

MANAGEMENT INFORMATION SYSTEMS

Chapter Five: Information Technology Economic Benefits

Business Value of Systems and Managing Change

Learning Objectives

By the end of this chapter the learner shall be able to;

- i. Evaluate models for understanding the business value of information systems.
- ii. Analyze the principal causes of information system failure.
- iii. Assess the change management requirements for building successful systems.
- iv. Select appropriate strategies to manage the system implementation process.
- v. Identify the challenges posed by implementing new systems and management solutions.

5.1 Understanding the Business Value of Information Systems

Just as you can analyze the benefit of purchasing a new piece of equipment for your business, you can analyze the impact of an information system. Think about it: you tell the boss you need a new storage system for all the widgets you are producing. The boss will ask you to complete some type of analysis to see how the bottom line will be affected. The same is true for a new information system. Just how will it benefit the business overall? What benefits will your customers gain from the new system?

However, you can't reduce everything to dollars and cents. Sometimes the benefits of the new system will be measured in other ways, but you can employ several different methods to evaluate a new information system, just as you would a new storage system.

5.2 Traditional Capital Budgeting Models

Capital budgeting models are one of several techniques used to measure the value of investing in long term capital investment projects. The process of analyzing and selecting various proposals for capital expenditures is called capital budgeting. Firms invest in capital projects to expand production to meet anticipated demand or to modernize production equipment to reduce costs.

Firms also invest in capital projects for many noneconomic reasons, such as installing pollution control equipment, converting to a human resources database to meet some government regulations, or satisfying nonmarket public demands. Information systems are considered long-term capital investment projects.

Six capital budgeting models are used to evaluate capital projects:

- The payback method
- The accounting rate of return on investment (ROI)
- The net present value
- The cost-benefit ratio
- The profitability index
- The internal rate of return (IRR)

Capital budgeting methods rely on measures of cash flows into and out of the firm.

Capital projects generate cash flows into and out of the firm. The investment cost is an immediate cash outflow caused by the purchase of the capital equipment. In subsequent years, the investment may cause additional cash outflows that will be balanced by cash inflows resulting from the investment. Cash inflows take the form of increased sales of more products (for reasons such as new products, higher quality, or increasing market share) or reduced costs in production and operations. The difference between cash outflows and cash inflows is used for calculating the financial worth of an investment. Once the cash flows have been established, several alternative methods are available for comparing different projects and deciding about the investment.

Financial models assume that all relevant alternatives have been examined, that all costs and benefits are known, and that these costs and benefits can be expressed in a common metric, specifically, money. Tangible benefits can be quantified and assigned a monetary value.

Intangible benefits, such as more efficient customer service or enhanced employee goodwill, cannot be immediately quantified but may lead to quantifiable gains in the long run.

TABLE 15-1 Costs and Benefits of Information Systems

COSTS

- Hardware
- Telecommunications
- Software
- Services
- Personnel

TANGIBLE BENEFITS (COST SAVINGS)

- Increased productivity
- Lower operational costs
- Reduced workforce
- Lower computer expenses
- Lower outside vendor costs
- Lower clerical and professional costs
- Reduced rate of growth in expenses
- Reduced facility costs

INTANGIBLE BENEFITS

- Improved asset utilization
- Improved resource control
- Improved organizational planning
- Increased organizational flexibility
- More timely information
- More information
- Increased organizational learning
- Legal requirements attained
- Enhanced employee goodwill
- Increased job satisfaction
- Improved decision making
- Improved operations
- Higher client satisfaction
- Better corporate image

5.3 Financial Models

The payback method

This method is quite simple. It is a measure of time required to payback the initial investment of a project. The payback period is computed as follows;

$$\frac{\text{Original investment}}{\text{Annual Net cash inflow}} = \text{Number of years to pay}$$

The accounting Rate of return on investment (ROI)

Organisations make capital investments to earn a satisfactory rate of return. The ROI calculates the rate of return from investment by adjusting the cash inflows produced by the investment for depreciation. It gives an approximation of the accounting income earned by the project. To find the ROI, first calculate the average net benefit as follows

This net benefit is divided by the total initial investment to arrive at ROI as follows

$$\frac{(\text{Total benefits} - \text{Total cost} - \text{Depreciation})}{\text{Useful life}} = \text{Net Benefit}$$

This net benefit is divided by the total initial investment to arrive at ROI as follows

$$\frac{\text{Net Benefit}}{\text{Total initial investment}} = \text{ROI}$$

Net Present Value

Evaluating a capital project requires that the cost of an investment (a cash outflow usually in year 0) be compared with the net cash inflows that occur many years later. But these two kinds of cash flows are not directly comparable because of the time value of money. Money you have been promised to receive three, four, and five years from now is not worth as much as money received today. Money received in the future has to be discounted by some appropriate percentage rate usually the prevailing interest rate, or sometimes the cost of capital. Present value is the value in current dollars of a payment or streams of payments to be received in the future. It can be calculated by using the following formula:

$$\text{Payment} \times \frac{1 - (1 + \text{interest})^{-n}}{\text{Interest}} = \text{Present Value}$$

The net present value is the amount of money an investment is worth, taking into account its cost, earnings, and the time value of money. The formula for net present value is this:

$$\text{Present value of expected cash flows} - \text{Initial investment cost} = \text{Net present value}$$

Cost benefit Ratio

The cost benefit ratio is the ratio of benefits to costs. It is calculated as follows;

$$\frac{\text{Total benefits}}{\text{Total Costs}} = \text{Cost - Benefit Ratio}$$

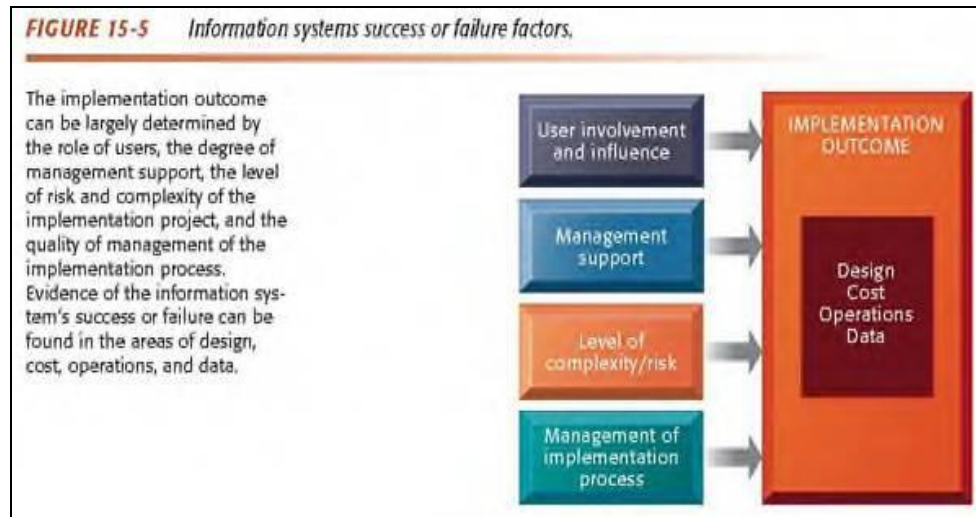
Profitability Index

One limitation of net present value is that it provides no measure of profitability. Neither does it provide a way to rank order different possible investments. One simple solution is provided by the profitability index. The profitability index is calculated by dividing the present value of the total cash inflow from an investment by the initial cost of the investment. The result can be used to compare the profitability of alternative investments.

$$\frac{\text{Present Value of Inflows}}{\text{Investment}} = \text{Profitability index}$$

5.4 Causes of Implementation Success and Failure

Understanding the causes of failure can help prevent some projects from being doomed from the start. Understanding that success is sometimes more a function of luck than skill can also help you.



User Involvement and Influence

Make users feel they own the new system instead of it being an enemy or something they should fear. That's why we stress user involvement through the entire development process. The new system shouldn't be a surprise on Monday morning! Familiarity doesn't always breed contempt; it should breed acceptance when it comes to new information systems.

Management Support and Commitment

If managers don't like the new system or fear it, then how in the world can you expect the workers to accept it? The best way to get managers to like, support, and fund the new system is to communicate with them every step of the way. Make sure they know what's going on. After all, managers are people too, and they have the same fears as anyone else.

Level of Complexity and Risk

The more complex, the more risk. That's pretty easy to understand, but harder to manage. Risks associated with the project should be clearly outlined and discussed. The three major risks are project size, project structure, and experience with technology.

Management of the Implementation Process

The development of a new system must be carefully managed and orchestrated, and the way a project is orchestrated is likely to be the most important factor affecting its outcome. Things to be managed are; user training, budget, funds etc.

5.5 Change Management Challenges

The text gives the startling fact that 70 percent of all business process reengineering projects fail to deliver promised benefits. It doesn't have to be that way. One abiding theme in most of the failures and successes is people. If the changes required by and in people were managed properly, then the success rate increases. Conversely, if the people were poorly managed or, just as likely not managed at all, then the project was a failure. The leading threats of BPR projects are:

- dealing with fear and anxiety throughout the organization
- overcoming resistance by key managers
- changing job functions, career paths, and recruitment practices
- training

Controlling Risk Factors

There is risk in everything you do. The smallest project has risk. Understanding and managing risk, especially when it comes to people, will help you succeed.

1. **Managing Technical Complexity:** You can use special tools to help you manage the implementation of a new information system (internal integration tools). If nothing else, these special tools will help you communicate with everyone on the implementation team and in the organization as a whole. Use your organization's intranet as much as possible to communicate and inform.
2. **Formal Planning and Control Tools:** Automated management tools such as PERT or Gantt charts (formal planning and control tools) can also help you manage a complex project. They are extremely beneficial for scheduling events and tracking the hundreds of details involved.
3. **Increasing User Involvement and Overcoming User Resistance:** We simply can't say it enough! Get them involved and keep them involved. Use the external integration tools to keep people involved and informed. Guard against destructive, although innocent, sabotage of the system (counter implementation). Remember, people will weigh their own needs against those of the organization. You have to make sure the two agree as much as possible.

5.6 Management Opportunities, Challenges, and Solutions

It pays to do your homework upfront when developing new systems for the digital firm. The entire organization will live or die for years to come based on the decisions made early on.

Opportunities

All is not doom-and-gloom when you build a new system. New systems can in fact create new opportunities previously not available. System builders, managers, and employees must understand all the pitfalls, plan accordingly, and try to prevent the same problems others have faced before them.

Management Challenges

The challenges presented by new systems and the changes they bring are:

- Determining system benefits and costs: using the capital budgeting models presented in this chapter can help managers determine the quantifiable costs of new systems.
- Managers must understand however, that these models are not absolute and the intangible factors of new systems must be considered.
- Dealing with the complexity of large-scale systems projects: the bigger the project, the more change it brings to the organization. That sounds simple enough but many companies overlook just how difficult it is to implement large-scale information systems.

Solution Guidelines

In addition to the models presented in this chapter, here are a few more suggestions for managing the implementation of information systems:

- Fully document the firm's applications and IT infrastructure and conduct periodic reviews of the firm's IT portfolio
- Ensure that information systems investments are closely aligned with the firm's business objectives.
- Project risks and returns should be clearly identified
- Continually measure the business value of new systems and weed out underperforming projects
- For large-scale projects, managers should assume an enterprise-wide focus, solve problems and meet challenges as they arise rather than simple meeting formal project milestones
- Emphasize learning as well as planning and adapt to unforeseen uncertainties and chaos
- Establish a separate office to manage subprojects and coordinate the entire project effort with other ongoing projects
- Coordinate the project with ongoing changes in the firm's business strategy, information technology infrastructure, and business processes

Chapter Review Questions ?

1. Why should you consider the intangible benefits of a new system when they are difficult to factor into a capital budgeting model?
2. What are some of the causes of implementation success and failure? Which one(s) do you think are the most important?
3. What kinds of problems provide evidence of information systems failure?
4. Why do builders of new I.S. need to address change management?

Laudon K, Laudon J, Management Information Systems, Managing the digital firm (Eleventh Edition)