Lecture Objectives

At the completion of this topic, you should:
- understand the need for the initiation phase in project selection and systems development
- understand the main tasks in this phase
- understand the basics of carrying out a feasibility assessment
- be able to write a Baseline Project Plan (Feasibility Report)

The Initiation Phase in the SDLC

Identifying and Selecting Projects

Three main activities:
- Identifying potential development projects
- Classifying and ranking projects
- Selecting IS projects for development

Project identification and selection decisions can be improved if guided by the organisation’s corporate strategic plans and information systems plans.

Planning

Corporate strategic plans - define the mission, objectives and strategies of organisations
Information systems plans - assess the information needs of organisations and defines the systems, databases, and technologies that will best satisfy those needs

Characteristics of Alternative Methods: Hoffer et al., Table 5.1

Top Management - greater strategic focus, largest project size, longest project duration
Note: Some projects skip straight to the analysis phase because they are initiated by a high-ranking member of the organisation eg. CEO

Steering Committee - cross-functional focus, greater organisational change, formal cost-benefit analysis, larger and riskier projects

User Departments - narrow, non-strategic focus, faster development, fewer users, management layers and business functions

Development Group - integration with existing system focus, fewer development delays, less concern on cost-benefit analysis
Classifying and Ranking Projects

Possible evaluation criteria when assessing the merit of potential projects:

- **Value Chain Analysis** - extent to which activities add value and costs when developing products and/or services
- **Strategic Alignment** - does it help the organisation meet its long term objectives?
- **Potential Benefits** - eg. increased profit, improved customer services, etc. ... duration of benefits?
- **Resource Availability** - is what the project needs readily available

Hoffer et al., Table 5.2

Classifying and Ranking Projects - contd.

Possible evaluation criteria when assessing the merit of potential projects:

- **Project Size/Duration** - no. of staff and length of time needed to complete the project
- **Technical Difficulty/Risks** - level of technical difficulty to successfully complete the project within given time and resource constraints

Hoffer et al., Table 5.2

Selecting IS Projects for Development

PERCEIVED AND REAL NEEDS
- List of Potential and Ongoing Projects
- Existing and Available Resources
- Current Organisational Environment

PROJECT SELECTION DECISION
- Evaluation Criteria

DECISION OUTCOME
- Accept Project
- Reject Project
- Delay Project
- Refocus Project
- End-User Development
- Proof of Concept

Hoffer et al., Table 5.3

Deliverables and Outcomes

- A schedule of specific IS development projects
- An assurance that careful consideration was given to the project

Note - A selected project does not always result in a working system ... need INCREMENTAL COMMITMENT - the project needs to be assessed and approved after each development phase
(see The Creeping Commitment Approach Whitten et al.p.365)

Assessing feasibility

- "Feasibility is the measure of how beneficial or practical the development of an information systems will be to an organisation" Whitten et al., p365
- Why bother assessing feasibility throughout the project?
  - a project that is feasible at one stage may become infeasible later:
    - change of scope, global changes
    - incremental commitment
    - don't throw good money after bad

Project Initiation & Planning

- Transforms a vague system request into a tangible project description
- Usually carried out by senior systems analysts
- Requires feasibility assessment of the project
Assessing feasibility

Categories of feasibility tests
- Operational: does it solve the problems?, does it take advantage of the opportunities?, how well will it work?, how do people feel about it?
- Political: Is it supported right through the organisation?
- Legal and Contractual
- Technical: are the technical resources and expertise available?, is the technical solution practical?
- Schedule: is the time-table reasonable?
- Economic: how cost-effective is it?

Operational feasibility

Is the problem worth solving?
- Need to look at the existing system to see how well it meets the quality requirements set by the organisation, so as to determine the urgency of the problem

Operational feasibility

The PIECES framework (written et al., p368 and Ch 3, 5, 6) can be used as the basis for analyzing the urgency of a problem or the effectiveness of a solution.
- Performance. Does the system provide adequate throughput and response time?
- Information. Does the system provide end-users and managers with timely, pertinent, accurate, and usefully formatted information?

Operational feasibility

PIECES (contd.)
- Economy. Does the system offer adequate service level and capacity to reduce the costs of the business or increase the profits of the business?
- Control. Does the system offer adequate controls to protect against fraud and embezzlement and to guarantee the accuracy and security of data and information?

Operational feasibility

PIECES (contd.)
- Efficiency. Does the system make maximum use of available resources including people, time, flow of forms, minimum processing delays, and the like?
- Services. Does the system provide desirable and reliable service to those who need it? Is the system flexible and expandable?

(See PIECES checklist - Whitten et al. Figure 3.6  p.87)

Operational feasibility

Usability analysis (later stages of SDLC)
- Ease of learning
- Ease of use
- Satisfaction
- Does it support desired productivity levels
Political feasibility

- How do users and management feel about the problem?
  - A workable solution sometimes fails if there is user or management resistance
  - If there is resistance to change, can it be overcome?
- How well will the system fit into the current day-to-day operations

Legal and Contractual feasibility

- Potential legal issues to be considered
  - Copyright, labour laws, data sharing with other organisations, foreign trade regulations, financial reporting standards, contractual obligations
- Contractual obligations may include:
  - Software ownership, hardware & software license agreements
  - Especially important when system not developed in-house

Technical feasibility

- Can the proposed technology provide a suitable solution?
  - Is the technology mature
  - Is suitable vendor support available
- Do we currently possess the necessary technical expertise?
  - No, will training impact schedule feasibility

Economic feasibility

- A process (cost-benefit analysis) of identifying the financial benefits and costs associated with a development project
  - Very hard to do during the initiation phase because no in-depth analysis has occurred of the requirements or technical alternatives
- Highlights the need to assess feasibility at various points throughout development

Schedule feasibility

- Given the requirements and constraints (technical, human resources, business peak periods), can the solution be delivered on time?
- What are the consequences if the project is delayed?
- A balance is often said to be required when weighing up system delivery on time, against possible sacrifices in quality
  - Is this reasonable?
Determining Project Benefits

- An information system can provide both tangible and intangible benefits to an organisation
- Tangible benefits - can be measured in dollars and with certainty
- Intangible benefits - cannot be easily measured in dollars or with certainty
  - can sometimes be quantified as project proceeds

Tangible Benefits

- Most will fit within the following categories:
  - cost reduction and avoidance
  - error reduction
  - increased flexibility
  - increased speed of activity
  - improvement of management planning and control
  - opening new markets and increasing sale opportunities

Intangible Benefits

- Some possible intangible benefits
  - competitive necessity
  - availability of new, better or more timely information
  - faster decision making
  - improved customer goodwill
  - improved work process that can improve employee morale
  - better service to community

Determining Project Costs

- System costs can be:
  - Tangible - can be measured in dollars and with certainty
    - hardware costs, labour costs, operational costs
  - Intangible - cannot be easily measured in terms of dollars of with certainty
    - loss of goodwill or employee morale, operational inefficiency

Determining Project Costs

- They can be:
  - development costs (one-time)
  - costs associated with project start-up and development and system start-up
  - operating costs (recurring)
  - costs associated with the evolution and use of the system
  - they can be either:
    - fixed costs
    - variable costs

Development Costs

- Most will fit into the following categories:
  - personnel costs: Consultants, in-house staff, outsourcing, etc. must include time lost by users working on the development rather than their normal tasks
  - computer usage
  - training
  - administration costs
  - new networks, hardware and software
  - site preparation
  - capital costs
Operating Costs

\*\*Fixed cost such as:
- Lease payments & software license payments
- Salaries (generally minimal variability)

\*\*Variable costs such as:
- Computer usage
- Supplies
- Prorated overhead costs eg. electricity
- Software maintenance

Cost-effectiveness techniques

\*\*There are three popular techniques used to assess economic feasibility:
- Payback or break-even analysis
- Return on investment
- Net present value


\*\*Spreadsheets are a useful tool to assist in these techniques

Time Value of Money

\*\*Used in all 3 techniques
- Present value refers to the "current $ value of a future cash flow.. varies depending on the time period and discount rate
- There are tables available which allow you to easily calculate this (Whitten et al., Fig. 9.4, p 375.)
- Eg. $20 in 3 years time is equal to $15.80 today at a discount rate of 8%
- Helps better evaluate alternatives which may have different lifetimes and/or benefit and cost occurring at different times

Examples

In the following examples the following details will be used:
- Development cost - $100
-Annual operating costs - $20
-Annual benefits - $50
- Expected lifetime - 7 years

Payback (break-even) analysis

\*\*finds the amount of time required to recover the cost of the initial development and ongoing system

\*\*Many organisations have a payback period guideline for all investments eg. all investments must have a payback period of < or = to 5 years

Payback (break-even) analysis

<table>
<thead>
<tr>
<th>Year 0</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development Costs</td>
<td>$100</td>
<td>$120</td>
<td>$140</td>
<td>$160</td>
</tr>
<tr>
<td>Operating Costs</td>
<td>$20</td>
<td>$20</td>
<td>$20</td>
<td>$20</td>
</tr>
<tr>
<td>Cumulative Costs</td>
<td>$120</td>
<td>$160</td>
<td>$180</td>
<td>$200</td>
</tr>
<tr>
<td>Annual Benefits</td>
<td>$50</td>
<td>$50</td>
<td>$50</td>
<td>$50</td>
</tr>
<tr>
<td>Cumulative Benefits</td>
<td>$50</td>
<td>$100</td>
<td>$150</td>
<td>$200</td>
</tr>
<tr>
<td>Net profit or (loss)</td>
<td>($100)</td>
<td>($70)</td>
<td>($40)</td>
<td>($10)</td>
</tr>
</tbody>
</table>

Note: these calculations were not done using the present values

The system will break-even in Year 4
Return on investment

Return on investment compares the lifetime profitability of alternative solutions.

\[
\text{ROI} = \frac{\text{Estimated lifetime benefits} - \text{Estimated lifetime costs}}{\text{Estimated lifetime costs}}
\]

\[
\text{ROI} = \frac{($50 \times 7 \text{ years}) - ($100 + ($20 \times 7 \text{ years}))}{($100 + ($20 \times 7 \text{ years}))}
\]

\[
\text{ROI} = \frac{$350 - $240}{$240} = 0.458 = \text{Lifetime ROI}
\]

To calculate the Annual ROI, simply divide by the lifetime.

\[
\text{Annual ROI} = \frac{0.458}{7} = 6.5\%
\]

Net present value

Net present value determines profitability based on today's dollars.

- Calculates the lifetime costs of the system, adjusting for present day values.
- Calculates the lifetime benefits of the system, adjusting for present day values.
- Subtract the sum of the discounted costs from the sum of the discounted benefits.
- If positive, good; if negative, bad.
- If comparing investments, the alternative with the highest net present value is the best.

3. Plan the Project

- Develop the initial project schedule and resource tasks.
  - Review system problems, opportunities, and directives; as well as, project scope.
  - Decide on development strategy.
  - Prepare plan, estimating, resource allocation.
  - Negotiate expectations and schedule.
  - Document plan - project plan.
    - A phase-level plan that covers the entire project.
    - An activity-level plan that details the next phase of the project.

4. Present the Project

- Secure approval to continue the project, and communicate the project and goals to all staff.
  - Review the deliverables of all prior activities.
  - Present the project proposal (charter) to the steering body, address issues, defend recommendations, answer questions.
  - Communicate approved project all affected staff.
  - Document findings - project charter.

Initiation - Conclusion

- Project may be terminated.
  - Project not worth proposing.
  - Executive sponsor might not endorse the project.
  - Put low on the priority list.

OR

- With the blessing of all system owners, the project can now proceed.

Baseline Project Plan (Feasibility Report)

All information collected during project initiation and planning is detailed in the System Proposal or Baseline Project Plan. It consists of:

- Introduction.
- System description.
- Feasibility Assessment.
- Management Issues.

(Note: See Whitten et al., pp. 380-383; Hoffer et al., Fig. 6.10, p.212.)
Supplementary Slides

These slides are supplementary information for the PIECES framework Slide. It is in Whitten et al p 85-87.

PIECES Problem Solving Framework

The following checklist for problem, opportunity, and directive identification uses Whitten’s PIECES framework. Note that the categories of PIECES are not mutually exclusive; some possible problems show up in multiple lists. Also, the list of possible problems is not exhaustive. The PIECES framework is equally suited to analyzing both manual and computerized systems and applications.

**PERFORMANCE Problems, Opportunities, and Directives**
- Throughput - the amount of work performed over some period of time.
- Response time - the average delay between a transaction or request and a response to that transaction or request.

**INFORMATION (and Data) Problems, Opportunities, and Directives**

A. Outputs
   1. Lack of any information
   2. Lack of necessary information
   3. Lack of relevant information
   4. Too much information - "information overload"
   5. Information that is not in a useful format
   6. Information that is not accurate
   7. Information that is difficult to produce
   8. Information is not timely to its subsequent use

B. Inputs
   1. Data is not captured
   2. Data is not captured in time to be useful
   3. Data is not accurately captured – contains errors
   4. Data is difficult to capture
   5. Data is captured redundantly – same data captured more than once
   6. Too much data is captured
   7. Illegal data is captured

C. Stored Data
   1. Data is stored redundantly in multiple files and/or databases
   2. Stored data is not accurate (may be related to #1)
   3. Data is not secure to accident or vandalism
   4. Data is not well organized
   5. Data is not flexible - not easy to meet new information needs from stored data
   6. Data is not accessible

**ECONOMICS Problems, Opportunities, and Directives**

A. Costs
   1. Costs are unknown
   2. Costs are untraceable to source
   3. Costs are too high

B. Profits
   1. New markets can be explored
   2. Current marketing can be improved
   3. Orders can be increased

**CONTROL (and Security) Problems, Opportunities, and Directives**

A. Too little security or control
   1. Input data is not adequately edited
   2. Crimes are (or can be) committed against data
      a. Fraud
      b. Embezzlement
   3. Ethics are breached on data or information – refers to data or information letting to unauthorized people
   4. Redundantly stored data is inconsistent in different files or databases

B. Too much security or control
   1. Bureaucratic red tape slows the system
   2. Controls inconvenience customers or employees
   3. Excessive controls cause processing delays

**EFFICIENCY Problems, Opportunities, and Directives**

A. People, machines, or computers waste time
   1. Data is redundantly input or copied
   2. Data is redundantly processed
   3. Information is redundantly generated
   4. People, machines, or computers avoid materials and supplies
   5. Effort required for tasks is excessive
   6. Materials required for tasks is excessive

**SERVICE Problems, Opportunities, and Directives**

A. The system produces inaccurate results
B. The system produces inconsistent results
C. The system produces unreliable results
D. The system is not easy to learn
E. The system is not easy to use
F. The system is awkward to use
G. The system is inflexible to new or exceptional situations
H. The system is inflexible to change
I. The system is incompatible with other systems
J. The system is not coordinated with other systems

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**PIECES Problem Solving Framework (continued)**

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**PIECES Problem Solving Framework (continued)**
References

  Chapter 5: p. 174-180

  Chapter 5: p. 157-164, Chapter 6: p. 191-220