depends on the product or client. We do a deep dive into understanding our clients needs, finding the problems that need solving, and also understanding / researching our client's target customer.

Biggest Challenge: Quality. Getting producers to see our vision of quality, cost, and clean materials. Also, sometimes we have designs where the production technique does not yet exist—that's a challenge because you have a vision—and you need to spend a lot of time and energy looking for a way to produce it. For example, we are currently looking for a large-scale circular knitting machine that works with natural yarns.

Biggest Hurdles in Manufacturing: Finding a suitable design manufacturer where manufacturing cost, shipping cost, and minimum production quantities align.

From Idea to Manufacturing: We've worked on designs that take anywhere from 3 months to 2 years of development.

What Went Well: Winning a Red Dot and iF Design Award! Being selected as Industrial Designer of the Year in Finland (2012). I love it when our work helps clients achieve their vision or brings joy to people's lives.

What is Your Price Point?: It ranges depending on the product. Lighting ranges from about \$300-900, artwork \$800-\$15,000, and ceramics \$75-500+.

What Would You Do Differently? Have the courage to be imperfect.

PRO TIPS

Understand the Designer's Role: Identify what kind of expertise you are looking for. Are you seeking assistance for the research phase? To develop a design concept? Or design management from prototyping through production? This may include engineering, focus groups, color and material development, quality control, and more. Decide if the designer will be part of the entire process (which requires a higher investment, but often yields better results) or if you need their input for just one phase.

Engage Early: Start collaborating with a designer early in the process, even if you don't plan to use their services for another 6-12 months. Designers often require a retainer to reserve their time.

Allow Time for Creativity: Good design requires time to develop, percolate, and refine. To ensure the best results, avoid rushing the process.

Define the Project Scope: Have a clear idea of the project scope, goals, and deliverables when contacting a designer. This clarity will facilitate smoother communication and planning.

Review Portfolios: Carefully examine the designer's portfolio. If their work aligns with your vision and you're interested in a project-specific design proposal, be prepared to pay a design fee for this service. This is a standard industry practice.

Consider Emotional Design: Pay attention to the emotional aspects of the design. Great design resonates emotionally, and can significantly enhance the connection between the product and its users.



Images courtesy of Rove Soapsheets.

ROVE SOAPSHEETS

Sales channel(s): We sell in Meijer, All Things Marketplace, Detroit People's Food Co-op, and Neighborhood Grocery Store. We sell online at Walmart Marketplace, Etsy, and our website. We also sell on Pinterest and TikTok, and are available on the My Beauty Kit app. We have also partnered with many nonprofits locally and internationally to provide Rove Soapsheets to returning citizens as well as low income community members. We sell wholesale to Meijer and are looking for more whitelabel/ licensing deals as well as wholesale contracts with government agencies, schools, outdoor suppliers, hospitality, and airport concessionaires for airport retail and distributors.

Target Audience: Rove Soapsheets target a diverse demographic that includes women with kids, professionals who travel, and women who enjoy camping, hiking, and other outdoor activities. Women who are conscious about health and wellness and seek products that allow them to conveniently manage their hygiene on-the-go, while being eco-friendly.

Specialization: Single-use paper hand soap

Product Category:
Hard Goods, Consumer Goods,
Beauty and Wellness

Annual Production Volume:
5000-8000

Batch Production Volume:
500-2000

Website:
rovefreely.com



Images courtesy of Rove Soapsheets.

What problem(s) are/were you trying to solve with this product? The CDC says washing hands with soap and water is the best way to rid hands of illness-causing viruses and germs to prevent hospitalization and virus spread. Sanitizer has alcohol that dries and cracks skin, making it susceptible to infection. Bar soap drips when wet, making it inconvenient for travel and outdoor adventures. Also, soap can carry bacteria such as MRSA on the bar soap and in the water it sits in when wet. Liquid soap can ruin valuables when traveling as well. Rove Soapsheets address several major hand hygiene-related problems, particularly in the context of modern lifestyles and the ongoing emphasis on sanitation. They provide a convenient solution for individuals who find themselves in situations where traditional soap is unavailable, such as public restrooms, while traveling, or outdoors.

Biggest Challenge: Communicating the vision and finding a designer with a wide range of high-level experience.

Biggest Hurdles in Manufacturing: Shipping delays and production issues/quality.

From Idea to Manufacturing: 9 - 12 months

What Went Well: Package design and sample production.

What is Your Price Point?: Less than \$50

What Would You Do Differently? Vet who I work with more strategically and thoroughly.

PRO TIPS

Vet your co-packers. Look at their certifications, number of years in business, etc.

Understand what sales channels work best for you and your product. Going after individual retailers versus a larger singular contract is different in terms of use of time and energy, and relationship management.

Understand your production process. Know how many fit in a master box, pallet, and shipping container.

Understand your sales partners' needs. Do they need all of the product to be on pallets so it fits on their machinery, shelving, etc. (i.e. Meijer)? These are all design considerations.



Images courtesy of Scarlet Crane.

SCARLET CRANE

Specialization: Surface pattern, print, and textile designer specializing in soft home goods and accessories like throw pillows, bags, and tea towels.

Process: My assistant and I develop new product ideas and we test them in the store that is housed in our studio called POST. There, we are able to develop several prototypes and get feedback pretty quickly. We use a screen printing studio and yardage printing table, along with a couple of heavy duty sewing machines. We design and print sustainable fabric yardage in the studio and assemble 80% of the bags, pillows, and seasonal items like scarves. The remaining 20% of the production is done by other cut and sew partners in the city.

What problem(s) are/were you trying to solve with this product?

We have found that many who value sustainability have a difficult time finding high-quality, durable, eco-friendly textile products that are not beige and lack-luster. Our answer is unique textile products in colorful patterns and designs that are made with plant-based dyes.

Product Category: Furniture and Home Goods, Fashion, and Accessories

Production Method: Handcrafted, Small Batch

Annual Production Volume: 500

Batch Production Volume: 100

Sales Channel(s): Scarlet Crane offers our products via a handful of retailers through wholesale relationships, on our ecommerce website, and collaborate with local designers and corporations for custom work

Target Audience: Customers looking for a stylish crossbody bag that celebrates Detroit

Website:
scarletcrane.com



Images courtesy of Scarlet Crane.



Biggest Challenge: The biggest design challenge for us has been narrowing down our collections so they tell coherent stories. We have several designs that celebrate Detroit that are difficult to position next to our botanicals. We have had to be more strategic with product placement and our target market.

Biggest Hurdles in Manufacturing: Local production is very expensive and drives the price beyond what many consumers will pay. We also have difficulty finding production partners in the U.S. that can match the quality of goods made overseas. However, we have found creative ways to keep costs down and remain committed to local production. Large MOQs for production partners also make test marketing difficult, as we would prefer not to order more than 50 units for testing and gauging customer reception.

From Idea to Manufacturing: 3 months

What Went Well: Our production partners have been really flexible and open to our design input. They also provided great insight and recommendations along the way that helped us to achieve our target price point. I have worked with Sarah Ayers of William & Bonnie for the production of my zipper pouches. She's a wonderful sewist who is very knowledgeable and passionate about her craft. We also worked with Darrin Brouhard of Daylight Factory who was formerly a designer with Shinola.

He produced our large crossbody bag and demonstrated stellar craftsmanship and professionalism.

What is Your Price Point?: Between \$50–100

What Would You Do Differently? I would plan out the launch of a new product carefully by first developing a handful of samples to gain customer feedback and gauge interest with preorders.

PRO TIPS

Understand the difficulties that may come with local sourcing. As I transitioned away from China sourcing, people just had to wait. Made in the U.S. is a value I offer, but the margins are not always there.

Think of the longevity of the product when sourcing the materials. We print, then heat-set (to prevent bleeding of the dye).

Do not have a large amount of inventory on-hand. This was a lesson learned after starting. Smaller runs are good.

Be sure to include the cost of ALL materials including your own labor as well as shipping when determining the profit margins and market feasibility. Try partnering with larger manufacturers/brands who can take care of all production and provide more exposure.



Images courtesy of Studio Variously.

STUDIO VARIOUSLY

Specialization: Based out of Bloomfield Hills in Michigan, Studio Variously pursues sustainable design goals by ethically sourcing the highest qualities of pure natural yarns, plantbased and eco-friendly dyes, and combining these with the ancient artisanal techniques of weaving and dyeing. We design textiles for products like throws, blankets, bedspreads, rugs, pillows, table linen (currently custom orders only), and luxurious, timeless scarves under our in-house trademarked brand Variously. Variously is an award winning lifestyle brand that explores modern design elements that are functional and minimalistic in nature.

Process: All our manufacturing is pursued ethically by forging only direct partnerships (no middlemen/agents) with artisan clusters who are experts in the ancient techniques of weaving, dyeing, and embroidery, all done exclusively by hand. All our artisan partnerships take place with on-site visits, daily updates on production, and quality testing for dyes and yarns used in every piece manufactured. All products are shipped from our company based in Michigan to our buyer warehouse.

Product Category: Furniture and Home Goods, Fashion and Accessories

Annual Production Volume: 250 to 500 pieces per year, including pre-orders, across all product categories including scarves, throws, pillows, rugs, and tableware linen

Batch Production Volume: 20 to 25 units in one batch, the same style can be made 3 to 4 times a year

Sales Channel(s): Wholesale, direct retail, interior trade, and pre-orders

Website:
studiovariously.com



Images courtesy of Studio Variously.

The artisans we work with in different parts of India and Nepal are experts in their field, 3rd and 4th generation master weavers and dyers whose skills and heritage stories need to be sustained. The majority of our artisans are women who are involved in processes of hand spinning, weaving, dyeing, and finishing.

Biggest Hurdles in Manufacturing: Vetting the artisan partners and supply chain alignment. You have to keep factors like seasonal changes in mind, such as excessive rains or floods, as all textiles are dried naturally. There may be logistic issues like delays, customs, price changes in shipping costs, price changes in yarn costs, or shortage of yarns and dyes. There may also be a lack of genuine artisans, the interest in handwoven textiles has declined due to the pandemic and availability of very low-cost, massmanufactured goods.

From Idea to Manufacturing: Between designing and manufacturing, a considerable amount of time is invested in researching unique techniques, developing swatches, combining pure materials, and exploring art forms. Collaborating and innovating with our artisans is key to our process, instead of just replicating

what already exists. This allows for improvisation both in design and skillsets, which is also part of our sustainable goals. For us, beauty lies in slow-made textiles that bring people and their cultural stories together. We are creating this one textile at a time.

What is Your Price Point?: The production method influences the cost of the final product 100%. For me, this is a known factor before starting the process, since handmade products will cost more due to the nature of the work, as the time taken to make a piece is way more than if it were machine-made.

PRO TIPS

Consider the care instructions for your product during the design process and include them in your final packaging for your customer.

Consider hiring a professional designer. I did this to help me add collections and products on an e-commerce platform, specifically for the backend process of editing images and lining up the products effectively. It was a very streamlined experience as everything was well planned in advance.



GLOSSARY

Let's break down the buzzwords.

2

2D:

Two-dimensional representations, such as drawings or images with length and width. Compare with "3D."

3

3-Axis CNC:

A machining system with three axes of motion (X, Y, Z). This is typically a basic level of capability for machining systems. Compare with "5-Axis CNC."

3D:

Three-dimensional representations that incorporate depth to create a more realistic and spatial depiction of objects or scenes. Compare with "2D."

3D Printing:

A manufacturing process that builds threedimensional objects layer by layer from digital models, using materials such as plastics, metals, or ceramics.

5

5-Axis CNC:

A machining system with five axes of motion, allowing for more complex and versatile machining capabilities than a 3-Axis CNC.

A

Assembly:

A step in the production process when major components are joined together to create a finished product.

B

Batch Dye:

A dyeing method where a specific quantity of fabric or yarn is dyed in a single production run, ensuring uniform color consistency within that batch.

Bill of Goods:

A list of items needed for a specific purpose, often associated with estimating costs.

Bill of Materials:

A comprehensive list outlining the raw materials, components, and quantities required to manufacture a product. It usually includes information like whether the part is purchased, made new, or modified, and the cost associated with each part.

Break-Even Point:

The level of sales or revenue at which total costs equal total revenue, resulting in neither profit nor loss for a business.

Buying Agent:

A representative or intermediary hired by a purchaser to facilitate the procurement of goods or services, acting on behalf of the buyer to negotiate terms, source products, and coordinate the purchasing process.

C

Computer Aided Design (CAD):

The use of computer technology to create detailed digital representations of objects or systems, facilitating the design and visualization process in various industries.

Cost and Freight (CNF):

An international trade term where the seller is responsible for the cost and freight of delivering goods to a named port of destination, with the buyer assuming the risk after the goods are loaded onto the vessel.

Capability Statement:

A concise document that highlights the key competencies, qualifications, and experiences of a business, providing potential clients or partners with essential information about the firm's capabilities and expertise.

Composite Material:

A material made from two or more different substances with distinct properties, combined to create a new material with enhanced characteristics, such as strength, durability, or lightness.

Contract:

A legally binding agreement between two or more parties specifying the terms and conditions of their relationship, including rights, obligations, and the scope of work or services to be provided.

Cost of Goods Sold (COGS):

A summary of various costs involved in manufacturing and shipping a finished product. Typically includes materials, labor, and overhead costs allocated to manufacturing.

Customer Persona:

A semi-fictional representation of an ideal customer based on market research and data, helping businesses better understand and target their audience.

D**Dead Stock:**

Inventory that has not been sold and remains in storage for an extended period, often resulting in financial loss due to depreciation, obsolescence, or other factors.

Digital Printing:

A printing method that directly applies digital-based images or designs onto a variety of materials, offering high precision and flexibility in design reproduction.

Direct-to-Consumer:

Selling products directly to end-users, bypassing intermediaries. Compare with "Wholesale."

Distribution Channel:

Ways to store and transport inventory to the end consumer that can be through direct, indirect, or hybrid channels. Type of product, price, brand advertising, and product positioning should be considered when selecting a distribution channel.

Distributor:

An intermediary or middleman that purchases products from manufacturers and sells them to retailers or end customers, facilitating the distribution of goods across the supply chain.

E**Electronic Data Interchange (EDI):**

Allows companies to send and receive documents like invoices, purchase orders, and payments in a standardized format that helps streamline communications and improve operational efficiency between trading partners.

End of Lifecycle:

The stage in the product or technology life cycle where a product is no longer produced, sold, or actively supported, often due to technological advancements, market changes, or the introduction of newer models.

F**Free On Board / Freight On Board (FOB):**

A shipping term that refers to the point at which the seller's responsibility for the goods ends and the buyer assumes ownership and liability, typically specifying a location or port where the transfer occurs.

G**GS1 Barcode:**

A standardized system for the identification of products and services, utilizing unique tags to facilitate accurate and efficient tracking throughout the supply chain.

H

Hand-Spun:

Fibers that are spun into yarn or thread manually by hand, often resulting in unique and artisanal products. Compare with "Machine-Spun."

Harmonized Code:

A standardized international system for classifying products and goods for customs and trade purposes, facilitating the uniform identification of items during import and export transactions.

High-Fidelity Prototype:

A prototype that closely resembles a finished product and often has working features. Compare with "Low-Fidelity Prototype."

I

Industrial Design / Industrial Product Design:

The process of creating and developing aesthetically pleasing and functional products, considering both form and function to meet the needs of users and align with manufacturing capabilities.

Injection Molding:

A manufacturing process where molten material, typically plastic, is injected into a mold cavity to produce intricate and precise three-dimensional components or products.

Investment Costs:

The expenses associated with acquiring or developing assets, such as equipment, facilities, or technology, incurred by a business with the expectation of generating future benefits or returns.

J

Juki:

A brand of sewing machine produced by the Juki Corporation, known for its high quality and innovative features, widely used in the textile and garment industry.

K

Keystone Pricing:

A pricing strategy where the selling price of a product is set at double the cost, resulting in a 50% profit margin and a markup of 100%.

L

Low-Fidelity Prototype:

A basic model that replicates the overall shape of a product or the basic navigation of the user interface. Compare with "High-Fidelity Prototype."

M

Machine-Spun:

Yarn or thread produced using automated machinery, which often improves cost and consistency in the finished product. Compare with "Hand-Spun."

Manufacturer's Representative:

An independent sales agent or representative who works on behalf of a manufacturing company to promote and sell its products to potential buyers, typically earning a commission on sales.

Manufacturing / Production:

The process and capabilities involved in building a product, usually including all steps starting from raw materials to a finished product.

Material Safety Data Sheet (MSDS):

A document providing detailed information about the properties, hazards, and safe use of a chemical product, intended to assist in the safe handling, storage, and disposal of the substance.

Merchant / Buyers:

An individual responsible for selecting and purchasing merchandise for a business, ensuring a well-curated product assortment that aligns with the target market and business objectives.

Minimum Order Quantity (MOQ):

The smallest quantity of a product that a manufacturer or supplier is willing to sell in a single order, often set to ensure cost-effectiveness and efficient production processes.

Minimum Viable Product (MVP):

A product with enough features to attract early-adopter customers and validate a product idea early in the product development cycle.

N

North American Industry Classification System (NAICS) Code:

A standardized system used to classify businesses and industries in North America based on their primary economic activities.

Non-Disclosure Agreement (NDA):

A legal contract between two or more parties that outlines the confidential information they intend to share with each other, prohibiting the disclosure of such information to third parties without consent.

Non-Parametric Data:

Information within a computer model or process that is generally not editable in an interactive way.

Non-Recurring Cost:

One-time costs or fees incurred by a business that are not expected to repeat regularly, often associated with specific events, projects, or unique circumstances.

O

On-Demand Manufacturing:

A production approach where goods are produced and delivered in response to customer orders, enabling flexibility and reducing the need for large inventory stockpiles.

Opening Order:

The initial purchase made by a new retail customer or business when establishing a relationship with a supplier or manufacturer, often indicating the start of a business partnership.

Overstock:

An excess amount of inventory beyond what is needed or can be sold within a reasonable timeframe, potentially leading to storage challenges and financial losses for a business.

P

Parametric Data:

Information within a computer model of a product that is defined and controlled by parameters, allowing for dynamic and interconnected adjustments, modifications, or updates.

Patent:

A legal document granting an inventor exclusive rights to their invention, preventing others from making, using, or selling the patented invention without permission for a specified period.

Pretty Darn Quick or Product Displayed Quickly (PDQ):

PDQ refers to retail displays that are easy to set up and allow a retailer to quickly showcase your products. It can refer to pallet displays, countertop displays, and packaging.

Power Loom:

A mechanized loom powered by electricity or other sources of energy, used in the textile industry to automate the weaving process.

Pre-Order:

Placing an order for materials that may or may not be needed for the design or production process, usually done to accelerate certain phases of the process.

Project Brief:

A concise document summarizing the essential details of a project, including its goals, requirements, timelines, and key stakeholders, serving as a foundation for project planning and execution.

Production:

The entire process of building a finished product from raw materials. It includes assembly, which is a step in the production process when major components are joined together to create a finished product.

Prototype:

A preliminary model or sample of a product, typically developed to test and evaluate design concepts before full-scale production.

Purchase Order:

A formal document issued by a buyer to a seller, specifying the details of goods or services to be purchased, including quantity, price, and other relevant terms.

R

Recycling:

Converting products or parts into materials which can be used in another production process.

Recyclable Materials:

Materials that can be processed and used to create new products, contributing to environmental sustainability.

Recycled Content:

The percentage of a product's material that comes from recycled sources, indicating its environmental sustainability.

Recycled Paper:

Paper made from reclaimed materials, contributing to resource conservation and reduced environmental impact.

Recycled Plastic:

Plastic materials obtained from post-consumer or post-industrial sources, promoting sustainability and reducing reliance on new plastic production.

Recycling Symbol:

A symbol indicating that a product or packaging material is recyclable, encouraging consumers to participate in recycling programs.

Returns:

Goods or products that customers send back to a retailer or manufacturer for various reasons, typically due to dissatisfaction, defects, or other issues, prompting a refund, replacement, or credit.

Return Fees / Restocking Fees:

Costs charged to manufacturers by retailers for unwanted products that customers have returned.

Return On Investment (ROI):

A measurement of financial performance that compares the amount of money invested versus revenues and profitability. Typically used to compare various investment options and their returns. Higher ROI investments are typically more attractive to investors versus lower ROIs.

Rhino / Rhinoceros3D:

A software application that provides 3D modeling tools used in various industries such as product design, architecture, and automotive design.

S

Sales Channel:

Where a product or service is sold to target specific customers. Examples include direct channels like a company retail store or website, or indirect channels such as affiliate marketing and third-party marketplaces.

Sample:

An early batch of a product made from the production process.

Screen Printing:

A printing technique where a stencil or design is applied to a screen, allowing ink to pass through and create a printed image on a substrate.

Commonly used in fabric and apparel decoration.

Scope of Work (SOW):

A detailed document outlining the specific tasks, deliverables, and activities that are included or excluded in a project, providing a clear understanding of the project's objectives and boundaries.

Silkscreen:

A printing technique where ink is forced through a mesh screen onto a substrate, commonly used for fabric and paper printing.

Sensitivity Analysis:

A research process used to assess the impact of changes to a product, helping to create understanding of what changes create the most meaningful benefits.

Shipping Container:

A large metal container used for transporting goods by sea, rail, or road, designed for easy handling and secure storage during transportation.

Shipping Cost:

The expense associated with transporting goods from one location to another, influenced by factors such as distance, mode of transport, and shipping method.

Shipping Label:

A label affixed to a package or container, providing information about the contents, destination, and handling instructions for shipping.

Shipping Manifest:

A document listing the details of goods being transported, including product descriptions, quantities, and destination information, used for tracking and regulatory compliance.

Shipping Process:

The set of activities involved in preparing, packaging, and dispatching goods for transportation to their destination, ensuring they reach customers in a timely and intact manner.

Shipping Rate:

The cost charged by a shipping carrier for transporting goods from one location to another, often influenced by factors such as weight, dimensions, and shipping speed.

Small Batch or Small Scale Manufacturing:

The production of limited quantities of goods, often tailored to niche markets, allowing for flexibility and customization.

Smolder Test:

A test conducted to assess how a material will slowly burn without the presence of a flame, often used to evaluate the fire safety characteristics of textiles and other materials.

Stamping:

A manufacturing process that involves shaping or forming metal sheets or other materials by applying force through a die to create specific shapes or patterns.

Sublimation:

A process where a substance transitions directly from a solid to a gas, typically involving the application of heat and pressure to transfer dye onto materials such as fabric, resulting in vibrant and durable prints.

Swatches:

Small, representative samples or specimens of materials, colors, or textures, used for reference or selection in design, textiles, or manufacturing. These are sometimes provided free of charge by materials companies.

T

Tech Pack:

A document often created by designers that includes all information necessary for a manufacturer to make the product. Often used in the fashion industry.

Thomas Register:

A comprehensive directory and database providing information on industrial products and services, widely used for sourcing and procurement in the manufacturing and industrial sectors.

Tool-Ready Data:

A computer model (CAD model) with enough detail and engineering analysis to support the development of a manufacturing tool. Low-fidelity or “surface” models do not typically contain enough information to build a manufacturing tool.

U

Upcycling:

The creative reuse of existing items to give them a higher value or improved functionality without breaking down the materials.

Usability Buck:

Frequently used in the automotive industry, this is a reconfigurable prototype that can be re-sized to fit different human shapes. It's used to dial in the product to best fit users.

V

Vacuum-Forming:

A process where a heated sheet of plastic is stretched over a mold and then vacuum-sucked onto the mold's surface, creating a three-dimensional shape as it cools and solidifies.

Variable Cost-Per-Unit:

The cost associated with producing one additional unit of a product, where the expense fluctuates based on the quantity of units manufactured or sold.

W

Wholesale:

Selling goods in large quantities to retailers, who then sell to end consumers. Compare with “Direct-to-Consumer.”

Working Prototype:

A prototype that demonstrates certain product features well enough to test their effectiveness with users or in real-world conditions.

Working Sample:

A sample that includes functional features—electronic components, movable parts, usable materials, etc.—to be tested.

Y

Yarn Dye:

A dyeing process applied to yarn before it is woven or knitted into fabric, allowing for the creation of patterns and designs.

RESOURCES

Business Resources

Accounting Aid Society

The Accounting Aid Society is the only no-cost tax preparation services provider to low-and-moderate income residents of southeast Michigan. The Accounting Aid Academy educates small businesses on financial management best practices through free workshops, labs, and open office hours. Lowcost small business services include income and sales tax filing, book-keeping training, and one-on-one technical assistance through its THRIVE program.

Basecamp

Project management software that tracks all aspects of a project including budgets, timelines, to-do lists, file sharing, team communication, progress reports, and more.

The BizGrid

An interactive online and physical directory designed to help entrepreneurs navigate the landscape of organizations providing business assistance in Detroit.

The Bottom Line

This blog, published by Square, includes What is the Cost of Goods Sold and How Do You Calculate It? <https://rb.gy/9dqulo>

Business Model Canvas

A strategic management and entrepreneurial tool that helps you to describe, design, challenge, invent, and pivot your business model.

Build Institute

Build Institute assists Metro Detroiters with turning their business ideas into reality by providing tools, resources, and a support network of over 1,800 graduates. Build Institute also offers networking events, mentorship, resource connections, and a nurturing community to help empower individuals to pursue entrepreneurship and build successful businesses.

Detroit Economic Growth Corporation

Small business support programs, including Motor City Match, BuyDetroit, and Detroit Means Business. These programs are designed to support Detroit's new and existing base of companies to transform their operations, boost productivity, and generate growth.

Detroit Means Business

Detroit Means Business (DMB) is Detroit's front door to entrepreneurial success and the one place dedicated to driving a strong small business community. DMB is committed to providing a path to business ownership, neighborhood stability, inclusive employment, and upward mobility of all Detroiters. District Business Liaisons help business owners navigate city processes, connect to financial resources, and inform policy and process improvements that benefit all Detroit small businesses. The Digital Access Hub offers small business owners access to digital tools, business support, and resources.

Detroit Public Library: Business & Finance Research and Data

The library is an excellent resource for any business or entrepreneur, offering a variety of resources, including, but not limited to, extensive databases and expert research assistance on market data, industry trends, and more.

Detroit Public Library: Patent and Trademark Resource Center (PTRC)

The PTRC is a service supported by the U.S. Patent and Trademark Office. Knowledgeable staff will help answer questions on patents, trademarks, and copyright. Appointments are requested to ensure availability.

Google for Small Business

A free tool that helps businesses manage their profile on Google with tools for listing contact information and business hours, claiming location on Google Maps, and advertising events and customer reviews. Google Workspace offers custom emails and online productivity and collaboration tools.

Intuit Quickbooks: Free Business Plan Template

A free downloadable business template with simple instructions for filling it out.

Invest Detroit

Invest Detroit is a mission-driven financial institution that catalyzes equity, investment, and wealth generation. Invest Detroit creates financial vehicles to bridge funding gaps and advocate for collaborative systemic change through intentionally dismantling barriers and providing access for historically underserved communities. Its small business program services both new and existing locally-owned businesses with loans that support operational and property needs. The small business team provides ongoing technical assistance to help small business owners refine plans and achieve business goals. Invest Detroit is a certified Community Development Financial Institution (CDFI).

LinkedIn Learning

Online learning and development platform that offers continuing education and certification courses in business, design, production, engineering, and technology.

Michigan Department of Licensing and Regulatory Affairs (LARA)

The Michigan Department of Licensing and Regulatory Affairs (LARA) supports business growth and job creation, while safeguarding Michigan's citizens through a simple, fair, efficient and transparent regulatory structure.

Michigan eLibrary (MeL)

A free, online library for Michigan residents. MeL users can access a powerful database system for business research, online fulltext articles, full-text books, digital images, and other valuable research information.

Michigan Women Forward

Michigan Women Forward is a community development financial institution whose mission is to expand economic opportunity for women and entrepreneurs of color by providing access to capital and business resources. Services include classes, seminars, and pitch competitions, as well as coaching and guidance. As a certified Community Development Financial Institution (CDFI), Michigan Women Forward help entrepreneurs get access to the capital they need to help their businesses thrive, create generational wealth, and invest in their communities.

ProsperUS Detroit

ProsperUS advances economic equity in underresourced communities by supporting entrepreneurs with opportunities and capital needed to build businesses, generational wealth, and vibrant neighborhoods. ProsperUS offers several programs and services that are designed to support entrepreneurs at each stage of developing a business. ProsperUS is invested in supporting entrepreneurship dreams at every stage of development from planning to execution. ProsperUS Detroit is a certified Community Development Financial Institution (CDFI).

Small Business Association of Michigan

The Small Business Association of Michigan is a premier organization of more than 32,000 Michigan small business owner members. It offers access to connection opportunities through its Owner2Owner network program, as well as tools and resources to help business owners attract talent, stay compliant, and operate more efficiently. Members also have opportunities for certification training, expense savings, and resources for legal and human resource services.

SCORE

SCORE is a 501(c)(3) nonprofit organization and a resource partner of the U.S. Small Business Administration (SBA). Services include free mentoring, webinars and courses on-demand, local workshops, and a library of online resources. More than 10,000 dedicated volunteers deliver most offerings at no cost.

Small Business Development Centers (SBDC)

SBDCs provide counseling and training to small businesses including working with the Small Business Association (SBA) to develop and provide informational tools to support business start-ups and existing business expansion.

TechTown Detroit

TechTown is dedicated to facilitating the meaningful and equitable revitalization of Detroit by supporting the launch and sustainable growth of tech startups and small businesses. Services include connecting entrepreneurs to learning and networking events in Detroit, as well as providing access to resources and meeting spaces to help startups and small businesses develop, launch, and grow.

The United States Patent and Trademark Office (USPTO) Elijah J. McCoy Midwest Regional Office (MWRO)

Since 2012, the MWRO serves as the first USPTO regional office. Their mission is to promote innovation and stimulate the economy by facilitating connections between entrepreneurs and government resources, supporting STEM education programs for students and teachers, offering professional development for educators, gathering feedback from regional stakeholders, and fostering diversity in talent recruitment from the region.

U.S. Patent and Trademark Office (USPTO)

The federal agency responsible for granting U.S. patents and registering trademarks. Entrepreneurs and inventors have access to a library of free tools and resources on a variety of topics including learning about types of intellectual property (IP), how to protect your product, and how to search existing patents and trademarks to find out if your idea is unique.

University of Michigan Detroit Neighborhood Entrepreneurs Project

The Detroit Neighborhood Entrepreneurs Project is an accelerator program for neighborhood businesses in Detroit. The program connects U-M students and faculty with entrepreneurs and small businesses for free strategic and technical assistance consulting projects. Entrepreneurs work with student teams, supervised by U-M faculty from the Business School, Law School, Stamps School of Art and Design, and/or the Ford School of Public Policy. Previous projects have included deliverables on customer discovery, contract and non-disclosure agreements, and intellectual property.

Wholesale in a Box

Training and coaching for wholesale business. Their How to Make Pricing Work for Wholesale blog offers lots of great information and tips.

Design Resources

Behance

A platform to discover the latest work from top online portfolios by creative professionals across industries.

Botzen Design

Botzen Design is a Michigan-based firm that boasts over 30 years of experience in industrial design. Specializing in consumer products, their expertise spans a range of product types including tabletop, handheld, and wearable products, encompassing both hard and soft goods, with or without electronic integration.

Brainchild Engineering, Inc.

Brainchild Engineering is a Michigan-based design and engineering company specializing in helping individuals and companies bring their visions to life. They provide services in design, engineering, and product launch support.

Canva

Online design and visual communication platform that offers tools, templates, and resources for visual documents, photo and video, print, and marketing materials.

DesignWise

DesignWise is a fully integrated product design and development team that collaborates with management organizations. Their services include exploring new markets and products, redesigning or modernizing existing ones, improving ergonomics, increasing maintenance efficiency, and enhancing product profitability by streamlining production processes.

Evans Distribution

Evans Distribution is a privately owned third-party logistics company. Evans provides warehousing, transportation, and staffing services for a variety of industries including automotive, food/beverage, consumer goods, hazmat, paper/raw materials, and government sectors. In addition, direct-to-consumer fulfillment, order processing, and subscription box services support businesses in apparel, bath, beauty, beverages, food, furniture, and pet supplies.

The Grommet

The Grommet provides a platform called Guides, which offers curated gift guides, detailed product reviews, exclusive interviews, and more, serving as a go-to source for the latest innovations. They aim to create engaging and entertaining content, while helping innovative small businesses gain exposure to millions of shoppers who value supporting such enterprises. It also includes a platform to submit products for exposure.

Gravity Sketch

A virtual reality (VR) design platform that enables users to create three-dimensional sketches and models in a virtual space, fostering immersive and collaborative design experiences.

Innovate 3D Great Lakes

Innovate 3D Great Lakes is a Michigan-based invention service company dedicated to supporting inventors and startups in bringing innovative products to market. They offer free consultation for potential clients and affordable product design and engineering facilities, providing technical expertise and tools such as patent drawings, 3D computer models, and prototypes.

Jackson Makerspace

Jackson Makerspace is a versatile facility designed for individuals to gather and engage in a wide range of activities, including meeting, creating, tinkering, building, crafting, fixing, sewing, painting, printing, and more.

Michigan Box Company

Michigan Box Company has operated for over 80 years as one of Michigan's largest independent box plants supplying corrugated products to Midwest clients and beyond. Their services include package design and consulting, digital prototyping, box performance testing, assembly and fulfillment, and warehouse services.

Michigan Manufacturing Technology Center

The Michigan Manufacturing Technology Center is committed to finding the right solutions for Michigan manufacturers in every situation. They offer personalized consulting services aimed at enabling manufacturers to operate more efficiently, compete effectively, and thrive in their industries. Their services include developing effective business leaders, driving product and process innovation, providing guidance on governmental and industry regulations, promoting operational excellence across companies, and developing strategies for business growth and increased profitability.

New Foundry

New Foundry offers product development services catering to clients ranging from global leaders to startup enterprises. Their services address a variety of challenges, including enhancing sales strategies, streamlining information systems and workflows, and facilitating rapid prototyping and product conceptualization. Their multidisciplinary team of strategists, designers, and engineers collaborate to deliver tailored solutions designed for usability and client success.

NewLab

NewLab is home to more than 250 deep tech startups and over 1,000 entrepreneurs, inventors, investors, and optimists working together to address critical challenges in energy, mobility, and materials. Its Detroit location offers its members 270,000 square feet for advanced prototyping, robotics and fabrication workshops, dedicated studios, and event spaces. NewLab also has locations in New York and Uruguay.

Thumbprint Fulfillment

Thumbprint Fulfillment is a Detroit-based, woman-owned, full service shipping company. It offers a complete range of warehousing, packaging, and shipment services. Offerings also include inventory management, shopping cart integration, and value-added services including customized gift packaging with handwritten thank you notes, swag bags, and corporate gifting. Business owners are also provided with monthly sales reports with dozens of accounting and e-commerce integrations.

Product Design Education & Resources

Design Core Detroit

Design Core Detroit is dedicated to championing design-driven businesses and their contribution to Detroit's economy. As a department within the College for Creative Studies, Design Core offers a range of services aimed at strengthening, growing, and attracting design businesses. These services include initiatives to increase market demand for design services and efforts to promote Detroit's design story both locally and globally. Design Core serves industries that specialize in design or utilize design as a central aspect of their business strategy.

Inventors Association of Metro Detroit

The Inventors Association is a non-profit organization dedicated to educating inventors of all levels about the inventing process. Serving as a valuable resource center, the association also functions as a support group where inventors can exchange information, share experiences, and provide advice on successfully completing projects.

MSU Product Center

The MSU Product Center assists Michigan entrepreneurs and businesses in developing and launching new product and service ideas in the food, agriculture, and bioenergy markets. The Product Center provides access to Michigan State University's extensive technical expertise, research, and outreach services. Services offered include business planning, market analysis, scientific support, technical services, and customized support tailored to each client's needs. The Product Center helps clients from concept development to launch, and addresses specialized issues such as packaging, labeling, or nutritional analysis.

Product Design and Development

This clear and detailed book by Karl Ulrich and Steven Epponger addresses a wide array of topics, including identifying customer needs, design for manufacturing, prototyping, and industrial design, in a way that demonstrates the connection and helps these functions work together.

Product Design for Manufacture and Assembly

This textbook by Geoffrey Boothroyd, Peter Dewhurst, and Winston Knight offers university-level course content in product design and manufacturing design.

Tinkercad

Tinkercad is a free web-based application for 3D design, electronics, and coding that is widely used globally. It enables users to build STEM (Science, Technology, Engineering, and Mathematics) confidence by facilitating project-based learning in classrooms and beyond.

Uplift Michigan™

Uplift Michigan™ is a strategic movement aimed at ensuring equitable access for all diverse entrepreneurs across Michigan. Recognizing the barriers faced by historically marginalized entrepreneurs, particularly those in underserved communities, Uplift Michigan™ emphasizes the significant contribution these small businesses make to Michigan's economy and local communities. By building pathways to success for minority and underrepresented small businesses, Uplift Michigan™ aims to create positive outcomes for the state's economy as a whole.

Trade and Networking Organizations

Industrial Designers Society of America (IDSA)

The IDSA offers a range of services aimed at advancing the careers of industrial designers. They provide support for professionals at all career stages, offering opportunities for learning and networking through engaging events and localized community experiences. From student to seasoned professional, IDSA offers professional development opportunities to support growth tailored to enhance designers' skills and confidence.

Inventors Council of Mid-Michigan

The Inventors Council of Mid-Michigan is a non-profit 501(c)(3) organization based in Michigan, dedicated to assisting inventors in bringing new and innovative products to market. Their mission is to help inventors succeed efficiently and affordably by offering education and business networking opportunities.

Urban Manufacturing Alliance

The Urban Manufacturing Alliance provides a national voice on equitable economic development strategies that support small and mid-sized manufacturers in urban areas and create important pathways to the middle class. They offer online and in-person platforms to foster exchanges on community development tools, local branding, equity, workforce development, and land use policy. UMA showcases current practices, programs, and people that are uplifting manufacturing and creating more equitable communities.

American Society of Mechanical Engineers (ASME)

ASME promotes the art, science, and practice of multidisciplinary engineering and allied sciences around the globe. Offers certification and accreditation programs, continuing education opportunities, and resources on bioengineering, manufacturing, energy, robotics, and the ASME Innovation Showcase (ISHOW).

Manufacturing and Consultancy Service Providers

Centrepolis Accelerator

The Centrepolis Accelerator provides access to key product manufacturing resources including mentors, workshops, cutting-edge technologies, corporate connections, student and faculty engagement, events, workspace, and a collaborative community of peers. Members have access to a state-of-the-art facility featuring additional workspaces, training, and a manufacturing technology lab.

Industrial Sewing and Innovation Center (ISAIC)

ISAIC is a Detroit-based 501(c)(3) nonprofit organization that focuses on responsible production of high-quality garments and providing solutions centered around people, education, advanced manufacturing, and upward mobility for workers. ISAIC's proprietary training curriculum is utilized in multiple states across the country, and their learning and contract manufacturing factory is located in midtown Detroit, above Carhartt's flagship store.

Lake Superior State University Product Development Center

Lake Superior State University (LSSU) Product Development Center offers prototyping and engineering services, provided by students and managed by administrative professional staff with extensive industrial, manufacturing, and entrepreneurial experience. LSSU engineering students get real world project experience, and clients benefit from economical engineering services. The related LSSU Business Development Center can provide business plan support, marketing, and other similar services.

Michigan Fashion Proto

An apparel development firm located in Lansing, Michigan. Offers launching brands preproduction resources such as design, line planning, sourcing, pattern making, and sample making, as well as in-house small-batch production.

TechPacker

The Ultimate Guide to Tech Packs in Fashion will help you understand what a Tech Pack is, why it is important, and how to create it using up-to-date tools. A free Tech Pack template is available.

Workforce Service Providers

Goodwill Industries International (GII)

Goodwill Industries International collaborates with like-minded partners to help people build skills and access the support needed to earn good jobs, advance into sustainable careers, and provide for their families. GII is interested in partnering with companies that have strong brand identities and reputations. As North America's leading nonprofit provider of employment training, job placement services, and other community programs for people looking to secure employment and build their skills, GII advocates for training and employment opportunities that help these populations find jobs and careers.

Focus HOPE

Each year, Focus HOPE serves thousands of community members across Southeast Michigan. Through its programs, the organization provides an intergenerational and holistic mix of services to help disrupt the effects of racism, poverty, and other forms of injustice. Its workforce development programs are scholarship-based and free to most students. Programs are offered in many areas including information technology, construction, logistics, and transportation. The industrial manufacturing program is a 15-week, 300-hour industrial manufacturing course that covers manufacturing readiness, hi-lo, Computer Numerical Control (CNC) operations, industrial robotics, and welding, preparing students for middle-skilled and multi-middle-skilled manufacturing positions.

LIFT

Located in Detroit, LIFT is a non-profit, public-private partnership between industry, academia, and government, which supports the nation's economy, and enhances its national security by accelerating innovative advanced manufacturing and talent development. Developing new venues, tools, and teaching techniques, LIFT's competency-based, technology-infused talent development program is redefining manufacturing education. From providing a foundational high school curriculum to training adults to enter the manufacturing workforce, the LIFT Talent Program ensures the manufacturing workforce of the future has the knowledge, skills, and abilities to successfully work in the advanced manufacturing future. Students can earn certifications in CNC operations, welding, robotics, and industrial technology maintenance.

Workforce Intelligence Network (WIN)

The mission of WIN for Southeast Michigan is to help cultivate a cohesive talent system by facilitating data-driven workforce solutions to ensure responsiveness to changing labor market demands. WIN provides employer training reimbursement funds available through 2027 for healthcare, cybersecurity, transportation, advanced manufacturing, EV/mobility, and apprenticeship.

TEMPLATES & TOOLS

Intuit Quickbooks Business Plan Template



Michigan Small Business Development Center's Business Plan Executive Summary Template



Michigan Small Business Development Center Marketing Plan Guide



Alberto—Villarreal Product Design Process



DFX - BOM BOP - DFMEA Workshop Exercise Templates - Provided by Centrepolis Accelerator



Evans Distribution Outsourcing Order Fulfillment PDF



Evans Distribution Systems Supply Chain Glossary Logistics Terminology



Acknowledgments

Design Core Detroit wishes to thank Bank of America and the many entrepreneurs, designers, businesses, and resource organizations who contributed to this work. A full list of industry advisors and individual contributors follows. Without the input, expertise, and support of each one, this project would not have been possible.

If your organization is interested in hosting interactive, hands-on educational workshops for your clients using this guide, please email info@designcore.org. We look forward to connecting with you.

Published by



With Support From



Designed by

Angela Ficorell, Subtle Design Co.

Edited by

Carolyn Darr

Project Managed by

Sarah Donnelly, Retail Reality

CONTRIBUTORS

Industry Advisory Council

- Amanda Lee**, Makers United | Nest
- Amy Rinaldo**, Ward Law Office LLC
- Andrew Dahlgren**, Urban Manufacturing Alliance
- Dan Radomski**, Centropolis |
Lawrence Tech University
- Denis Shaver**, Centropolis |
Lawrence Tech University
- Eric Strebel**, Botzen Design
- Greg Darby**, College for Creative Studies
- Jeevak Badve**, RLE International
- Jim Gorman**, MMTc-The Center
- John Hopkins**, Michigan Inventors Coalition
- Katie Schaible**, MonMade
- Kevin Gilboe**, Design Core Detroit
- Lindsay Struck**, Makers United | Nest
- Richard Choi**, Michigan Small
Business Development Center |
Eastern Michigan University
- Todd Karenen**, General Motors
- Tom Pavlak**, Poco Labs

Workshop Participants and Survey Respondents

- Abhishek Sen

Advaith Urs

Ambirr Momon

Anjali Purohit

Bethany Shorb

Bre Moore

Brenna Lane

Celeste Robinson

Chris Casteel

Christine Bossier
- DaTrice Clark

David Medina Alvarez

David Smith

Duran Roberson

Elizabeth Salonen

Gina Adams

Irene Walker

`ordette Applewhite

`ose Robinson

`ose Regueiro
- Lawrielle West

Lisa Sauve

Mari Bryd

R` Miller

Shay Dockery

Shayla `ohnson

Tafari Roberts

Tama Smith

Tamara Lincoln

Vaughn McCall

Remember to have faith in yourself and have fun. If you trust your designer and participate actively in the process, you are far more likely to achieve your design and business goals.

We hope this Design Guide for Product Business has inspired you to consider what's possible and given you the confidence to manage a successful relationship and project with a professional designer. Design is known to drive the competitiveness of businesses, enhance the overall appearance and function of products, and create engaging and inclusive products that capture the market and allow businesses to thrive.

Design Core is excited to see how you use this guide and welcomes you to share stories, pictures, and examples of your future product projects with us so we can help celebrate your success.

Please email info@designcore.org or call 313-664-7400, if we can be of any further assistance to your business.

 facebook.com/designcoredet

 [@designcoredet](https://www.instagram.com/designcoredet) [designcore.](https://www.instagram.com/designcore)

[designcore](https://www.designcore.org)
org

