



**INSTITUTE OF AERONAUTICAL ENGINEERING COLLEGE
(AUTONOMOUS)**

**POWERPOINT PRESENTATION
ON
MANAGEMENT OF TECHNOLOGY
IV SEMESTAR**

**Mrs.K.Lakshmi Revathi
ASSISTANT PROFESSOR**

DEPARTMENT OF MASTER OF BUSINESS ADMINISTRATION

UNIT-I

TECHNOLOGICAL INNOVATION

TECHNOLOGICAL INNOVATION

- The technological innovation system is a concept developed within the scientific field of innovation studies which serves to explain the nature and rate of technological change .
- A Technological Innovation System can be defined as ‘a dynamic network of agents interacting in a specific economic/industrial area under a particular institutional infrastructure and involved in the generation, diffusion, and utilization of technology’.

THREE BASIC CATEGORIES

- Actors
- Institutions
- Technological factors

SEVEN SYSTEM FUNCTIONS

- F1. Entrepreneurial activities
- F2. Knowledge development
- F3. Knowledge diffusion / knowledge exchange through networks
- F4. Guidance of the search
- F5. Market formation
- F6. Resource mobilization
- F7. Support from advocacy coalitions

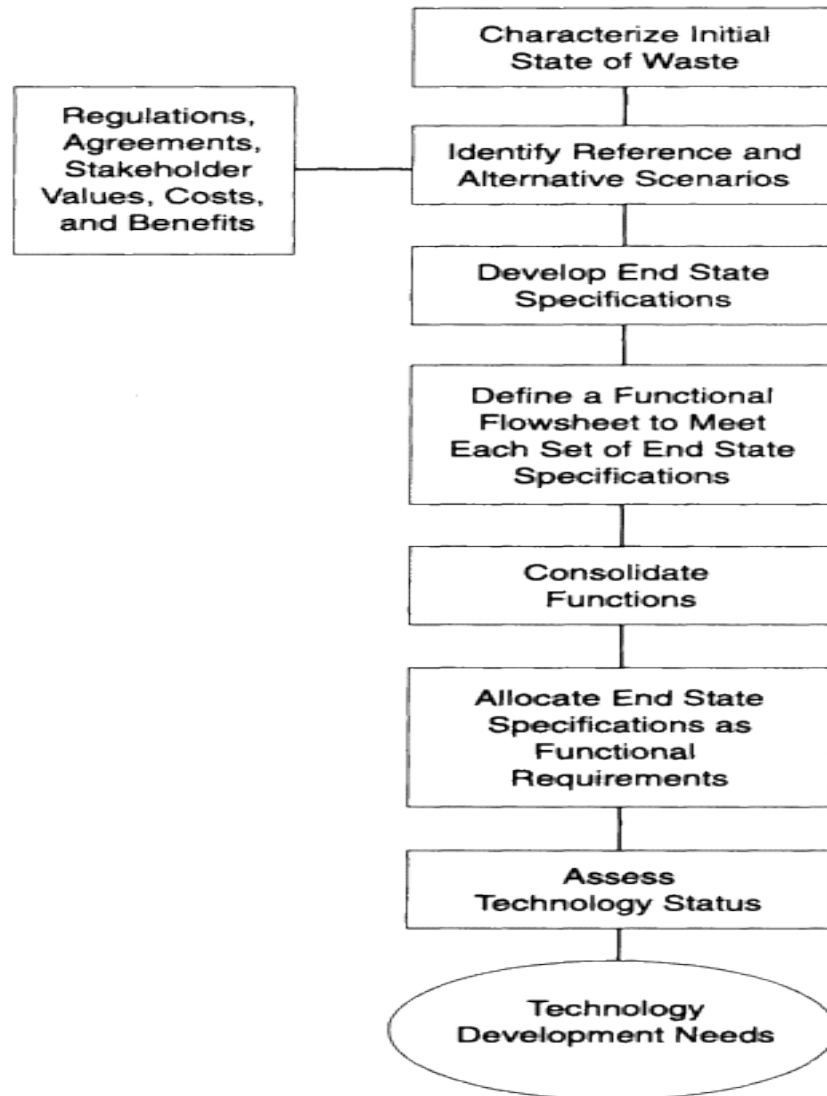
ACQUIRING NEW TECHNOLOGIES AND CAPABILITIES

- To improve competitiveness and retain sustainability, firms require new technologies and capabilities. In this age of rapid innovation and complexity, it is challenging for the firms to develop internally and remain competitive at the same time. Merger, acquisition and alliance are some of the ways to achieve this, but the primary driver is the desire to obtain valuable resources.

NEED FOR A CONCEPTUAL APPROACH:

- Typical concepts used in technology management are:
- technology strategy
- technology forecasting
- technology roadmap
- Technology project portfolio

END STATE BASED APPROACH



5 factors for successful technological innovation

- Leadership support.
- Stakeholder involvement.
- Training.
- Resources and financial support.
- Support from campus community.

RESEARCH AND DEVELOPMENT (R&D)

- Research and development (R&D) refers to the investigative activities a business conducts to improve existing products and procedures or to lead to the development of new products and procedures.
- Consumer companies across all sectors and industries utilize R&D to improve on product lines, and corporations experience growth through these improvements and through the development of new goods and services.
- In general, pharmaceuticals, semiconductor and software/technology companies tend to spend the most on R&D.

BASIC AND APPLIED RESEARCH

- Basic research is systematic study aiming at fuller, more complete knowledge and understanding of the fundamental aspects of a concept or a phenomenon.
- Applied research is the systematic study and gleaning of knowledge and understanding to apply to determining and developing products, policies or operational processes.

THREE FORMS OF GENERIC COMPETITIVE STRATEGY

- Cost leadership strategy
- Differential strategy
- Focus strategy

CPS STEPS

- Clarify and identify the problem
- Research the problem
- Formulate creative challenges
- Generate ideas
- Combine and evaluate the ideas
- Draw up an action plan
- Do it! (implement the ideas)

UNIT-2

FINANCIAL EVALUATION OF RESEARCH AND DEVELOPMENT

COST-EFFECTIVENESS ANALYSIS (CEA)

- It is a form of economic analysis that compares the relative costs and outcomes (effects) of different courses of action.
- Analysis is distinct from cost–benefit analysis, which assigns a monetary value to the measure of effect. Cost-effectiveness analysis is often used in the field of health services, where it may be inappropriate to monetize health effect.

COST–BENEFIT ANALYSIS (CBA)

- It is sometimes called **benefit costs analysis (BCA)**, is a systematic approach to estimating the strengths and weaknesses of alternatives (for example in transactions, activities, functional business requirements or projects investments); it is used to determine options that provide the best approach to achieve benefits while preserving savings

RISK ANALYSIS

Risk analysis is the process of assessing the likelihood of an adverse event occurring within the corporate, government, or environmental sector.

Risk analysis is the study of the underlying uncertainty of a given course of action and refers to the uncertainty of forecasted cash flow streams, variance of portfolio/stock returns, the probability of a project's success or failure, and possible future economic states

QUANTITATIVE RISK ANALYSIS

- Under quantitative risk analysis, a risk model is built using simulation or deterministic statistics to assign numerical values to risk.
- Inputs which are mostly assumptions and random variables are fed into a risk model. For any given range of input, the model generates a range of output or outcome

QUALITATIVE RISK ANALYSIS

- Qualitative risk analysis is an analytical method that does not identify and evaluate risks with numerical and quantitative ratings.
- Qualitative analysis involves a written definition of the uncertainties, an evaluation of the extent of impact if the risk ensues, and countermeasure plans in the case of a negative event occurring

WHEN TO USE EACH VALUATION TECHNIQUE

- Comparable Company Analysis.
- Discounted Cash Flow Analysis (DCF) .
- Precedent Transaction Analysis.
- Leverage Buyout Analysis (LBO) .
- Comparable Company Analysis.
- Discounted Cash Flow (DCF) Analysis.
- Precedent Transaction/Premium Paid Analysis.
- Leverage Buyout (LBO) Analysis.

COMPARABLE COMPANY VALUATION

- The Comparable Company valuation technique is generally the easiest to perform. It requires that the comparable companies have publicly traded securities, so that the value of the comparable companies can be estimated properly.

DISCOUNTED CASH FLOW ANALYSIS (DCF)

- A DCF valuation attempts to get at the value of a company in the most direct manner possible: a company's worth is equal to *the current value of the cash it will generate in the future*, and DCF is a framework for attempting to calculate exactly that.
- In this respect, DCF is the most theoretically correct of all of the valuation methods because it is the most precise.

PRECEDENT TRANSACTION ANALYSIS

- The Precedent Transaction valuation technique is also generally fairly easy to perform. It does require that the specifics of a prior acquisition/divestiture deal are known (price per share, number of shares acquired or spun off, amount of debt assumed, etc.), but this is usually the case if the target (acquired company) had publicly traded instruments prior to the transaction.
- In some industries, however, relatively few truly comparable M&A transactions have occurred (or the acquisitions were too small to have publicized deal details), so the Precedent Transaction analysis maybe be difficult to conduct.

LEVERAGE BUYOUT ANALYSIS (LBO)

- Another possible way to value a company is via LBO analysis. LBOs are typically used by “financial sponsors” (private equity firms) who are looking to acquire companies inexpensively in the hopes that they can be sold at a profit in several years.
- In order to maximize returns from these investments, LBO firms generally try to use as much borrowed capital (debt financing) as possible to fund the acquisition of the company, thereby minimizing the amount of equity capital That the sponsor itself must invest (equity financing).

DCF TECHNIQUES:

- Step 1—Forecast Expected Cash Flow
- Step 2—Estimate the Discount Rate
- Step 3—Calculate the Value of the Corporation
- Step 4—Calculate Intrinsic Stock Value

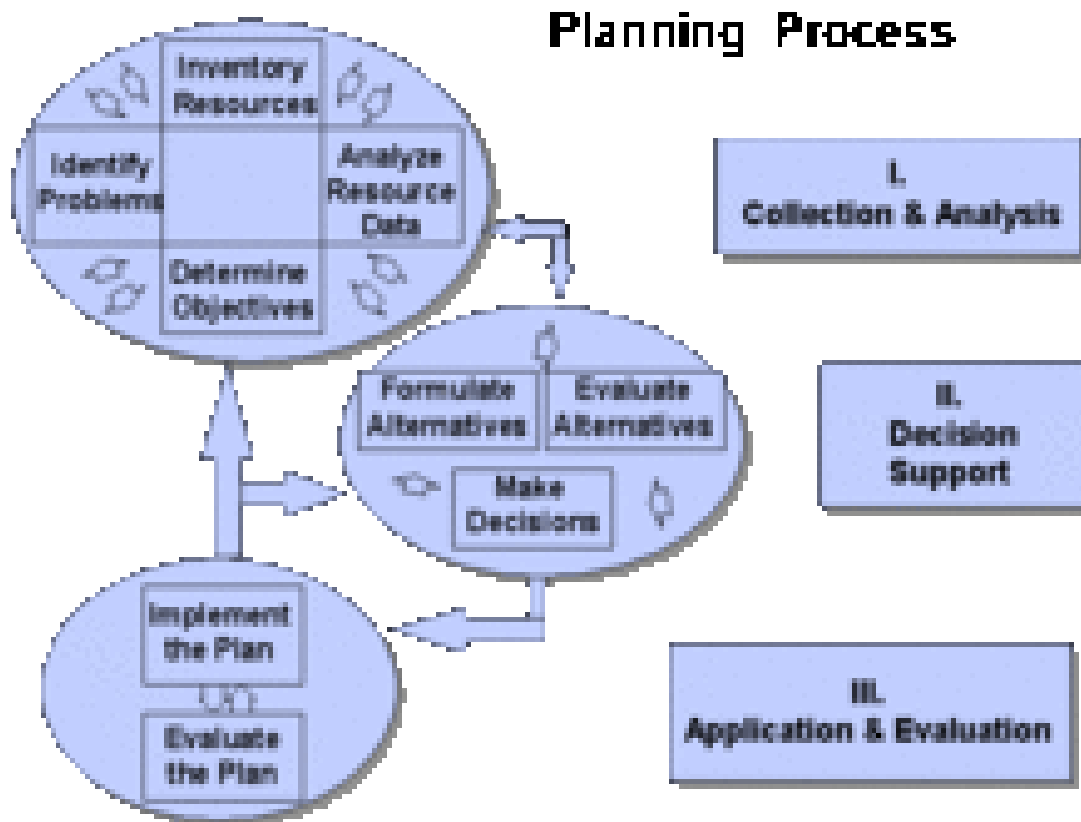
UNIT-III

- **RESEARCH AND DEVELOPMENT**

PROGRAM ME PLANNING AND CONTROL:

- Planning (also called forethought) is the process of thinking about and organizing the activities required to achieve a desired goal.
- It involves the creation and maintenance of a plan, such as psychological aspects that require conceptual skills.
- There are even a couple of tests to measure someone's capability of planning well. As such, planning is a fundamental property of intelligent behavior.

PLANNING PROCESS



PORTFOLIO PLAN

- An investment strategy applied to a personal or corporate portfolio that determines its general purpose and constraints. Once a portfolio plan has been determined, investments adhering to the plan are bought and sold accordingly.

PROJECT TERMINATION

- Project termination is sometimes also called project close-out or final shutdown. During this phase the people involved are acknowledged for their achieved goals and the work is considered complete.

10 RESOURCE ALLOCATION TIPS FOR MANAGERS

1. Know Your Scope
2. Identify Resources
3. Don't Procrastinate
4. Think Holistically
5. Track Time
6. Use Tools
7. Don't Over-allocate:
8. Be Realistic
9. Have a Routine
10. Know Your Resources

NEW PRODUCT DEVELOPMENT

- In business and engineering, **new product development (NPD)** covers the complete process of bringing a new product to market. A central aspect of NPD is product design, along with various business considerations.
- New product development is described broadly as the transformation of a market opportunity into a product available for sale.

MARKETING RESEARCH

- **Marketing research** is "the process or set of processes that links the producers, customers, and end users to the marketer through information used to identify and define marketing opportunities and problems; generate, refine, and evaluate marketing actions; monitor marketing performance; and improve understanding of marketing as a process.
- Marketing research specifies the information required to address these issues, designs the method for collecting information, manages and implements the data collection process, analyzes the results, and communicates the findings and their implications."

TYPES OF RESEARCH DESIGNS:

- **Based on questioning**
- Qualitative marketing research
- Quantitative marketing research
- **Based on observations**
- Ethnographic studies
- Experimental techniques -

INDUSTRIAL DESIGN

- **Industrial design** is a process of design applied to products that are to be manufactured through techniques of mass production.
- Its key characteristic is that design is separated from manufacture: the creative act of determining and defining a product's form and features takes place in advance of the physical act of making a product, which consists purely of repeated, often automated, replication.
- This distinguishes industrial design from craft-based design, where the form of the product is determined by the product's creator at the time of its creation.

PRODUCT DESIGN PROCESS

- The set of strategic and tactical activities, from idea generation to commercialization, used to create a product design.
- In a systematic approach, product designers conceptualize and evaluate ideas, turning them into tangible inventions and products.
- The product designer's role is to combine art, science, and technology to create new products that people can use.

PRODUCT DESIGN PROCESS

three main aspects:

- Analysis
- Concept
- Synthesis

PRODUCT DESIGN PROCESS

ANALYSIS

- Accept Situation:
- Analyze:

CONCEPT

- Define:

SYNTHESIS

- Ideate:
- Select:
- Implement:
- Evaluate:

Demand-pull innovation

- Demand-pull happens when there is an opportunity in the market to be explored by the design of a product. This product design attempts to solve a design problem.
- The design solution may be the development of a new product or developing a product that's already on the market, such as developing an existing invention for another purpose

INVENTION-PUSH INNOVATION

- Invention-push innovation happens when there is an advancement in intelligence. This can occur through research or it can occur when the product designer comes up with a new product design idea.

DESIGN FOR MANUFACTURABILITY

- **Design for manufacturability** (also sometimes known as design for manufacturing or DFM) is the general engineering practice of designing products in such a way that they are easy to manufacture.
- The concept exists in almost all engineering disciplines, but the implementation differs widely depending on the manufacturing technology.
- DFM describes the process of designing or engineering a product in order to facilitate the manufacturing process in order to reduce its manufacturing costs.

DESIGN FOR INSPECTION

- The concept of Design for Inspection (DFI) should complement and work in collaboration with Design for Manufacturability (DFM) and Design for Assembly (DFA) to reduce product manufacturing cost and increase manufacturing practicality

UNIT-IV

TECHNOLOGICAL FORECASTING FOR DECISION MAKING

RATIONAL AND EXPLICIT METHODS

The virtues of the use of rational methods are as follows:

- They can be taught and learned,
- They can be described and explained,
- They provide a procedure follow able by anyone who has absorbed the necessary training, and in some cases,
- These methods are even guaranteed to produce the same forecast regardless of who uses them.

METHODS OF TECHNOLOGY FORECASTING

- Commonly adopted methods of technology forecasting include the Delphi method, forecast by analogy, growth curves and extrapolation .
- Normative methods of technology forecasting — like the relevance trees, morphological models, and mission flow diagrams — are also commonly used.

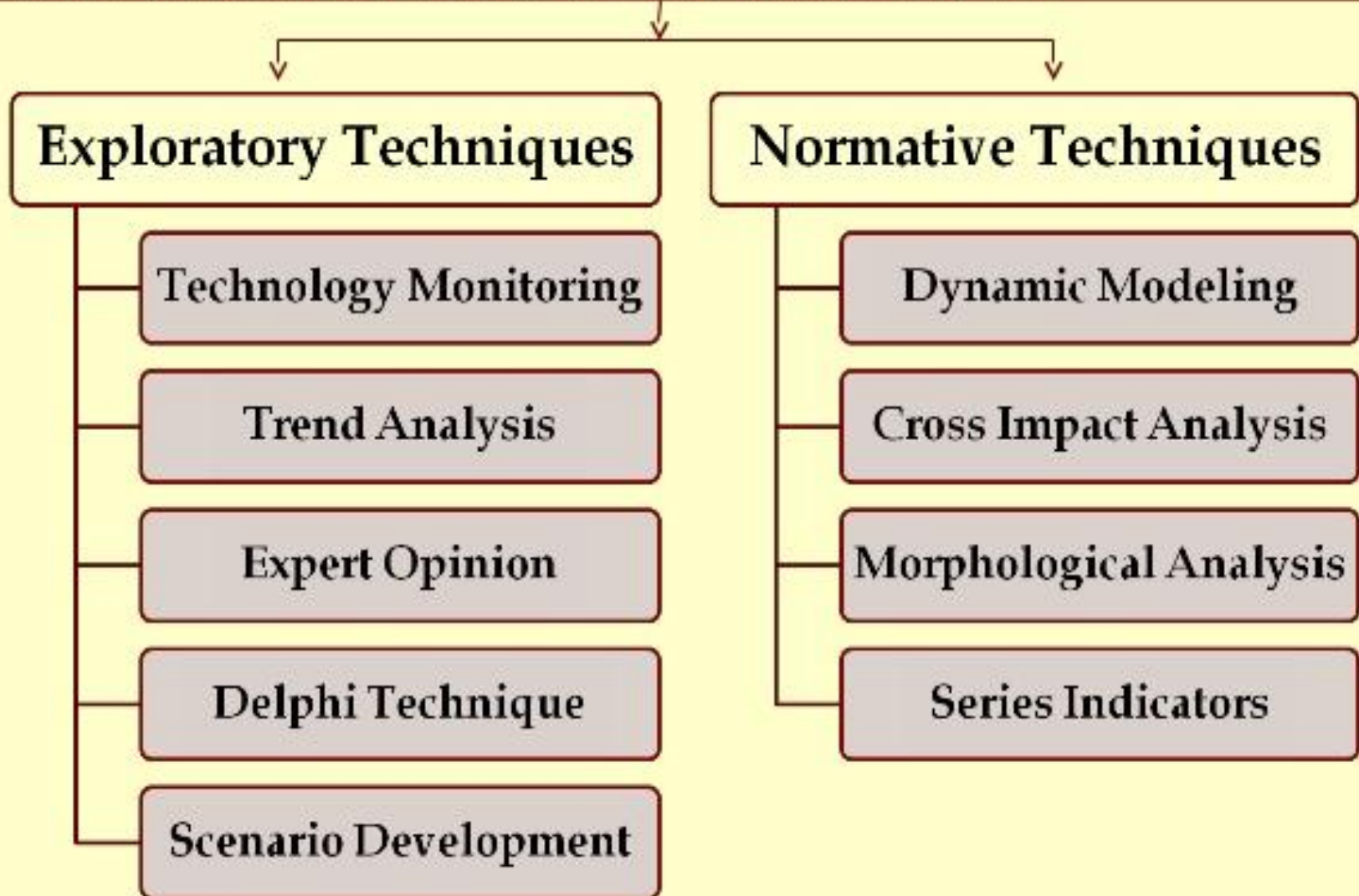
FORECASTING

- Forecasting is the process of making predictions of the future based on past and present data and most commonly by analysis of trends. A commonplace example might be estimation of some variable of interest at some specified future date.
- Prediction is a similar, but more general term. Both might refer to formal statistical methods employing time series, cross-sectional or longitudinal data, or alternatively to less formal judgmental methods.

MASTER PRODUCTION SCHEDULE (MPS)

- A **master production schedule (MPS)** is a plan for individual commodities to be produced in each time period such as production, staffing, inventory, etc. It is usually linked to manufacturing where the plan indicates when and how much of each product will be demanded.
- This plan quantifies significant processes, parts, and other resources in order to optimize production, to identify bottlenecks, and to anticipate needs and completed goods.

METHODS OR TECHNIQUES



ROLE OF FORECASTING

- Since planning involves the future, no usable plan can be made unless the manager is able to take all possible future events into account. This explains why forecasting is a critical element in the planning process.
- In fact, every decision in the organization is based on some sort of forecasting.

STEPS IN FORECASTING:

The process of forecasting generally involves the following steps:

- *1. Developing the Basis:*
- *2. Estimation of Future Operations:*
- *3. Regulation of Forecasts:*
- *4. Review of the Forecasting Process:*

TECHNIQUES OF FORECASTING:

- *1. Historical Analogy Method:*
- *2. Survey Method:*
- *3. Opinion Poll:*
- *5. Time Series Analysis:*
- *6. Regression Analysis:*
- *7. Input-Output Analysis:*

TECHNOLOGICAL FORECASTING

- Technological Forecasting (TF) is concerned with the investigation of new trends, radically new technologies, and new forces which could arise from the interplay of factors such as new public concerns, national policies and scientific discoveries. Many of these forces are beyond the control, influence and knowledge of individual companies.

UNIT-V

TRANSFER OF TECHNOLOGY

MAJOR CATEGORIES OF TECHNOLOGY TRANSFER AND COMMERCIALIZATION

- technology codified and embodied in tangible artifacts
- processes for implementing technology
- knowledge and skills that provide the basis for technology and process development

FOUR GENERALLY RECOGNIZED FORMS OF INTELLECTUAL PROPERTY

- patents, dealing with functional and design inventions
- trademarks, dealing with commercial origin and identity
- copyrights, dealing with literary and artistic expressions
- trade secrets, which protect the proprietary capabilities of the firm

FIVE INFORMATION ACTIVITIES

- Technology
- technology
- Technology
- transfer-related
- Finding experts

DISTRIBUTIVE NEGOTIATION

- Distributive negotiation is also sometimes called positional or hard-bargaining negotiation and attempts to distribute a "fixed pie" of benefits. Distributive negotiation operates under zero sum conditions and implies that any gain one party makes is at the expense of the other and vice versa.
- For this reason, distributive negotiation is also sometimes called *win-lose* because of the assumption that one person's gain results in another person's loss.

INTEGRATIVE NEGOTIATION

- Integrative negotiation is also called interest-based, merit-based, or principled negotiation.
- It is a set of techniques that attempts to improve the quality and likelihood of negotiated agreement by taking advantage of the fact that different parties value various outcomes differently.
- While distributive negotiation assumes there is a fixed amount of value (a "fixed pie") to be divided between the parties, integrative negotiation often attempts to create value in the course of the negotiation

NEGOTIATION

- **Negotiation** is a dialogue between two or more people or parties intended to reach a beneficial outcome over one or more issues where a conflict exists with respect to at least one of these issues. This beneficial outcome can be for all of the parties involved, or just for one or some of them.

PRIVATE TECHNOLOGY TRANSFER

- Technology transfer between private companies is most commonly accomplished through licensing, although other mechanisms such as joint ventures, research consortia, and research partnerships are also quite popular.
- Licensing is a big business by itself. In 2002 U.S. companies received over \$66 billion in payments on technology licenses from other organizations, of which \$58 billion was from domestic sources.
- Data from the U.S. Department of Commerce compiled in the mid-1990s indicated that international technology licensing was rising at approximately 18 percent per year, and domestic technology licensing was rising at 10 percent per year.

FIVE INFORMATION ACTIVITIES

- Technology
- technology marketing
- Technology assessment
- transfer-related activities
- Finding experts