Finally, the system is selected, and the development feasibility of the system, the analysts perform a feasibility analysis to determine 1st step in the process is to identify a project that will deliver value to the business and create a system request that provides basic information about the proposed system. 1st step in the process is technical, economic, organizational feasibility of the system, Finally, the system is selected, and the development project begins.

Why Implement a new system?

Many projects are started without a clear understanding of how the system will improve the business. The IS field is filled with thousands of buzzwords, fads, and trends, such as; customer relationship management [CRM], mobile computing, data mining, … The promise of these innovations can appear so attractive that organizations begin projects even if they are not sure what value they offer, because they believe that the technologies are somehow important in their own right.

Why Implement a new system?

The first step in any new development project is to see an opportunity to improve the business. New systems start first and foremost from some business need or opportunity. Many ideas for new systems or improvements to existing ones arise from the application of a new technology. However, an understanding of technology is usually secondary to a solid understanding of the business and its objectives.

Why Implement a new system?

A 1996 survey by the Standish Group found that 42 percent of all corporate IS projects were abandoned before completion; A similar 1996 study by the General Accounting Office found 53 percent of all U.S. government IS projects were abandoned. Most times, problems can be traced back to the very beginning of the SDLC where too little attention was given to the identifying business value understanding the risks associated with the project.
In a new systems project, the ideal situation is for both IT people and the business people to work closely to find ways for technology to support business needs.

So, organizations can leverage the exciting technologies that are available while ensuring that projects are based upon real business objectives, such as:

- increasing sales,
- improving customer service,
- decreasing operating expenses.

---

Why Implement a new system?

- **Capability: Efficiency**
  - improve processing speed
  - Point of sale systems, Bar coding
  - ability to handle increased volume
  - PC vs. manual methods, more PC's, LAN
  - faster retrieval of information
  - Bigger, faster data storage, SQL-based DBMS Canned-software (Order entry, Manufacturing, etc.)

- **Control: Efficiency/Effectiveness**
  - Improved accuracy and consistency
  - automating the process to reduce human error
  - Computer prompting, error detection, field value checks
  - Provide better security
  - Need to know screens
  - Password protection

- **Communication: Effectiveness**
  - Enhance communication
  - Credit card systems, brokerage systems, E-Mail
  - Integration of business areas: Coordination
  - CIM, LAN communication, Manufacturing systems

- **Cost: Effectiveness**
  - Monitor Costs
  - Tracking cost through a system
  - Reducing costs
  - automatic calculation-retrieval systems
Why Implement a new system?

– Competitive Advantage: Effectiveness: a strategic weapon
  • Lock in customers
    – by offering a better price
    – by providing a unique service
    – by presenting distinctive products
  • Lock out competitors
  • Improve arrangement with suppliers
  • Form a basis for new products
  • the value of information, commercial data bases on anything, mailing lists, etc.
  • Innovation

Project

• A project is
  – a planned set of related activities with a beginning and an end.
  – meant to create a system that brings value to the business.
• Project initiation begins when someone in the organization (project sponsor) identifies some business value that can be gained from using IT.
• The proposed project is described briefly using a technique called the system request,
  – which is submitted to an approval committee for consideration.

• The approval committee reviews the system request and makes an initial determination,
  – based on the information provided, of whether to investigate the proposal or not.
• If so, the next step is the feasibility analysis.

Project initiation

• The first phase of the project management process in which activities are performed
  – to assess
    • size,
    • scope,
    • complexity
  – of the project
  – to establish procedures to support later project activities.

• Types of activities performed when initiating a project
  – Establish project initiation team
    • This activity involves organizing an initial core team to assist in accomplishing the project initiation activities
  – Establish relationship with customer
    • A thorough understanding of your customer builds stronger partnerships and higher level of trust
  – Establish project initiation plan
    • This step defines the activities required to organize the initiation team
    • while it is working to define the goals and scope of the project
**Project initiation**

- Establish management procedures
  - Successful projects require the development of effective management procedures.
- Establish project management environment and workbook
  - The focus of this activity is to collect and organize the tools that you will use while managing the project and to construct the project workbook.
  - Project workbook:
    - An online or hard-copy repository for all project correspondence, inputs, outputs, deliverables, procedures, and standards that is used for performing project audits, orienting new team members, communicating with management and customers, identifying future projects, and performing post-project reviews.

**Feasibility Analysis**

- plays an important role in deciding whether to proceed with an IS development project.
- examines the technical, economic, and organizational pros and cons of developing the system,
- gives the organization a more detailed picture of the advantages of investing in the system as well as any obstacles that could arise.
- In most cases, the project sponsor works together with an analyst (or analyst team) to develop the feasibility analysis for the approval committee.

**Approval committee**

- Once the feasibility analysis has been completed, it is submitted back to the approval committee along with a revised system request.
- The committee then decides whether
  - to approve the project,
  - to decline the project,
  - or to table it until additional information is available.
- Projects are selected by weighing risks and return, and by making trade-offs at the organizational level.

**Elements of the System Request Form**

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Sponsor</td>
<td>The person who initiates the project and who serves as the primary point of contact for the project on the business side.</td>
<td>General manager, IT Manager, etc.</td>
</tr>
<tr>
<td>Business Need</td>
<td>The business-related reason for initiating the system.</td>
<td>Increase sales, improve customer service, improve inventory management, streamline supply acquisition processes.</td>
</tr>
<tr>
<td>Business Requirements</td>
<td>The business capabilities that the system will provide.</td>
<td>Provide online access to information, improve customer service, etc.</td>
</tr>
</tbody>
</table>

**IDENTIFYING PROJECTS WITH BUSINESS VALUE**

A project is identified when someone in the organization identifies a business need to build a system.

This could occur within a business unit or IT, by a steering committee charged with identifying business opportunities, or evolve from a recommendation made by external consultants.
Examples of business needs include
  – supporting a new marketing campaign,
  – reaching out to a new type of customer,
  – improving interactions with suppliers.
Sometimes, needs arise from some kind of “pain” within the organization, such as
  – a drop in market share,
  – poor customer service levels,
  – increased competition.
Other times, new business initiatives and strategies are created, and a system is required to enable them.

Business needs also can surface when the organization identifies unique and competitive ways of using IT.
Many organizations keep an eye on emerging technology, which is technology that is still being developed and not yet viable for widespread business use.
  – Companies can develop business strategies that leverage the capabilities of these technologies and introduce them into the marketplace as a first mover.
  – Ideally, they can take advantage of this first-mover advantage by making money and continuing to innovate while competitors trail behind.

Project sponsor
someone who recognizes the strong business need for a system and has an interest in seeing the system succeed.
(S)he will work throughout the SDLC to make sure that the project is moving in the right direction from the perspective of the business.
The project sponsor serves as the primary point of contact for the system.
Usually the sponsor of the project is from a business function, such as Marketing, Accounting, or Finance;
however, members of the IT area also can sponsor or cosponsor a project.

The size or scope of the project determines the kind of sponsor that is needed.
  – A small, departmental system may only require sponsorship from a single manager;
  – however, a large, organizational initiative may need support from the entire senior management team, and even the CEO.
  – If a project is purely technical in nature, then sponsorship from IT is appropriate.
  – When projects have great importance to the business, yet are technically complex, joint sponsorship by both the business and IT may be necessary.

The project sponsor also should have an idea of the business value to be gained from the system,
  – both in tangible and intangible ways.
  – Tangible value can be quantified and measured easily – e.g., 2 percent reduction in operating costs.
  – An intangible value results from an intuitive belief that the system provides important, but hard-to-measure benefits to the organization – e.g., improved customer service, a better competitive position.

The business need drives the high-level business requirements for the system. Requirements are
  – what the information system will do,
  – what functionality it will contain.
They need to be explained at a high level so that the approval committee and, ultimately, the project team understand what the business expects from the final product.
Business requirements are what features and capabilities the information system will have to include, such as
  – the ability to collect customer orders online
  – the ability for suppliers to receive inventory information as orders are placed and sales are made.
How Do Projects Begin?

- Once the project sponsor identifies a project that meets an important business need, and (s)he can identify the system’s business requirements and value, it is time to formally initiate the project.
- In most organizations, project initiation begins with a technique called a system request.

System request

- A system request is a document
  - describing the business reasons for building a system and the value that the system is expected to provide.
- The project sponsor usually completes this form as part of a formal system project selection process within the organization.
- Most system requests include five elements:
  - project sponsor,
  - business need,
  - business requirements,
  - business value,
  - special issues or constraints

System request

- The sponsor describes the person who will serve as the primary contact for the project, and the business need presents the reasons prompting the project.
- The business requirements refer to the business capabilities that the system will need to have.
- The business value describes the benefits that the organization should expect from the system.
- Special issues are included on the document as a catchall for other information that should be considered in assessing the project.
  - For example, the project may need to be completed by a specific deadline.
  - Project teams need to be aware of any special circumstances that could affect the outcome of the system.

System request

- The completed system request is submitted to the approval committee for consideration.
  - Approval committee could be
    - a company steering committee that meets regularly to make information systems decisions,
    - a senior executive who has control of organizational resources,
    - any other decision-making body that governs the use of business investments.
- Based on the information provided, the committee reviews the system request and makes an initial determination whether to investigate the proposal or not.
- If so, the next step is to conduct a feasibility analysis.

Example

- Next couple of slides will illustrate the creation of a system request.
- We will apply the concepts to a fictitious company called CD Selections.
- CD Selections is a chain of fifty music stores located in California, with headquarters in Los Angeles.
- Annual sales last year were $50 million, and they have been growing at about 3 percent to 5 percent per year for the past few years.

Example

- Vice President of Marketing, has recently become both excited by and concerned with the rise of Internet sites selling CDs.
- The Internet has great potential, but manager of the company wants to use it in the right way.
- Rushing into e-commerce without considering things like its effect on existing brick-and-mortar stores and the implications on existing systems at CD Selections could cause more harm than good.
System Request Examples

• Project sponsor – VP of Marketing
• Business need – Reach new customers and improve service to existing customers
• Business requirements – Provide web-based shopping capability
• Business value - $750,000 in new customer sales; $1.8M in existing customer sales
• Special issues or constraints – System must be operational by holiday shopping season

System Request for CD Selections

System Request—Internet order project

Project sponsor: Internet Manager, Vice President of Marketing
Business Need: This project has been initiated to reach new internet customers and to better serve existing customers using internet sales support.
Business Requirements:
Using the web, customers should be able to search for products and identify the brick-and-mortar stores that have them in stock. They should be able to purchase on hold at a store location or place an order for items that are not carried or not in stock. The feasibility that the system should have is listed below:
• Search through the CD Selections' inventory of products
  • Identify the small stores that have the product in stock
  • Place an order on hold at a retail store and schedule a time to pick up the product
  • Place an order for products not currently in stock or not carried for CD Selections
  • Receive confirmation that an order can be placed and when it will be in stock

Your Turn

• If you were building a web-based system for course registration,
  – What is the business need?
  – What would be the business requirements?
  – What would be the business value (tangible and intangible)?
  – What special issues or constraints would you foresee?

Feasibility analysis

• guides the organization in determining whether to proceed with a project.
• identifies the important risks associated with the project that must be addressed if the project is approved.
• As with the system request, each organization has its own process and format for the feasibility analysis, but most include three techniques:
  – technical feasibility,
  – economic feasibility,
  – organizational feasibility.
Feasibility analysis

- The results of these techniques are combined into a Feasibility Study deliverable that is given to the approval committee at the end of Project Initiation.
- Although feasibility analysis will be discussed within the context of Project Initiation,
  - most project teams will revise their feasibility study throughout the SDLC and revisit its contents at various checkpoints during the project.
- If at any point the project’s risks and limitations outweigh its benefits, the project team may decide to cancel the project or make necessary improvements.

Technical feasibility: Can we build?

- The first technique in the feasibility analysis is to assess the technical feasibility of the project, the extent to which the system can be successfully designed, developed, and installed by the IT group.
- Technical feasibility analysis is in essence a technical risk analysis that strives to answer the question: “Can we build it?”
  - Organizations can also choose to buy a commercial software package and install it, in which case, the question might be: “Can we select the right package and successfully install it?”

Risks that can endanger the successful completion of the project

- Users’ and analysts’ familiarity with the business application area
- Familiarity with technology
- Project size
- Compatibility with existing systems

Users’ and analysts’ familiarity with the application

- When analysts are unfamiliar with the business application area,
  - they have a greater chance of misunderstanding the users or missing opportunities for improvement.
- The risks increase dramatically when the users themselves are less familiar with an application,
  - such as with the development of a system to support a new business
- In general, the development of new systems is riskier than extensions to an existing system
  - because existing systems tend to be better understood.

Familiarity with the technology

- When a system will use technology that has not been used before within the organization,
  - there is a greater chance that problems will occur and delays will be incurred
  - because of the need to learn how to use the technology.
- Risk increases dramatically when the technology itself is new
  - e.g., a new Java development toolkit.

Project size

- is an important consideration, whether measured as the number of people on the development team, the length of time it will take to complete the project, or the number of distinct features in the system.
- Larger projects present more risk, both because
  - they are more complicated to manage and
  - there is a greater chance that some important system requirements will be overlooked or misunderstood.
- The extent to which the project is highly integrated with other systems can cause problems
  - because complexity is increased when many systems must work together.
Compatibility with existing systems

- Project teams need to consider the compatibility of the new system with the technology that already exists in the organization.
- Systems are built in organizations that usually have numerous systems already in place.
- New technology and applications need to be able to integrate with the existing environment for many reasons.
  - They may rely on data from existing systems,
  - they may produce data that feed other applications,
  - they may have to use the company’s existing communications infrastructure.

Can we build it?

- Feasibility
  - Technical
    - Do we have the capability to develop the system?
    - Does the necessary tech exist? Can it be acquired?
    - Does the proposed equipment have the right capacity for the data?
    - Does the propose have the right response time, interface,
    - Can the system be expanded?
    - Are the accuracy, reliability, ease of use, ease of access, security ok?

Economic Feasibility: Should we build?

- Also called a cost–benefit analysis that identifies the financial risk associated with the project.
- This attempts to answer the question: “Should we build the system?”
- Determined by identifying costs and benefits associated with the system, assigning values to them, and then calculating the cash flow and return on investment for the project.
- The more expensive the project, the more rigorous and detailed the analysis.
- Following figure lists the steps to perform a cost–benefit analysis.

Steps to Conduct Economic Feasibility

1. Identify Costs and Benefits
   - List the tangible costs and benefits for the project. Include both one-time and recurring costs.
   - Work with business users and IT professionals to create numbers for each of the costs and benefits. Ensure the numbers should be valued at all possible.
   - Calculate what the value of future costs and benefits are if measured by today’s standards. You will need to select a rate of growth to apply the NPV formula.
   - Calculate how much money the organization will receive in return for the investment it will make using the IRR formula.
   - Find the first year in which the system has greatest benefit than costs. Apply the breakeven formula using figures from that year. This will help you understand how long it will take before the system create real value for the organization.
   - Plot the cost and benefits on a line graph. The point at which the lines cross is the breakeven point.

2. Identify Costs and Benefits
   - 1st task when developing an economic feasibility analysis is to identify the kinds of costs and benefits the system will have.
   - list them along the left-hand column of a spreadsheet
   - The costs and benefits can be broken down into four categories
     - development costs,
     - operational costs,
     - tangible benefits,
     - intangibles.
   - Following slide lists examples of costs and benefits that may be included.
Development costs

- Tangible expenses that are incurred during the construction of the system, such as
  - salaries for the project team,
  - hardware and software expenses,
  - consultant fees,
  - training,
  - office space and equipment.
- Development costs are usually thought of as one-time costs.

Operational costs

- Tangible costs that are required to operate the system, such as
  - salaries for operations staff,
  - software licensing fees,
  - equipment upgrades,
  - communications charges.
- Operational costs are usually thought of as ongoing costs.

Tangible benefits

- Revenues and cost savings are those
  - tangible benefits that the system enables the organization to collect or
  - tangible expenses that the system enables the organization to avoid.
- Tangible benefits may include
  - increased sales,
  - reductions in staff,
  - reductions in inventory.

Intangible benefits

- A project also can affect the organization’s bottom line by reaping intangible benefits or incurring intangible costs.
- Intangible costs and benefits are more difficult to incorporate into the economic feasibility
  - because they are based on intuition and belief rather than “hard numbers”.
- They should be listed in the spreadsheet along with the tangible items.

Example Costs and Benefits for Economic Feasibility

<table>
<thead>
<tr>
<th>Development Costs</th>
<th>Operational Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development Team Salaries</td>
<td>Software Upgrades</td>
</tr>
<tr>
<td>Consultant Fees</td>
<td>Software Licensing Fees</td>
</tr>
<tr>
<td>Development Training</td>
<td>Hardware Repairs</td>
</tr>
<tr>
<td>Hardware and Software</td>
<td>Hardware Upgrades</td>
</tr>
<tr>
<td>Vendor Installation</td>
<td>Operational Team Salaries</td>
</tr>
<tr>
<td>Office Space and Equipment</td>
<td>Communications Charges</td>
</tr>
<tr>
<td>Data Conversion Costs</td>
<td>User Training</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tangible Benefits</th>
<th>Intangible Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased Sales</td>
<td>Increased Market Share</td>
</tr>
<tr>
<td>Reductions in Staff</td>
<td>Increased Brand Recognition</td>
</tr>
<tr>
<td>Reductions in Inventory</td>
<td>Higher Quality Products</td>
</tr>
<tr>
<td>Reductions in IT Costs</td>
<td>Improved Customer Service</td>
</tr>
<tr>
<td>Better Supplier Prices</td>
<td>Better Supplier Relations</td>
</tr>
</tbody>
</table>

Assign Values to Costs and Benefits

- Once the types of costs and benefits have been identified, you will need to assign specific $/€/TL values to them.
  - Although this task is very difficult, you have to do the best you can to come up with reasonable numbers for all of the costs and benefits.
  - Only then can the approval committee make an educated decision about whether or not to move ahead with the project.
- The best strategy for estimating costs and benefits is to rely on the people who have the best understanding of them.
Assign Values to Costs and Benefits

- For example, costs and benefits that are related to the technology or the project itself can be provided by the company’s IT group or external consultants, and business users can develop the numbers associated with the business (e.g., sales projections, order levels).
- You also can consider past projects, industry reports, and vendor information, although these approaches probably will be a bit less accurate.
- Likely, all of the estimates will be revised as the project proceeds.

Assign Values to Costs and Benefits

- It is also acceptable to list intangible benefits, such as improved customer service, without assigning a value;
- It is suggested that you quantify intangible costs or benefits if at all possible.
  - If you do not, how will you know if they have been realized?
- Suppose that a system is supposed to improve customer service. This is intangible,
  - but let’s assume that the greater customer service will decrease the number of customer complaints by 10 percent each year over three years and that $200,000 is spent on phone charges and phone operators who handle complaint calls.
- Suddenly we have some very tangible numbers with which to set goals and measure the original intangible benefit.

Determine Cash Flow

- A formal cost–benefit analysis usually contains costs and benefits over a selected number of years (usually 3 to 5 years) to show cash flow over time.
- When using this cash flow method, the years are listed across the top of the spreadsheet to represent the time period for analysis, and numeric values are entered in the appropriate cells within the spreadsheet’s body.
- Sometimes fixed amounts are entered into the columns.
- Usually amounts are augmented by some rate of growth to adjust for inflation or business improvements
- Finally, totals are added to determine what the overall benefits will be, and the higher the overall total, the more feasible the solution is in terms of its economic feasibility.

Determine Net Present Value and Return on Investment

- There are several problems with the cash flow method because it does not consider the time value of money and it does not show the overall “bang for the buck” that the organization is receiving from its investment.
- Therefore, some project teams add additional calculations to the spreadsheet to provide the approval committee with a more accurate picture of the project’s worth.
- Net present value (NPV) is used to compare the present value of future cash flows with the investment outlay required to implement the project.

Consider the following table that shows the future worth of a dollar investment today, given different numbers of years and different rates of change.

<table>
<thead>
<tr>
<th>Number of years</th>
<th>6%</th>
<th>10%</th>
<th>15%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.943</td>
<td>0.909</td>
<td>0.870</td>
</tr>
<tr>
<td>2</td>
<td>0.890</td>
<td>0.826</td>
<td>0.756</td>
</tr>
<tr>
<td>3</td>
<td>0.840</td>
<td>0.751</td>
<td>0.572</td>
</tr>
<tr>
<td>4</td>
<td>0.792</td>
<td>0.683</td>
<td>0.497</td>
</tr>
</tbody>
</table>

- If you have a friend who owes you a dollar today, but instead (s)he gives you a dollar three years from now—you’ve been had! Given a 10 percent increase in value, you’ll be receiving the equivalent of 75 cents in today’s terms.
**Net Present Value**

\[ \text{NPV} = \sum \text{PV(future cash inflows)} - \sum \text{PV(future cash outflows)} \]

Cash flow amount

\[ \text{PV} = \frac{\text{Cash flow amount}}{(1 + \text{interest rate})^n} \]

where

- interest rate = required return
- n = number of years in future

**Determine NPV**

If NPV > 0, Project is OK

If NPV < 0, Project is unacceptable

**Return on investment (ROI)**

- A calculation that is listed somewhere on the spreadsheet that measures the amount of money an organization receives in return for the money it spends
- A high ROI results when benefits far outweigh costs
- ROI is determined by taking the total benefits less the costs of the system and dividing that number by the total costs of the system.
- ROI can be determined per year, or for the entire project over a period of time.
- One drawback of ROI is that it only considers the end points of the investment, not the cash flow in between, so it should not be used as the sole indicator of a project’s worth.

**Return on investment (ROI)**

\[ \text{ROI} = \frac{\text{NPV}}{\sum \text{PV(cash outflows)}} \]

**Financial Calculations Used For Cost–Benefit Analysis**

<table>
<thead>
<tr>
<th>Calculation</th>
<th>Definition</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present Value (PV)</td>
<td>The amount of an investment scaled compared to the same amount if invested in the future, taking into account inflation and time.</td>
<td>Amount ( (1 + \text{interest rate})^n )</td>
</tr>
<tr>
<td>Net Present Value (NPV)</td>
<td>The present value of benefits less the present value of costs.</td>
<td>PV Benefits – PV Costs</td>
</tr>
<tr>
<td>Return on Investment (ROI)</td>
<td>The amount of money or cost savings results from a given investment.</td>
<td>Total benefits – Total costs</td>
</tr>
<tr>
<td>Break-Even Point</td>
<td>The point in time at which the costs of the project equal the value in has declined.</td>
<td>Break-even NPV = \text{Cumulative NPV}</td>
</tr>
</tbody>
</table>

*Use the Yearly NPV amount from the first year in which the project has a positive cash flow.

Add the above amount to the year in which the project has a positive cash flow.

**Determine Break-Even Point**

- If the project team needs to perform a rigorous cost–benefit analysis, they may need to include information about the length of time before the project will break-even.
- When the returns will match the amount invested in the project.
- The break-even point is determined by looking at the cash flow over time and identifying the year in which the benefits are larger than the costs.
- The greater the time it takes to break-even, the riskier the project.
- Then, the yearly and cumulative NPV for that year are divided by the yearly NPV to determine how far into the year the break-even will occur.
The break-even point also can be depicted graphically. The cumulative present value of the costs and benefits for each year are plotted on a line graph, and the point at which the lines cross is the break-even point.

One of the major problems of using traditional cost–benefit analysis to determine the economic feasibility of an IT investment is that traditional cost–benefit analysis is based on the assumption that the investor must either invest now or not invest at all. However, in most IT investment decisions, the decision to invest is not a now-or-never decision.

There have been different proposals made to overcome some of the weaknesses in traditional cost-benefit analysis. Option pricing models (OPMs) have been proposed for object-oriented systems (OOS):

- OPMs have had limited use in economic feasibility analysis for IT investment decisions in industry.
- In fact, there is some controversy as to whether an instrument created for a traded asset (stock) can be used in evaluating IT investment opportunities.
- However, the preliminary research results demonstrate that their use in IT investment evaluations may be warranted.

With OOSs, where classes are designed not only for the current application, but also for use in future development efforts, an investment in developing a class or a set of classes may pay "dividends" well beyond the original system development effort.

Furthermore, with the iterative and incremental development emphasis in the OOSs development approaches, an OO project can be viewed as a sequence of smaller projects.

Treat an IT investment as a call option allows management, at a relevant point in the future, to determine whether additional investment into the evolving system is reasonable.

This gives management the flexibility to determine the economic feasibility of a project to decide whether:
- to continue with the development as planned,
- to abandon the project,
- to expand the scope of the project,
- to defer future development,
- to shrink the current development effort.

In many ways, treating IT investments as call options simply allows management to delay investment decisions until more information is available.

Once the decision is made to invest (i.e., the call option is exercised) the decision is considered irreversible.

- The idea of irreversible decisions is one of the fundamental assumptions on which OPMs are based.
- This assumption fits quite well with modern OOS development approaches, in which:
  - once an iteration has begun, an increment is completed before another investment decision is made.
- Researchers have studied many different OPMs in terms of their applicability to IT investment.
  - However, all OPMs share a common thread: both the direct benefit of the proposed project and the indirect value (option value) must be computed to determine economic feasibility of an IT investment using an OPM.
Option pricing models (OPMs)

- The direct benefit can be computed using the traditional NPV while the value of the option can be computed using one of the OPMs in the literature.
- Given that the minimum expected value of an option is always zero, the minimum estimated value for investing using an OPM will be the same as the value given by the traditional approach.
  - However, when the expected value of the option (e.g., future iterations or projects) exceeds zero, an OPM will give an estimated value greater than the traditional approach.
- Although the actual calculation of the value of an option is quite complex, given how well the OPMs fit the OOS development approaches, it seems reasonable that OPMs should be considered as alternatives to evaluating IT investments in OOS.

Economic Feasibility: Should We Build It?

- Identify costs and benefits
- Assign values to costs and benefits
- Determine cash flow
- Assess financial viability
  - Net present value
  - Return on investment
  - Break even point

Organizational Feasibility - If we build it, will they come?

- This technique tries to address how well the system ultimately will be accepted by its users and incorporated into the ongoing operations of the organization.
- There are many organizational factors that can have an impact on the project, and seasoned developers know that organizational feasibility can be the most difficult feasibility dimension to assess.
- In essence, an organizational feasibility analysis attempts to answer the question: “If we build it, will they come?”
- One way to assess the organizational feasibility of the project is to understand how well the goals of the project align with business objectives.

Organizational Feasibility - If we build it, will they come?

- Strategic alignment is the fit between the project and business strategy
  - the greater the alignment, the less risky the project will be from an organizational feasibility perspective.
    - For example, if the Marketing Department has decided to become more customer focused, then a CRM project that produces integrated customer information would have strong strategic alignment with Marketing’s goal.
- Many IT projects fail when the IT department initiates them
  - because there is little or no alignment with business unit or organizational strategies.

Organizational Feasibility - If we build it, will they come?

- A second way to assess organizational feasibility is to conduct a stakeholder analysis.
- A stakeholder is
  - a person,
  - group,
  - organization
  that can affect (or will be affected by) a new system.

Organizational Feasibility - If we build it, will they come?

- In general, the most important stakeholders in the introduction of a new system are
  - project champion,
  - system users,
  - organizational management,
- but systems sometimes affect other stakeholders as well.
**Organizational Feasibility - If we build it, will they come?**

- For example,
  - the IS department can be a stakeholder of a system
    - because IS jobs or roles may be changed significantly after its implementation.
  - One key stakeholder outside of the champion, users, and management in Microsoft’s project that embedded Internet Explorer as a standard part of Windows was
    - the U.S. Department of Justice.

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**Why a new system?**

- **Organizational**
  - Is there support/resistance; from or by who
  - Are current business methods acceptable?
  - If not a change may be welcomed
  - Have the user's been involved? If not get them involved
  - Will the system cause harm?

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**What is Expected?**

- The EXPECTED RESULTS
  - SATISFIES the organizations requirements
  - operates RELIABLY
  - creates an “appropriate” working environment
  - is MAINTAINABLE
  - is MODIFIABLE
  - is ADAPTABLE to a changing environment
  - has controls to ensure:
    - security
    - privacy
    - audibility -

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**What is expected**

- Objectives of System Analysis
  - To establish in detail what the systems is to do
    - objectives
    - costs
    - benefits
    - implementation process
    - organizational changes required
    - INNOVATION
    - defines who the USERS are
    - Their input and output
    - THE SYSTEM FLOW

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**Why a new system?**

- **Alternative Specification**
  - Propose options
  - Make versus buy decisions
  - Cost-Benefit analysis
  - Assess project risk
  - Recommend
  - Unwritten- find allies

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**PROJECT SELECTION**

Once the feasibility analysis has been completed, it is submitted back to the approval committee along with a revised system request. The committee then decides whether to approve the project, decline the project, or table it until additional information is available.

At the project level, the committee considers the value of the project by examining the business need and the risks of building the system.
• Before approving the project, the committee also considers the project from an organizational perspective;
  – it has to keep in mind the company’s entire portfolio of projects.
• This way of managing projects is called portfolio management.
• Portfolio management takes into consideration the different kinds of projects that exist in an organization
  – large and small, high risk and low risk, strategic and tactical.

• A good project portfolio will have the most appropriate mix of projects for the organization’s needs.
• The committee acts as portfolio manager
  – with the goal of maximizing the cost/benefit performance and other important factors of the projects
    in their portfolio.
• For example,
  – an organization may want to keep high-risk projects to less than 20 percent of its total project portfolio.

• Approval committee must be selective about where to allocate resources
  – because the organization has limited funds.
• This involves trade-offs
  – in which the organization must give up something in return for something else to keep its portfolio well balanced.
• If there are three potentially high-payoff projects, yet all have very high risk, then maybe only one of the projects will be selected.

• Also, there are times when a system at the project level makes good business sense,
  – but it does not at the organization level.
• Thus, a project may show a very strong ROI and support important business needs for a part of the company,
  – however, it is not selected.
• This could happen for many reasons
  – because there is no money in the budget for another system,
  – the organization is about to go through some kind of change
  – projects that meet the same business requirements already are underway, or
  – the system does not align well with current or future corporate strategy.

**Project Selection Issues**

• Approval committee works from the system request and the feasibility study
  – Project portfolio – how does the project fit within the entire portfolio of projects?
  – Trade-offs must be made to select projects that will form a balanced project portfolio
  – Viable projects may be rejected or deferred because of project portfolio issues.

**Summary**

• **Project initiation** involves creating and assessing goals and expectations for a new system
• **Identifying the business value** of the new project is a key to success
• **Feasibility study** is concerned with insuring that technical, economic, and organizational benefits outweigh costs and risks
• **Project selection** involves viewing the project within the context of the entire project portfolio, and selecting those projects that contribute to balance in the portfolio