

## Lecture 2: Data Modelling & Databases

### 1. Describe and explain the role of database management systems in ensuring information quality in transaction processing

**Database:** A structured collection of data and information about entities (things) of interest.

**Database Management System:** A software application with which you can create, store, organize and retrieve data from one or many databases

Database management systems can help ensure **validity, accuracy, completeness** and **timeliness** by

- Providing security controls
- Maintaining audit trails
- Providing an integrated enterprise-wide data repository
- Ensuring Robust Transaction Processing via the “ACID” properties:
  - Atomicity: all or nothing (all steps in a transaction are executed, or none), e.g. you can’t withdraw money without debiting your account
  - Consistency: state of system must be consistent from business perspective, e.g. you can’t withdraw more money than is in your account
  - Isolation: transactions execute as if serial not parallel, e.g. two people can’t withdraw the same money from an account
  - Durability: a committed transaction must survive failures, e.g. the system won’t “forget” a deposit once the receipt is issued

Database Management Systems enforce **integrity rules**

- **Relational Integrity**
  - No duplicates or blanks allowed for primary key attribute value
- **Referential Integrity**
  - The value entered in a foreign key attribute, must exist as a value in the corresponding relation’s primary key
  - A student can’t register for a course unless they already have a record in the student relation.
  - Can’t remove a student from the student relation if they are currently registered for a course.

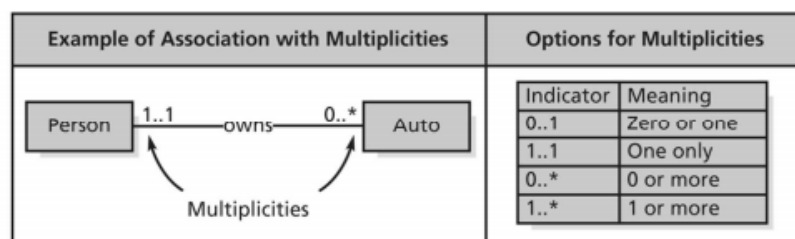
**Relational databases:**

- **Classes** are objects that the organisation wishes to collect data about and from
- Graphically displays the **associations** between classes
- The ways (times) one class can be associated with another class are described as **multiplicities**

**FIGURE 3.3**

#### Multiplicities

Each Person owns a minimum of 0 and a maximum of many Autos. Each Auto is owned by a minimum of 1 and a maximum of 1 Person.



- **Attribute:** data elements that describe details of a class (fields in a database table)

## Lecture 11: Behavioural and Ethical Issues of Accounting Information Systems

### **1. Explain and give examples of key ethical issues relating to accounting information systems**

Customer protection and privacy

- Security and data breaches
- Consent & Privacy laws
- Ownership of personal data
- Access to technology

### **2. Outline the regulatory framework for information privacy in Australia**

Personal information: information that identifies, or could identify, a person.

- Includes names, addresses, medical records, bank details, photos, videos, information about “likes”, opinion, work...
- This information can be captured by an individual's interactions and transactions in an electronic environment
- One way relationship (not give and take) - incursions into legally and socially undefended territory

Businesses can undertake **data mining** and **customer profiling**

- In-store loyalty cards
- Use of ‘cookies’
- Determine which banner ads to display
- Ensure ads are shown in a sequence
- Track the sites the users visits
- New data linkages e.g. Qantas, nib & fitbit

Use to target advertising to individuals

Consent

- Information about users can be gathered
- Without consent of the individual (may be illegal and/or unethical)
- With the informed consent
- With the implied consent – E.g. complete personal information on a webpage and click “next”, implies you agree to forward this information to the website owner

Informational privacy – Regulation & Security guidelines for organisations

- the collection of solicited personal information and receipt of unsolicited personal information including giving notice about collection
- how personal information can be used and disclosed (including overseas)
- maintaining the quality of personal information
- keeping personal information secure
- right for individuals to access and correct their personal information

Surveillance Economy

- Surveillance is the precise opposite of the trust-based relationships
- Organizations should internalize the costs

### **3. Discuss how and why decision makers depart from rational models**

Information has value for the decision maker

- Many decisions are probabilistic with no objectively 'correct' answer
- Normative model of probabilistic judgment – Bayes' Theorem
- Pervasive evidence that human decision makers do not apply Bayes' theorem
- Decision makers have limited cognitive capacity
- Complex judgment tasks are simplified by the use of heuristics (cognitive "short cuts") and biases

Positive & negatives consequences for decision quality

- Service innovations, higher product margins, new business models to improved healthcare
- Misuse of personal information, breaching privacy, profiling of individuals, discrimination

#### **4. Describe and given examples of heuristics and biases in decision-making**

**Representativeness:** Items or events that are viewed as being more representative will be assessed as having a higher probability of occurrence than those that are less representative

- Base rate information is under-weighted
- Other relevant information is ignored
- Examples – auditors' samples, fraud judgments, judgments of loan default or corporate failure

**Availability** - Assessed probability of an event based on the ease with which instances of the event come to mind

- Leads to over-estimation of 'sensational' events
- E.g. terrorism relative to road accidents
- Importance of media in the information set

**Anchoring and adjustment-** An initially generated or given response serves as an anchor, and new information is used to adjust the response

- Insufficient adjustment
- Examples – not changing internal controls to respond to changed risks, auditors anchored to management's financial statement numbers, auditors anchored to last year's work program

Other biases:

- Confirmation bias
- Over-confidence bias
- Hindsight bias
- Escalation of commitment
- Limited attention

How can we reduce the negative effects of heuristics & biases on decision making?

- Education and training
- More use of algorithms & other decision support models
- Change format & presentation of information – better data visualisation