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COMMERCIALIZATION OF INVENTIONS AND RESEARCH RESULTS: MARKETING AND BUSINESS PLANNING

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I. INTRODUCTION

Twenty five years ago, a young engineer was compelled by the distressing technological environment of the African continent and I decided to devote myself to technological innovation. I was shocked by a common wisdom among the profession; that the probability for a new idea to reach the market is 4%.

Only four out of one hundred research and development projects would come out with a commercial product. I was then convinced that this was a context specific figure. In developing countries where there is a huge deficit of technology, the figure should definitely be better.

During the next six years, I learned the hard way that in developing countries, the figure is even worse. I learned that without carefully planning, no research and development project would turn successful.

Planning used to be seen as a functional development model which describes process, resources, target and scope, in a static fashion, and with activity duration estimates and precedence relationships describing the network of development activities. To bring a product to the market however, one would have to explicitly model and integrate the influences of processes, resources, scope and targets on performance and develop a team-based model. During the process, the inventor himself would have to change.

To get an innovation to the marketplace you may either license it or do it yourself. Most other options are variations of these two possibilities. In either case it is teamwork. Globalization of the market makes it even more difficult for an individual to go along all the steps of the innovation process of getting an idea to the market place (see tables 1, 2, and 3).

II. PREREQUISITES COMMON TO LICENSING AND VENTURING

Whether you hope to go on and market yourself your invention, or persuade someone else to buy the rights to produce and distribute your invention, you should put together a convincing package including:

2.1 Proof that it works

Would be investors or licensees like to see, touch and watch your invention do its stuff. You have to show them more than just a working model. You should show them an engineering prototype.

The innovator is likely to lose on any deal he has not checked, prior to looking for investors, the following:

- Market analysis;
- Market channels;
- Why people will buy the new product.

2.1.1 A market analysis

This is a serious breakdown of who the potential customers are, how many of them there are, how much they will pay, what the competition is, and how you will beat it.

2.1.2 Exactly what the market channels

What are the channels through which products like yours reach the market. You should be able to show three significant points of difference between your product and the competition. You must be sure that none of your enabling business partners can kill your product.

2.1.3 Why people will buy your product

Above all, you have to be able to show, why people will buy your product and show this through statements from prospective customers, backed up with believable figures in money terms. Your market analysis determines whether it's worth developing your invention, regardless of its technical elegance, and that analysis forms the basis for the next thing you need, which is:

2.1.4 A commercialization plan

This is a detailed analysis showing what you intend to do to develop, market, and sell your technology, how much all this will cost, and who will do the work required - with all this information translated into a year-by-year money projection, five years into the future. If you can't produce such a plan, you will have little ammunition with which to counter the efforts of investors to beat down your price.

Table 1

The Innovation Process: Pre-Product Stage: from Concept to Engineering Prototype
(from Invention to Innovation DOE/NBB-067 US Department of Energy 1991)

Technical Steps	Market Steps	Business Steps	Skills Required	People Involved
Concept	Does Market Exist	Decide to Develop	Intuition to technical	Inventor
Concept Analysis	Define Market	Find Money	Technical to Engineering	Inventor
Working Model	Define Three Points of Difference	Find More Money	Engineering	Inventor Local Technicians Friends as Investors
Engineering Prototype Test Refine	Identify Market Barriers Decide to License or Venture	Find Even more Money Protect: Patent/ Trade secret Start Business Plan	Engineering Legal Market Analysis Capital acquisition	Inventor Engineer Patent Attorney More Investors Market Analysts Business Planner

2.2 Other factors in choosing a commercialization strategy

In deciding either to license or to venture, the innovator should accept that either way, he should give up some measure of ownership and/or control. The innovator must look for an exit strategy at the same time he is looking for a commercial strategy. The matter is nor to get out or not, but when, how completely, under what circumstances and by what method.

The innovator must also be ready to trade much of the existential pleasure of engineering for the assiduous unrelenting attention to the market and costs, which is the hallmark of a professional businessman.

2.3 Cost awareness

There are three kinds of costs: money, time, and personal. The three of them are intertwined, and to some extent interchangeable. If you think you can’t afford to hire a model maker, for example, you may decide to save money by building it yourself at a cost of your time, which in turn often involves a personal cost to your health, your family life, and so on, not to mention the fact that you may produce a poor model.

To measure these costs accurately in relationship to one another, you must understand and apply the principle of “opportunity cost”. In terms of money, it’s the interest lost by placing it somewhere other than in the safest investment you can find.

Opportunity costs, however, also apply to time and personal costs. While you’re doing one thing, you can’t be doing something else, and if you spend a lot of time doing things you don’t do well, you may be wasting something more precious than money. In the long run, money costs may be the least expensive of all because, if you run out of money, there’s always bankruptcy. If you run out of time, nothing can help you. So when needed one should hire an expert.

III. COMMERCIALIZATION STRATEGIES

In order to reach the market, somebody has to produce your technology, and somebody has to sell it. In fact, as your invention moves toward the market, business skills become more important than technical skills (see Table 2). You will need increasing quantities of time from people who have these skills, and of course you will need more and more money. Because many innovations compete for these limited resources, however, you will need the kind of plans that impress the people who from whom you except a deal. As an innovator, you may lack experience, but you can start the learning process by planning for a clear and stable goal: reaching the market.

Table 2

Entrepreneurial Stage: from Prototype to Production
(From Invention to Innovation DOE/NBB-067 US Department of Energy 1991)

Technical Steps	Market Steps	Business Steps	Skills Required	People Involved
Production Prototype Scale Up Test Refine Production Engineering Product Safety Engineering	Full Market Analysis and Plan Niches Barriers Pricing Competition Cost Data Distribution Method Alternative Product Applications Risk Analysis Sales projections	Find Big Money Complete Business Plan Form Business Meet Official Regulations Arrange insurance Price Production Facility	Engineering Production Product Safety Entrepreneurial Financing Marketing Cost Analysis Legal Management	Inventor (?) Entrepreneur Investors Engineers Production Safety Attorneys Patent Corporate Accountants Consultants Market Business Management Financial Insurance Brokers Trade Union Officers
Limited Production Qualification testing Running changes	Contact Customers Commence Distribution Seek Product Endorsements Follow up Sales Advertise Publish in Technical Journals	Find Big Big Money Start up Business Build Plan Buy Equipment Hire Foreman and Labor Arrange Product Service Purchasing Transportation Record Keeping	All above PLUS Speciality engineering Systems Engineering Sales Analysis Supervisory	All the above PLUS Foreman Labor Sales People Speciality Engineers Systems Engineers
Full Production Start-Up Initial Growth	All above PLUS Expand Distribution Analyze competitor Response	All the above PLUS Monitor Costs Finance Cash-Flow Deficit Refine Production System	All above PLUS Delegation Market Forecasting Strategic Planning Long Term Financial Projections	All above PLUS Expanding Management Sales Labor Force
	Increasingly Complex		Increasingly Complex	

3.1 The licensing option

Licensing tempts many inventors because the amount of money, as well as the catalog of tasks, skills, and people required, may seem considerably less than in running your own business. That doesn't necessarily mean it's the right alternative. In the first place, you may

not find a licensee in the second place, even when it's possible, licensing has its pros and cons. Here are some considerations:

3.1.1 The negative side

You lose control of the technology usually total control, for a long time, and often forever.

- Your own involvement is reduced

In most cases, you'll have no further direct Involvement at all. You may stay around as a consultant to the licensee, but usually for a limited time only.

- Finding the right licensee is tough

The right one may make you rich. The wrong one may bury your technology, or butcher it. Even If you can eventually get it back, it may be too late.

- Protecting your interests is crucial but it's also extremely difficult to do

The other side has professionals to represent it; they confront you with the immense staff resources of the corporation (lawyers, market analysts, production engineers) a tough team for you to take on by yourself. You need the help of a lawyer with experience in such negotiations.

3.1.2 The positive side

- Licensing multiplies the resources to develop your invention as the licensee can immediately put whole teams of professionals to work developing, producing, and marketing the technology

- Licensee may see more markets for your products than you do

- The licensee may pay you money up front (although probably not as much as you hope) and in addition, he may agree to a minimum amount of royalties for some period.

- You may make it won

- Licensing frees you to do something else

3.1.3 Before considering licensing, however, you should be able to answer yes to all these questions:

- Do you have a patent, copyright, or other legal protection?

If not, you won't get far, because no company will risk Investing in an unprotected innovation. Why should they pay you for something you don't own?

- Do you have a working model, or better yet, an engineering prototype?

If not, you can not prove the thing will work with competitive efficiency. If you haven't made it work, your licensee will have to, which will cost them money, which will weaken

your bargaining position. Indeed, licensing may succeed or fall on the basis of your technical development prior to licensing, for your licensee may have neither the skill nor the commitment.

- Do you have credible data about the size of the market, including probable impact of selling price on quantity demanded?

- Do you know what it will cost to produce at various levels of output?

You not only have to demonstrate technical feasibility, you also have to prepare a package of information about production and marketing so close to that required for a business plan that you might consider, in fact, writing one. Such a document will help you decide whether you want to venture or license in the first place, and then help you carry out that decision by supplying you with the data you need to raise money for your own business, or to persuade a prospective licensee to talk you out of it.

At the very least, if you decide to license your invention, you'll have to complete the steps on the Innovation Process tables through a Working Model; reaching the Engineering Prototype stage would greatly increase both your chances of finding a licensee and the amount of money you may convince him to pay. By contrast, if you want to start your own business, or develop the technology within a business you already operate, you'll have to do everything on the table through the "Entrepreneurial Stage."

3.2 The venturing strategy

Starting your own business, or "venturing", as it is often called, will require more from you, but has its own advantages and disadvantages to consider:

3.2.1 The disadvantages

- Venturing is risky. Many new businesses fail. A new business built around a new product runs a double risk, especially since the list of reasons for new business failures reads like a catalog of many inventors' weaknesses: Inadequate financing, lack of management skills, such as personnel, accounting, overestimating the market, poor choice of location, inability to delegate responsibility.

- Resources remain limited**.** Raising the kind of money required to set up production and marketing usually takes a professional. If you are not one, you'll have to find one.

- You cannot go alone through all the Innovation Process. If you cannot put together a ream, you are likely to run out of time.

- You probably won't make much money for quite a while. Building a business gobbles cash, and a lot of it will continue to be yours. If you can found a company and finance it adequately, you may be able to pay yourself a salary, but it'll probably be modest. Your backers WILL expect you to be frugal with their money.

3.2.2 The advantages of venturing

In the long run, you may make a lot more money. If your invention turns out to be a big success, your rewards could vastly exceed the royalties you could expect from any licensing agreement.

Running a company can be exciting. If you have the will and skill, you may enjoy it more than inventing.

Successful management of a business requires launching, mastering, and controlling a dynamic process, as well as dealing with continuous change caused by such things as the business's growth, new technology in the industry, revisions in tax laws, behavior of competitors, etc. A successful, growing, and dynamic business rests on a foundation of continuous planning, involving constant updating to reflect changing circumstances, goals, organization, etc. The plan will help keep you on track, and it's an invaluable tool with which to sell yourself and your business to prospective investors, customers, and suppliers (as well as to the people you want to recruit for your company.) especially in terms of future prospects.

IV. YOUR TECHNOLOGY AND ITS MARKET

An inventor's natural inclination to see his invention work usually provides sufficient motivation for building a working model. Scaling up from working model to engineering prototype follows logically in terms of technical development and you need also to show up for prospective investors.

None of this means that you should automatically go from concept to working model to engineering prototype. Whether you should depends not only on whether it's technically feasible, but equally (at least) on whether the potential market justifies the expense. In other words, you shouldn't go to the expense of continued technical development unless there's a market big enough to repay you, and to provide your backers with a decent return on their money.

The first step, then, in planning to take a product into the marketplace (commercialization) is to develop your concept, checking frequently as the concept clarifies, to verify market requirements. Don't think that you or anyone else can dictate to the buyer. Market knowledge, advertising, salesmanship, reputation, quality, these things sell products. Technology doesn't sell itself.

V. MARKET ANALYSIS

Just because something works doesn't mean enough people will buy it to support the expense of producing it. You would have to demonstrate to investors and licensees who your customers will be what channels exist to distribute your product to them, what competition you will face, and how your product will compete successfully.

Market analysis, like the other tasks you have to perform, gets more complex the closer your technology gets to the market. Whether you decide to license or venture, a full-scale analysis forms a basic part of your appeal to prospective licensees or investors. Either way, an appropriate market analysis becomes an essential component of your commercialization plan.

At every step of technical development, you should have appropriately detailed and documented responses to these following questions.

5.1 Market identification

- What specific customer needs does your product satisfy?
- Who will buy your product?
- Can you list specifically the people or companies that you consider likely customers?
- Why will they buy?
- What product characteristics encourage these customers to buy?
- Does your product have these characteristics?
- Is the timing right?
- Do some events have to occur (or conditions exist) before people will buy your product?
- Is there any chance that the "time" for your product has come and gone (or is almost gone)?
- Or is now the time. And, if so, why?
- Does a market exist right now for your Innovation?
  If not, you had better have some compelling reason to think that one will emerge soon.
  If one does exist, you should be able to say something about it, and about the way your technology relates to it.

5.2 Market size

Define the market for your product in detail; identify segments of that market and specify their size in terms of units that can be sold.

5.3 Your customers

Who is the end user of the product?

The end user may not be your customer, but your product obviously will have to satisfy his needs. You will need to analyze in detail those characteristics of the end user that might affect his demand for your product.

5.4 Distribution

Knowing your market means knowing more than who the end users are. You have to know the existing channels of distribution that pass goods from producer to end-user. Distribution networks suitable to your product probably exist already and if this is the case: "Who are your customers?"

Many inventors have wasted valuable time and money trying to sell the end user, who was not, in fact, the customer, or trying to sell to the customer without considering the end user's needs. In fact, your product must accommodate every link in the marketing chain.

You must therefore know the distribution channels through which your product moves from manufacturer to end-user. This includes knowing each intermediate step and the kind of company that performs it.

Do you know the distribution chain for your product, complete with company names?

Are your customers the end users or members of the distribution network?

5.5 Your competition

To succeed in the marketplace, you have to know your competition, as well as your competitive advantages and disadvantages**.** You should be able to list your competitors in detail.

You should also be able to list the specific characteristics that differentiate your technology from products now in the market and you should be able to describe the differentiation. If at any point in the development of your product you can't identify at least three points of difference, it may be time to quit. Moreover, your answers to these questions should enable you to explain why your potential customers will make two decisions: to quit buying from your competition, and to buy from you.

As you develop your technology you should continually integrate estimates of manufacturing costs (no matter how crude) and market potential (no matter how preliminary) into consideration of your commercialization strategy. As you advance toward a market-ready prototype, the multiplication of tasks and skills, the increasing number of people, and swelling flow of information will press upon your capacity to manage your enterprise. You will need to adapt the structure of your firm to support your evolving technical development and commercialization strategy.

VI. BUSINESS DEVELOPMENT: THE STRATEGY AND STRUCTURE OF THE INNOVATION PROCESS

The Innovation Process tables implicitly embody the progressive development of an appropriate business structure. The process of acquiring sufficient capital for development, forces innovators into a business format persuades investors that both development will go forward successfully, while providing them with legal safeguards such as limited liability.

If you do not have a functioning business already, you too will confront the necessity of either:

- Building a business from scratch;
- Entering a joint venture with an existing firm;
- Finding a licensee.

No matter where you stand now, no matter how far your idea may be from the market, you cannot begin too soon considering both your choice of commercialization strategy and the structural foundation you will need to support it. Plan accordingly. You should then be able to ask the question: "Is the current structure of my firm appropriate; that is, will its structure support the strategy I'm following? And, how long will it remain adequate?"

A business grown from scratch usually passes through some or all of the following structural stages:

- Sole Proprietorship;
- Sole Proprietorship with Limited Liability (A Personal Inc.);
- Partnership;
- Partnership with Limited Liability (A Limited Partnership);
- Close Corporation (Stock not publicly traded);
- Public Corporation (Stock Publicly Traded) where applicable.

These stages result from the pursuit of strategies that achieve two general objectives en route to the final goal of successful, sustainable market penetration:

- Creating a legal form appropriate to securing capital, building a management team, and producing a marketable product;
- Organizing the "People and Skills" in a structure that optimizes the ratio between inputs and outputs.

The former of course involves an expanding corpus of legal documents (and of course lawyers' fees) required to:

- Secure limited liability for investors;
- Trade ownership shares for capital infusions;
- Obtain liability insurance;
- Meet the array of laws regarding the environment, safety, employee benefits, etc.;
- Secure liability insurance; and finally, if the big dream comes true and if a stock exchange exists, to take the company public.

The latter objective involves (among other things):

- Prioritizing the required skills;
- Obtaining those skills by appropriate, sequential hiring;
- Arraying people and tasks in a structure producing accountable results; that is, it both achieves the specified goals and objectives of the original plan and collects data to update and revise it;
- Revising the structure to accommodate the demands of success, or to eliminate the causes of poor performance;
- Even the smallest business should function systematically in the present, guided by a plan anticipating structural change to support new strategies appropriate to revised goals and objectives. Without such planning, even the most promising technology has a high probability of joining the ranks of small business casualties.
- In general, however, only an attorney can provide expert advice on such subjects as tax implications of business structures, suitability of a given structure to provide various kinds of legal advantages, and the relationship of structure to various methods of raising capital.

VII. FACING THE PLANNING TASK

Few inventors have had the training or the opportunity to engage in planning and many have little inclination to begin. The Innovator must realize that planning, like developing a

technology, is an incremental, ongoing process, not the instantaneous creation of a finished product.

In fact, the plan should evolve in much the same way as the technology. At first simple and brief, then more detailed and complex as you refine your understanding of the marketplace and decide what role you yourself will take. Also, as circumstances force you to deal more frequently with strangers, rather than with family and friends, you will have to provide greater detail about complex issues.

6.1 Who writes the Plan?

The plan deals with your technology. So as the inventor you should do the plan no matter your level of skill. Practices make perfect so the sooner you start, the better.

6.2 What level of complexity is required?

The kind of plan you produce and its level of complexity depend on several factors, including, but not limited to:

- Your stage of technical development;
- The commercialization strategy you select;
- The growth strategy you select (e.g., bootstrap, slow and steady, high growth);
- The amount of capital you will need for development;
- The sources of capital you will approach (e.g., family, informal investors, bankers, institutional equity investors);

Your plan may begin as a simple description of your PROJECT-NOT JUST THE TECHNOLOGY, THE WHOLE PROJECT-INCLUDING information on management, commercialization strategy, resources required for development, and so forth. As you progress through the innovation process, however, you will become more knowledgeable about your market and your plan will change to reflect that increased knowledge.

6.3 How to get started

Start by writing a goal in general terms, either long or short range. Then, factor the goal into specific tasks prerequisite to achieving the goal, and arrange these sequentially. These must be finite tasks with observable results; that is, you and others must be able to tell that you have finished them. More important, perhaps, you must be able to demonstrate to prospective investors, for example, that you know how to define objectives and achieve them. For instance, you might set yourself the goal of producing parts for your technology more efficiently. No one could fault this as a goal, but it contains no finite means of measuring its achievement unless broken out into tasks such as: "Using a competitive bidding process, find a machine shop subcontractor by a given date, say November 19".

If you think out your goals, objectives, and enabling objectives carefully in terms of required resources, tasks, and measures of achievement, your plan will emerge clear and specific.

Writing a comprehensive plan means scaling up and integrating the plans you develop for specific dimensions of your project. In the next few pages we consider the planning process, and the plan itself.

VIII. PLANNING TO LICENSE OR VENTURE

7.1 The role of the Commercialization Plan

Writing a commercialization plan means a major step, and you should maximize its benefits. One way to achieve this "profit maximization" lies through hard work generating answers to questions like the ones we have raised. When you have answered them, you will have assembled the bulk of the material required for an effective document. The more detailed and accurate your answers, the better off you will be. A commercialization plan must honestly and comprehensively describe the technology and the method chosen for moving it into the marketplace. Framed in positive language, it should discuss the project developers, market, marketing strategy, and all aspects of financing. Truth and evidence underpin a credible, useful plan.

One will derive multiple benefits from developing a plan:

- It will crystallize your ideas about how you want to commercialize your technology;
- It lets you manage project development rather than letting the project manage you;
- It will help you develop the information necessary to entice others to consider licensing your technology or investing in it;
- It establishes an action plan to which you can, and should, refer continually;
- It helps you establish goals and performance targets;
- A completed plan may serve as a marketing tool.

Writing a long-range detailed plan not only generates the kind of material you need to make an effective presentation to prospective licensees or investors, but also shows you the resources your project will require. Your plan will help you decide what part you yourself will play in developing the project and running the resulting enterprise. If you have a technology that works (one for which a large enough market exists to make it worth producing) you'll still need a business plan or its near equivalent in order to succeed. As a precursor to that step, and as a means of assembling data to make decisions about the further development of your technology, a commercialization plan makes a good start.

Developing or formulating a commercialization plan forces you to organize your thoughts, formalize your assumptions translate these into projections (perhaps as far as five years ahead depending on the stage of development your technology has reached), and reduce everything to writing. Few people have much experience along these lines; most find it a challenge. On the other hand, practically everybody operates on the basis of informal planning. What you must do is convert that informality to a systematic process encompassing all the steps necessary to move your technology into the marketplace.

If you decide to venture your technology, you will eventually need a formal business plan, and you may need professional assistance putting one together. In fact, the business plan has emerged as a document with a widely recognized generic format. It can be written at several levels of complexity, as well as for various purposes and audiences. If you are

considering venturing, you should familiarize yourself with the basics because even if someone else writes the actual plan, the principal burden of developing the necessary information falls on you. Creating a commercialization plan can give you a long head start.

You can develop your commercialization plan at several levels:

- As a basic outline;
- As a simple, step-by-step guide through the earliest stages of developing your technology,
- As a reminder to collect information you will need during market analysis or other tasks; or
- As a way to articulate both long and short range goals.

As time passes, your plan should begin to look and sound like a formal business plan, and may ultimately prove useful in seeking capital. Whether you intend to license or venture, you need this plan; only the specific content and level of detail differ. The eventual audience for your plan includes your development team, potential licensees, prospective investors, and anyone else from whom you would like assistance, technical or otherwise.

7.1.1 Basic components of the Plan

The plan for either licensing or venturing should consist of the following components:

- Cover page;
- Table of contents;
- Executive summary;
- Detailed discussions of the project;
- The project;
- The product;
- The market.

If you plan to start your own business, you will also need to include sections detailing the company, your marketing strategy, an operations plan, and a management plan. Each major section of the plan contains subsections, as illustrated as follows:

1. The Project

The purpose of this section is to provide the reader with background information on your project as well as detailed information about the project team. This is the place to present:

- A succinct statement telling the reader what you want to do (i.e., license, venture, joint venture, sell) and what the advantages of this commercialization strategy are;
- A description of your enterprise, its' structure (e.g., sole proprietorship, corporation), what does it does, and how it does it;
- A description of your project team, including evidence of your technical and management qualifications to complete the project while providing similar information about your associates now in business, as well as information about the officers of your company;
- A description of your other professional commitments, what they are and how, if at all, they will affect your plan.

2. The Product

Here you tell the reader about your invention in technical language, remembering that non-technical people (potential investors and prospective licensees) will also need to understand your plan. Reduce your description to the simplest terms that will convey a full understanding of the technology, including:

- What it is;
- What it does;
- What potential applications it has;
- What tasks remain to make it market ready.

3. The Market

In this section of your plan you must demonstrate the size and nature of your market to convince the reader your project is a good bet. Potential investors and prospective licensees will check your assertions using their own staff of paid experts. Furthermore, if you plan to license, this estimate will become your negotiating tool. Finally, if you are not sure which strategy you should select, completing this work may tell you.

7.2 Venture planning

If you want to produce and/or sell your invention yourself, you will have to have a business. An effective, polished commercialization plan can serve as a strong foundation; however, a business plan demands a significant step upward in sophistication of information and presentation. Thus, if you intend to venture your invention, you will probably have to add some sections to your commercialization plan, and you will probably want to have a professional review and polish it.

The additional sections may include:

- Marketing strategy;
- Operations plan;
- Management plan;
- Financial information and risk analysis.

7.2.1 Management functions in new venture

The management section of any business plan deserves special attention. Management remains the most important factor in the success of a new business. If you decide to license, it may not matter, but if you go into business and look for outside capital, it may well make or break you in the minds of prospective investors.

The most important thing an innovator/entrepreneur can do is distinguish those tasks he can perform well from those that he should, and must, delegate. The next most important things are to determine what additional management is needed and then to recruit that management.

In addition to elaborating on the plans you have with respect to management, you may need to include more detailed discussions of your technology, including patents, know-how, confidential information, etc. You may also want to include articles published about your technology, as well as testimonials from satisfied customers, or from prospective users. Such information should be included in Appendices. A complete plan (either commercialization or business) may run 20 -40 pages.

Planning requires an ongoing process of information collection that supports a coordinated, systematic approach to technical development, market assessment and marketing strategy, as well.

Table 3

The Innovation Process: Managerial Stage: Production for Major Market Penetration
(From Invention to Innovation DOE/NBB-067 US Department of Energy 1991)

Technical Steps	Market Steps	Business Steps	Skills Required	People Involved
Product Improvement New Product Sustained Growth	Complexities Intensify	Complexity Management	Entrepreneur (?) Fully Bureaucratized Management R & D Staff Investment Firms	

7.2.2 Business Plan format and outline

- Cover sheet

One page, which should include the name of the business, address, phone number(s), principals, date of plan, and any other appropriate information about your company or plan

- Executive summary

This is a brief summary of your plan and is what sells someone the remainder of the plan. In a few pages describe the major objectives, product or service, its marketing, the financial projections, and the purpose of the written plan (financing or operations). Include any unique or truly significant aspects of your plan. (This section should be written after you have completed all of the detailed sections of the plan.)

- Table of contents

This single page should be specific enough to enable the reader to locate any particular item of interest. Some readers will judge the plan's thoroughness based upon what is included on this page alone (use major headings indicated in this outline, plus subheadings you include in your plan).

- History

This section is tailored to your needs as either a start-up venture or an existing business. If your history is brief, this section should explain how your venture came to exist, its organization to date, and the backgrounds of the founders. If yours is an existing company, you should explain the major highlights of your history, keeping it brief and adding detail through appendices as needed.

- Definition of the business

This section describes exactly what needs your business meets, whose needs these are, and how you meet those needs.

- Definition of the market

This section outlines in more detail the customers you target, describing your customer profile, the size and location of your market, your projected market share, and why you will be able to obtain this share. This is the portion of the plan where you discuss your competition and the tactics you use to participate in the marketplace. Your advertising and promotion campaign should be briefly explained.

- Description of the products or services

This section of the plan may well be placed before the marketing section if your product or service is new or requires extensive explanation. Here is where you explain how you will meet an identified need with a specific product or service. The status of your R & D efforts should be detailed with any information pertaining to copyrights, patents, trademarks, etc. Technical information and catalogue sheets or pictures may be appended as appropriate.

- Management structure

This section describes who will enact the plan, providing the basic background information on the principals, the organizational structure, staffing, employee policies, and the reporting structure. Much of this detail should be appended (such as resumes and organizational charts).

- Objectives and goals

This section includes varying amounts of detail depending upon the purpose of your plan. This is where you list your objectives, the specific tactics you will use to achieve those objectives, the time frames involved, and why you think the set of objectives is doable and advantageous.

- Financial data

This section explains how you will fund your operations over the planning period. You may include forecasted balance sheets, forecasted cash flow analyses, forecasted statements of earnings, forecasted statements of changes in financial position, cost-volume-profit analysis, and the company’s projected break-even point. This section should be detailed and as well

documented and supported as possible. Disclose the accounting policies and the major assumptions made in your plan. Any financing requests made with the plan as a backup should be justified in this section.

- Appendices

Include in the appendices any specific supporting information or detail that you feel your plan requires, but that does not fit into the context of the sections above. A business plan for an external audience that is too lengthy will probably be unable to hold that audience's attention. Keep it brief.

[End of document]

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