Management Accounting for Multinational Companies

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INTRODUCTION
Activities

- Lectures
- Case studies discussions
- Presentations
What are we going to discuss?

- Management accounting in an organization
- Cost Management Concepts and Cost Behavior
- Full (absorption) costing
- Strategic cost management
- Life-cycle, target and kaizen costing
- Differential cost analysis for marketing and production decisions
- Budgeting, responsibility centers, and performance evaluation
- Balanced scorecard
Textbooks

- Drury C. Cost and Management Accounting. 2006.

- Reference textbooks (Introduction of Management Accounting)
Case studies

- HBS case studies
- Russian case studies
Case studies

- Wilkerson Company: Introducing ABC
- Denim Finishing: Using ABC Information for Decision Making
- Kemps LLC: Introducing Time-Driven ABC
- AB SKA (Sweden): Management Accounting of R&D Expenses
- Microsoft Latin America: Balanced Scorecard
Presentations: some examples

- Operational and strategic activity-based management
- “Beyond budgeting”
- Using Balanced Scorecards for Universities
- Management accounting in transitional economies
- Using balanced scorecards in the public sector
- Management accounting in France
Grading Policy

- Case studies (based on your input) – 20%
- Presentations – 10% (presentation + report).
- Mid-term exam – 20%
- Final exam – 50%
  - Discussion questions
  - Problems and mini cases
Contacts

- Classes: Mondays 10:45am – 2:30pm
- Office: 317 (A. Schultz building)
- Office hours: Mondays 2:30pm and by appointment
- E-mail: baranov@som.pu.ru
Management Accounting in an Organization
Learning Objectives

- Distinguish between managerial & financial accounting.
- Understand how managers can use accounting information to implement strategies.
- Identify the key financial players in the organization.
- Understand managerial accountants’ professional environment.
- Master the concept of cost.
Compare Financial & Managerial Accounting

Financial Accounting
- Deals with reporting to parties outside the organization
- Highly regulated
- Primarily uses historical data

Managerial Accounting
- Deals with activities inside an organization
- Unregulated
- May use projections about the future
Management Accounting Information (1)

- The Institute of Management Accountants has defined management accounting as:
  - A value-adding continuous improvement process of planning, designing, measuring and operating both nonfinancial information systems and financial information systems that guides management action, motivates behavior, and supports and creates the cultural values necessary to achieve an organization’s strategic, tactical and operating objectives.
Management Accounting Information (2)

- Be aware that this definition identifies:
  - Management accounting as providing both financial information and nonfinancial information
  - The role of management information as supporting strategic (planning), operational (operating) and control (performance evaluation) management decision making

- In short, management accounting information is pervasive and purposeful
  - It is intended to meet specific decision-making needs at all levels in the organization
Examples of management accounting information include:

- The reported expense of an operating department, such as the assembly department of an automobile plant or an electronics company
- The costs of producing a product
- The cost of delivering a service
- The cost of performing an activity or business process – such as creating a customer invoice
- The costs of serving a customer
Management Accounting Information

- Management accounting also produces measures of the economic performance of decentralized operating units, such as:
  - Business units
  - Divisions
  - Departments

- These measures help senior managers assess the performance of the company’s decentralized units
Management Accounting Information (5)

- Management accounting information is a key source of information for decision making, improvement, and control in organizations.
- Effective management accounting systems can create considerable value to today’s organizations by providing timely and accurate information about the activities required for their success.
Changing Focus

- Traditionally, management accounting information has been financial information.
- Management accounting information has now expanded to encompass information that is operational and nonfinancial:
  - Quality and process times
  - More subjective measurements (such as customer satisfaction, employee capabilities, new product performance)

- Three dimensions:
  - Financial / Non-financial information
  - Internal / External information
  - Operational / Strategic information
Financial v. Management Accounting

**Financial Accounting**
- Deals with reporting to parties outside the organization
- Deals with the organization as a whole
- Highly regulated
- Primarily uses historical data

**Management Accounting**
- Deals with activities inside an organization
- Deals with responsibilities centers within the organization as well as with the organization as a whole
- Unregulated
- May use projections about the future
In the late 19th century, railroad managers implemented large and complex costing systems:
- Allowed them to compute the costs of the different types of freight that they carried
- Supported efficiency improvements and pricing in the railroads

The railroads were the first modern industry to develop and use broad financial statistics to assess organization performance.

About the same time, Andrew Carnegie was developing detailed records of the cost of materials and labor used to make the steel produced in his steel mills.
The emergence of large and integrated companies at the start of the 20th century created a demand for measuring the performance of different organizational units. DuPont and General Motors are examples.

Managers developed ways to measure the return on investment and the performance of their units.

After the late 1920s management accounting development stalled. Accounting interest focused on preparing financial statements to meet new regulatory requirements.
It was only in the 1970s that interest returned to developing more effective management accounting systems.

- American and European companies were under intense pressure from Japanese automobile manufacturers.

- During the latter part of the 20th century there were innovations in costing and performance measurement systems.
The Evolution of Management Accounting

- Cost Determination and Financial Control
- Information for Management Planning and Control
- Reduction of Waste of Resources in Business Processes
- Creation of Value through Effective Resource Use

1910s
1950s
1980s
1990s
The history of management accounting comprises two characteristics:

1. Management accounting was driven by the evolution of organizations and their strategic imperatives
   - When cost control was the goal, costing systems became more accurate
   - When the ability of organizations to adapt to environmental changes became important, management accounting systems that supported adaptability were developed

2. Management accounting innovations have usually been developed by managers to address their own decision-making needs
Work Activities That Will Increase in Importance

Management Accounting Systems

- Absorption (full) costing
  - Volume-based costing
  - Activity-based costing

- Direct (marginal, variable, differential) costing

- Responsibility accounting
Key Financial Players

President and Chief Executive Officer

Finance Vice-President (CFO)

Treasurer

Controller

Internal Audit

Management Accounting

Financial Reporting

Tax Reporting

Other Vice-Presidents
Finance function: Russian companies (traditional)
Finance function: Russian companies (modern)

- General Director
  - Chief Accountant
  - Finance Director
    - Accounting Department
    - Finance Department
    - Management Accounting / Budgeting Department
Professional Environment

- **Institute of Management Accountants (IMA)**
  - Sponsors Certified Management Accountant & Certified Financial Management programs
  - Publishes a journal, policy statements and research studies on management accounting issues
  - [www.imanet.org](http://www.imanet.org)

- **Chartered Institute of Management Accounting (CIMA)**
  - Leading professional organization in England and Wales
  - Sponsors certificate and diploma programs
  - [www.cimaglobal.org](http://www.cimaglobal.org)
Professional diploma (CIMA)
Cost Management Concepts and Cost Behavior
## Match Terms & Definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost</strong></td>
<td>The return that could not be realized from the best forgone alternative use of a resource</td>
</tr>
<tr>
<td><strong>Opportunity Cost</strong></td>
<td>A cost charged against revenue</td>
</tr>
<tr>
<td><strong>Expense</strong></td>
<td>Costs not directly related to a cost object</td>
</tr>
<tr>
<td><strong>Cost Object</strong></td>
<td>Any item for which a manager wants to measure a cost</td>
</tr>
<tr>
<td><strong>Direct Cost</strong></td>
<td>Costs directly related to a cost object</td>
</tr>
<tr>
<td><strong>Indirect Cost</strong></td>
<td>A sacrifice of resources</td>
</tr>
</tbody>
</table>
Information in Management Accounting

Revenue  
\(-\) Costs  
= Profit

Cash Inflow  
\(-\) Cash Outflow  
= Net Cash Flow
Opportunity Cost

- An opportunity cost is the sacrifice you make when you use a resource for one purpose instead of another.
- Opportunity costs = explicit costs + implicit costs that do not appear anywhere in the accounting records.
- Machine time used to make one product cannot be used to make another, so a product that has a higher contribution margin per unit may not be more profitable if it takes longer to make.
- Management accountants often use the concept of opportunity cost for decision making.
- Economic Profit v. Accounting Profit.
Classification of Costs

- Variable / Fixed costs
- Direct / Indirect costs
- Prime costs / Overheads

Cost hierarchy (types of activities and their associated costs) New!
Nature of Fixed & Variable Costs

- **Variable costs** - change in total as the level of activity changes
  - There is a definitive physical relationship to the activity measure
- **Fixed costs** - do not change in total with changes in activity levels
- **Accounting concepts of variable and fixed costs** are short run concepts
  - Apply to a particular period of time
  - Relate to a particular level of production
- **Relevant range** is the range of activity over which the firm expects cost behavior to be consistent
  - Outside the relevant range, estimates of fixed and variable costs may not be valid
Types of Fixed Costs (1)

- Capacity costs - fixed costs that provide a firm with the capacity to produce and/or sell its goods and services
  - Also known as committed costs and typically relate to a firm’s ownership of facilities and its basic organizational structure
  - Capacity costs may cease if operations shut down, but continue in fixed amounts at any level of operations
  - Examples: property taxes, executive salaries
Types of Fixed Costs (2)

- Discretionary costs - need not be incurred in the short run to operate the business, however, usually they are essential for achieving long-run goals
  - Also referred to as programmed or managed costs
  - Examples: research and development costs, advertising
Semifixed Costs

- Refers to costs that increase in steps
  - Example: A quality-control inspector can examine 1,000 units per day. Inspection costs are semifixed with a step up for every 1,000 units per day
  - Distinction between fixed and semifixed is subtle
    - Change in fixed costs usually involves a change in long-term assets: a change in semifixed costs often does not
Cost Object

A cost object is something for which we want to compute a cost:

- A product
  - A pair of pants
- A product line
  - Women’s boot cut jeans
- An organizational unit
  - The on-line sales unit of a clothing retailer
Direct Cost

- A cost of a resource or activity that is acquired for or used by a single cost object
- Cost object = A dining room table
  - Cost of the wood that went into the dining room table
- Cost object = Line of dining room tables
  - A manager’s salary would be a direct cost if a manager were hired to supervise the production of dining room tables and only dining room tables
Indirect Cost

- The cost of a resource that was acquired to be used by more than one cost object
- The cost of a saw used in a furniture factory to make different products
  - It is used to make different products such as dining room tables, china cabinets, and dining room chairs
Direct or Indirect?

A cost classification can vary as the chosen cost object varies

- Consider a factory supervisor’s salary
  - If the cost object is a product the factory supervisor’s salary is an indirect cost
  - If the factory is the cost object, the factory supervisor’s salary is a direct cost

- A cost object can be any unit of analysis including product, product line, customer, department, division, geographical area, country, or continent
Types Of Production Activities

- Traditional cost systems classified activities into those that varied with volume and those that did not.
- This simple dichotomy does not capture the variety of the types of activities that take place in organizations.
- A new classification system, developed originally for manufacturing operations, gives a broader framework for classifying an activity and its associated costs.
New Classification System

- The new classification system places activities and their associated costs into one of the following categories:
  - Unit related
  - Batch related
  - Product sustaining
  - Customer sustaining
  - Business sustaining
## Cost Hierarchies

<table>
<thead>
<tr>
<th>Activity Category</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>Plant Mgmt &amp; Depr</td>
</tr>
<tr>
<td>Customer</td>
<td>Mkt Research</td>
</tr>
<tr>
<td>Product</td>
<td>Product Specs &amp; Testing</td>
</tr>
<tr>
<td>Batch</td>
<td>Machine Setups</td>
</tr>
<tr>
<td>Unit</td>
<td>Direct Materials</td>
</tr>
</tbody>
</table>
Unit-Related Activities

- Unit-related activities are those whose volume or level is proportional to the number of units produced or to other measures, such as direct labor hours or machine hours that are themselves proportional to the number of units produced.
- Unit-related activities apply to more than just production activities.
  - Loading shipments onto a truck is an example of a unit-related activity because it is proportional to the volume of shipments.
Batch-Related Activities

- In a production environment, batch-related activities are triggered by the number of batches produced rather than by the number of units manufactured.
  - E.g., Machine setups are required when beginning the production of a new batch of products.
  - Indirect labor for first-item quality inspections involves testing a fixed number of units for each batch produced and is, therefore, associated with the number of batches.
  - Many shipping costs may be batch related if the organization pays the shipper a charge per container or truckload.
Product-Sustaining Activities

- Product-sustaining activities support the production and sale of individual products.
- These activities provide the infrastructure that enables the production, distribution, and sale of the product but are not involved directly in the production of the product.
- Examples include:
  - Administrative efforts required to maintain drawings and labor and machine routings for each part.
  - Product engineering efforts to maintain coherent specifications such as the bill of materials for individual products and their component parts and their routing through different work centers in the plant.
  - Managing and sustaining the product distribution channel.
  - The process engineering required to implement engineering change orders (ECOs).
Customer-Sustaining Activities

- Customer-sustaining activities enable the company to sell to an individual customer but are independent of the volume and mix of the products and services sold and delivered to the customer.

- Examples of customer-sustaining activities include:
  - Sales calls
  - Technical support provided to individual customers
Business-Sustaining Expenses

- Business-sustaining expenses are other resource supply capabilities that cannot be traced to individual products and customers:
  - The cost of a plant manager and administrative staff
  - Channel-sustaining expenses, such as the cost of trade shows, advertising, and catalogs
- The expenses can be assigned directly to the individual product lines, facilities, and channels, but should not be allocated down to individual products, services, or customers
Business-Sustaining Activities

- Business-sustaining activities are those required for the basic functioning of the business.
- For example, organizations need only one CEO irrespective of their size, and they need to perform certain basic functions, such as registration or reporting, that also are independent of the size of the organization.
- These core activities are independent of the size of the organization, or the volume and mix of products and customers.
Using The Cost Hierarchy

- The cost hierarchy just discussed is a model of cost behavior that can be used in two ways:
  - To predict costs
  - To develop the costs for a cost object such as a product or product line
- If we understand the underlying behavior of costs, we have a basis to predict costs and to understand how costs will behave as volume expands and contracts
Indirect Costs Allocations

- Traditional cost accounting systems assign indirect costs to products with a two-stage procedure:
  1. Indirect costs are assigned to production departments
  2. Production department costs are assigned to the products
Cost Pools

- Cost pools are groups of costs
- Three major types of cost pools:
  - Plant (traditional)
  - Department (traditional)
  - Activity center (activity-based costing)
Cost Driver Rates

- A cost driver is a factor that causes or “drives” an activity’s costs.
- All costs associated with a cost driver, such as setup hours, are accumulated separately.
  - Each subset of total support costs that can be associated with a distinct cost driver is referred to as a cost pool.
- Each cost pool has a separate cost driver rate.
- The cost driver rate is the ratio of the cost of a support activity accumulated in the cost pool to the level of the cost driver for the activity.
  - Activity cost driver rate = 
    
    Cost of support activity / Level of cost driver
Determination Of Cost Driver Rates

- Determining realistic cost driver rates has become increasingly important in recent years
  - Support costs now comprise a large portion of the total costs in many industries
- Many firms now recognize that several different factors may be driving support costs rather than one or even two factors, such as direct labor or machine hours
  - Firms are now taking greater care in identifying which support costs should relate to what cost driver
The number of cost pools can vary
- Some German firms use over 1,000
- Henkel-Era-Tosno

The general principle is to use separate cost pools if the cost or productivity of resources is different and if the pattern of demand varies across resources.

The increase in measurement costs required by a more detailed cost system must be traded off against the benefit of increased accuracy in estimating product costs.
- If cost and productivity differences between resources are small, having more cost pools will make little difference in the accuracy of product cost estimates.
Effect Of Departmental Structure

- Many plants are organized into departments that are responsible for performing designated activities
  - Departments that have direct responsibility for converting raw materials into finished products are called *production departments*
  - *Service departments* perform activities that support production, such as:
    - Machine maintenance
    - Machine setup
    - Production engineering
    - Production scheduling
  - All service department costs are indirect support activity costs because they do not arise from direct production activities
Two-Stage Cost Allocation (1)

- Conventional product costing systems assign indirect costs to jobs or products in two stages

1. **In the first stage:**
   - System identifies indirect costs with various production and service departments
   - Service department costs are then allocated to production departments

2. The system assigns the accumulated indirect costs for the production departments to individual jobs or products based on predetermined departmental cost driver rates
Two-Stage Cost Allocation (2)
Final Word on Two-Stage Allocation

- The fundamental assumption of the two-stage allocation method is the absence of a strong direct link between the support activities and the products manufactured.
  - For this reason, service department costs are first allocated to production departments using one of the conventional two-stage allocation methods previously described.
- Activity-based costing rejects this assumption and instead develops the idea of cost drivers that directly link the activities performed to the products manufactured and measure the average demand placed on each activity by the various products.
  - Activity costs are assigned to products in proportion to the average demand that the products place on the activities, usually eliminating the need for the second step in Stage 1 allocations.
Activity-based costing
Activity-Based Costing

- “Today’s management accounting information, driven by the procedures and cycles of the organisation’s financial reporting system, is too late, too aggregated and too distorted to be relevant for manager’s planning and control decisions”

Kaplan & Johnson, Relevance Lost: The Rise and Fall of Management Accounting, HBS Press 1987
### Problems With Simple Cost Accounting Systems: An Example

<table>
<thead>
<tr>
<th>Product mix</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Small</td>
</tr>
<tr>
<td>Volume</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>P1</td>
</tr>
<tr>
<td>High</td>
<td>P3</td>
</tr>
</tbody>
</table>

How about our competitive advantage (in terms of cost per unit)?
Traditional v. ABC System

**Traditional:**
- Uses actual departments or cost centers for accumulating and redistributing costs
- Asks how much of an allocation basis (usually based on volume) is used by the production department
- Service department expenses are allocated to a production department based on the ratio of the allocation basis used by the production department

**ABC:**
- Uses activities, for accumulating costs and redistributing costs
- Asks what activities are being performed by the resources of the service department
- Resource expenses are assigned to activities based on how much of the resource is required or used to perform the activities
Strategic Use of ABC

- Managers use activity-based information in 2 ways:
  - To shift the mix of activities and products away from less profitable to more profitable operations
  - To help them become a low-cost producer or seller

- Activity Analysis involves 4 steps:
  - Chart activities used to complete the product or service
  - Classify activities as value-added or non-value-added
  - Eliminate non-value-added activities
  - Continuously improve & reevaluate efficiency of activities or replace them with more efficient activities
Tracing Marketing-Related Costs to Customers

- The costs of marketing, selling, and distribution expenses have been increasing rapidly in recent years
  - Result of increased importance of customer satisfaction and market-oriented strategies
- Many of these expenses do not relate to individual products or product lines but are associated with:
  - Individual customers
  - Market segments
  - Distribution channels
- Companies need to understand the cost of selling to and serving their diverse customer base
**Alpha – Beta Example (1)**

- Assume Alpha and Beta are customers generating about equal revenue and seen as equally valuable customers
- Using a conventional cost accounting system, marketing, selling, distribution, and administrative (MSDA) expenses were allocated to customers at a rate of 35% of Sales

<table>
<thead>
<tr>
<th></th>
<th>ALPHA</th>
<th>BETA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$320,000</td>
<td>$315,000</td>
</tr>
<tr>
<td>CGS</td>
<td>154,000</td>
<td>156,000</td>
</tr>
<tr>
<td>Gross Margin</td>
<td>$166,000</td>
<td>$159,000</td>
</tr>
<tr>
<td>MSDA expenses  (@35% of Sales)</td>
<td>112,000</td>
<td>110,250</td>
</tr>
<tr>
<td>Operating profit</td>
<td>$ 54,000</td>
<td>$ 48,750</td>
</tr>
<tr>
<td>Profit percentage</td>
<td>16.9%</td>
<td>15.5%</td>
</tr>
</tbody>
</table>

In many respects, however, the customers were not similar.
Alpha – Beta Example (2)

- Beta’s account manager spent a huge amount of time on that account
- Beta required a great deal of hand-holding and was continually inquiring whether the company could modify products to meet its specific needs
- Beta’s account required many technical resources, in addition to marketing resources
- Beta also:
  - Tended to place many small orders for special products
  - Required expedited delivery
  - Tended to pay slowly
    - All of which increased the demands on the order processing, invoicing, and accounts receivable process
Alpha – Beta Example (3)

- Alpha, on the other hand:
  - Ordered only a few products and in large quantities
  - Placed its orders predictably and with long lead times
  - Required little sales and technical support

- The Accounting Manager in Marketing knew that Alpha was a much more profitable customer than the financial statements were currently reporting

- He launched an activity-based cost study of the company’s marketing, selling, distribution, and administrative costs
The multifunctional project team:
- Studied the resource spending of the various accounts
- Identified the activities performed by the resources
- Selected activity cost drivers that could link each activity to individual customers

The Accounting Manager used:
- Transactional activity cost drivers
  - Number of orders, number of mailings
- Duration drivers
  - Estimated time and effort
- Intensity drivers when he had readily-available data
  - Actual freight and travel expenses
Alpha – Beta Example (5)

- The manager also used a customer cost hierarchy that was similar to the manufacturing cost hierarchy
  - Some activities were order-related
    - Handle customer orders
    - Ship to customers
  - Others were customer-sustaining
    - Service customers
    - Travel to customers
    - Provide marketing and technical support
The picture of relative profitability of Alpha and Beta shifted dramatically

<table>
<thead>
<tr>
<th>Activity</th>
<th>Alpha</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Margin (as previously)</td>
<td>$166,000</td>
<td>$159,000</td>
</tr>
<tr>
<td>Marketing &amp; tech. support</td>
<td>7,000</td>
<td>54,000</td>
</tr>
<tr>
<td>Travel to customer</td>
<td>1,200</td>
<td>7,200</td>
</tr>
<tr>
<td>Distribute sales catalog</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Service customers</td>
<td>4,000</td>
<td>42,000</td>
</tr>
<tr>
<td>Handle customer orders</td>
<td>500</td>
<td>18,000</td>
</tr>
<tr>
<td>Warehouse inventory</td>
<td>800</td>
<td>8,800</td>
</tr>
<tr>
<td>Ship to customers</td>
<td>12,600</td>
<td>42,000</td>
</tr>
<tr>
<td>Total activity expenses</td>
<td>26,200</td>
<td>172,100</td>
</tr>
<tr>
<td>Operating profit</td>
<td>$139,800</td>
<td>$(13,100)</td>
</tr>
<tr>
<td>Profit percentage</td>
<td>43.7%</td>
<td>(4.2%)</td>
</tr>
</tbody>
</table>
Alpha – Beta Example (7)

- As the manager suspected, Alpha Company was a highly profitable customer
  - Its ordering and support activities placed few demands on the company’s marketing, selling, distribution, and administrative resources
  - Almost all the gross margin earned by selling to Alpha dropped to the operating margin bottom line
- Beta Company was now seen to be the most unprofitable customer that the company had
- While the manager intuitively sensed that Alpha was a more profitable customer than Beta, he had no idea of the magnitude of the difference
ABC Customer Analysis

- The output from an ABC customer analysis is often portrayed as a whale curve
  - A plot of cumulative profitability versus the number of customers
  - Customers are ranked, on the horizontal axis from most profitable to least profitable (or most unprofitable)
Customer Profitability

- Cumulative **sales** follow the usual 20-80 rule
  - 20% of the customers provide 80% of the sales
- A whale curve for cumulative profitability typically reveals:
  - The most profitable 20% of customers generate between 150% and 300% of total profits
  - The middle 70% of customers break even
  - The least profitable 10% of customers lose 50% - 200% of total profits, leaving the company with its 100% of total profits
- It is not unusual for some of the largest customers to turn out being the most unprofitable
  - The largest customers are either the company’s most profitable or its most unprofitable
  - They are rarely in the middle
Managing Customer Profitability

- High-profit customers, such as Alpha, appear in the left section of the profitability whale curve
  - These customers should be cherished and protected
  - They could be vulnerable to competitive inroads
  - The managers of a company serving them should be prepared to offer discounts, incentives, and special services to retain the loyalty of these valuable customers if a competitor threatens
Managing Customer Profitability (2)

- The challenging customers, like Beta, appear on the right tail of the whale curve, dragging the company’s profitability down with their low margins and high cost-to-serve.

- The high cost of serving such customers can be caused by their:
  - Unpredictable order pattern
  - Small order quantities for customized products
  - Nonstandard logistics and delivery requirements
  - Large demands on technical and sales personnel
Managing Customer Profitability

- The opportunities for a company to transform its unprofitable customers into profitable ones is perhaps the most powerful benefit the company’s managers can receive from an activity-based costing system.
- Managers have a full range of actions for transforming unprofitable customers into profitable ones:
  - Process improvements
  - Activity-based pricing
  - Managing customer relationships
Life-cycle costing
Life-Cycle Costs

- Life-cycle costing is a relatively new perspective that argues that organizations should consider a product’s costs over its entire lifetime when deciding whether to introduce a new product.

- There are five distinct stages in a typical product’s life cycle:
  - Not all products will follow this pattern.
  - Some products will fail early and have a truncated life cycle.
Product Life Cycle

- Product development and planning
  - The organization incurs significant research and development costs and product testing costs.
  - Because of the increasing costs of launching products, organizations are devoting more effort to the product development and planning phase.
  - The nature and magnitude of these costs should be identified so that when products are initially proposed, planners have some idea of the cost that new product development will inflict on the organization.
  - Shorter life cycles provide less time to recover costs.
Product Life Cycle (2)

- **Introduction phase**
  - The organization incurs significant promotional costs as the new product is introduced to the marketplace.
  - At this stage the product’s revenue will often not cover the flexible and capacity-related costs that it has inflicted on the organization.
Product Life Cycle (3)

- Growth phase
  - The product’s revenues finally begin to cover the flexible and capacity-related costs incurred to produce, market, and distribute the product
  - There is often little or no price competition
  - The focus of attention is on developing systems to deliver the product to the customer in the most effective way
Product Life Cycle (4)

- Product maturity phase
  - Price competition becomes intense and product margins begin to decline
  - While the product is still profitable, profitability is declining relative to the growth phase
  - The organization undertakes intense efforts to reduce costs to remain competitive and profitable
Product Life Cycle (5)

- **Product decline and abandonment phase**
  - Phase in which the product begins to become unprofitable
  - Competitors begin to drop out—the least efficient first—and the remaining competitors find themselves competing for a share of a smaller and declining market
  - The organization incurs abandonment costs, which can include selling off equipment no longer required or restoring an asset (e.g., land) prior to abandoning it
Product Life Cycle

- Product-related costs occur unevenly over the product’s lifetime.
- The motivation for considering total life cycle costs before the product is introduced is to ensure that the difference between the product’s revenues and its manufacturing and distribution costs cover the other costs associated with developing, supporting, and abandoning the product.
- Life-cycle costing is a good example of a costing system designed for decision making that has little or no practical relevance in external reporting.
Direct costing and short-term decisions
Cost-Volume-Profit Analysis

- Decision makers often like to combine information about flexible and capacity-related costs with revenue information to project profits for different levels of volume.

- Conventional cost-volume-profit (CVP) analysis rests on the following assumptions:
  - All organization costs are either purely variable or fixed.
  - Units made equal units sold.
  - Revenue per unit does not change as volume changes.
CVP Model

- Cost-volume-profit (CVP) model summarizes the effects of volume changes on a firm’s costs, revenues, and profit
  - Analysis can be extended to determine the impact on profit of changes in selling prices, service fees, costs, income tax rates, and the mix of products and services
- Break-even point is the volume of activity that produces equal revenues and costs for the firm
  - No profit or loss at this point
The CVP Profit Equation

Profit:
= Revenue - Flexible costs - Capacity-related costs
= (Units sold x Revenue per unit) - (Units sold x flexible cost per unit) - Capacity-related costs
= [Units sold x (Revenue per unit - Flexible cost per unit)] - Capacity-related costs
= (Units sold x Contribution margin per unit) - Capacity-related costs
Break-even Volume

- Using the CVP profit equation, break-even volume is determined by calculating the volume where profit = 0
- $0 = (\text{Units sold} \times \text{Contribution margin per unit}) - \text{Fixed costs}$
- Units sold to break even = $\frac{\text{Fixed costs}}{\text{Contribution margin per unit}}$
Target Profit

- CVP analysis can be used to determine the sales volume required to achieve a specified target profit
  - Note that the previous break-even analysis was used to determine the unit sales required to achieve a target profit of $0
Margin of Safety

- **Margin of safety** - excess of projected sales units over break-even sales level, calculated as follows:

  Sales Units - Break-Even Sales Units = Margin of Safety

- Provides an estimate of the amount that sales can drop before the firm incurs a loss
Multiple Product
Financial Modeling (1)

- When a firm has multiple products, several alternatives are available to facilitate financial modeling
  - Assume all products have the same contribution margin
  - Assume a weighted-average contribution margin
  - Treat each product line as a separate entity
  - Use sales dollars as a measure of volume
Multiple Product Financial Modeling (2)

- Assume all products have the same contribution margin
  - Can group products so they have equal or near equal contribution margins
  - Can be a problem when products have substantially different contribution margins
- Assume a weighted-average contribution margin
  - To determine break-even units, use the following formula:

\[
\frac{\text{Fixed Costs}}{\text{Weighted Average Contribution Margin}}
\]
Multiple Product Financial Modeling (3)

- Treat each product line as a separate entity
  - Requires allocating indirect costs to product lines
  - To extent allocations are arbitrary, may lead to inaccurate estimates
- Use sales dollars as a measure of volume
  - Can use weighted average contribution margin break-even dollar sales calculated as follows:

\[
\text{Total Contribution Margin} = \frac{\text{Total Contribution Margin}}{\text{Total Sales}}
\]
CVP Model Assumptions

- Costs can be separated into fixed and variable components.
- Cost and revenue behavior is linear throughout the relevant range.
  - Total fixed costs, variable costs per unit, and sales price per unit remain constant throughout the relevant range.
- Product mix remains constant.
Relevant Costs and Revenues

- Whether particular costs and revenues are relevant for decision making depends on the decision context and the alternatives available.
- When choosing among different alternatives, managers should concentrate only on the costs and revenues that differ across the decision alternatives.
  - These are the relevant cost/revenues.
  - Opportunity costs by definition are relevant costs for any decision.
  - The costs that remain the same regardless of the alternative chosen are not relevant for the decision.
Sunk Costs are Not Relevant

- *Sunk costs* often cause confusion for decision makers
  - Costs of resources that already have been committed and no current action or decision can change
  - Not relevant to the evaluation of alternatives because they cannot be influenced by any alternative the manager chooses
Replacement Of A Machine (1)

- A Company purchased a new drilling machine for $180,000 on September 1, 2003
  - They paid $30,000 in cash and financed the remaining $150,000 with a bank loan
  - The loan requires a monthly payment of $5,200 for the next 36 months
- On September 27, 2003, a sales representative from another supplier of drilling machines approached the company with a newly designed machine that had only recently been introduced to the market and offered special financing arrangements
  - The new supplier agreed to pay $50,000 for the old machine, which would serve as the down payment required for the new machine
  - In addition, the new supplier would require monthly payments of $6,000 for the next 35 months
Replacement Of A Machine (2)

- The new design relied on innovative computer chips, which would reduce the labor required to operate the machine
  - The company estimated that direct labor costs would decrease by $4,400 per month on the average if it purchased the new machine
- In addition it had fewer moving parts than the current machine
  - The new machine would decrease maintenance costs by $800 per month
- The new machine has greater reliability
  - This would allow the company to reduce materials scrap cost by $1,000 per month
- Should the company dispose of the machine it just purchased on September 1 and buy the new machine?
Analysis Of Relevant Costs

- If the company buys the new machine, it will still be responsible for the monthly payments of $5,200 committed to on September 1.
  - Therefore, the $30,000 that it paid in cash for the old machine and the $5,200 it is committed to pay each month for the next 36 months are sunk costs.
  - The company already has committed these resources, and regardless if it decides to buy the new machine, it cannot avoid any of these costs.
- None of these sunk costs are relevant to the decision.
Analysis Of Relevant Costs

- What costs are relevant?
  - The 35 monthly payments of $6,000 and the down payment of $50,000 are relevant costs, because they depend on the decision.
  - Labor, materials, and machine maintenance costs will be affected if the company acquires the new machine.
    - The relevant expected monthly savings are:
      - $4,400 in labor costs
      - $1,000 in materials costs
      - $800 in machine maintenance costs
  - The revenue of $50,000 expected on the trade-in of the old machine is also relevant, because the old machine will be disposed of only if the company decides to acquire the new machine.
Analysis Of Relevant Costs

- In a comparison of the cost increases/cash outflows to cost savings/cash inflows
  - The down payment required for the new machine is matched by the expected trade-in value of the old machine
  - The expected savings in labor, materials, and machine maintenance costs each month ($6,200) are more than the monthly lease payments for the new machine ($6,000)
  - Thus, it is apparent that the company will be better off trading in the old machine and replacing it with the new machine