

# COM6655 Professional Issues

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### Liability

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### Aims of this lecture

- To explain the serious impact of computer-aided mistakes.
- To explain legal liability for computer aided mistakes, and how this differs from accountability and responsibility.
- To explain remedies for computer-aided mistakes via contract law, negligence and product liability.
- To review the implications of the Unfair Contract Terms Act 1977 in relation to exclusion of liability.

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SLIDE 2

## Computer-aided mistakes

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SLIDE 3

### Ariane 5 explosion

- Its first flight failed.
- 40 seconds after leaving the ground, at an altitude of 3700m, the rocket veered sharply to one side and was automatically destroyed.
- Payload included equipment built in Sheffield (Cluster satellite).
- Video of the launch can be seen [here](#).

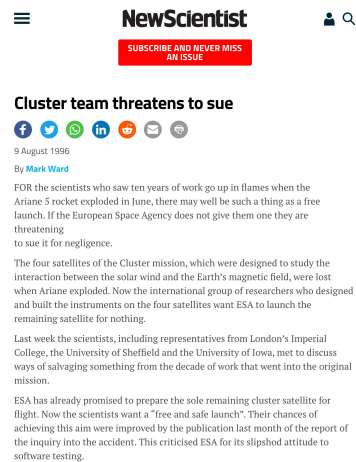


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SLIDE 4

## What went wrong?

- Ariane 5 used some software designed for the earlier Ariane 4.
- Used a module which did calculations related to velocity.
- But Ariane 5 travels faster than Ariane 4, so calculations produced numbers bigger than the program was designed to handle.
- Leading to a numerical overflow, which caused the system to halt.

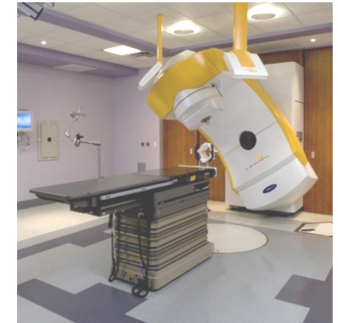


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SLIDE 5

## Radiotherapy treatment

- Therac-25 incidents 1985-1987:
  - Massive overdoses of radiation to 6 patients.
  - Sometimes overdose repeated because machine's display said no dose given.
  - Frequent malfunctions – operators used to seeing error messages for under-doses.
- Why so many overdoses?
  - Manufacturers insisted errors could not have been caused by machine.
  - First patient told the operator she had been "burned" but told this was impossible.
- Overconfidence in software.



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SLIDE 6

## Software and ethical failures

- Volkswagen September 2015: Emissions testing scandal
  - VW diesel cars were emitting up to 40 times more toxic fumes than permitted.
- Diesel cars were designed to cheat in tests
  - Program in engine software let cars perceive if being driven under test conditions
  - If so, it reduces emissions
  - Deployed in 11,000,000 cars worldwide
- Scandal has cost VW \$33.3 billion in fines, lawsuits and other costs
- [https://en.wikipedia.org/wiki/Volkswagen\\_emissions\\_scandal](https://en.wikipedia.org/wiki/Volkswagen_emissions_scandal)

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## Liability for computer aided mistakes

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SLIDE 8

## Accountable vs. responsible

### • Accountability

- The person (or collective group) who is the appropriate agent
  - to respond
  - to give a report
  - to go to jail or pay compensation
  - to bear guilt and remorse

### • Responsibility

- Role responsibility
  - What is socially expected
- Causal responsibility
  - e.g. John failed to stop at a stop sign and caused a car accident
- Blameworthy
  - Council who didn't display a "slippery road" sign

A team leader may be **accountable** even if another team member was **responsible**

## Liability

- Liability is about how the situation is treated **legally**:
  - Who is liable to pay damages or compensate when certain events occur?
  - Legal liability often related to one of the senses of responsibility.
- Example:
  - Software vendor sells software to customer X, but lies about what the software can do. X installs the package, but it crashes and disrupts X's business for several weeks, causing loss of revenue.
- Software vendor may be liable. But X would need to show:
  - Vendor had been dishonest, and failed to fulfil role responsibility.
  - Vendor was causally responsible for the loss of revenue.

## Liability for computer aided mistakes

- Liability for computer-aided mistakes depends on several factors:
  - Whether there is a contract
  - The nature of the software
  - Whether the mistake resulted from an error in a computer program
  - Whether the person using the software was adequately trained
- If a person suffers loss as a result of a defect in a computer product (hardware or software), these areas of law may apply:
  - Contract law
  - Law of negligence
  - Negligent misstatement
  - Product liability (Consumer Protection Act 1987)

## Contract law

- Contractual liability is often the simplest route to a remedy. However, only the parties to a contract can sue upon it, due to **privity of contract**.
- If software is written for a client, this constitutes a contract for the supply of a service between the software developer and the client.
- Such a contract is covered by the Supply of Goods and Services Act 1982 (SGSA) and Consumer Rights Act 2015 (CRA).
  - The supply of AI which provides advice may also fall within the jurisdiction of these acts, since such software could be deemed to be supplying a service.
  - SGSA does not apply to other off-the-shelf software, since software is not 'goods'.
  - CRA makes specific provision for digital content.

## The SGSA/CRA and contractual liability

- The SGSA and CRA imply a term into contracts for the supply of services that the supplier must carry out the service with reasonable care and skill.
- If a supplier does not take reasonable care, they are in breach of contract.
- The definition of 'reasonable' is subjective.

### Consumer Rights Act s. 49

#### Service to be performed with reasonable care and skill

*(1) Every contract to supply a service is to be treated as including a term that the trader must perform the service with reasonable care and skill.*

## Scope of exemptions

- Contracts may include exemption clauses, which exclude or restrict the liability of a party who is in breach of contract.
- However, the scope of exemptions is **limited** by the Unfair Contract Terms Act 1977:
  - Liability for death or personal injury resulting from negligence cannot be excluded or limited.
  - In the case of other damage, liability can only be excluded or restricted where the term purporting to do this satisfied a test of 'reasonableness'.
  - Liability for defective products under the Consumer Protection Act 1987 cannot be excluded or limited.

## Negligence

## Negligence

- Negligence imposes liability on a person who has acted carelessly. To be able to sue in negligence, three essential ingredients must be present:
  1. A duty of care owed to the injured party
  2. A breach of that duty of care
  3. Consequential loss, i.e. loss which is a direct result of the breach of duty of care.
- The **consequential loss** may be to persons or to property.
  - Errors in software may cause loss indirectly.
  - Errors in hardware may cause loss directly (e.g. electric shock)
- Recall *Donoghue v. Stevenson* (1932). No slugs in software or computers, but computer 'bugs' could cause injury or loss.

## Negligence: implications

- The fact that an action in negligence does not depend on a contract has important repercussions:
  - If a program is licensed by a publisher, the program **author** may be liable in negligence even though s/he is not a party to the licence agreement.
  - A person suffering loss through the negligence of a hardware manufacturer will have a claim in negligence against the **manufacturer** even though the contract of sale exists with a dealer.

## Negligence: limitations

- A **duty of care** must be owed to the injured party.
  - A software developer is only liable to those who it is reasonable to believe could be adversely affected by any negligent act or omission.
- The claimant must show that the defendant was negligent.
- **Contributory negligence** – damages may be reduced if the claimant has contributed to the negligence.
  - A badly made computer may be an electrical hazard - but if buyer tampers with it (e.g. trying to fix it), the damages could be reduced in proportion to their contribution to the accident.

## Negligent misstatement (1/2)

- Liability for negligence is significant with regard to software that provides advice.
- Tortious liability for negligent advice is called **negligent misstatement**.
- If advice given by decision support system is incorrect, developers of the system may be liable in negligent misstatement to the recipient.
- These persons include:
  - Experts who provide the knowledge
  - Knowledge engineers who formalise the knowledge
  - Programmers and analysts

## Negligent misstatement (2/2)

- However, two factors may negate or reduce liability:
  - The developers of the system have little control over the way the system is used or interpreted.
  - Liability may be avoided by including a disclaimer which excludes legal responsibility for the advice.
- Note that exclusion of liability is limited by the Unfair Contract Terms Act 1977 (see later).

## Factors affecting liability for decision support or expert system errors

- A person using a system to advise a client is potentially liable under contract and negligence law.
- As with normal software, liability will not be avoided simply because the program has a fault.
- To determine whether there has been negligence, it will be important to consider whether it is reasonable for the person using the system for the purpose of advising others to rely on the system's output.
- This will depend on whether the error would have been made by a competent professional having the standard and type of skill that the defendant is held to have.

## Consumer Protection Act 1987

- Product liability imposes a liability on the producer of a defective product. In the UK, product liability is provided for by the Consumer Protection Act 1987 (CPA).
- The CPA protects consumers from faulty or defective products which cause damage to persons or property.
- Manufacturers and suppliers are obliged to ensure that goods conform to the contract description, are fit for the intended purpose and are of reasonable quality.
- Software does **not** meet the definition of **product** used in the Act. But it does apply to a defective product that **incorporates** software.
- The CPA does apply to computer hardware.

## CPA: state-of-the-art defence

- The CPA allows a **state-of-the-art** defence.
- Manufacturers can claim that they cannot be held liable for designs or products that reflect 'state of the art'
  - *The state of scientific and technical knowledge at the relevant time was not such that the producer of the product might be expected to have discovered the defect*
- Example:
  - Manufacturers of new monitors might be liable under the CPA if alleged links between computer monitor use and illness are proven.
  - Manufacturers of old ones may have a state-of-the-art defence.

## Health and Safety Act 1974

- Concerns responsibility for health and safety precautions in the workplace – most responsibility falls on employers.
- Infringement of this Act is a criminal offence.
- Act also places a duty on designers and manufacturers to ensure equipment is safe.
- Implications for safety-critical software:
  - If person is injured as the result of an error in software of a computer controlled machine, software developers could be liable for prosecution if they cannot demonstrate sufficient care in its design and development.

## Vicarious liability

This is very interesting but not required reading (not examinable):  
[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3850418](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3850418)

- This refers to “secondary” liability
  - Employers might be liable for employees’ actions
  - Parents might be liable for children’s actions
  - Owners might be liable for animals’ actions
- **Q. What about AI systems?**
  - They are not in themselves “responsible” or capable of paying damages
  - If there is a third party behind the system are they vicariously liable (and who is it – vendor? developer?)

## Exemption clauses

- Recall, there are two types: **exclusions** and **limitations**.
- Exemption of liability is limited by the Unfair Contract Terms Act 1977 (UCTA). But this is unclear regarding software, since it states that:
  - *Sections 2 to 4 of this Act do not extend to ... Any contract so far as it relates to the creation or transfer of a right or interest in any patent, trademark, copyright, registered design, technical or commercial information or other intellectual property...*
- (Sections 2 to 4 of the UCTA cover liability for breach, negligence and unreasonable indemnity clauses.)
- But recall: The Salvage Association v CAP Financial Services Ltd (1995), the judge ruled that the exclusion clause was unreasonable.

## Summary

- The reliability of computer systems is largely determined by software.
- The current situation is something of a 'software crisis'. Software is delivered late, doesn't meet requirements and is often of suspect quality.
- A remedy for computer aided mistakes can be provided by
  - contract law
  - the law of negligence
  - negligent misstatement
  - product liability.
- Product liability imposes a liability on the producer of a defective product, but only applies to hardware, not software.
- Software contracts are not exempt from the Unfair Contract Terms Act 1977.