Chapter 13

Understanding the Business Value of Systems and Managing Change

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OBJECTIVES

Evaluate models for understanding the business value of information systems

Analyze the principal causes of information system failure

Assess the change management requirements for building successful systems

OBJECTIVES (Continued)

Select appropriate strategies to manage the system implementation process

Identify the challenges posed by implementing new systems and management solutions

HSBC Malaysia Case

- Challenge: Change the organization and business processes at one of the world's largest retail banking firms in order to support V-Banking systems
- Solutions: develop new business processes, retrain workforce, develop a customer-centric culture
- Train customers in the use of new digital banking services
- Illustrates the importance of changing the organization and culture in a business to support technology change

UNDERSTANDING THE BUSINESS VALUE OF INFORMATION SYSTEMS

Two kinds of IS investments:

Projects with 12-24 month objectives

Longer periods infrastructure investments

Two ways for producing value:

Improvement in business processes to increase firm efficiency

Improvements in management decision making

UNDERSTANDING THE BUSINESS VALUE OF INFORMATION SYSTEMS

Additional IS value from:

Strengthening firm strategically (ties to partners, customers, increasing flexibility, etc.)

Enabling future implementation of new technologies

Traditional Capital Budgeting Models

Capital Budgeting: Process of analyzing and selecting various proposals for capital expenditures

Capital expenditures:

Expand production to meet anticipated demand

Modernize production equipment to reduce costs

Can be noneconomic, e.g. installing pollution control equipment

COST and BENEFIT Information System

Cost

Hardware
Telecommunication
Software
Service
Personnel

COST and BENEFIT Information System

Tangible Benefit

Increased Productivity
Lower Operational Cost
Reduced workspace
Lower Computer Expenses
Lower outside vendor costs
Lower clerical and professional costs
Reduced rate of growth in expenses
Reduced facility costs

COST and BENEFIT Information System

Intangible Benefit

Improved Asset Utilization
Improved resource control
Improved organizational planning
Improved organizational flexibility
More timely information
More Information
Increased organization learning

Intangible Benefit (2)

Legal requirement attained
Enhanced employee goodwill
Increase Job satisfation
Improved Decision Making
Improved Operation
Higher Client Satisfaction
Better Corporate Image

UNDERSTANDING THE BUSINESS VALUE OF INFORMATION SYSTEMS

Six capital budgeting models for evaluating 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)

Limitations of Financial Models

Do not express the risks and uncertainty of their own costs and benefits estimates

Costs and benefits do not occur in the same time frame.

Inflation may affect costs and benefits differently.

Intangible benefits are difficult to quantify.

Case Example: Capital Budgeting for a New Supply Chain Management System

Heartland Stores:

General merchandise retail chain in eight Midwestern states

Five regional distribution centers, 377 stores, and about 14,000 different products in each store

Investment strategy and goals:

New software and hardware to upgrade its supply chain management system

Reduce inventory and inventory costs

Reduce labor costs

Reduce telecommunications costs

Reduce transportation costs

UNDERSTANDING THE BUSINESS VALUE OF INFORMATION SYSTEMS

Costs and Benefits of the New SCM System

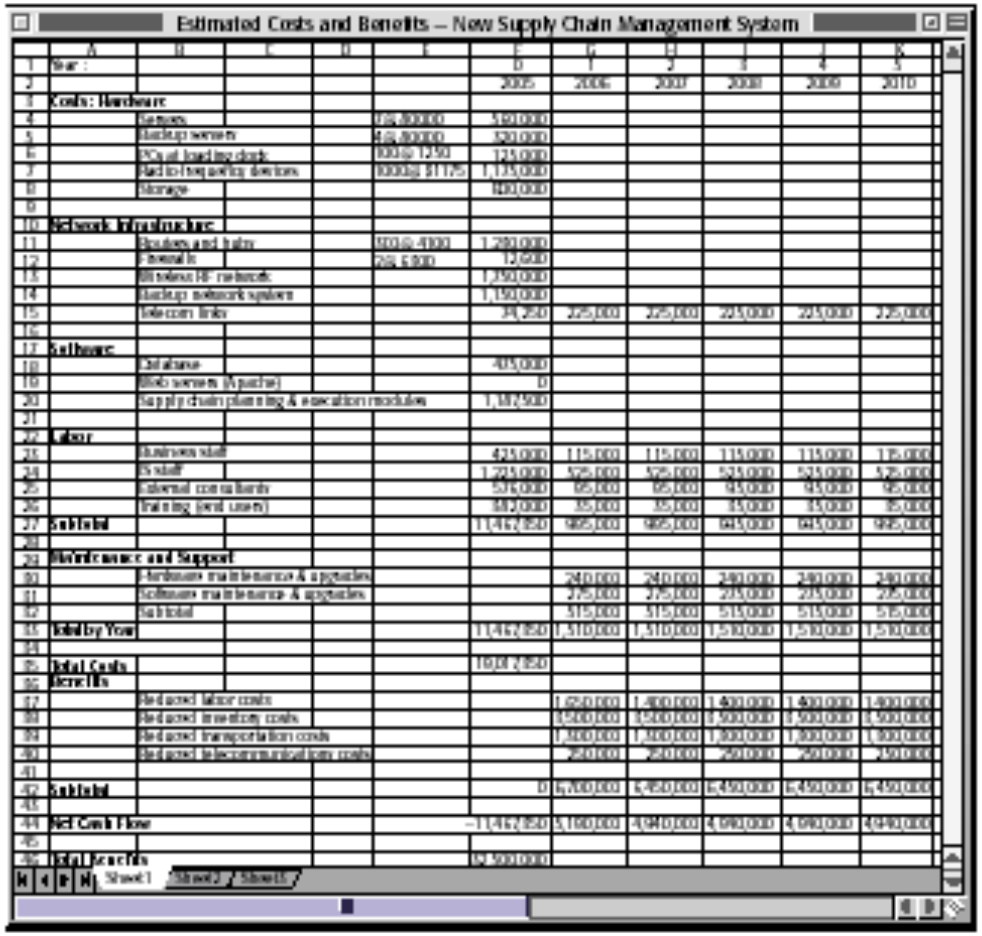

Figure 13-1

UNDERSTANDING THE BUSINESS VALUE OF INFORMATION SYSTEMS

Financial Models

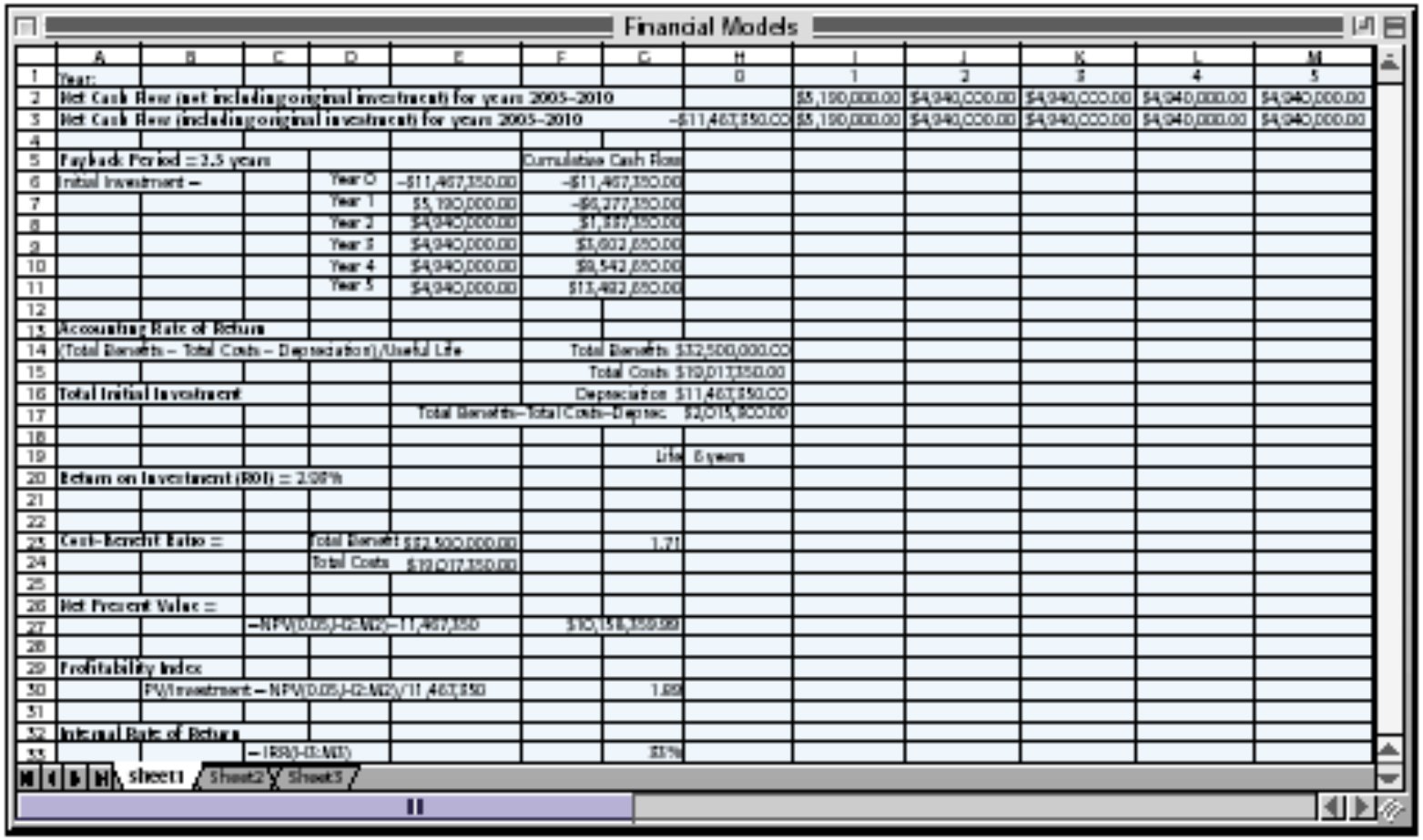

Figure 13-2

The Payback Method

Payback method: Measures the time required to pay back the initial investment of a project

$$\frac{\text{Original Investment}}{\text{Annual net cash inflow}} = \text{Number of years to pay back}$$

Heartland Stores: More than 2 years to pay back initial investment

Accounting Rate of Return on Investment (ROI):

Calculates rate of return by adjusting the cash inflows produced by the investment for depreciation

Calculate net benefit

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

2. Calculate ROI by dividing net benefit by the total initial investment

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

Heartland Stores ROI: 2.93 %

Net Present Value

Present value: The value in current dollars of a payment or stream of payments to be received in the future

It can be calculated by using the following formula:

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

UNDERSTANDING THE BUSINESS VALUE OF INFORMATION SYSTEMS

Net present value: Amount of money an investment is worth, taking into account its cost, earnings, and the time value of money

Calculate present value of stream of benefits:

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

2. Calculate net present value:

Present value of expected cash flows - Initial investment cost = Net present value

UNDERSTANDING THE BUSINESS VALUE OF INFORMATION SYSTEMS

Heartland Stores present value = $21,625,709

Investment cost = $11,467,350

Net Present value = $10,158,359

Cost-Benefit Ratio:

$$\frac{\text{Total benefits}}{\text{Total costs}} = \text{Cost-benefit ratio}$$

Heartland Stores Cost-Benefit Ratio: 1.71

Profitability Index: Can be used to compare the profitability of alternative investments

$$\frac{\text{Present value of cash inflows}}{\text{Investment}} = \text{Profitability index}$$

Heartland Stores Profitability Index: 1.89

Internal Rate of Return (IRR):

Rate of return or profit that an investment is expected to earn, taking into account the time value of money

The discount (interest) rate that will equate the present value of the project's future cash flows to the initial cost of the project

Value of *R* (discount rate) is such that Present value – Initial cost = 0

Heartland Stores IRR: 33%

Strategic Considerations

Portfolio Analysis:

Seeks to develop

An overall understanding of where the firm is making information technology investments

Based on inventory of all information systems projects and assets, including infrastructure, outsourcing contracts, and licenses

Assigns risk and benefit profiles to IS investments

A System Portfolio

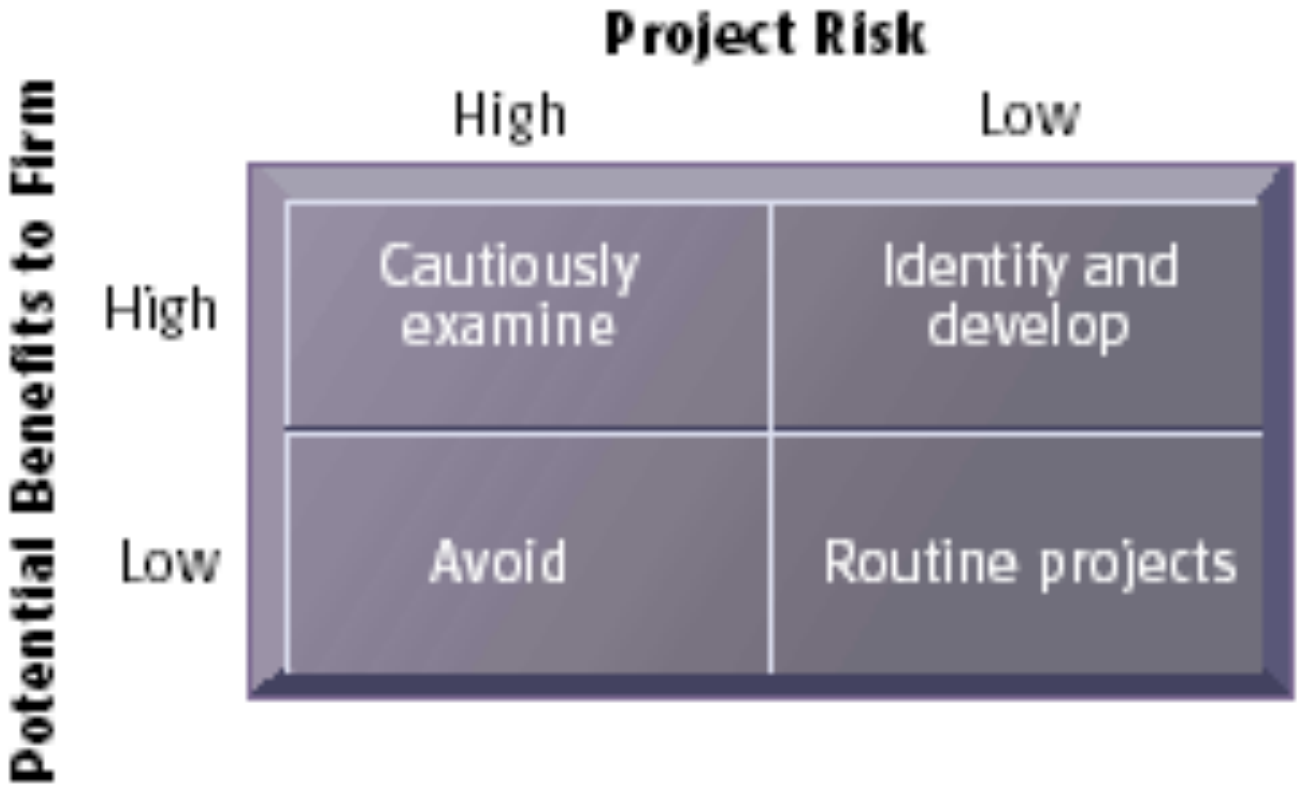

Figure 13-3

Scoring Models:

A quick and sometimes compelling method for arriving at a decision on alternative systems

The most important outcome of a scoring model is not the score but agreement on the criteria used to judge a system.

Best practice is to cycle through the scoring model several times, changing the criteria and weights, to see how sensitive the outcome is to reasonable changes in criteria.

Real Options Pricing Models (ROPM):

Uses the financial industry concept of options valuation

An option is the right, but not obligation, to act at a future date.

An initial expenditure on IS technology creates the right, but not the obligation, to obtain the benefits associated with further development and deployment of the technology.

Real Options Pricing Models (ROPM): (Continued)

Capital investments cannot be traded on a market and differ in value based on the firm.

Factors, such as prior expertise, skilled labor force, market conditions, and other factors

UNDERSTANDING THE BUSINESS VALUE OF INFORMATION SYSTEMS

Value of IT project (real option) is a function of the following:

Value of underlying IT asset (present value of expected revenues)

Volatility of value of asset (exercise price)

Risk-free interest rate

Option time to maturity (length of project deferment)

Knowledge Value-Added Approach:

Any program that uses information technology to change business processes requires knowledge input

The value of the knowledge used to produce improved outputs of the new process can be used as a measure of the value added

Knowledge inputs can be measured in terms of learning time to master a new process, and a return on knowledge can be estimated

Information Technology Investments and Productivity

Productivity is a measure of the firm's efficiency in converting inputs to outputs.

It refers to the amount of capital and labor required to produce a unit of output.

Information technology has increased productivity in manufacturing, but productivity gains in service sector are unclear.

Information Technology Investments and Productivity (Continued)

Contribution of IT to productivity in information and knowledge industries is difficult to quantify.

Information technology investments are more likely to improve firm performance if accompanied by complementary investments in new business processes, organizational structures, and organizational learning.

THE IMPORTANCE OF CHANGE MANAGEMENT IN INFORMATION SYSTEMS SUCCESS AND FAILURE

Information Systems Problem Areas

Figure 15-4

THE IMPORTANCE OF CHANGE MANAGEMENT IN INFORMATION SYSTEMS SUCCESS AND FAILURE

Design:

System design may fail to capture essential business requirements or improve organizational performance.

Information may not be timely: Information may be in a format that is difficult to understand or have a poor user interface.

THE IMPORTANCE OF CHANGE MANAGEMENT IN INFORMATION SYSTEMS SUCCESS AND FAILURE

Data:

The data in the system may have a high level of inaccuracy or inconsistency, may be inaccessible or incomplete.

Cost:

Some systems operate quite smoothly, but their costs to implement and run on a production basis may be way over budget.

THE IMPORTANCE OF CHANGE MANAGEMENT IN INFORMATION SYSTEMS SUCCESS AND FAILURE

Operations:

The system does not run well or breaks down and information is not provided in a timely and efficient manner.

System response time is too long.

Operations problems can be attributed to technical features, but most stem from organizational factors.

THE IMPORTANCE OF CHANGE MANAGEMENT IN INFORMATION SYSTEMS SUCCESS AND FAILURE

Change Management and the Concept of Implementation

Implementation: All organizational activities working toward the adoption, management, and routinization of a new system change agent

Change Management and the Concept of Implementation (Continued)

The systems analyst who develops technical solutions and redefines the configurations, interactions, job activities, and power relationships of various organizational groups

Acts as catalyst for the entire change process and is responsible for ensuring that all parties involved accept the changes created by a new system

THE IMPORTANCE OF CHANGE MANAGEMENT IN INFORMATION SYSTEMS SUCCESS AND FAILURE

Causes of Implementation Success and Failure

Information Systems Success or Failure Factors

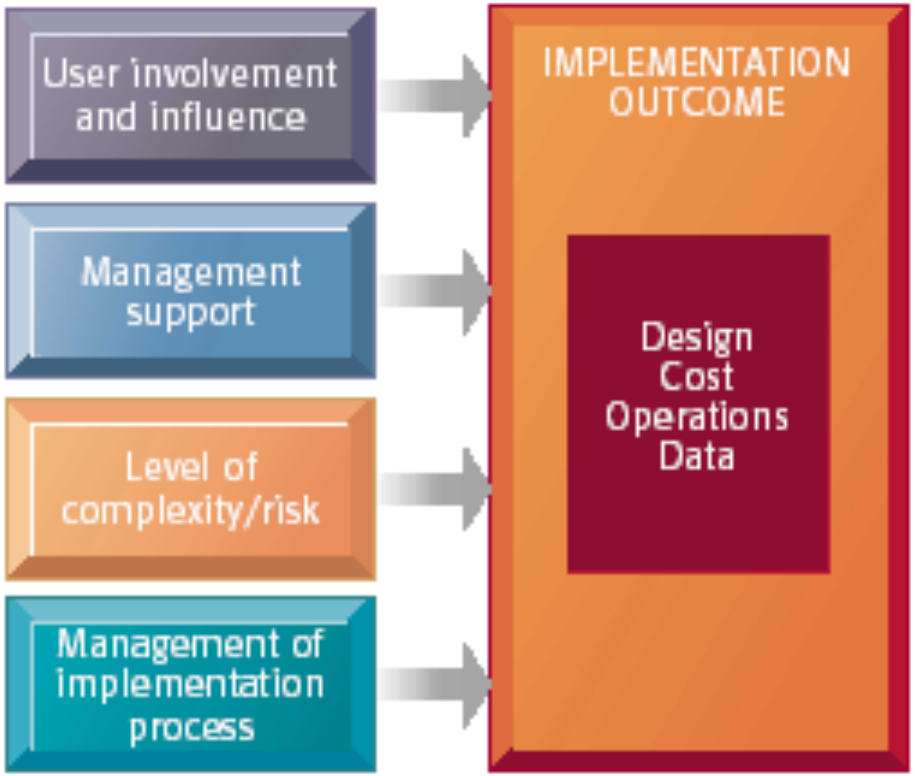

Figure 13-5

THE IMPORTANCE OF CHANGE MANAGEMENT IN INFORMATION SYSTEMS SUCCESS AND FAILURE

User Involvement and Influence:

If users are heavily involved in systems design, they have more opportunities to mold the system according to their priorities and business requirements and control the outcome.

Involved users are more likely to react positively to the completed system.

THE IMPORTANCE OF CHANGE MANAGEMENT IN INFORMATION SYSTEMS SUCCESS AND FAILURE

User-Designer Communications Gap:

Users can have limited understanding of other issues and solutions.

Management Support and Commitment:

Commitment of management to

An information systems project usually results in a more positive perception and acceptance by users and the technical services staff.

Management Support and Commitment: (Continued)

Management backing also ensures that a systems project receives sufficient funding and resources to be successful

All the changes in work habits and procedures and any organizational realignment associated with a new system depend on management backing

Level of Complexity and Risk:

The level of project risk is influenced by:

- Project size
- Project structure
- Level of technical expertise of the information systems team

THE IMPORTANCE OF CHANGE MANAGEMENT IN INFORMATION SYSTEMS SUCCESS AND FAILURE

Management of the Implementation Process

Consequences of Poor Project Management

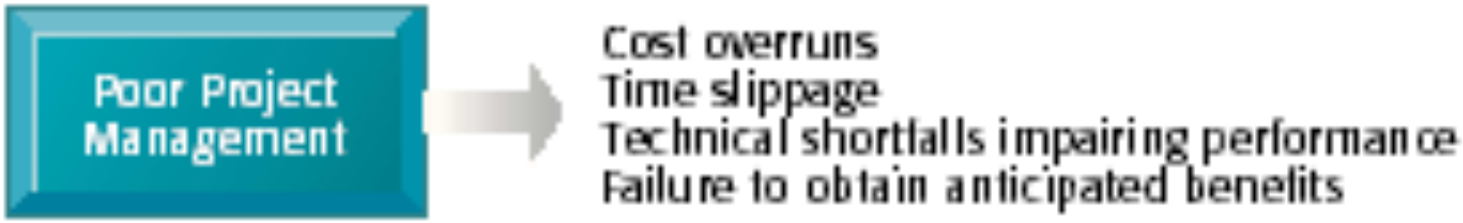

Figure 13-6

THE IMPORTANCE OF CHANGE MANAGEMENT IN INFORMATION SYSTEMS SUCCESS AND FAILURE

Likely Consequences of Poor Project Management:

Costs that vastly exceed budgets

Unexpected time slippage

Technical shortfalls resulting in performance that is significantly below the estimated level

THE IMPORTANCE OF CHANGE MANAGEMENT IN INFORMATION SYSTEMS SUCCESS AND FAILURE

Likely Consequences of Poor Project Management:

Failure to obtain anticipated benefits

Possible reasons for poor management:

- Ignorance and optimism
- Mythical man-month
- Falling behind: Bad news travels slowly upward

THE IMPORTANCE OF CHANGE MANAGEMENT IN INFORMATION SYSTEMS SUCCESS AND FAILURE

Change Management Challenges for Business Process Reengineering, Enterprise Applications, and Mergers and Acquisitions

Successful implementation includes addressing employees' concerns about change

- Resistance by key managers
- Changing job functions, career paths, recruitment practices
- Managing training

THE IMPORTANCE OF CHANGE MANAGEMENT IN INFORMATION SYSTEMS SUCCESS AND FAILURE

System Implications of Mergers and Acquisitions (M&As):

As are major growth engines for businesses, enabling firms to

Gain market share and expertise very quickly

Critical issues include the organizational characteristics of the merging companies and IT infrastructures

System Implementation of Mergers and Acquisitions (M&As): (Continued)

Realistic costs of integration

Estimated benefits of economies in operation, scope, knowledge, and time

Problematic systems that require major investments to integrate

More than 70 percent of all M&As result in a decline in shareholder value

MANAGING IMPLEMENTATION

Controlling Risk Factors

Managing technical complexity:

Formal planning and control tools

Increasing user involvement and overcoming user resistance

MANAGING IMPLEMENTATION

Managing technical complexity: (Continued)

External integration tools: Ways to link the work of the implementation team to users at all organizational levels

Counter implementation: Deliberate strategy to thwart the implementation of an information system or an innovation in an organization

MANAGING IMPLEMENTATION

Formal Planning and Control Tools Help to Manage Information Systems Projects Successfully

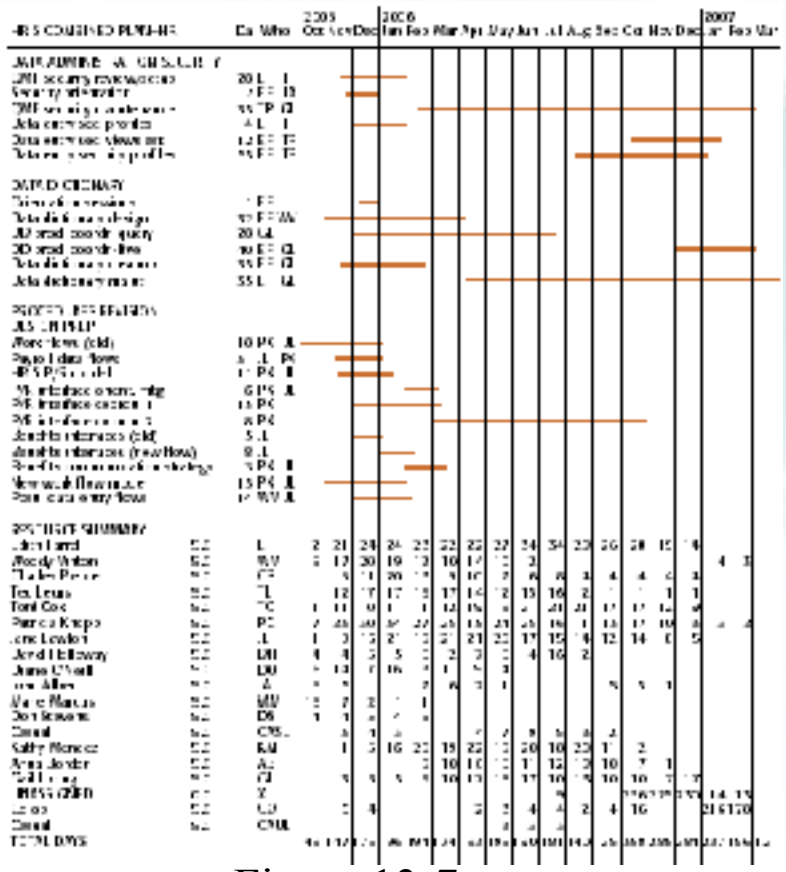

Figure 13-7

MANAGING IMPLEMENTATION

Designing for the Organization

Systems development must address how the organization will change when the new system is installed, including installation of intranets, extranets, and Web applications

Organizational impact analysis

Designing for the Organization: (Continued)

Allowing for the human factor

User performance standards

Ergonomics

MANAGING IMPLEMENTATION

Sociotechnical Design:

Explores workgroup organization and impacts from technical solutions

Blends technical efficiency with sensitivity to human and organizational needs

Raises productivity without sacrificing human and social goals

MANAGEMENT OPPORTUNITIES, CHALLENGES, AND SOLUTIONS

Management Opportunities:

New information systems can produce extraordinarily high returns if system builders can

Manage the change process and

Accurately calculate the costs and benefits of the investments

Management Challenges:

Determining system benefits and costs when they are difficult to quantify

Dealing with the complexity of large-scale systems projects

Solution Guidelines:

Obtaining more value from information technology investments:

Full documentation of the firm's applications and IT infrastructure and periodic reviews of the firm's IT portfolio

Use of appropriate metrics for monitoring project outcomes

Solution Guidelines: (Continued)

Ensure IS investments are closely linked to business objectives. Clear identification of project risks and returns, with real options analysis

Measure business value throughout the duration of new system projects and weed out underperforming projects if necessary

Solution Guidelines: (Continued)

New approaches to project management:

Assuming an enterprise-wide focus, driven by the firm's strategic business vision and technology architecture

Solving problems and meeting challenges as they arise rather than simply meeting formal project milestones

Emphasize learning as well as planning, seeking ways to adapt to unforeseen uncertainties and chaos that, if properly handled, could provide additional opportunities and benefits