

Keele University

Module:
Managing Information Technology

**Acquiring information
systems**

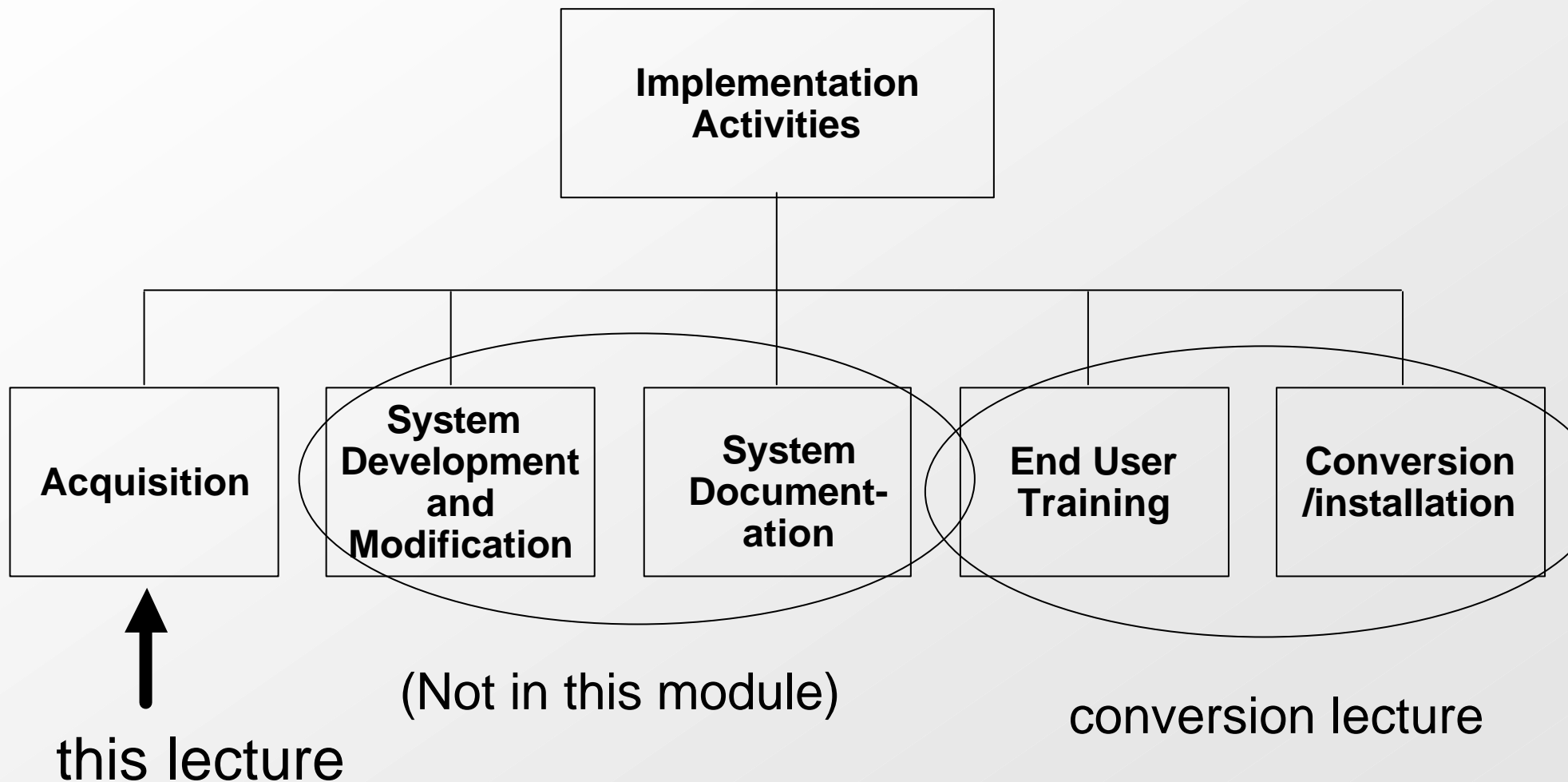
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The implementation process



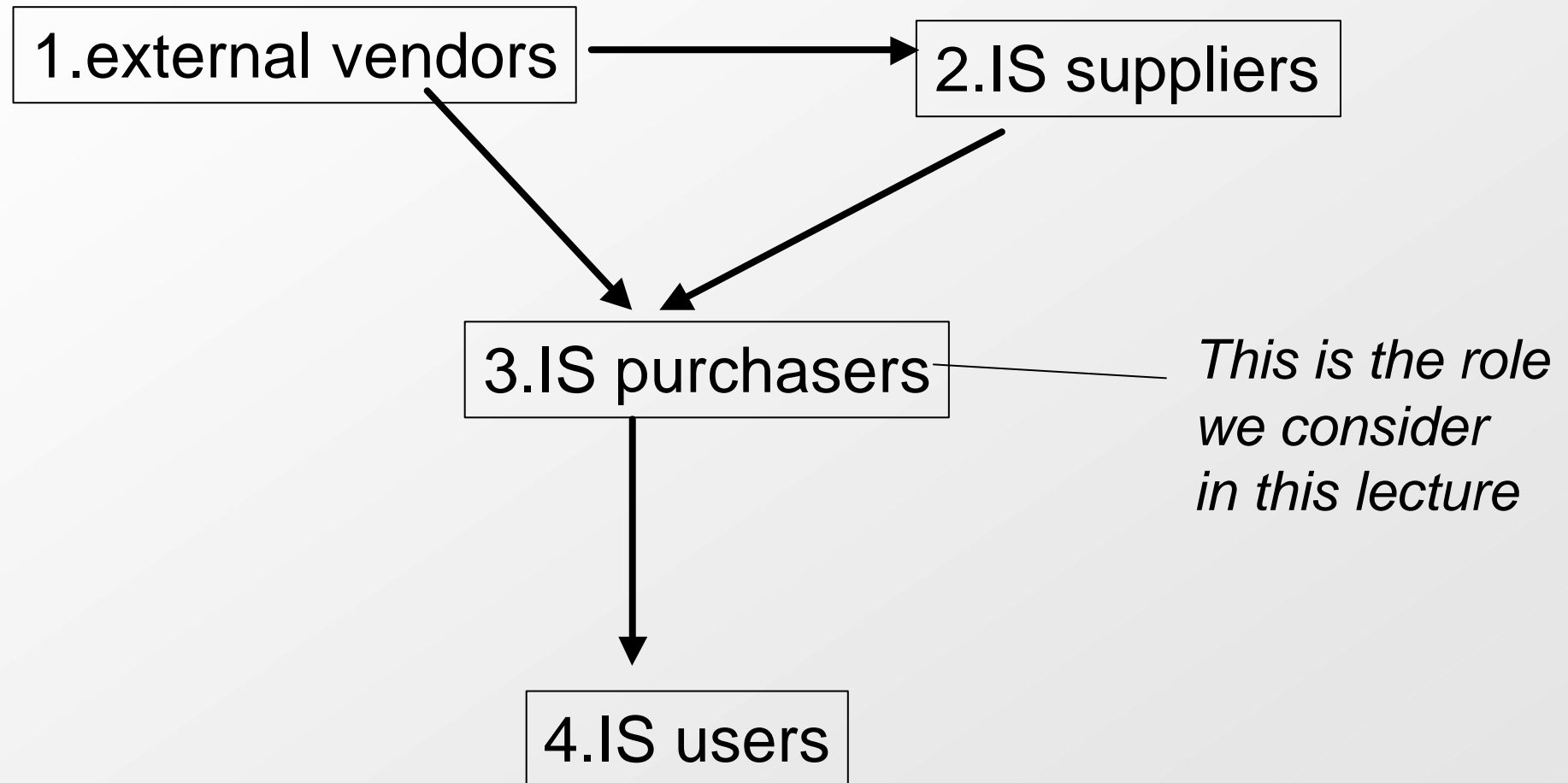
Overview

- ✍ what is acquisition?
- ✍ selection
- ✍ software
- ✍ hardware
- ✍ downsizing, rightsizing
- ✍ open systems
- ✍ outsourcing
- ✍ payment methods and contracts

Acquisition involves selection

- ✍ the IS strategy is the basis of the selection of projects based on prioritized needs of
 - must-do features : not viable without
 - should-do features: unlikely without
 - nice-to-do features: enhancements which might favour one project over another
- ✍ selection requires knowledge to reduce the risk of a wrong choice

IS service cost transfers - the players



The players (or roles)

1. external vendors
providing any element, concern is profit
 2. IS suppliers (function/department)
provides user service, and purchases services
 3. IS purchasers (function/department)
concerned with purchase alternatives
 4. IS users (function/department)
concerned with charge-back to pay for its services
- 2 & 3 could be the same, 3 & 4 could be the same.

Management responsibilities in acquisition

- ✍ recognize the potential for benefit in acquisition and therefore support the procurement (buying) process
- ✍ review the relationship between acquisition, IS strategy and business strategy so IS development supports long term goals as well as short term requirements
- ✍ assess the business implications of any sensitive applications, which may place restrictions on procurement

The selection process

problem specification



software alternatives



hardware alternatives



rank



select

Ranking and selection process

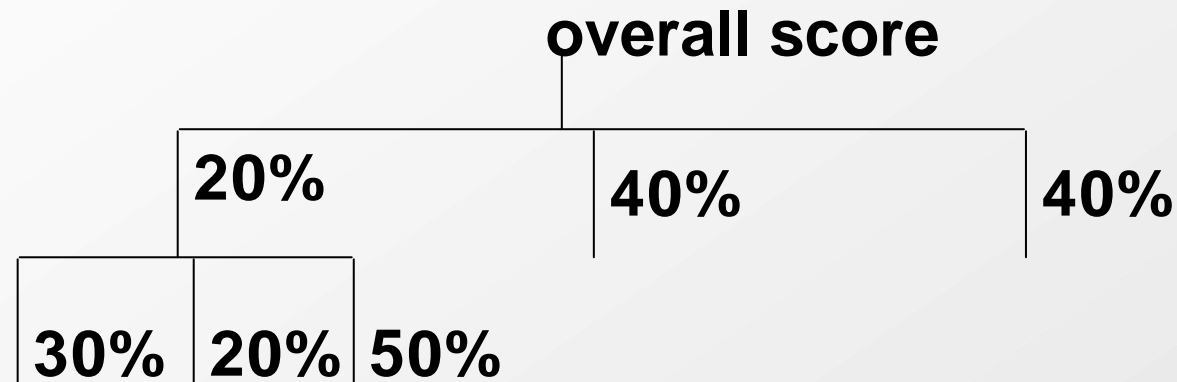
1. select the criteria
2. associate weights to each criterion
3. score candidates against each criterion
4. calculate each candidate's rating
(sum of score x weight)
5. select the candidate with the highest score

1,2,3 are difficult

Scoring

- ✍ each criterion must be scored
- ✍ e.g. 0 for no feature, 10 for excellent
- ✍ descriptions like 'average' must be converted to numbers
- ✍ some features can be measured in benchmark tests

Criteria can be multi-level



- ✍ e.g. 20% weight for hardware of a project can be decomposed as 30% processor speed, 20% communication, and 50% output devices
- ✍ each level is assessed & a weighted value moved to the level above and up to a final score

Guidelines for attribute weightings and scoring - 1

- ✍ ✍ applications ✍ system software ✍ hardware
so hardware economy is not the primary criterion
- ✍ data lives longer than software which lives longer than hardware
- ✍ current client base is part of the selection criteria
- ✍ architecture is more important than specific kit
so compatibility with current architecture crucial
- ✍ different vendors' equipment is generally incompatible -
combining it will be more complex or costly

Guidelines for attribute weightings and scoring - 2

- ✍ users, who define the goals, are more important than developers
- ✍ flexibility is more important than correctness, as requirements will change
- ✍ avoid pioneering unless there are good business reasons
- ✍ use 4GLs where possible (x10 faster development than 3GL)
- ✍ don't change the criteria, and keep them simple
- ✍ go for flexibility

Software acquisition options

in house

- in house bespoke development
- in house user development
- contract staff working in house

vendor system

- vendor system tailored in house
- vendor system tailored externally
- vendor system tailored by vendor
- vendor bespoke turn-key

standard package

In-house development

- ✍ to avoid over time, over budget, development use effective project control and a software *factory* environment (software engineering)
- ✍ trend is away from large in-house staff development teams because:
 - poor reliability
 - poor project management
 - difficult staff retention
- ✍ so, generally, development by users or externally, in-house is no longer the default

A heuristic: an approach to software acquisition

- ✍ if a common type of system
 - if a package available - use the package
 - if no package - use vendor system, tailored if necessary
- ✍ if not a common application
 - if no strategic impact - user development if possible
 - if strategic - develop in house or contract out

Issues in acquiring a system

resources

- does the organisation have the personnel and expertise, or is there a backlog of projects?

risk

- for risky projects off-load some risk to a fixed price supplier

technology transfer

- from software house to personnel

Standard packages, on PCs and other hardware

- ✍ more businesses rely on IS, but do not have in-house expertise
- ✍ requirements specification is the same for all acquisitions but delivery is very rapid here
- ✍ prewritten packages have a broad target , but
 - businesses processes mostly standard
 - & packages can be configured
- ✍ risk much lower than for software development
- ✍ buy if package matches 80% of requirements then customize it, modify process, or tolerate

Standard packages - advantages

- ✍ rapid availability
- ✍ sound business practices built in
- ✍ known quality
- ✍ low initial and overall costs
- ✍ documentation available in advance
- ✍ maintenance available
- ✍ continual research and updates
- ✍ varied support and training available
- ✍ growth in open systems favour compatibility
- ✍ acquisition is more management than technical

Standard packages - problems

- ✍ lower cost not so important for core, business critical, applications where in-house development is better
- ✍ possibly higher operational costs if it cannot be optimized for the business environment
- ✍ support may be based abroad (US)
- ✍ the vendor may lose in the competition and maintenance & development therefore stop
- ✍ a long term decision: move to new hardware?
- ✍ who is responsible for maintenance?
- ✍ who owns any modifications?

Exercise: which acquisition method?

Example acquisitions:

- ✍ integrated applications for a small business to use without modification, from a single vendor
- ✍ application non-critical to main business line with a simple interface to other applications used
- ✍ a complex application with no competitive advantage, which cannot justify the cost of in-house development

Hardware selection

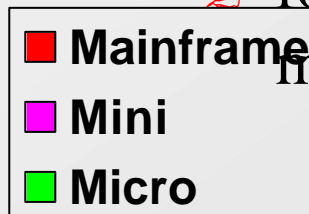
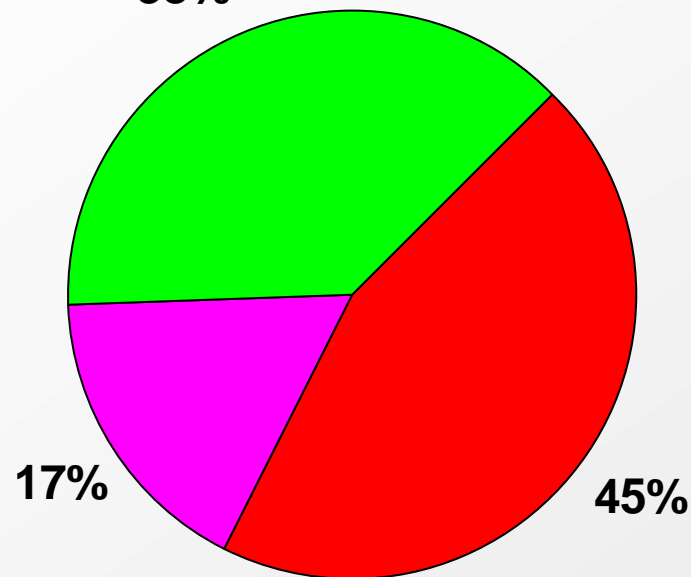
- ✍ select operating system needed for applications
- ✍ select hardware for operating system
- ✍ can only build microcomputers, so concerns are for selecting vendors and 'platforms'
- ✍ mainframes from manufacturers or third party specialists
- ✍ minicomputers from manufacturers or Value Added Resellers (VAR)
- ✍ new or second hand? Plenty of obsolescent kit - buy on basis of its condition.

Sources of PCs

- ✍ large businesses can buy from the manufacturer who will tailor for them, and maintain them; multiple vendors means more varied problems and less support
 - ✍ value added retailers provide services in addition to hardware: e.g. total (turnkey) solutions of hardware, software and networks
- ↓
- ✍ high street shops: for small business only
 - ✍ computer supermarket: choice plus service
- ↑
- ✍ mail order: cheaper, 1/3 of UK market
 - ✍ kit building: not worth the small savings

Downsizing (hardware)

**Platform for new applications,
UK, 1993**



- ✍ decline of mainframe, rise of mini and microcomputer
- ✍ long term trend to distributed computing, end user computing
- ✍ user autonomy from increasing PC power for new applications and migrating existing ones

Downsizing - advantages

- ✍ greater user control
- ✍ increased flexibility
- ✍ lower costs
- ✍ improved responsiveness
- ✍ purchased not leased
- ✍ changed (reduced?) IS workload
- ✍ encourages user innovation
- ✍ open systems
- ✍ faster development of future applications

Downsizing - disadvantages

- ✍ weaker central control
- ✍ large initial outlay
- ✍ increase demands on user skills, skills shortfall
- ✍ increased user workload
- ✍ manager distraction
- ✍ database disintegration
- ✍ loss of standardization, parochialism
- ✍ fragments strategic direction, business disruption
- ✍ technical complexity

Downsizing - hidden costs?

- ✍ increased user control and cost savings
- ✍ larger hardware has larger overheads
- ✍ e.g. replace a VAX Mini with 50 networked PCs and annual running costs drop £263k to £11K
- ✍ PC maintenance costs more than terminals
- ✍ broader training needs, increased help desk support, network maintenance and management, data security costs
- ✍ migration costs
- ✍ ‘network computer’ idea - diskless workstation

'Rightsizing'

- ✍ long term trend from mainframe + dumb terminals to client-server network, distributed processing and data
- ✍ in a client-server environment, what will be the servers to the PC clients?
- ✍ how distributed will be the data, and hence the processing?
- ✍ cultural issue in ownership of data to be shared
- ✍ savings on hardware should not dominate, but organisational changes are an opportunity

Deciding to rightsize

- ✍ will all the costs really be lower?
- ✍ will decentralized processing match organisation structure?
- ✍ how important (costly) is security?
- ✍ does a large data volume need a mainframe?
- ✍ how important are open systems in the IS strategy; downsizing makes more use of it
- ✍ downsizing is more risky; organisation culture?
- ✍ need for processing stability - when and how can migration be done?

Open systems

✍ islands of technology because

- proprietary systems not worth cost of linking
- 1980's devolved responsibility for IS

✍ 1990's needs integrated systems

- standards needed for systems to cooperate
- 'Open Systems' are public standards allowing for manufacturers' equipment
- allows a modular, components approach to building IS

✍ in an ideal world!

Open systems - connectivity between vendors' equipment

- ✗ difficult to get agreement of all vendors

American National Standards Committee, International Standards Organisation, Consultative Committee for International Telephony and Telegraph (now ITU) agree standards, slower than the market needs, so proprietary standards *become* open (e.g. RS232C)

- ✗ ISO Open Systems Interconnection is unfinished
- ✗ UNIX public domain operating system intended to be portable, but many variants by vendors!

Open systems


- management issues

- ✍ a modular approach to acquiring IS has benefits
 - inter-operability
 - portability
 - scalability
- ✍ Open Systems are the technical foundation for BPR (process redesign), being able to move business IS solutions from one architecture to another, and up or down in scale

Payment methods


how do we pay for it? - 1

increasing cost & flexibility,
decreasing risk of obsolescence :

- 
- ✗ outright purchase
simple; cost savings if used for entire life but requires expertise to recover residual value, and takes all the risk of changing needs.
 - ✗ temporary purchase
a fixed term lease. Vendors take the risk of ownership, but purchaser loses flexibility.

Payment methods

how do we pay for it? - 2

- 
- ✍ operating lease (Straightforward lease)
3-5 years, vendor retains ownership and risk;
cheap, flexible, tax efficient, capital not used.
 - ✍ purchase-lease (finance lease)
lease holder has right to purchase at the end of the
lease, or owns some of the residual value
 - ✍ renting
short term, expensive (3 months rent is 1/10 of
purchase price) but flexible, to cover demand
peaks or test new configurations

Contracts - 1

Fixed price

you specify the deliverables and time

- Issues: time scales, quality, performance levels, penalties and corrections, intellectual property rights, acceptance test
- does the source code stay with the developers or a third party like a bank?
- cost includes the risk of over time or budget

Contracts - 2

Time and materials

a rate paid for time, materials and costs

- rate for managing project? named persons or substitutes?
- the buyer retains the risk.

Contracts - legal issues

- ✍️ Rolls Royce or mini?
new requirements cost money
- ✍️ support and maintenance contract (10-15%)
help line, visits, response times, enhancements
- ✍️ Consumer Protection Act 1987 (UK)
vendor is liable for damage caused by defects,
should have insurance to reduce risks
- ✍️ Data Protection Act 1984 (UK)
- ✍️ Computer Misuse Act 1990 (UK)
- ✍️ Health and Safety (Display Screen Equipment)
regulations 1992 - responsible for environment

Outsourcing

- ✍ acquisition of *IS services* (not hardware or software as such) from outside the organisation
- ✍ vendors provide outsourcing for many organisations
- ✍ economies of scale
- ✍ access to better technology and expertise

Outsourcing types - 1

Time-share Vendors

- buy access to online processing, either hiring use of hardware for own application or hiring use of application
- ad hoc access to processing-intensive jobs; good for smoothing processing capacity or disaster recovery method;
- previously more common when hardware more expensive

Outsourcing types - 2

Service Bureaux

- contact out entire job not just processing
- discrete, small jobs e.g. payroll processing
- used regularly or as a backup for disaster recovery
- specialist but routine applications so cost effective
- easy to manage
- but slow to respond to new needs and
- difficult to add value to the data created

Outsourcing types - 3

- ✍ Facilities Management (FM) - recently popular
 - physically the IS is within the organisation but its operation and *management* is wholly/partly done by outside contractors
 - certainty of delivery, legally binding
 - access to expertise and economics of scale
 - flexibility, cost savings, full access to data, good for stable IS activities
 - but contracts need management and disputes when requirements change

Outsourcing arrangements - a continuum

Operational

- short term or transitional, client or supplier owned, data centre management by a supplier
- for: cost savings

Strategic

- long term, supplier owned, business application management by a supplier
- for: business re-engineering



Outsourcing / FM

- *is it cheaper?*

- ✍ 1992, UK: 40% of FM users concerned about cost; only 41% thought FM was value for money
- ✍ FM provision is growing and lucrative - their profit is the business' loss
- ✍ long term contract, usually linked to retail price index, BUT hardware costs are falling, so vendor benefits
- ✍ there is a cost of managing the contract
- ✍ new requirements must be negotiated

Problems with FM / Outsourcing

- ✗ dependence on FM vendor
- ✗ price may rise in future
- ✗ FM vendor does not understand the business
- ✗ loss of control/direction/strategy
- ✗ loss of in-house expertise
- ✗ no real cost reductions
- ✗ loss of data security

Outsourcing / FM

- pros and cons

✍ 'FM is a partnership'

no, its a legal contract with different objectives on two sides

✍ 'FM is a total solution'

but some IS functions should not go outside: new strategic systems, IS strategic management

✍ 'Specialist supplier of FM to your industry'

but specialism within FM may mean vendor is effectively too small to give stability and savings of scale

Issues for the FM decision (and all acquisition decisions)

- ✍ management calibre
can we manage IS inside, or an FM contract?
- ✍ staff calibre and commitment
skills shortages in technical and business areas
- ✍ long-term position
long term loss of staff, resource, expertise
- ✍ cost effectiveness
sharing costs to the benefit of both, but inevitable
conflict of interest in contract
- ✍ the degree of commonality of requirements

Summary

- ✍ what is acquisition?
- ✍ selection
- ✍ software
- ✍ hardware
- ✍ downsizing, rightsizing
- ✍ open systems
- ✍ outsourcing
- ✍ payment methods and contracts