

Product Development

The purpose of this section is to familiarize the business counselor with various stages of product development and barriers that inventors should be prepared to overcome.

The Inventor will become familiar with “The Commercialization Process Model” developed by Dr. H. Randall Goldsmith and the Mid-Continent Technology Transfer Center.

It takes a lot more than a great idea – or even a great product – to be successful at bringing a new idea into today’s marketplace. The following explains what is needed

COMMERCIALIZATION STRATEGIES

There are two ways to commercialize a new product:

- 1) The client produces and sells the product by **starting their own venture**.
- 2) The client **licenses the product** to someone else to produce and sell.

1) THE VENTURING OPTION

Pros and Cons of the Venture Option:

Pros	Cons
Running a company can be exciting.	It is risky. Many new businesses fail.
In the long run, venturing can make more money than licensing.	Requires substantial resources.
	Venturing is more time intensive.
	The inventor will not make money for some time.

2) THE LICENSING OPTION

Licensing grants another person or company the rights to an intellectual property. This idea appeals to many inventors because the amount of money as well as the amount of tasks, skills, and people required seem considerably less than what it would take for the client to set up a new business. This reduction in work volume is observed below in “The Commercialization Process Model” by realizing that the licensor is able to end the process after the Strategic Business Plan stage. In contrast, a person who is venturing must complete all stages in the model.

Pros and Cons of Licensing:

Pros	Cons
Licensing multiplies the resources to develop the invention.	The inventor will lose control of the technology.
Licensees often see things that the inventor does not see.	The inventor’s involvement is reduced.
The inventor may get some money up front the invention.	Finding the right licensee is tough.
Licensing frees up the inventor to do something else.	Tougher to protect inventor’s interest.

A person should be able to answer **YES** to the following questions **before** they try to license a product?

1) Does the inventor have a patent, copyright, or other legal protection?

If not, the client probably won't get far. Why should a company pay the inventor for something that the inventor does not own?

2) Does the inventor have a working model, or an engineering prototype?

If not, the inventor is unable to prove the product will work. This weakens the client’s bargaining position.

3) Does the inventor have credible data about the size of the market, including probable impact of selling price on quantity demanded?

4) Does the inventor know what it will cost to produce at various levels of output?

Many inventors think that licensing will enable them to avoid answering questions 3 and 4 – they think that it is the job of the licensee. However, if the inventor does not know the answers, then he or she won't know what the invention will be worth to the licensee. The end result is that the licensee has the ability to offer a small amount of money for the invention and the licensor is unable to object to this small amount. For this reason, all inventors who plan to license their invention must complete the first seven stages of the “Commercialization Process Model,” described later in this module.

THE COMMERCIALIZATION PROCESS MODEL

The Commercialization Process Model developed by Dr. Randall Goldsmith and the Mid-Continent Technology Transfer Center **defines the process of transforming a product from the idea stage to a full – fledged manufacturing company.** The model breaks the commercialization process down into three categories: technical, marketing, and business. Each of these categories requires attention and the inventor must proceed through the three phases of concept, development and commercial in each of the categories. There are significant steps and critical activities within each of the phases. The matrix shown on the next page details how these categories, phases, stages and steps work together for the successful development of the product. The following definitions will make the matrix more meaningful.

Definition of the Categories:

- **Technical Steps:** The technical, engineering, and manufacturing components of producing a product.
- **Marketing Steps:** The customer, sales, advertising, and distribution of components.
- **Business Steps:** The coordination and control of management, marketing, production, finance, and legal activities required to sustain a commercial venture.

Definition of Phases

- **Concept Phase:** The theory or idea of developing a product and a business around it. The concept phase is the period that validates the technical, marketing, and business assumptions concerning the product's commercial potential.
- **Development Phase:** The growth of maturing of a plan to commercialize a product. The development phase is the period of establishing the feasibility of producing and selling the product
- **Commercial Phase:** The activity of producing a product for sale in the marketplace.

The Commercialization Model: REQUIRED ORDER OF EXECUTION

	TECHNICAL	MARKET	BUSINESS
CONCEPT PHASE			
INVESTIGATION	TECHNICAL CONCEPT	MARKET NEEDS ASSESSMENT	VENTURE ASSESSMENT
	1	2	3
DEVELOPMENT PHASE			
FEASIBILITY	TECHNICAL FEASIBILITY	MARKET STUDY	ECONOMIC FEASIBILITY
	5	4	4
DEVELOPMENT	ENGINEERING PROTOTYPE	STRATEGIC MARKETING PLAN	STRATEGIC BUSINESS PLAN
	6	8	7 Stop if Licensing Continue if Venturing
INTRODUCTION	PRE-PRODUCTION PROTOTYPE	MARKET VALIDATION	BUSINESS START-UP
	9	10	10
COMMERCIAL PHASE			
GROWTH	PRODUCTION	SALES AND DISTRIBUTION	BUSINESS GROWTH
	11	12	11
MATURITY	PRODUCTION SUPPORT	MARKET DIVERSIFICATION	BUSINESS MATURITY
	13	13	13

The Commercialization Model: KEY QUESTIONS

TECHNICAL	MARKET	BUSINESS
------------------	---------------	-----------------

CONCEPT PHASE

INVESTIGATION	TECHNICAL CONCEPT ANALYSIS	MARKET NEEDS ASSESSMENT	VENTURE ASSESSMENT
	<ul style="list-style-type: none"> • New and unique? • Valid? 	<ul style="list-style-type: none"> • Market need? 	<ul style="list-style-type: none"> • Profit?

DEVELOPMENT PHASE

FEASIBILITY	TECHNICAL FEASIBILITY	MARKET STUDY	ECONOMIC FEASIBILITY
	<ul style="list-style-type: none"> • Producible? 	<ul style="list-style-type: none"> • Who? • How many? • How much? 	<ul style="list-style-type: none"> • Investment justification?
DEVELOPMENT	ENGINEERING PROTOTYPE	STRATEGIC MARKETING PLAN	STRATEGIC BUSINESS PLAN
	<ul style="list-style-type: none"> • Commercially producible? 	<ul style="list-style-type: none"> • Target market? 	<ul style="list-style-type: none"> • Venture or License? • Business plan?
INTRODUCTION	PRE-PRODUCTION PROTOTYPE	MARKET VALIDATION	BUSINESS START-UP
	<ul style="list-style-type: none"> • Performance and reliability? 	<ul style="list-style-type: none"> • Market response? 	<ul style="list-style-type: none"> • Key personnel?

COMMERCIAL PHASE

GROWTH	PRODUCTION	SALES AND DISTRIBUTION	BUSINESS GROWTH
	<ul style="list-style-type: none"> • Technical process established? 	<ul style="list-style-type: none"> • Target structure in place? 	<ul style="list-style-type: none"> • Gaining market share? • Increasing profits?
MATURITY	PRODUCTION SUPPORT	MARKET DIVERSIFICATION	BUSINESS MATURITY
	<ul style="list-style-type: none"> • Maximizing product value? 	<ul style="list-style-type: none"> • Target market diversification? • Product diversification 	<ul style="list-style-type: none"> • Optimizing potential profits?

The Commercialization Model: ACTIVITIES

TECHNICAL	MARKET	BUSINESS
------------------	---------------	-----------------

CONCEPT PHASE

	TECHNICAL CONCEPT ANALYSIS	MARKET NEEDS ASSESSMENT	VENTURE ASSESSMENT
INVESTIGATION	<ul style="list-style-type: none"> Define concept Confirm critical assumptions Survey state of the art Id critical barriers Evaluate applicability Determine technology 	<ul style="list-style-type: none"> Conduct market overview Id pricing structure Id market barriers Id risks Id distribution channels Id trends & competitors 	<ul style="list-style-type: none"> Estimate profit potential Conduct self, enterprise, and commercialization assessment Identify professional needs Identify capital needs

DEVELOPMENT PHASE

	TECHNICAL FEASIBILITY	MARKET STUDY	ECONOMIC FEASIBILITY
FEASIBILITY	<ul style="list-style-type: none"> Develop working model Test technical features Assess prelim producibility Conduct mfg assessment Assess safety and environmental features Finalize designs 	<ul style="list-style-type: none"> Identify and quantify: Market size Customers Volume Prices Distribution Competitors 	<ul style="list-style-type: none"> Formulate financial assumptions Develop proforma Identify seed capital Form advisory team
	ENGINEERING PROTOTYPE	STRATEGIC MARKETING PLAN	STRATEGIC BUSINESS PLAN
DEVELOPMENT	<ul style="list-style-type: none"> Develop prototype Id materials & processes Conduct tests Develop mfg methods 	<ul style="list-style-type: none"> Identify marketing team Define target market Select market channels Field test 	<ul style="list-style-type: none"> Decide venture or license Finalize intellectual prop. Identify mgt team Select organization struct. Write business plan
	PRE-PRODUCTION PROTOTYPE	MARKET VALIDATION	BUSINESS START-UP
INTRODUCTION	<ul style="list-style-type: none"> Develop production prototype Determine production process Select mfg equip Design field support sys Demo product features 	<ul style="list-style-type: none"> Establish market relationships Conduct limited sales Analyze sales Survey customers refine marketing plan 	<ul style="list-style-type: none"> Establish business function Hire staff Execute contracts Secure 1st stage finance

COMMERCIAL PHASE

	PRODUCTION	SALES AND DISTRIBUTION	BUSINESS GROWTH
GROWTH	<ul style="list-style-type: none"> Prepare commercial design Establish quality control Construct facilities Conduct full production Finalize internal dist sys 	<ul style="list-style-type: none"> Expand distribution Analyze competitor response Asses customer satisfaction Assess distributor satisfaction Refine product features 	<ul style="list-style-type: none"> Monitor enterprise position Hire and train personnel Execute contracts Arrange 2nd stage financing Institute vision, mission, and manufacturing policies
	PRODUCTION SUPPORT	MARKET DIVERSIFICATION	BUSINESS MATURITY
MATURITY	<ul style="list-style-type: none"> Maximize production Establish aftermarket support Warranty service Implement training prog 	<ul style="list-style-type: none"> Develop market retention Establish market scan Identify new markets Identify new products 	<ul style="list-style-type: none"> Establish SWOT process Invest profits Monitor product life cycle Monitor business trends Monitor mgt tech Implement innovations

The Commercialization Model: SERVICE PROVIDERS

TECHNICAL	MARKET	BUSINESS
------------------	---------------	-----------------

CONCEPT PHASE

INVESTIGATION	TECHNICAL CONCEPT ANALYSIS	MARKET NEEDS ASSESSMENT	VENTURE ASSESSMENT
	<ul style="list-style-type: none"> • Patent researchers • Faculty researchers • Engineers 	<ul style="list-style-type: none"> • Market researchers • Trade associations • Industry contacts 	<ul style="list-style-type: none"> • Business acquaintances • Entrepreneurs • SBDCs RTTCs

DEVELOPMENT PHASE

FEASIBILITY	TECHNICAL FEASIBILITY	MARKET STUDY	ECONOMIC FEASIBILITY
	<ul style="list-style-type: none"> • Engineering firms • Testing labs • Equipment vendors 	<ul style="list-style-type: none"> • Marketing consultants • Universities • Industry contacts 	<ul style="list-style-type: none"> • Business consultants • Accounting firms • Intellectual property firms
DEVELOPMENT	ENGINEERING PROTOTYPE	STRATEGIC MARKETING PLAN	STRATEGIC BUSINESS PLAN
	<ul style="list-style-type: none"> • Engineering firms • Industrial design firms • Engineering schools 	<ul style="list-style-type: none"> • Marketing consultants • Universities • Industry contacts 	<ul style="list-style-type: none"> • Business consultants • Financial advisors • Legal firms
INTRODUCTION	PRE-PRODUCTION PROTOTYPE	MARKET VALIDATION	BUSINESS START-UP
	<ul style="list-style-type: none"> • Engineering firms • Industrial design firms • Equipment vendors 	<ul style="list-style-type: none"> • Marketing consultants • Industry contacts • Trade associations 	<ul style="list-style-type: none"> • Business consultants • Financial insurance • Management advisors

COMMERCIAL PHASE

GROWTH	PRODUCTION	SALES AND DISTRIBUTION	BUSINESS GROWTH
	<ul style="list-style-type: none"> • Consulting firms • Equipment vendors • Manufacturing technology centers 	<ul style="list-style-type: none"> • Marketing consultants • Sales representatives 	<ul style="list-style-type: none"> • Financial advisors • Business consultants • Legal insurance
MATURITY	PRODUCTION SUPPORT	MARKET DIVERSIFICATION	BUSINESS MATURITY
	<ul style="list-style-type: none"> • Consulting firms • Equipment vendors • Manufacturing technology centers 	<ul style="list-style-type: none"> • Marketing consultants • Trade associations 	<ul style="list-style-type: none"> • Investment advisors • Business consultants • Strategic planners

The Commercialization Model: Funding

TECHNICAL	MARKET	BUSINESS
------------------	---------------	-----------------

CONCEPT PHASE

INVESTIGATION	TECHNICAL CONCEPT ANALYSIS	MARKET NEEDS ASSESSMENT	VENTURE ASSESSMENT
	<ul style="list-style-type: none"> • Financing: pre-seed capital 	<ul style="list-style-type: none"> • Average amount: \$5,000 	<ul style="list-style-type: none"> • Source: Self • Internal corporate funds • Time: 2-3 months

DEVELOPMENT PHASE

FEASIBILITY	TECHNICAL FEASIBILITY	MARKET STUDY	ECONOMIC FEASIBILITY
	<ul style="list-style-type: none"> • Financing: Seed Capital 	<ul style="list-style-type: none"> • Range: \$10k -\$50k 	<ul style="list-style-type: none"> • Source: Friends, Acquaintances, relatives, Internal Corporate Funds • Time: 2 – 12 months
DEVELOPMENT	ENGINEERING PROTOTYPE	STRATEGIC MARKETING PLAN	STRATEGIC BUSINESS PLAN
	<ul style="list-style-type: none"> • Financing • R&D Capital 	<ul style="list-style-type: none"> • Average amount • Feasibility X 20 	<ul style="list-style-type: none"> • Source: Angel Investors • Internal Corporate Funds • Time: 3-12 months
INTRODUCTION	PRE-PRODUCTION PROTOTYPE	MARKET VALIDATION	BUSINESS START-UP
	<ul style="list-style-type: none"> • Financing • 1st Stage Start-Up 	<ul style="list-style-type: none"> • Average amount • Development X 20 	<ul style="list-style-type: none"> • Source: Intuitional Capital • Time: Continual

COMMERCIAL PHASE

GROWTH	PRODUCTION	SALES AND DISTRUBITION	BUSINESS GROWTH
	<ul style="list-style-type: none"> • Financing: • 2nd and 3rd stage 	<ul style="list-style-type: none"> • Average • Product Prep X 20 	<ul style="list-style-type: none"> • Source: Institutional Capital, Bank Financing, Stock Sell • Time: 24-48 months
MATURITY	PRODUCTION SUPPORT	MARKET DIVERSIFICATION	BUSINESS MATURITY
	<ul style="list-style-type: none"> • Financing: Management Buyout, IPO 	<ul style="list-style-type: none"> • Average amount • Multiple Millions 	<ul style="list-style-type: none"> • Source: Institutional Capital, Internal Corporate Funds • Time: 6-36 months

Tools for Intellectual Property Protection

Copyrights, Trademarks, Patents, and Trade Secrets

- **Copyrights**

- Copyrights are for protecting “original works of authorship”.
 - Protection is automatic and immediate
 - In the case of works made for hire, the employer and not the employee is considered to be the author.
 - Protected for author’s life plus 70 years
 - See www.copyright.gov for more information
- Copyrights do not cover
 - Titles, names, short phrases, and slogans; familiar symbols or designs; mere variations of typographic ornamentation, lettering, or coloring; mere listings of ingredients or contents
 - Ideas, procedures, methods, systems, processes, concepts, principles, discoveries, or devices, as distinguished from a description, explanation, or illustration
 - See www.copyright.gov for more information

- **Trademarks**

- A trademark is a word, phrase, symbol or design, or a combination of words, phrases, symbols or designs, that identifies and distinguishes the source of the goods of one party from those of others.
 - The concept central to Trademarks is the **prevention of confusion in the marketplace**. The law protects against consumer confusion by ensuring that the marks on the same or similar products or services are sufficiently different.
 - Protection is automatic and immediate
 - Any time you claim rights in a mark, you may use the "TM" (trademark) or "SM" (service mark) designation to alert the public to your claim, regardless of whether you have filed an application with the USPTO.
 - TM’s are not just words, they may include symbols and fonts and colors.
 - See www.uspto.gov for more information

- **Patents**

- A patent usually provides protection for 20 years from application date.
- A Patent lawyer should be hired to compose the application and correspond with the USPTO
- Estimated cost for obtaining a patent range from \$5,000 to \$25,000
- If no problems are found, the patent will be granted 18 to 24 months after applying
- A patent grants **the right to exclude others** from making, using, offering for sale, or selling the invention in the United States or “importing” the invention into the United States.
 - **Important:** notice that the wording does not give you clearance to make something, it only gives you the rights to prevent others from engaging some action.
 - Example: Just because you patented a nuclear reactor, you **are not** granted the right to manufacture and sell the nuclear reactor.
- An invention must be new to the entire world, useful, and non-obvious to someone familiar with the field.
- Once a patent is issued, the patentee must enforce the patent without aid of the USPTO.
 - This means using lawyers for costly legal engagements with infringers.
- There are three types of patents:
 - Utility Patent
 - May be granted to anyone who invents or discovers any new and useful process, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof.
 - The type of patent most inventions require.
 - Design Patent
 - May be granted to anyone who invents a new, original, and ornamental design for an article of manufacture
 - Useless in protecting most forms of intellectual property.
 - Plant Patent
 - May be granted to anyone who invents or discovers and asexually reproduces any distinct and new variety of plant
- See www.uspto.gov for more information.

- **Trade Secrets**

- Protected as long as the secret is maintained
- Covered under state laws
 - Mississippi Code of 1972 – Title 25 – Chapter 61 – 9
- A trade secret is defined as any valuable business information that is not generally known and is subject to reasonable efforts to preserve confidentiality.
- The owner must be able to prove that they are trying to protect the secret.
- See www.ipwatchdog.com/tradeseecret.html for more information.

Resources for Intellectual Property Protection

MSBDC Contact us if you need help protecting your IP
www.mssbdc.org

Google Patent Search Best Place for Prior art Searches
<http://www.google.com/ptshp>

USPTO Official Patent and Trademark Website
<http://www.uspto.gov/>

US Copyright Office Official Copyright Website
www.copyright.gov

InventorED Best Website Available for Inventors
<http://www.inventored.org/>

FTC Discusses Invention/Patent Scams
<http://www.ftc.gov/bcp/online/pubs/services/invent.shtm>
www.ftc.gov