# OPERATIONS DEVELOPMENT WORKBOOK

## ANALYSIS SECTION

**VERSION 1.2**



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**June 2000**

# PREFACE

This workbook is a part of a larger venture planning development program. Its primary objective is to assist in the development of new business without large development staffs.

The tools consist of a series of workbooks which provide check lists of key issues during the development of most business concepts. We believe that the process of venture development is an active one. We believe, that most activities should be dedicated to "hands on work" with the product, the process, and the potential customers. We hope that these tools will act to focus activities on "what must be done".

We intend that this workbook and all others in the series will be "evergreen". New versions of the workbooks are expected to be published periodically, reflecting constructive comments by users. This workbook reflects the efforts of many individuals who have provided ideas and comments. The philosophy expressed in this workbook reflects that of the authors and not of the organizations or corporations involved.

## INTRODUCTION

This is a *Operations Development Workbook*. It is one of the tools for defining Venture Ideas as legitimate Business Venture Candidates. Proper definition and analysis of an idea in business terms are essential. This workbook is compatible with the *Business Planning Guide*.

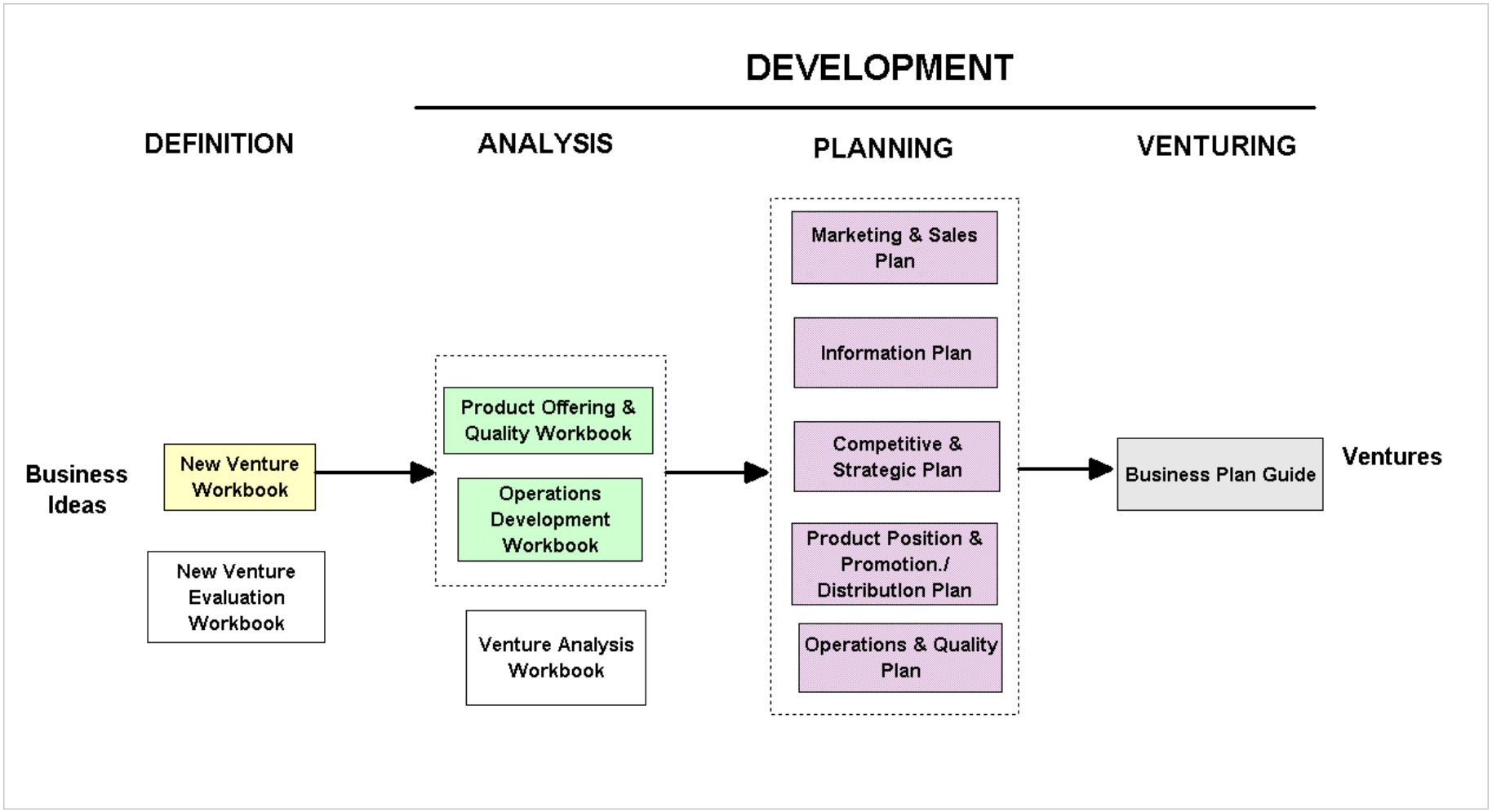
We have come to recognize that many good Ideas, which might have become successful Ventures, have gone undefined and undeveloped. There has been a perception that only big ticket "Ideas to Ventures", controlled by large organizations, would be of interest. In addition, "user-friendly" systems have not been available to individuals with candidate ideas.

This *Operations Development Workbook* represents a third of the Analysis Section, or Step Two of a detailed four-step process for taking an Idea to a Venture. Following prescreening, the major steps are Definition, Analysis, Planning, and Venturing. The other two thirds of the Analysis Section are the *Product Offering and Quality* and the *Venture Analysis Workbooks*. It is generally best to complete this and the *Product Offering and Quality* workbooks before the *Venture Analysis Workbook*.

Operations in this workbook includes all manufacturing, marketing, distribution, and management functions necessary to operate the business. The focus of this workbook is on the manufacturing process. The development of this process is critical to establish cost feasibility for the business.

It is not expected that you will have immediate answers to all the questions in this workbook. Developing adequate information is part of the analysis process.

Good luck. It is not supposed to be easy.


DEVELOPMENT
DEFINITION
ANALYSIS
PLANNING
VENTURING
Business Ideas
New Venture Workbook
New Venture Evaluation Workbook
Product Offering & Quality Workbook
Operations Development Workbook
Venture Analysis Workbook
Marketing & Sales Plan
Information Plan
Competitive & Strategic Plan
Product Position & Promotion./ Distribution Plan
Operations & Quality Plan
Business Plan Guide
Ventures

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# I. BUSINESS DEFINITION & FEASIBILITY

We assume, before you start this section, that you completed the *New Venture Workbook* and have reviewed your entries. In that workbook the business concept should have been defined. Much information is likely to have accumulated since that definition was formulated. Business concepts evolve. Do not feel constrained by the previous definitions.

This section asks you to define your Venture Candidate as a refined Business Definition. There are three sub-sections, covering Products, Markets, and Verification.

If you can clearly outline each of these sub-sections, you will have refined your Venture Candidate Concept into a better Business Definition.

If you can not clearly outline some or all of the sub-sections, you have an Undefined Business Idea. You either need additional information or another idea.

Well-outlined and reasoned Business Concepts translate into useful Business Definitions.

# I. BUSINESS DEFINITION & FEASIBILITY

## A. Products

### What products and services do you intend to sell?

This description should be as specific or as general as this stage of development will permit. Try to be as specific as possible The product definition limits the range of the business that will be considered. The more specific the product is, the easier it is to define the means of production. Recognize that the character of the products may change as the business is redefined during the development process.

At a minimum, specify the use of the product and service to the customer and user.

# I. BUSINESS DEFINITION & FEASIBILITY

## B. Markets

### To whom will you sell the products and services and who will use them?

The identities of buyers, specifiers, and users of the products and services are critical for defining the business. It should be noted that the buyers, specifiers and users may be different individuals with widely different needs. All, however, are considered to be customers.

If the product will be purchased more than once, either through a distributor or through subsequent processing where the identity of the product is maintained, (i.e. a Dacron Shirt) all customers should be identified. If the product loses its identity (i.e. sulfuric acid in a metal pickling process) subsequent elements of the use channel need not be identified.

If feasible, key perceived customer benefits should be identified along with the customers.

# I. BUSINESS DEFINITION & FEASIBILITY

## C. Verification

### 1. Product Test

**What tests have been performed to verify that the product concept would be of interest to the potential customer at the target price?**

This requires "hands on" activity with potential customers. General statements of verification are insufficient as a user test. While concept testing is acceptable as a start, full use test by the customer should be conducted by an independent resource is desirable.

Indicate what procedures have been or are planned for testing the product.

## C. Verification

### 2. Process Feasibility

**What tests have been conducted that demonstrate that the product and services can be produced using the targeted technology?**

This requires "hands on" effort in the production area. While full scale tests are desirable, laboratory, semi-works, and pilot plant tests are acceptable. Indicate the level of test and who is or will perform it.

## C. Verification

### 3. Customer Commitment

| **What commitments have the potential customers made for buying this product and services from this business?** |
| --- |
| Indicate the type of commitment and to whom. |

## II. MARKET OPPORTUNITY

This section asks you to define the Market Opportunity for your Venture Candidate. The opportunity represents the range of applications that the product can enter, the speed at entry, and the price that the customers are willing to pay. The sub-sections of this focus attention of the components of opportunity.

If all the sub-sections can be clearly outlined, you will have a reasonable clear picture of the Market Opportunity for your Candidate Venture. This is not an area for short cuts, generalized statements, or hopeful conjecture. Historically ventures which fail have almost always demonstrated short falls in the Market and Marketing/Distribution areas.

If these sub-sections can not be clearly defined you need to such for more information.

# II. MARKET OPPORTUNITY

## A. Applications

**What are the potential applications or market segments for which the offering could potentially be used?**

While there are likely to be large number of potential applications[1], indicate only the major applications that will be developed immediately. These applications should provide sufficient information to determine the viability of the business.

Application 1

Application 2

Application 3

[1] A larger number of applications are identified in the *Product Offering & Quality Workbook*.

# II. MARKET OPPORTUNITY

## B. Value-in-Use

**What is the economic value of the product for each of these applications?**

The value-in-use or economic value consists of the highest price that the customer should be willing to pay for the product based on a comparison with the best competition. The value in use is generally computed based on a user cost model. This model includes all costs to the customer associated with using the product or its competition, including: its price, labor costs, additional materials, investment expenses, yield, capacity, and waste. Value-in-use is generally focused on industrial products.

Indicate the key financial advantages for using the product compared with competition and its value-in-use in dollars/unit.

| | Financial Advantage | V-I-U |
|---|---|---|
| Application 1 | | |
| Application 2 | | |
| Application 3 | | |

## 1. Additional Value

**What additional non-monetary value could be gained from using this product for each application?**

There are value conveyed by product attributes that are not economically based. These attributes include quality, support, training, and image of high technology. While the value is not based on comparative economics, monetary evaluation of these perceived values should be estimated.

Identify these attributes and give an estimate of their value.

| | Attributes | Perceived Values |
|---|---|---|
| Application 1 | | |
| Application 2 | | |
| Application 3 | | |

## 2. Total Value

**What is the estimated total value of the product to each application?**

The total value consists of both the Value-In-Use and additional premium attributed to any non-included value. The total value is the highest price that the product can be priced compared with its best competition.

Note, however, that the customer will need to be given value in order to adopt the new product. Therefore, there must be some value that the customer will retain.

| | V-I-U | + | Premium Value | = | Total Value | vs | Best Competitive Value |
|---|---|---|---|---|---|---|---|
| Application 1 | | | | | | | |
| Application 2 | | | | | | | |
| Application 3 | | | | | | | |

# II. MARKET OPPORTUNITY

## C. Segment Size

**What are the potential annual sales possible for each application?**

Indicate the sales in terms of physical units. The units should be comparable between applications. For example if a unit of weight is used, the same unit should be used for all applications. Volume should be in annual sales, units/year.

Application 1

Application 2

Application 3

# II. MARKET OPPORTUNITY

## D. Capturable Size

**What fraction of the volume for each application is actually capturable by these products?**

While a potential may be very large, only a fraction may be actually captured by this venture's type of product. Indicate the applicable fraction of each key application.

Application 1

Application 2

Application 3

# II. MARKET OPPORTUNITY

## E. Pricing Policy

**What pricing policy will be followed?**[2]

Indicate the price of the product for each application along. Identify how the price will be negotiated and under what conditions the price will be discounted.

| | Pricing Policy | Negotiation Style | Discount Conditions |
|---|---|---|---|
| Application 1 | | | |
| Application 2 | | | |
| Application 3 | | | |

[2] Value elements such as value-in-use, perceived value, reference price, and competitive price are covered in the *Product Offering and Quality Workbook*. That information should be used in preparing this section.

## II. MARKET OPPORTUNITY

### F. Share

**Under the expected pricing policies, what share of the market for each application does this business expect to capture?**

If there is replaceable in-kind competition then it is expected that the market will be split among competitors. Indicate the market share that you expect to eventually obtain in each major application[3].

| | Low Estimate | Expected Value | High Estimate |
|---|---|---|---|
| Application 1 | | | |
| Application 2 | | | |
| Application 3 | | | |

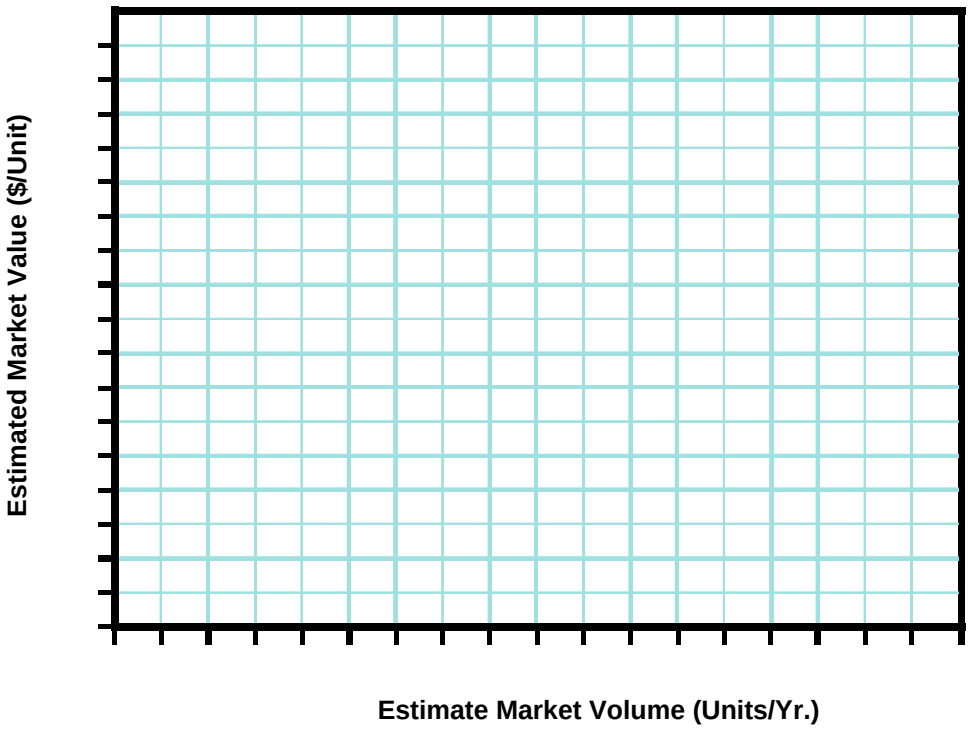
[3] Historical data has indicated that market shares usually break down into various standard fractions: for two competitors (approximately 75%, 25%), for three competitors (approximately 65%, 25%, 10%).

# II. MARKET OPPORTUNITY

## G. Functional Demand Curve (Price/Volume)

**What is the expected value-volume relationship for this offering?**

An estimate of the demand curve can be obtained by plotting the



# II. MARKET OPPORTUNITY

## H. Penetration

### How long will it take to penetrate this market?

For each major applications indicate when sales will start and how long should it to take to arrive at a threshold level of sales (i.e. 75% of the targeted sales). Express this in years and months.

### How fast will that penetration take place?

For each of the major applications indicate how fast will sales grow. Give estimates from project management, sales, production.

| | Growth Rate (%) | | |
|---|---|---|---|
| Project Management Estimate | Sales Estimate | Production Estimate | Aggregate Estimate |
| Application 1 | | | |
| Application 2 | | | |
| Application 3 | | | |

# II. MARKET OPPORTUNITY

## I. Physical Sales Forecast

**What is the 10 years forecast for physical sales of the product?**

Indicate bounds on the forecast by giving a low and high estimate as well as the expected value. The low estimate should be based on a reasonable but less than a good performance (assuming that the venture is undertaken as the product does basically perform). The high estimate should be achievable given existing plans for production, sales and service resources.[4]

| Year | Low Estimate | Expected Value | High Estimate |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

[4] Generally the major uncertainty tends to be timing of sales rather than the sales levels. Low and high estimates can be obtained if you assume a delay or acceleration of sales for a year or two.

# II. MARKET OPPORTUNITY

## J. Revenue Forecast

**During the next 10 years how much money will come in from this business?**

The revenue estimates are obtained by merging the price and sales forecasts. Indicate bounds on the forecast by giving a low and high estimate as well as the expected value. As for the sales forecast, the low estimate should be based on a reasonable but less than a good performance (assuming that the venture is undertaken as the product does basically perform). The high estimate should be achievable given existing plans for production, sales and service resources.[5]

| Year | Low Estimate | Expected Value | High Estimate |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

[5] Generally the major uncertainty tends to be timing of sales and the acceptable price. Both should be considered.

## III OPERATIONS

This section addresses Operations including: Manufacture, Marketing, Sales, Customer Support, Packaging, Distribution, Development, and Administration. In order to obtain the best information for this section, a number of individuals may be needed to be consulted. Furthermore, the goal of this section is to outline the characteristics of the business. Since other individual may be involved in the effort to implement the development of the business they should be involved in its characterization.

Proper definition of the Operations of this candidate venture represents the heart of this workbook. All sub-sections must be completely addressed for the business venture to be analyzed properly. The development of a business relies operations to be adequately defined.

## A. Manufacturing Process

**What process will be used to make the products and services?**

Indicate key steps in the process.

| Steps | Activity/Process |
|---|---|

## A. Manufacturing Process

### 1. Process Verification

**What evidence supports the premise that products can be produced using this process within targeted costs?**

Physical tests based on laboratory, semi-works, or pilot plants are needed. If such tests are not available, some must be planned to verify that the process will work. Indicate the tests that have been successful, plans for further verification if necessary, and evidence that the process is viable.

## A. Manufacturing Process

### 2. Operations Flow Diagram

| **What are the steps of the process that will be used?** |
| --- |
| Use multi-level diagrams if necessary. Attach additional or auxiliary diagrams. Specify equipment if it has been determined for use. |

## A. Manufacturing Process

### 3. Material Flow Diagram

| **How do materials flow about the process?** |
| --- |
| Use multi-level diagrams if necessary. Attach additional or auxiliary diagrams. Material and energy balances are desirable but not necessary. |

## A. Manufacturing Process

### 4. Yield

**What is the expected yield over the first 10 years for the process?**

Yield is defined in terms of Quality product produced. Indicate bounds on the forecast by giving a low and high estimate as well as the expected value. As for the yield forecast, the low estimate should be based on a reasonable, but less than a good performance (assuming that the product can basically be produced with the outlined process). The high estimate should be achievable given existing plans for production and sales.

| Year | Low Yield Estimate | Expected Yield Value | High Yield Estimate |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

## A. Manufacturing Process

### 5. Material & Power Requirements

**What materials and energy sources and how much will be needed for the product?**

Specify all input materials and sources of energy into the process. Indicate those inputs over which the firm has control, of such as resins. Note the quantities per unit of production.

| Item | Quantity | Source |
|---|---|---|

## A. Manufacturing Process

### 6. Process Scaling

**What capacities will be needed at each stage of the process to assure quality delivery of forecasted sales?**

Do not include inventories. These are covered in a separate section. Include any need to hold product for inspection.

| Stage | Capacity |
|---|---|
| 1. | |
| 2. | |
| 3. | |
| 4. | |
| 5. | |
| 6. | |
| 7. | |
| 8. | |
| 9. | |

## A. Manufacturing Process

### 7. Inventory Requirements

**What inventory levels will be needed for raw materials, in-process, and finished products inventories to support this business?**

There is usually a balance among the equipment flexibility, assurance of supplier delivery, desired responsiveness of the business, and required inventories. The selection of desired inventory level reflects the nature of the manufacturing process and the mission of the business.

| Raw Materials | | Work In-Process | | Finished Products | |
|---|---|---|---|---|---|
| Material | Level | Material | Level | Material | Level |

## A. Manufacturing Process

### 8. Direct Labor

**What direct labor will be needed to produce the products?**

Specify labor requirements in applicable site terms. Indicate bounds on the forecast by giving a low and high estimate as well as the expected value. As for the labor requirement forecast, the low estimate should be based on a reasonable, but less than a good performance (assuming that the product can basically be produced with the outlined process). The high estimate should be achievable given existing plans for production.

| Year | Low Labor Estimate | Expected Labor Value | High Labor Estimate |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
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| 9 | | | |
| 10 | | | |

## A. Manufacturing Process

### 9. Maintenance

**What maintenance and support are required for the process?**

Maintenance and support include all non-direct labor costs required to continue long term operations. It includes both routine, scheduled, maintenance as well as facilities to do critical repairs.

Indicate bounds on the forecast by giving a low and high estimate as well as the expected value. As for the yield forecast, the low estimate should be based on a reasonable, but less than a good performance (assuming that the product can basically be produced with the outlined process). The high estimate should be achievable given existing plans for production and sales.

| Year | Low M&S Estimate | Expected M&S Value | High M&S Estimate |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
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| 8 | | | |
| 9 | | | |
| 10 | | | |

## A. Manufacturing Process

### 10. Process Technical Support

**What technical support will be needed for the process?**

Improvement of yield, quality, and cost control do not happen without resources. Technical support includes all process staff dedicated to process improvement. For batch or campaigned production, include the costs of product change over.

Indicate bounds on the forecast by giving a low and high estimate as well as the expected value. As for the other forecasts, the low estimate should be based on a reasonable, but less than a good performance (assuming that the product can basically be produced with the outlined process). The high estimate should be achievable given existing plans for production and sales.

| Year | Low Support Estimate | Expected Support Value | High Support Estimate |
|---|---|---|---|
| 1 | | | |
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| 8 | | | |
| 9 | | | |
| 10 | | | |

## B. Marketing, Sales and Customer Support

### 1. Market Segments and Customers

**How many customers must be supported over time for a successful business?**

**What is the nature of the customers and the support necessary?**

Describe the customers in terms of their characteristics (i.e. demographic and industry characteristics).

Customers

Industrial Characteristics

Demographic Characteristics

Other Characteristics

## B. Marketing, Sales and Customer Support

### 2. Marketing Strategy

**What general marketing strategy do you plan to use to promote this product?**

Indicate how you intend to get customers to try the product and to use the product after trial.[1]

**What market segments will be targeted first for developing the business?**

Indicate how you intend to look at the customers as groups. Marketing plans are usually formulated in terms of these groups or segments[2].

[1] Detailed outlining of the sales and marketing strategy is covered in a separate subsequent planning workbook, *Marketing & Sales Plan Workbook*.

[2] A number of market segmentations are outlined in the *Product Offering and Quality Workbook*. In this section, the specific market view or segmentation is required that has been used to formulate the marketing strategy.

## B. Marketing, Sales and Customer Support

### 3. Marketing Strategy Justification

**What evidence supports the use of this marketing strategy?**

Indicate existing market behavior, previous "hands-on" experience and marketing research information that supports or questions this strategy.

| Item | Evidence |
|---|---|
| 1. | |
| 2. | |
| 3. | |
| 4. | |
| 5. | |

## B. Marketing, Sales and Customer Support

### 4. Sales Force

**How large a sales force is needed to support this business, in compliance with the marketing strategy?**

Sales just don't happen. Sales people must go out, gain and maintain business. Include with the sales force all costs for maintenance (i.e. travel, office expenses and clerical assistance). Customer technical support is considered separately and is not included here.

Indicate bounds on the forecast by giving a low and high estimate as well as the expected value. As for the other forecasts, the low estimate should be based on a reasonable, but less than a good performance (assuming that the product can basically be produced with the outlined process). The high estimate should be achievable given existing plans for production and sales.

| Year | Low Cost Estimate | Expected Cost Value | High Cost Estimate |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

## B. Marketing, Sales and Customer Support

### 5. Customer Technical Support

**How large a customer technical support staff will be needed to implement the marketing strategy?**

Industrial sales tends to require customer support, particularly during the qualification phase of introduction. Indicate all customer technical support expenses including R&D and out-of-pocket costs. If prove-out requires the purchase of customer materials, that cost also should be included.

Indicate bounds on the forecast by giving a low and high estimate as well as the expected value. As for the other forecasts, the low estimate should be based on a reasonable, but less than a good performance (assuming that the product can basically be produced with the outlined process). The high estimate should be achievable given existing plans for production and sales.

| Year | Low Cost Estimate | Expected Cost Value | High Cost Estimate |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
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| 9 | | | |
| 10 | | | |

## B. Marketing, Sales and Customer Support

### 6. Promotion

**What is the goal for the promotional effort by market segment?**

Include direct assistance, conferences, product information, sales aids, special promotional campaigns and, exhibits.

| Market Segment | Promotional Effort Items |
|---|---|

**How much will the promotional effort cost, excluding print advertising and mass communications?**

| Promotional Effort Items | Estimate Cost |
|---|---|

## 6. Promotion

### a. Advertising

**What role will advertising play in the promotional plan?**

Include any cooperative advertising programs that are expected whether it is customary or unique.

**How much will that advertising program cost?**

## 6. Promotion

### b. Rebates & Discounts

**What role will rebates and discounts play in developing the market?**

Indicate the size of the rebate and discount and the conditions under which the rebate or discount will be effective.

**To what fraction of sales will they apply?**

**How much will rebates and discounts cost?**

| Item | Rebates | Discount | Estimate Cost |
|---|---|---|---|

## B. Marketing, Sales and Customer Support

### 7. Allowance for Returns and Warranties

**What will be the return and warranty policies?**

Describe the return and warranty policy. Include the objectives of the policy and its rationale. Indicate the conditions by that must be met and the method of verification.

**To what fraction of sales will they apply to?**

**How much will rebates and discounts cost?**

## C. Packaging

### 1. For the End-User

| **How will the product be packaged for the end-user?** |
| --- |
| Indicate any provision for packaging for the end user. If labeling is necessary for the end-user, indicate how that information is conveyed to him.<br><br>Indicate any competitive advantage conveyed by packaging to the end-user. |

| Item/Customer | Packaging & Labeling for End User |
| --- | --- |

## C. Packaging

### 2. For Distribution

**How will the product be packaged for distribution?**

Specify the physical structure of the packaging including labeling and palletizing. Indicate the reasons for using any unconventional techniques. If unconventional sizes or types of pallets are used, indicate how they are to be disposed.

Indicate any competitive advantage conveyed by packaging to the distributor.

| Item/Customer | Packaging Physical Structure |
|---|---|

## C. Packaging

### 3. Costs of Packaging

**How much will packaging cost during the first 10 years of the venture?**

Indicate both average cost per unit and the total costs. Indicate if packaging requirements for special grades creates distortion in package costing; for example sterile packing for medical applications.

| Year | Average Packaging Cost/Unit | Total Packaging Cost |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |

## D. Distribution

### 1. Distribution Channel Description & Arrangements

**How will the product and services get to the end-user?**

Describe the mechanism by which product is transferred through the distribution channel to the user. Indicate who owns the product along the channel and what agreements or arrangement have been made. Note whether any agreements for returning product have been given or implied.

| Item/ Customer | Distribution Channel Transfer | Product Ownership | Agreement & Arrangement |
|---|---|---|---|

## D. Distribution

### 2. Distribution Plan Justification

**What evidence supports that this method of distribution will be successful and economical?**

Indicate any direct, "hands-on" evidence for the effectiveness of this method of distribution. Indicate whether this method is traditional for the industry or novel.

## D. Distribution

### 3. Distribution Flow Diagram

**How will be product be transferred? What is the value to each point in the distribution channel?**

Diagram the flow; show the critical points; and estimate the product value at each point.

## D. Distribution

### 4. Mode of Transportation

**How will the product be delivered to customers?**

Specify the exact mode of transportation. For example, if a common carrier are to be used, what carriers. Indicate the distribution and delivery points; the timing; and special arrangements.

| Items/ Customer | Distribution Points | Delivery Points | Carriers | Special Arrangement |
|---|---|---|---|---|

## D. Distribution

### 5. Cost of Transport

**How much will transportation cost and who will pay?**

Indicate whether is payment is by the firm or the customer. If payment is to be split, indicate the nature of the arrangement as well as any liability for shipping charges.

Indicate the basis for transportation charges (i.e. point of origin, full truck, etc.) Separate international charges and indicate the currency that those charges are to be based.

| Year | Average Transportation Cost/Unit | Total Transportantion Cost | Remarks |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

## D. Distribution

### 6. Method of Payment

| **How will the business be paid for the products and services?** |
| --- |
| Indicate who will pay whom for the product and how payment will be made. |

## D. Distribution

### 7. Terms of Payment

**What will be the terms of payment? How much credit will the firm extend to the customers?**

The terms of payment include the nature of the payment, timing, and credit. If any discount is made for early payment or penalty for late payment it should be noted.

| Application/ Customer | Terms of Payment | Discount, Penalties, Remarks |
|---|---|---|

## E. Development

### 1. Market Development

**What support will be needed to develop this market?**

Include all customer technical support. Indicate if consultant will be desirable to facilitate customer acceptance.

**What start up costs and customer product warranty support will be needed to encourage market development?**

Include payments for trials, if necessary, as well as purchase of trial product.

## E. Development

### 2. R&D Support

**How much R&D support will be needed to develop the business over the first 10 years?**

R&D support beyond process and customer support are often necessary for new product and business development. R&D can provide information on the product and the process, and also on customers' processes. This can be necessary to build and maintain competitive advantage.

Include within the R&D support, is that necessary for the Product Quality program. Cost estimates should be based on man-power requirements in assigned staff (man-years).

Indicate bounds on the forecast by giving a low and high estimate as well as the expected value. The low estimate should be based on a reasonable optimistic view of the business.

| Year | Low R&D Estimate | Expected R&D Value | High R&D Estimate |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

## F. Administration

**How much will management cost this venture?**

Indicate the number and level of management personnel needed to support the business. The management staff should reflect the size of the business unit. Use partial charges for managers with joint project responsibility, i.e. 1.2 managers might be one full time manager and one fifth of a upper level manager or co-assigned manager.

| Year | Management Staff | Cost/ Person | Total Costs |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

## G. Risk

**What are key potential events that could impact the business?**

Identify those factors beyond those covered with general uncertainty in volume, price, timing and manufacturing costs. Indicate the specific events including the conditions, potential outcomes, impact on sales and earnings, and their likelihood. Include such items as entry of competition and potential government action.

| Item | Event | Impact | Likelihood |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |

## H. Critical Issues

**What are the critical issues for further development of this venture?**

Specify the critical issues that must be addressed or monitored during the next phase of the development process. These issues are critical, in that they can determine whether the venture should be commercialized. Issues that could be under the control of the business should be addressed; those that are external to the business must be monitored.

| Item | Critical Issue | Addressed or Monitored |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |
| 11 | | |
| 12 | | |
| 13 | | |
| 14 | | |
| 15 | | |

## IV. DEVELOPMENT PLAN

The development plan is the path forward for this venture. It is the primary result of the operations analysis. This section covers: Product Development, Process Development, Marketing, and R&D. Since it will involve the efforts of various functions, personnel who are intended to carry out the program should be involved in its development, if feasible and warranted.

## A. Product Development

**What key elements need to be undertaken to assure that the customer will buy the product at the targeted price?**

Indicate the program elements, their objectives, and when they need to be completed.

| Item | Element | Objective | When |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |

## A. Product Development

### 1. Prototype

| When will a functional prototype of the product be available? |
|---|

| What patent-related action needs to be taken to allow external testing of the prototype? |
|---|

## A. Product Development

### 2. Take-out

**When will materials be available for customer in-site testing?**

**What take-out procedures will be used?**

**What data should be presented to the customer and by whom?**

**Will the customers be under secrecy agreements?**

| Application /Customer | Data to be Presented | by Whom | Secrecy Agreement | Procedure |
|---|---|---|---|---|

## B. Process Development

**When will basic data fro the process be available?**

Indicate check points for the process definition and requirements and the dates for completion. The intermediate check points or milestones should be selected to assure that the final basic data and design of the process is sufficiently complete for an authorization request on the facilities.[3]

| | Check Point | When |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |

Basic Definition

[3] The traditional (and effcient) progression is from laboratory scale to semi-works/pilot facility to production/commercial facility.

## B. Process Development

### 1. Prove-out

**When will the process be proven-out using tech lab and/or pilot plant facilities?**

Indicate check points for the process prove-out and the date for completion. The intermediate check points or milestones should be selected advise the management of potential problems. The process should be proven with sufficient confidence to allow product delivery commitments.

| | Check Point | When |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |

Final Definition

## B. Process Development

### 2. Precision Cost Estimates

**When will precise cost estimates for the commercial facility be available?**

Indicate check points for the facilities costing and the date for completion. The intermediate check points or milestones should be selected to assure that the final facilities cost estimate is sufficiently precise for an authorization request.

| Check Point | When |
|---|---|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| Final Definition | |

## B. Process Development

### 3. Market Development Facilities

**When will a market development manufacturing facility be available?**

This facility goes beyond laboratory or tech lab scale and may be a sophisticated pilot facility, a semi-works operation or a dedicated commercial operation. The facility must be able to provide commercial quality materials in a volume sufficient to meet immediate and short term demand. Describe the facility and indicate the resource required and timing.

Facility Description

Resources Required

Timing

## B. Process Development

### 4. Product Availability

**What is the schedule for product availability for marketing and sales?**

Indicate the quantity in units for each quarter starting from the first year of commercialization. Note any issue of product mix and expected changes for production facilities. Indicate the limit of pilot/semi-works capacity and the required timing for full production facilities.

Changes of product mix and production facilities may trigger delivery and quality problems. Indicate potential problems.

First Year of Commercialization:

| Year | 1Q | 2Q | 3Q | 4Q |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |

Potential Problems

## C. Marketing

### 1. Customer Quality Partnerships

**What customer partnerships should be formed?**

Customer partnerships include any development or sales agreements, formal or informal in nature. Indicate what organizations are involved and their position in the distribution channel. Include intermediate users, distributors, dealers as well as traditional customers and end-users. Identify who in the firm's organization is responsible for negotiations and who sets the limits on those arrangements.

**What is the purpose of the partnership?**

**What are the terms?**

Indicate the firm's and partner obligations. Include any security agreements and exclusivity arrangements and discussions.

**When will they be executed?**

## C. Marketing

### 2. Shows and Exhibits

**What provisions have been made to show the products to the trade?**

Include all public and trade exhibitions being planned.

**What is the timing for these shows and public demonstrations?**

**What product information and sales aids will be needed?**

## C. Marketing

### 3. Advertising and Promotional Activities

**What advertising and promotional activities are planned for business development?**

Advertising and promotion include all print materials, other than sales aids that are directed to potential customers.

**What are the objectives for the advertising and promotional activities?**

**What are the messages planned to be conveyed?**

**Who are the targeted audience for the advertising and promotion?**

**What media do you expect to use?**

**Who will develop advertising and promotion?**

**Who is responsible for the program?**[4]

[4] The empowerment for advertising usually includes responsibility for accuracy, authority to approve the copy and for the release.

## C. Marketing

### 4. Tradenames, Trademarks, Copyrights and Patents

**What provisions been made to assure adequate protection of the firm's information and trade property?**

## C. Marketing

### 5. Marketing Intelligence

**What kinds of marketing information and research are needed to assure that the marketing and development strategy will be successful?**

These activities expand beyond concept and business tests to include selection of marketing activities, product design and pricing. The focus of the marketing information should be on the development of the business. Indicate key questions that need to be addressed to ensure development program validity.

Key Questions

1.

2.

3.

4.

5.

6.

## C. Marketing

### 6. Competitive Intelligence

**What kind of competitive information should be collected to prevent the venture from being "blind sided" by competitive behavior?**

Indicate key questions that needed to be addressed.

Key Questions

1.

2.

3.

4.

5.

6.

## C. Marketing

### 7. Competitive R&D Program

**What R&D programs or actions are necessary to assure patent protection of the firm's technology and to prevent competitive action?**

| Item | Research & Development Programs/Actions |
|---|---|

## D. Programs

**What key program elements must be undertaken?**

Not all desirable activities can be undertaken. Select only those key elements that must be accomplished in order that an early evaluation of the venture can be made and a quality, well-targeted product enters the market as soon as possible. Relate each key program element to a critical issue.

| | Critical Issue | Program Element |
|---|---|---|
| 1. | | |
| 2. | | |
| 3. | | |
| 4. | | |
| 5. | | |
| 6. | | |
| 7. | | |
| 8. | | |
| 9. | | |
| 10. | | |
| 11. | | |
| 12. | | |
| 13. | | |
| 14. | | |

## E. Milestones and Timing

**What are the milestones for each program element and when will they be accomplished?**

| | Program Element | Milestone | When? |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| 13. | | | |
| 14. | | | |

## F. Responsibility

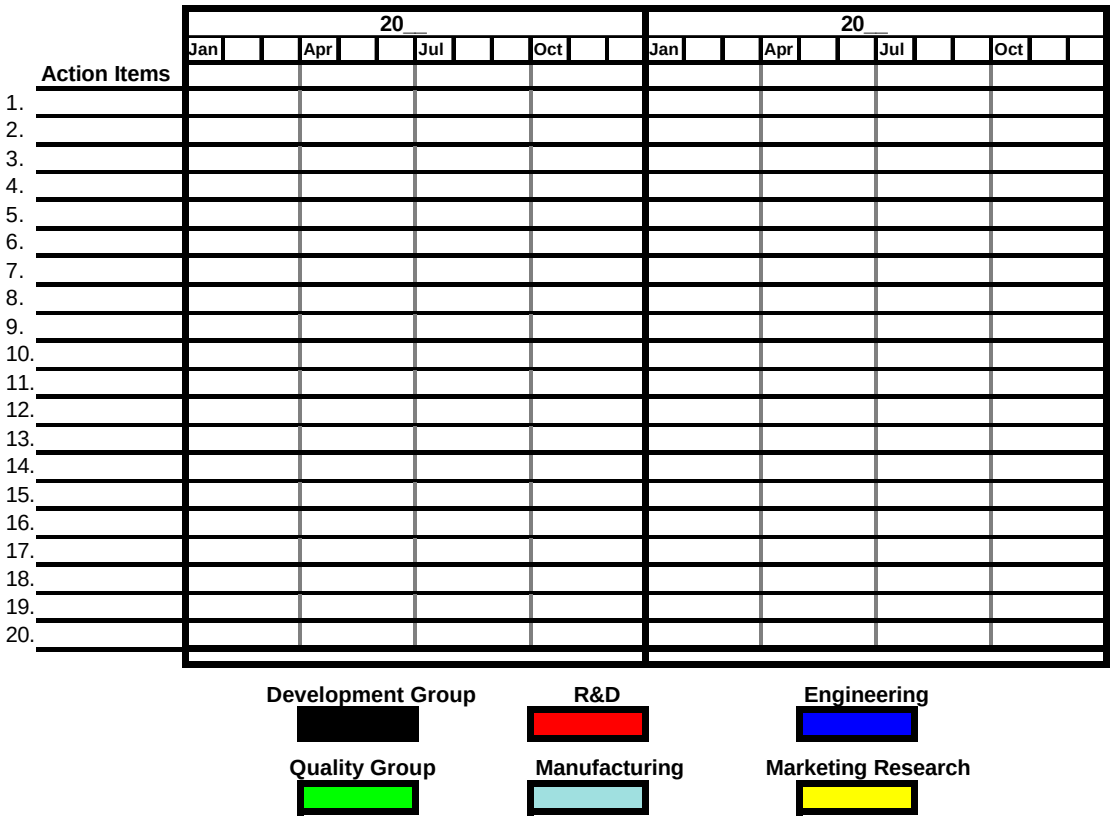
**Who is responsible for each milestone accomplishment?**

Responsibility must include the authority and resources to execute the program elements.

| | Program Element | Responsibility |
|---|---|---|
| 1. | | |
| 2. | | |
| 3. | | |
| 4. | | |
| 5. | | |
| 6. | | |
| 7. | | |
| 8. | | |
| 9. | | |
| 10. | | |
| 11. | | |
| 12. | | |
| 13. | | |
| 14. | | |

## G. Gantt Chart

**How to track the progress of the program?**



## V. DEVELOPMENT BUDGET PROPOSAL

Resources are required for any development program to forward. The purpose of this section is to outline the required resources. If the candidate venture pases the analysis check point, it should have budgetary support to enter the next planning part of the development process.

Coordination with management is required in filling out this section of the workbook. Estimates of man-power and out-of-pocket costs should be derived from experience. Seek assistance, if available.

## A. Internal Man-power

| **Who is necessary to successfully complete this venture program through prove-out?** |
|---|
| Specify the skills and disciplines needed. Where possible specify the individuals. If specified individuals are critical for rapid progress, indicate them. |

| **How much will that man-power cost?** |
|---|

## B. Out-of-Pocket

**What out-of-pocket costs will be necessary to develop this venture through prove-out?**

Indicate the categories for allocation of the out-of-pocket expenses. Routine expenses should be included in man-time costs.

| Item | Cost |
|---|---|
| Travel | |
| Materials | |
| Product Production | |
| Customer Expenses | |
| Advertising | |
| Exhibits | |
| Sales Aids | |
| Marketing Research | |
| Consultants | |
| Other | |

## C. Investment

| **What investment is needed during the development of the venture?** |
| --- |
| Indicate the reasons for the investment. Do not include working capital. |

# SUMMARY

## I. BUSINESS DEFINITION & FEASIBILITY

A. PRODUCTS
B. MARKETS
C. VERIFICATION
    *1. Product Test*
    *2. Process Feasibility*
    *3. Customer Commitment*

## II. MARKET OPPORTUNITY

A. APPLICATIONS
B. VALUE-IN-USE
C. SEGMENT SIZE
D. CAPTURABLE SIZE
E. PRICING POLICY
F. SHARE
G. FUNCTIONAL DEMAND CURVE ("PRICE/VOLUME")
H. PENETRATION
I. PHYSICAL SALES FORECAST
J. REVENUE FORECAST

## III OPERATIONS

A. MANUFACTURING PROCESS
    *1. Process Verification*
    *2. Operations Flow Diagram*
    *3. Material Flow Diagram*
    *4. Yield*
    *5. Material & Power Requirement*
    *6. Process Scaling*
    *7. Inventory Requirements*
    *8. Direct Labor*
    *9. Maintenance*
    *10. Process Technical Support*
B. MARKETING, SALES AND CUSTOMER SUPPORT
    *1. Market Segments and Customers*
    *2. Marketing Strategy*
    *3. Marketing Strategy Justification*
    *4. Sales Force*
    *5. Customer Technical Support*
    *6. Promotion*
        a. Advertising
        b. Rebates & Discounts
    *7. Allowance for Returns and Warranties*

## SUMMARY, Continued

C. PACKAGING
- *1. For the End-User*
- *2. For Distribution*
- *3. Costs of Packaging*

D. DISTRIBUTION
- *1. Distribution Channel Description & Arrangements*
- *2. Distribution Plan Justification*
- *3. Distribution Flow Diagram*
- *4. Mode of Transportation*
- *5. Cost of Transport*
- *6. Method of Payment*
- *7. Terms of Payment*

E. DEVELOPMENT
- *1. Market Development*
- *2. R&D Support*

F. ADMINISTRATION

G. RISK

H. CRITICAL ISSUES

**IV. DEVELOPMENT PLAN**

A. PRODUCT DEVELOPMENT
- *1. Prototype*
- *2. Take-out*

B. PROCESS DEVELOPMENT
- *1. Prove-out*
- *2. Precision Cost Estimates*
- *3. Market Development Facilities*
- *4. Product Availability*

C. MARKETING
- *1. Customer Quality Partnerships*
- *2. Shows and Exhibits*
- *3. Advertising and Promotional*
- *4. Tradenames, Trademarks, Copyrights, and Patents*
- *5. Marketing Intelligence*
- *6. Competitive Intelligence*
- *7. Competitive R&D Program*

D. PROGRAMS

E. MILESTONES AND TIMING

F. RESPONSIBILITY

G. GANTT CHART

**V. DEVELOPMENT BUDGET PROPOSAL**

A. INTERNAL MAN-POWER
B. OUT-OF-POCKET
C. INVESTMENT

# GLOSSARY

Many of the terms used in this workbook have broader definitions than are intended here. The following definitions refer to this *Operations Development Workbook*.

**Advertising** Advertising in the workbook is considered any paid print or mass media activity directed at promoting the product or exposing it to potential customers.

**Attributes** Product attributes are all the characteristic of the product offering that can influence the customer.

**Capturable Share** Capturable share refers to the fraction of the market that this business could ultimately secure.

**Competitive Price** The Competitive Price is the price of the nearest competiting product based on the specific use. Normally, competitive prices refer to in-kind competition where the alternative product can be directly substituted for your product.

**Copyrights** Copyrights consists of the legal ownership of printed material. Securing such right depend on the national laws involved. Generally this applies to protection published materials.

**Customer Commitment** Substantial signs of customer commitment include willingness to sign a contract. Less substantial signs may be sufficient to indicate strong interest, such as a willingness to negotiate a development or pricing agreement.

**Customer Technical Support** Customer technical support includes all direct support activities of the customers' activities using the firm's personnel or people contracted by the firm.

**Customers** Customers consist of all individuals who buy the product directly or indirectly. This includes for this workbook distributors and dealers as well as users of the product.

**Demand Curve** A Demand Curve is a representation of expected sales versus price or price premium.

**Direct Labor** Direct labor in this workbook refers to only manufacturing and processing the product. No sales or support man-power are considered in direct labor.

**Discounts** Discounts are given to promote the product or as a means of differentiating among customers based usually

on size. Prices are usually given as a list price. Discounts may be given below that. Discounting is likely to have an major impact on the expected or average price.

**Distribution** Distribution is the function of getting the product to the customer. In this workbook, we consider only the physical distribution of the product.

**Distribution Channel** The Distribution Channel consists of the specific route by which a product gets to the customer. It is a list of intermediate owners and agents who handle the product or take ownership of it.

**End-User** Industrial products tend to be used in products which themselves are later sold. The end-user is the person along this chain where the product can still be identified either physically or in terms of function.

**Exhibits** Exhibitions are usually held in conjunction with tradeshows and conferences and represent an opportunity to show products. Exhibits are generally formally built and can be for multiple shows annually.

**Expected Value** Expected value is used in this workbook to be equivalent to the "most likely" or typical. It does not necessarily refer formally to the "average" or central moment of all possible outcomes.

**Finished Products Inventory** The Finished Products Inventory refers to all warehoused finished product that is owned by this business. This includes all products at the plant, warehouses, or at agencies. Consignment products at dealers or customers may or may not be considered, depending on the nature of the business.

**Impact** Impact of events usually focus on effects on earnings, sales or investment.

**In-Kind Competition** In-Kind Competition consists of competitive products that can be "dropped in" as substitutes for ours. These usually include identical materials. Different materials for specific applications may behavior identically, and therefore, can be considered in-kind competitors for that application. However, in-kind competitors are generally restricted to identical compositions.

**In-Process Inventory** The In-process Inventory consists of all stores of materials for which some process has started, but not finished as final product.

**Internal Man-power** Internal manpower comprise the firm's personnel involved in the business. Both staff and business personnel are usually considered. Certain internal

contract personnel such as marketing research and engineering may not be considered depending on the present policy.

**Investments** Physical investments consists of any property that is large enough or mandated to be "capitalized" for tax purposes.

**Likelihood** A "Likelihood" measure is a subjective estimate of the probability that an event will take place.

**Maintenance** Plant maintenance, as used in the workbook, refers to manufacturing support required to keep the process functional. It does not include technical service to upgrade the process, to develop the quality assurance program; nor to develop the cost control activities.

**Manufacturing** Manufacturing include all means of physically producing the specified product.

**Market Development Facility** The Market Development Facility (MDF) is a plant built to produce adequate product for market entry. While the size of the facility and its need varies depending on the business, it is usually a plant larger than either a semi-works or pilot operation but smaller than the envisioned production scale facility.

**Market Segments** Market segments are groups of customers with similar characteristics. The choice of characteristics reflects the specific objective of using the segmentation.

**Marketing Strategy** The Marketing Strategy for this workbook consists of an outline of activities with objectives that are meant to encourage customers to try and use the product.

**Milestones** Milestones are measurable events in a program that can be used to tract progress.

**Operations** Operations in the workbook refers to all functions necessary for the business to function. These include: manufacturing, sales, marketing, development, and management.

**Out-of-Pocket Costs** Out-of-Pocket expenses are costs that involve the direct transfer of cash to outside vendors.

**Patents** Patents are legal grants for the exclusive use of a technology/or design for a specified period of use in exchange for its disclosure. The law governing acceptability of technology and designs for patent protection varies among countries. However, in almost all cases, patents are given only for non-previously disclosed technology. Under this condition, it is important to review the patent situation before disclosing

technology either directly or indirectly through the marketing of products.

**Penetration** Sales tend to grow for successful business into a limit, generally referred as a market potential, which represents the ultimate sales for the product. Penetration is the rate at which sales will grow into that potential.

**Perceived Value** Perceived value is the customers estimated worth of the product to himself. This estimate includes both monetary value such as this process cost savings and non-monetary items such as the reliability of the firm.

**Precise Cost Estimates** Precise Cost Estimates are the projection of investment costs with sufficient precision and accuracy for a investment proposal to upper management.

**Price Volume Curve** A Price-Volume Curve is the relationship between the volume of product sold and price of a class of products or product group. The price-volume curve may refer to either a price-point distribution for a product group or to a expected demand curve.

**Pricing Policy** The pricing policy includes conditions for discounting, the price structure, and credit and payment terms.

**Process Feasibility** Process feasibility consists of activities to determine if a product can be produced by the proposed process. It must meet specifications and quality standards within cost estimates, on a consistent basis using projected available man-power skills.

**Process Scaling** Manufacturing processes usually require several steps. During each step there are time delays and material loss. Process scaling consists of the estimating the size of each step in both the process and required inventory to assure that process will run efficiently.

**Product Test** Product tests consist of experiments by customers to determine the functionality and desirability of the product.

**Products** The Product or Product Offering consists of all aspects of that which the business delivers to the customer. Service and image aspects of the product as well as its physical attributes must be considered.

**Promotion** Promotion in this workbook refers to all activities beyond direct selling and pricing to encourage the customer to buy the product.

**Prototype** The prototype of the product or process is an early model which can be tested in key ways to determine the feasibility of the business.

**Prove-out** Process prove-out consists of those activities needed to determine that the process will eventually function according to specifications.

**Quality** Quality is the meeting and exceeding customers expectations. In this workbook Quality mainly refers to "Product Quality" which is the delivering of product which meets specifications and performance to the customers satisfaction.

**Raw Material Inventory** The Raw Material Inventory consists of the stores of feed stocks for use by manufacturing.

**Rebates** Rebates are funds transferred by the business to customers for buying the product. Usually this is done to assure a pass through of a down stream discount.

**Reference Price** The Reference Price is expected price by the customer for a product within the proposed product category. For example, the expected price for a new commodity plastic might be less than $1.00/pound or for new laboratory test equipment might be less than $40,000.

**Returns** Products are returned to the business under a number of conditions including non-performance and over stocking.

**Revenue** Revenues are the total funds that come to the business. Depending on the accounting convention, rebates and discounts are often deducted before a net revenue is reported.

**Sales Force** All sales personnel are included in the sales force. Generally the customer support staff is considered separately.

**Secrecy Agreements** Secrecy or Confidentiality Agreements consists of all written agreements between customers, users, testers, contractors, and vendors which specify that certain information will be kept secret. This is a critical factor for securing information that might later be used in a patent proposal.

**Share** The market share is the fraction of the market sales captured by the business. It should be noted that the share depends on the definition of the market share. Usually, market share is defined in terms of in-kind

competition.

**Shows (Trade)** Tradeshows and conferences represent an opportunity to show products. Exhibits are generally formally built and can be for multiple shows annually.

**Take-out** Take-out is the marketing stage by which commercial standard product is put into the hands of the customers.

**Tradenames/ Trademarks** Tradenames and Trademarks are legally protected product names or identifications. Laws regarding registration and protection vary among countries.

**Value-In-Use** The Value-In-Use is the monetary value of the product to the customer and end-user. It focuses on the "engineering type" calculation of value. The Value-In-Use is computed as the value compared with the best economic alternative.

**Verification** Verification in the workbook refers to "hands-on" evidence of the likelihood of success of aspects of the business. This includes verification of process feasibility, customer interest, or product functionality.

**Warranties** Warranties are any explicit or implicit guarantees that have been made with the product. The cost of that warranty should based on the expected rate of redemption.

**Yield** Yield is the ratio of the quantity of product that is produced to that quantity which could be produced based on expended materials.