

# Introduction to Management Information Systems

# Management Information Systems

Functional Applications of Information Systems

## Learning objectives

- ▶ to understand information systems used in the support of decision making
- ▶ to identify the different types and differences between support systems
- ▶ to know aspects of different information systems that use intelligence
- ▶ to understand the impact of information systems growth of use and expansion of functionality to a global level

support  
systems

## decision support systems

- ▶ internal & external data
  - ▶ past & future strategy
  - ▶ targeted to a functional area (department)
  - ▶ different level of management
  - ▶ high level - what-if analysis
  - ▶ knowledge - data relationships
- alternative - use human expertise & knowledge

## group DSS

- ▶ group DSS software
- ▶ improves the decision-making process for a group
- ▶ electronic meeting room
- ▶ anonymous
- ▶ brainstorming
- ▶ use of groupware

## reporting systems

### decision support - data warehouses

- ▶ updated periodically
- ▶ wider scope
- ▶ data from multiple sources

### tools

- ▶ statistical analysis
- ▶ data mining
- ▶ online analytical processing
- ▶ geographical IS (GIS)

## decision support systems

specialized software

deal with data issues

- ▶ duplication removal
- ▶ missing fields

complex analysis

- ▶ hidden patterns
- ▶ e.g.
- ▶ relationship between customers, fraud detection
- ▶ identify potential customers , reposition products



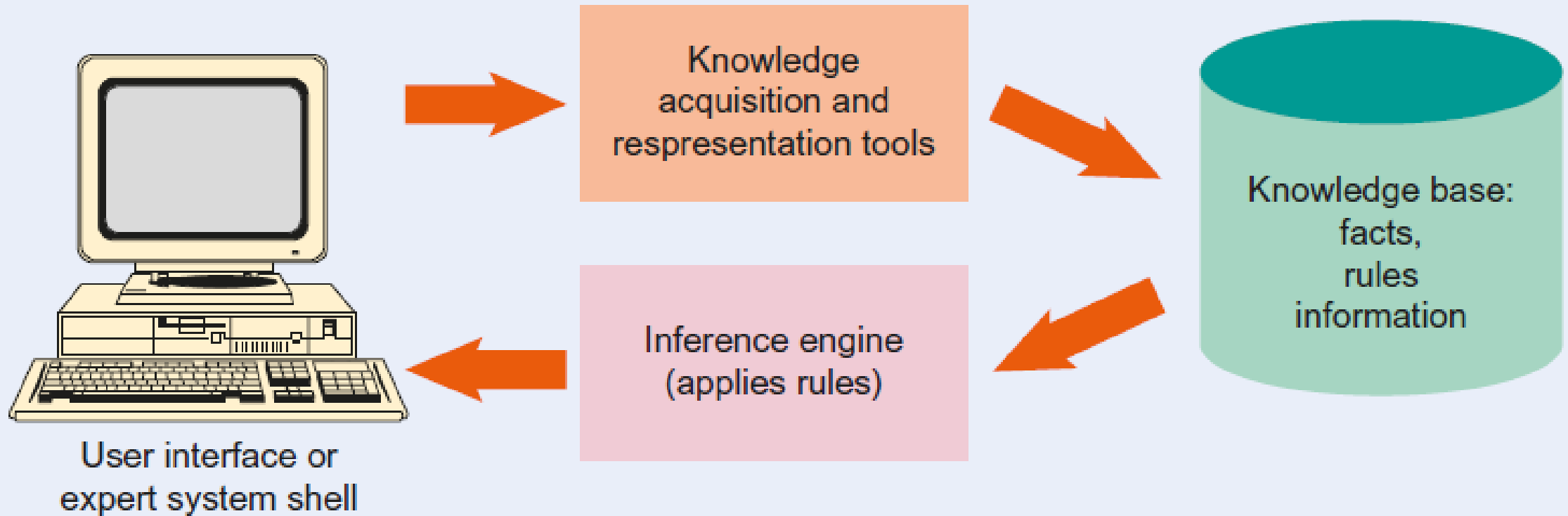
## more support systems

many terms used to describe software developed to help solve unstructured and semi-structured problems

- ▶ business intelligence (BI) systems (*previous lesson*)
- ▶ expert systems
- ▶ artificial intelligence (AI)
- ▶ neural networks

These assist decision making by using software to mimic the way decisions are made by experts in their own field

## expert systems



## expert systems

- mimics expert
- do you need expertise?
- what is an expert?
  - years of experience
  - specialized knowledge
  - able to make decisions
    - correctly
    - quickly

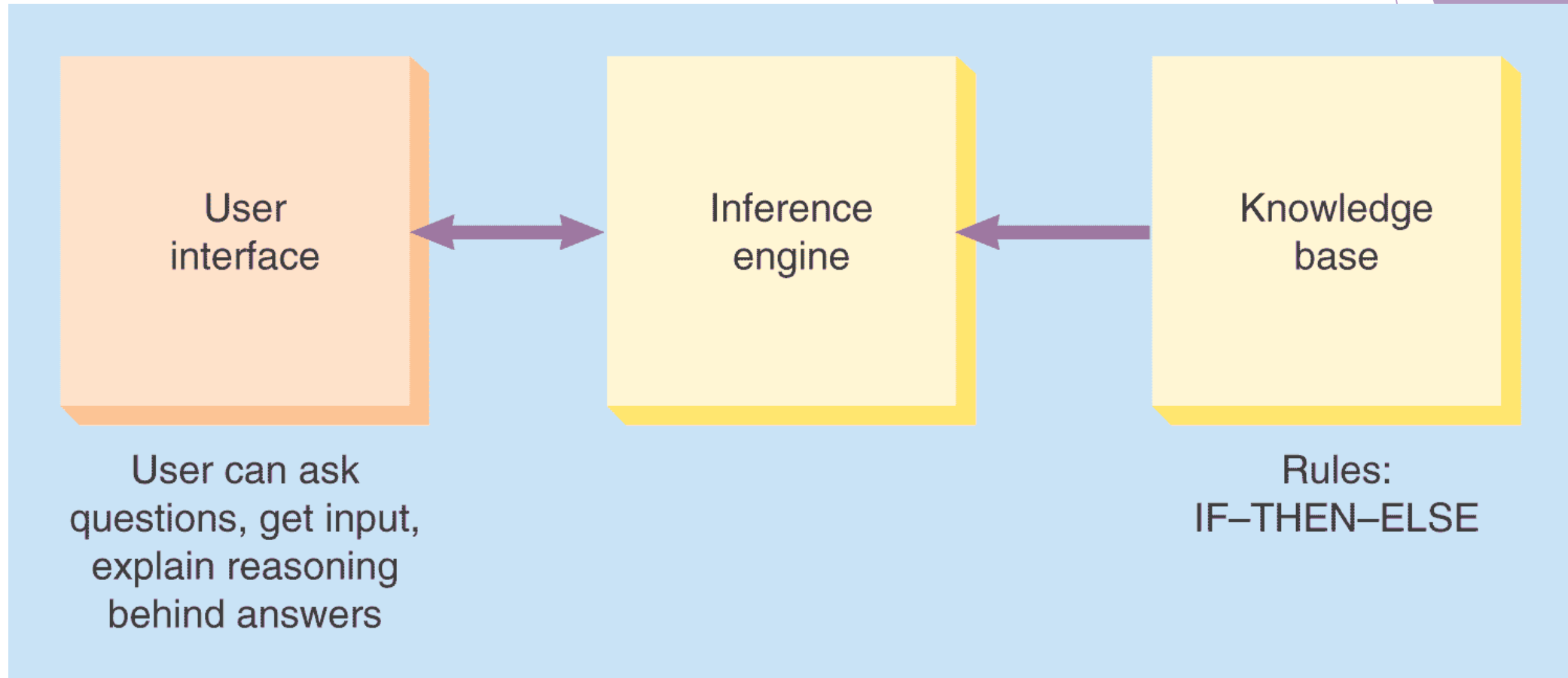
## benefits of expert 'systems'

- consistency
- memory
- logic
- diligence
- persistence
- availability
- longevity

## disadvantages of expert 'systems'

- lacks emotion
- lacks creativity
- lacks common sense
  - age = -1
- data integrity
  - can't think of the unseen
- does not learn

## Expert System



## expert system components

- knowledge base
  - rules e.g. if-then
- also DB facts
  - data on current situation
  - e.g. patient data
  - different patient, different data

## expert system components

- Inference engine
  - Knowledge + facts -> processed -> conclusions
- explanation mechanism
  - support for human
  - i.e. options, data to support option
  - user interface



## expert system

Applications of expert systems include:

- ▶ medical diagnosis
- ▶ credit decisions and insurance underwriting
- ▶ product design, management and testing

## expert system

- ▶ used to represent the knowledge and decision-making skills of specialists
- ▶ encapsulate the knowledge of experts
- ▶ so that non-specialists can take decisions.
- ▶ providing tools for the acquisition of knowledge and representation of rules

## expert system

### knowledge base

- ▶ contain information relevant to taking the decision
- ▶ includes the rules on which the decisions are based.
- ▶ suggest actions not based only on rules and algorithms
- ▶ also use heuristic techniques that may involve searching through different 'rules of thumb' that recommend the best action

### inference engine

- ▶ different rules are applied using a separate module of the expert system, known as the.

### user interface

- ▶ sometimes referred to as the 'expert system shell', is used to build rules and ask questions of the system.

## expert system - medical diagnosis

- ▶ MYCIN identified the treatment for blood disorders
- ▶ symptoms entered into the expert system,
- ▶ compares them with all the known symptoms
- ▶ in a knowledge base
- ▶ also a series of rules that match the symptom to the problem.
- ▶ to give a diagnosis

## support systems

- ▶ used in the financial services industry
- ▶ assessing investment risk of investing in shares, futures market, loans or in personal finance
- ▶ e.g. customer loan
  - ▶ give personal details, employment history and where live,
  - ▶ expert system will assess credit risk based on pattern of behaviour

## support systems

vary from assessing the individual on a series of rules or a more advanced system using neural networks

rules-based approach

- ▶ no credit if not lived in a location for six months over five years
- ▶ or loan is greater than 10% of salary.

neural network approach

- ▶ learn from the history of previous customers
- ▶ what characteristics represented a bad credit risk

## expert systems

mimic human expertise

e.g. medical

- ▶ case histories
- ▶ statistical analysis
- ▶ recommend further tests

User Interface, inference engine, knowledge base

- ▶ facts from experts, answer users query

## expert systems

developed

‘off-the-shelf’

expert system -> knowledge engineering -> knowledge base

backward chaining

query

forward chaining

active

create new rules with new data



## executive information systems (EIS)

information for high-ranking executives

enterprise-wide focus

like DSS

- ▶ data synthesis, trends, case analysis

can browse underlying data - not just query

- ▶ facilitates communication
  - ▶ knowledge management strategy
- ▶ increasingly groupware-orientated

## executive information systems (EIS)

branch of support system

digital dashboard for examining & analyzing information

simple UI, ease of use

access to internal & external data

- ▶ spot trends, make forecasts, different types of analysis
- ▶ “critical success factors” data

executive information systems (EIS)

digital dashboard

integrated information

charts & graphs

up-to-data

rule-based

## executive information systems (EIS)

### executive information systems (EIS)

- ▶ tailored to information needs
- ▶ extract, compress, filter & track data
- ▶ trend analysis, exceptions
- ▶ GUI
- ▶ statistical analysis
- ▶ wide range of platforms & formats
- ▶ supports email & video conferencing

## executive information systems (EIS)

why use an EIS?

- ▶ shared analysis - improve efficiency
- ▶ fast & easy access
- ▶ report effects & trends

## executive information systems (EIS)

avoid failures

- ▶ organization not ready
- ▶ objectives not clearly defined or met
- ▶ too long development
- ▶ support discontinued
- ▶ user dislike
- ▶ lack of understanding from users

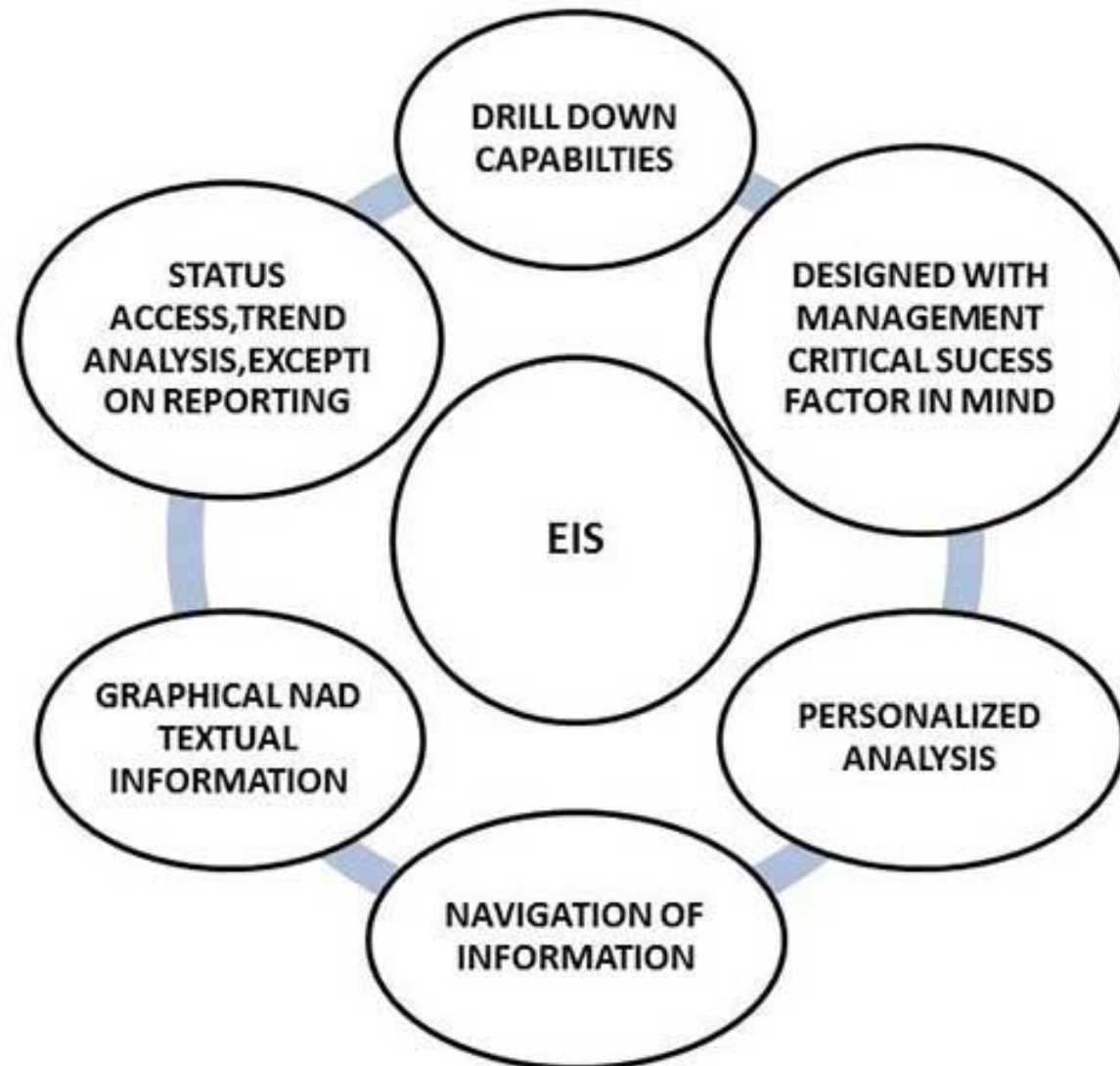
## executive information systems (EIS)

### EIS packages & tools

provides additional tools to

- ▶ track performance, flag exceptions, spot trends
- ▶ investigate / explore
- ▶ admin module    data access
- ▶ builder module    developers
- ▶ runtime module    using the system

## executive information systems (EIS)





## executive support systems (ESS)

- ▶ intended to be used by the senior managers
- ▶ provide support to non-programmed strategic decisions
- ▶ external, unstructured, uncertain
- ▶ not exact scope
- ▶ intelligence based-information
  - Market intelligence
  - Investment intelligence
  - Technology intelligence

## ESS advantages

- Easy for upper level executive to use
- Ability to analyze trends
- Augmentation of managers' leadership capabilities
- Enhance personal thinking and decision-making
- Contribution to strategic control flexibility
- Enhance organizational competitiveness in the market-place
- Instruments of change
- Increased executive time horizons
- Better reporting system

## ESS advantages

- Improved mental model of business executive
- Help improve consensus building and communication
- Improve office automation
- Reduce time for finding information
- Early identification of company performance
- Detail examination of critical success factor
- Better understanding
- Time management
- Increased communication capacity and quality

## ESS disadvantages

- Functions are limited
- Hard to quantify benefits
- Executive may encounter information overload
- System may become slow
- Difficult to keep current data
- May lead to less reliable and insecure data
- Excessive cost for small company

groupware

creation

communication

organization

management

## groupware

### computer-supported cooperative workgroups

- communication
  - synchronous - same time
  - asynchronous - different time
- organization
  - different formats

## groupware

### computer-supported cooperative workgroups

- creation
  - shared files, shared editing
- management
  - shared documents, security = restrictive access
  - cost savings ROI
  - use of information agents
    - project management, progress chasing

## groupware

### issues

- ▶ information overload
- ▶ inappropriate information sharing
- ▶ time wasting
- ▶ human factors



## group support systems (GSS)

### group support systems

- ▶ assist decision-makers working in groups
- ▶ ICT technology
- ▶ good for order & efficiency
- ▶ clearer focus
- ▶ used for:
  - ▶ committees, review panels, board meetings
  - ▶ task forces, multiple decision-makers

## group support systems (GSS)

### advantages

- ▶ less formal
- ▶ time management
- ▶ anonymity
- ▶ better collaboration
- ▶ greater effectiveness

## group support systems (GSS)

### disadvantages

- ▶ no human touch
- ▶ no body language
- ▶ unnecessary meetings
- ▶ higher costs
- ▶ less security

The background features abstract, overlapping geometric shapes in various shades of purple, ranging from light lavender to deep, dark purple. These shapes are primarily located on the right side of the slide, creating a modern, layered effect.

Thank you!  
any questions?