

Evaluation, Comparison, Justification

25 November 2009
Lecture 6

Topics for Today

- Request for Proposals
 - What is an RFP? Who is its Target?
 - Contents of the RFP
- Preparation of the Response
- Evaluating Proposals by Suppliers
 - Costs
 - Benefits
- Calculating Cost/Benefit and Choosing
- Evaluating and Justifying Information Systems
 - IT/IS Evaluation and Justification
 - A framework for IT/IS Evaluation and Justification
- Source: PS98 3.3 - 4.3, IL1

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Request for Proposals (RFP)

- The **Request for Proposals (RFP)** document is a **description of an organization's needs** which is sent to **potential suppliers**.
 - It is **prepared** using the information gathered during the previous stages we have discussed

RFP is **summarized** and **organized** for distribution

- Potentially **proprietary information** must be removed
- May be distributed to:
 - Development houses
 - Software and application suppliers
 - Advisory companies
 - Computer supply companies (for hardware and software)
 - In-house development division (optional)
- The organization expects to **receive responses** and **choose** from them
- We'll talk about an RFP for **developing a system**

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What the supplier must provide

- **Some scenarios:**
 - New development requests
 - Purchase of off the shelf products
 - Hardware or connectivity requests
 - Support and training requests
 - Public Sector RFPs
- **Common elements:**
 - Price lists
 - Supplier Description

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New Development (1/5)

- Vendor should be told about the processes and actions – **but the vendor must figure out the details**
- If the **אפיון ראשוני** is **not detailed**, the vendor will need to define the requirements and details
 - Vendors who respond will give varying responses
 - Comparing them will be hard
- Even if it **is detailed**, the vendor may change things:
 - Experience
 - Cost
 - Laziness
- Vendor must give **guarantees** about timetables and phases
- Must **provide proof** they have the **resources, tools, manpower** to complete the contract
 - Experience may be **mandatory**
- Must answer for
 - Security requirements
 - Quality control
 - Prototype requirements
 - Cost

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Off the shelf products (2/5)

- More concern here about **appropriateness of the product**
- **Support contracts**
 - Unless support is by a third party
- Vendor must give an **overview** of their products, features, strengths
- Vendor must argue that the **product fulfills the requirements**
 - Point out any **missing requirements**
- Address how system will be **customized**

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Hardware/Connectivity (3/5)

- Details of hardware to be provided – including price per piece
- Details of
 - Hardware manufacturer
 - Warranty
 - Support information
- Guarantees that the hardware is sufficient for the size, data, and usage requirements

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Support/Training (4/5)

- For **support**, vendor must indicate
 - How long the contract is for
 - What is **included** in the contract – hardware, software, updates
 - How much **manpower** is promised – workers, managers
 - How much the support **costs** – per person / hour / day / issue
- **Similar structure for continued development and update contracts**
- For **training**:
 - List of the **courses** to be provided
 - **When and where**
 - How much the courses **cost** – per sessions / attendee / course

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Public Sector (5/5)

- Municipal and public sector RFPs usually have special sections with clear guidance
- Conflict of interest statements
- Common to have a Question / Answer process
 - All answers sent to all recipients
- "Cone of silence"
 - No questions after a given date
 - No private questions or answers
- Preliminary meeting
 - Vendors meet the rep, questions and answers, tour the physical site
 - May be required or optional
- RFP must give a clear process for choosing the winner
- After the decision, the chosen supplier to be publicized
 - Normally the winning offer is published too
- Vendors may raise complaints if they wrongly lose

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Price Lists / Supplier Description

- | | |
|--|--|
| Price List | Supplier Description |
| <ul style="list-style-type: none">• Vendor may be required to give a detailed list of all prices for all units• Prerequisites, dates for payments• Taxes• Delivery or outside costs | <ul style="list-style-type: none">• Vendor must send documentation about itself• Common to include:<ul style="list-style-type: none">– Ownership information– How many workers– Experience of relevant workers– Main customers and their experience with them– CVs of main workers and managers |

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Preparing the Response

- Vendor decides whether to participate
 - If it was short listed and declined to bid, send a note
- Vendor must clarify whether it can satisfy all requirements
 - If not, find other vendors who can sub-contract
- Vendor must then do
 - Cost-benefit of the system
 - System analysis to discover parts / requirements
 - Consider goals, boundaries, critical portions
- Vendor may change requirements or goals – with good reason
 - The organization may disagree

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Communication

- Type of communication between vendors/organization is varied before and during RFP process
 - In private-to-private it is likely to be unstructured and random
 - In private-to-public it will be more structured and restricted
- Some public sector RFPs have a very restrictive communication policy
 - Meant to prevent favoritism and fraud
- If the RFP is not detailed enough –
 - Many questions
 - Lots of clarification communications

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RFP Examples

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Preparing a Proposal

- The RFP communicates what the system should be and what the requester wants
 - Or at least it should
- The supplier must then decide whether to respond
 - Does it have the skills, manpower, business resources?
- If yes – a preliminary analysis is needed
 - Discover major parts
 - Calculate costs and expected income
 - Profit?
 - Can it be resold later?
- Are changes needed to the RFP?
- Supplier must provide a budget, timeline, and support contracts

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Communication

- Can the vendor talk to the requester
- If **yes** – there may be contact people
- Is the communication **structured** or **unstructured**?
 - **Structured** – clear who talks to whom, what format they are sent and received, usually in public service contracts
 - **Unstructured** – Many-to-many communication, not no formats or timetables
- It's **worth it** to do structured, but **the vast majority** of the time it's unstructured.

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Evaluating Proposals: Costs

- For each reasonable response, an examination must be made
- We'll talk about some measurement guidelines

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Receiving & First Pass

- First go over each proposal, note:
 - **Missing** sections
 - **Additional** sections
- Ask the vendor to **adapt, add, or remove**
 - Some government bodies can't do this – so it is **discarded**
 - Some just won't change
- You may have a **pleasant surprise** – something you didn't think of
- After that, go over each proposal and discard bad ones
 - Consider **critical and make-or-break** features or constraints

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Measuring & Comparing

- Many parts of the decision making process
 - Cost – benefit analysis is just one tool
- Money based evaluation has ups and downs
 - **Good** – gives a numerical and easily comparable answer
 - **Bad** – computing relative benefits for some features is hard
 - **Example:** Will the store benefit more from having a server based or out-sourced inventory management system?
- We'll talk a bit more about cost – benefit analysis now
 - PS goes into a lot of detail here – we won't
 - We'll talk more about evaluating and justifying systems later

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Capitalization of Costs היוון העלויות

- Separate **equipment costs** from **support costs**
 - Really all **one time** costs from **recurring** costs
- **Key observation:** Money costs different amounts
 - The longer you hold onto it, the more you can make off it
 - **Interest, cost and availability of credit** can be significant
- Thinking about **interest rates** (ריבית)
 - **Low** → starting new projects and extending payment is easier
 - **High** → wait to start or pay all at once
- **Currency issues** – local or חוץ מטבע?
- Payback subject to **inflation** or **cost of living** (מדד)?
 - Cultural and accepted practice differences
- **Conclusion:** Consult an accountant or finance specialist

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Indirect Costs - עלויות עקיפות

- **Key Measurement: Indirect costs**
 - **Total cost of ownership (TCO) (next)**
 - Documentation תיעוד
 - User training תדרכה
 - Required hardware/software and electricity usage חומרה או תוכניות חשמל
 - Warranty and support contract length תמיכה ותוקף האחריות
 - Expected redundancy hardware/software גיבויים
 - Increased manpower הוספת כוח אדם

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TCO Example

How Windows Reduces TCO

Everyone knows that TCO is a useful metric for capturing the costs of an IT decision over time. But how does your server OS platform contribute to the total cost? And where do the bulk of costs creep into your business?

Total Cost of Ownership

- Staffing costs: management & maintenance 60%
- Initial software costs make up only 7 percent of total cost of ownership.
- Downtime is 33 percent of TCO.

Did you know...

- Staffing—the cost of managing and maintaining IT systems—accounts for 60 percent of TCO.
- Downtime is 33 percent of TCO.

These two cost areas are the largest contributors to TCO over three years.

Together, the costs of ongoing management and maintenance, as well as downtime, typically represent 75 percent or more of your total cost of ownership. To successfully reduce TCO, focus on improving system manageability by using mature management tools and consistent processes, and by having well-trained resources.

Chip Larouche, City of Lake Oswego: "I'd like to tell me that Linux is free. However, that's not really the case when you consider I'd have to increase my staff [.]"

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System Lifetime - תקופת תפעול

- Find out from similar businesses **what** worked and **how long** it worked for
 - It's hard to know up front
- **Support costs** may vary
 - **Third party** support costs vary
 - In house support requires **training and maintaining the internal staff**
- Can the system be **resold** when finished with it?
 - This affects the cost

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Income From Using the System

- **How much do you earn from using the system?**
 - Any system must make business sense – **cut costs** or **raise more income** than it costs
- Some ways to measure income:
 - Hardware which can be **resold** when finished
 - eBay, donated for a tax deduction
 - Software licenses **repackaged and sold**
 - **Efficiency increases** (more work / less people)
 - Reduce **power consumption** (cooling, electrical bill, space)
 - **Carbon credits** (in some countries)
- **Conclusion:** Ask an accountant, tax specialist, or business consultant

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Paying for it

Buying – Pay for it up front

- Big fixed cost – then support

• **Plusses:**

- Own and customize it
- Depreciation benefits
- Cost is known up front

• **Minuses:**

- Obsolescence
- Can't do heaving pre-testing

Renting – Pay a fixed periodic fee

- Recurring costs, usually includes support and failure guarantees

• **Plusses:**

- Includes support/replacement
- Smaller periodic fees
- No heavy investment

• **Minuses:**

- No equity
- Costs will not go down with time

Leasing – Pay a fixed fee with the option to buy at the end

- Also with support, but generally less

• **Plusses:**

- Cheaper than renting
- Service, support customary
- Can buy it at the end

• **Minuses:**

- Similar to Renting

- **Conclusion:** Best left to accountants and finance people, but IS Engineers can guide them

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Evaluating Proposals: Benefits

1. How to evaluate the benefits of a system
2. Attributes and ingredients for evaluating benefits
3. Comparing benefits using the weighted model

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How to Evaluate Benefits

- IS provide **tangible** and **intangible** benefits

- Intangibles are **harder to quantify**
- Easiest trick to map everything into money or manpower saved

- Applications have different gauges of use or efficiency

- Example: Unique visits per day/month/year
- Example: Average checkout time per checkout clerk
- Example: Number of items scanned per minute
- Example: In telecommunications – Erlang

- **Doing this before the system is up is very hard**

- Intangibles can be **very important**

- Customer **satisfaction** (Ex: ATMs, web site)
- Market share increase
- Ease of supplier **communication**
- Experience and previous success

- Does one solution or supplier do this **better than another?**

- It's **hard** to give numerical scores
- Rate 1-10 on many things, add up the points, make graphs

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Attributes and Ingredients

- Staff should assemble a list of important attributes
 - From the RFP and Initial Design
 - Make evaluations / comparison easier
 - Steering committee uses the list to evaluate the importance of parts

Example considerations:

- **Hardware**
 - Sufficient space, power, computing speed
 - Mean time to failure
 - Upgrades, backups, redundancy
- **Communications Equipment**
 - Ease of use and integration
 - Availability for expansion and optional modules
 - Security and user control

- **Applications**

- Off the shelf / custom
- Manner of delivery
- Timetable for each phase / evaluation
- Management and Quality Control
- Documentation and training

- **Supplier issues:**

- Experience in the field, strengths
- More important for custom development

- **Integration issues:**

- Will employees understand it?
- Can you hire people who do?
- Can it scale to the business cycle?

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Weighted Model for Comparison

1. Break down attributes **hierarchically**
 - Each top level topic gets a weight – together add up to 100
 - Each sub-topic gets a weight – together add up to 100
2. Assemble the topics with a **spreadsheet or table**
3. Give **grades** or scores for each topic
4. **Calculate** the final score using the weights
 - Should help balance out different aspects of the system and give a final number

- **PS gives other models too – see the book**



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Calculating Cost/Benefit and Choosing

- **First** remove inferior proposals
 - If it's clear
- Compare by **Cost or Benefit**
 - Select the cheapest (and pick the top from them)
 - Select the best (and pick the bottom price)
- Compare by **Cost/Benefit**
 - **Cost/Benefit** – how much each shekel buys you
 - **Benefit/Cost** – how much each benefit costs you
 - Look carefully at the benefits break downs and weights
- Comparing by **adjusted Costs and Benefits**
 - Compare via percentages or ratings
 - Normalization (see the book)
 - Weight costs or benefits by company constraints
 - Is cost less or more important than benefit?
 - Subjective weights and considerations
 - This is why it's best to decide this **ahead of time**

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Cost/Benefit Graphs

- Graphically displays cost and benefit data
 - Inferior proposals come out on the bottom of the graph

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Discussing with Chosen Supplier

- Once you decide, **contact the supplier and negotiate**
 - If two were close, work on the supplier to **lower cost or match benefits of the other**
- Contract is a **legal document** but also must include **technical details** as listed in the RFP
 - May even make one for **in house development**
- **Common elements:**
 - Description of the system and its goals
 - Hardware listing
 - Basic software requirements
 - Application software (bought/developed)
 - Plans for implementation (schedule / late fees)
 - Acceptance tests
 - Training and documentation
 - Support
 - Prices, payments, means of payment
 - **Dispute resolution**

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Evaluating and Justifying IS

- Evaluating and justifying Information Technology and Information Systems is a **hard process**
 - Some techniques:
 - Cost/Benefit calculations (as in PS)
 - Quantitative / Qualitative techniques
- **The problem:** Quantitative systems for capital investment decisions miss important aspects of systems evaluation
 - Intangible benefits (improved communication/control, capabilities, competitive advantages)
 - Costs hard to quantify
- **The result:** Failures in justification
 - Level of required investment is huge
 - Projects consume a lot of time and resources
 - Many companies end up unhappy

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Tangibles/Intangibles

- Evaluation is important since IT involves large investments and significant risks
 - No consensus on why some IT project succeed and some fail
 - IT constantly improves in complexity so we may **never fully understand**
- **Common problem:** Managers don't properly weight intangibles in the cost and benefit calculations
 - May have long term effects that are hard to see in the short run
 - Balancing tangibles and intangibles is essential
 - Ex. Services application → heavier on intangibles,
 - Ex. Manufacturing application → heavier on tangibles
 - Balancing financial and non-financial aspects
 - Ex. Marketing project → heavier financial and intangible (e.g., customer satisfaction)
 - Ex. Manufacturing project → heaving on non-financial (e.g., capacity utilization (tangible) and flexibility (intangible))

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Management and Evaluation

- Managers may try standard appraisal criteria
- Problem:** Without management guidelines for investment decisions, managers may:
 - refuse to implement an IT infrastructure that could be beneficial to the long-term competitiveness of the organization
 - invest in IT as an "act of faith"
 - use creative accounting (assigning arbitrary values to benefits and costs) as a means of passing the budgetary process
- Inability to justify or evaluate IT may lead to underinvestment or mis-investment

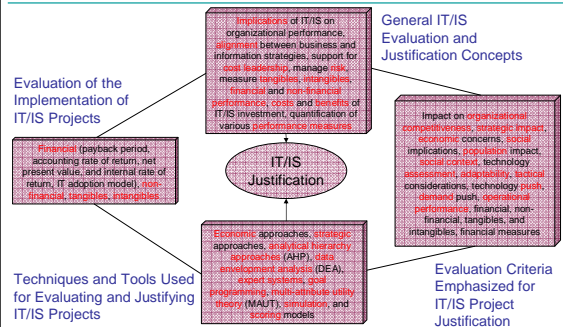
Subclassifications for IT Evaluation/Justification

Major Classification	Sub-classification
General IT/IS evaluation and justification concepts	Justification of investment in IT/IS projects
	Costs and benefits of IT/IS investments
	Implications of IT/IS evaluation
Evaluation criteria emphasized for justifying IT/IS projects	Strategic impact
	Tactical considerations
	Operational performance
	Financial measures
	Non-financial indicators
	Tangibles
	Intangibles
Techniques and tools used for evaluating and justifying IT/IS projects	Economic approaches
	Strategic approaches
	Analytic approaches
Evaluation of the implementation of IT/IS projects	Financial
	Non-financial
	Tangibles
	Intangibles

A Framework

- Book IL08 discusses a framework for IT justification as a summary of existing work
 - Divides the approaches into four categories as in the previous table

A framework for the evaluation and justification of IT/IS



General IT/IS Evaluation and Justification Concepts

Implications of IT/IS on organizational performance, alignment between business and information strategies, support for social leadership, manage risk, measure tangibles, intangibles, financial and non-financial performance, costs and benefits of IT/IS investment, quantification of various performance measures

General IT/IS Evaluation and Justification Concepts

- Evaluate potential IT/IS investment with respect to the organization
 - Improve the organization?
 - Strategically? Tactically? Operationally?
- If it can't be found to benefit – question it
- Managers must honestly define purpose of the investment
- Goals essential to assess progress, success/failure
- Managers must work with accountants

Evaluation Criteria Emphasized for IT/IS Project Justification

- Must be based on a good understanding of vision, mission, strategy, goals
 - Some organizations miss strategic or tactical benefits
- Depend on the goal of the project:
 - Strategic, tactical, operational
- Some jump at perceived benefits without evaluating real costs
- Social implications and "soft" considerations have been overlooked (but shouldn't be)

Impact on organizational competitiveness, strategic impact, economic concerns, social implications, regulatory impact, social context, technology assessment, adaptability, tactical considerations, technology push, demand pull, operational performance, financial, non-financial, tangibles, and intangibles, financial measures

Evaluation Criteria Emphasized for IT/IS Project Justification

Techniques and Tools Used for Evaluating and Justifying IT/IS Projects

- Evaluating alternatives is hard, so even after selecting the criteria, use the correct tools and techniques
- Tools and techniques fall into a number of categories
 - I am not familiar with all of them (but interested students should look)

Techniques and Tools Used for Evaluating and Justifying IT/IS Projects

Evaluating approaches, strategic approaches, analytical hierarchy approaches (AHP), data envelopment analysis (DEA), expert systems, goal programming, multi attribute utility theory (MAUT), simulation, and scoring models

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Evaluation of the Implementation of IT/IS Projects

Evaluation of the Implementation of IT/IS Projects

Financial (payback period, accounting rate of return, net present value, and internal rate of return, IT adoption model), non-financial, tangible, intangibles

- After evaluation has been done, implementation must be done
- SDLC emphasizes evaluation of development at each stage
 - Called "feasibility study" – it's really justification
 - At each stage, **decide whether to continue or stop**
- **Post implementation review** essential too

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