

Chapter 1: Law and Government

- **Jurisdiction:** area covered by a single legal system and set of laws.
- **Civil Law:** rules for settling disputes between people (legal persons).
- **Criminal Law:** set of mechanisms that tries to punish wrongdoers, by fines or imprisonment. It can be considered to represent society's view of the minimum standard of acceptable behaviour. It defines what constitutes a crime, lays down the mechanisms for deciding whether a person accused of a crime is guilty or innocent, and specifies the range of punishments applicable to different categories of crime.
- **Burden of Proof:** prosecution must demonstrate that they are guilty beyond all reasonable doubt. Defendant assumed to be innocent by default.
- **Standard of Proof:** have to show that their claim is correct on the balance of probabilities.
- **Statute Law:** laid down by Acts of Parliament. It is often referred to as legislation. E.g. laws to regulate child labour and laws to prevent the misuse of computers. Increasingly, common law is being replaced by statute law.
- **Common Law:** traditional law that is not written down, but which depends on the judgement of judges over the centuries. When deciding the rights and wrongs of a case, a court will look at the way in which similar cases have been decided in the past; such cases are known as *precedents*. (USA, Commonwealth)
- **Statute Lawmaking in the UK**
 - **Bill:** Initiation/Introduction of a legislation. Set of proposals parliament is invited to discuss, modify and approve.
 - * House of Commons
 - * House of Lords (after this, Act of Parliament)
 - * The Queen (*royal assent*)
 - **Act:** After the bill was approved by House of Commons and House of Lords. The queen cannot refuse to give royal assent. Acts of Parliament constitute what is known as *primary legislation*.
 - **Green Paper:** Government may want to canvass opinion before creating a bill. Explains why the government wants to create new laws in a certain area and discusses a number of possible approaches. The green paper will be discussed by Parliament and comments on it will be invited from the public and from bodies that have an interest in the area (e.g. BCS).
 - **White Paper:** describes the proposed legislation and will be used as the basis for discussing and possibly modifying the details of what is proposed. At the end of this process, the government will take into account these discussions and produce a bill.

Chapter 2: Profession

- **The nature of a profession**
 - substantial education and training are required in order to practise the profession;
 - the members of the profession themselves decide the nature of this training and, more generally, control entry to the profession;
 - the profession is organized into one or more professional bodies;
 - the profession lays down standards of conduct with which its members must comply and, where necessary, enforces these through disciplinary procedures.
- **Professional Bodies:** group of people coming together because of a shared interest in a particular type of activity.
 - code of conduct to regulate the way members of the body behave in their professional lives and a disciplinary procedure to discipline members who breach this code;
 - establishing mechanisms for disseminating knowledge of good practice and new developments to its members, typically through publications and conferences but increasingly also through the use of the internet;
 - setting standards of education and experience that must be met by people wishing to become members of the body;
 - advising government and regulatory bodies about matters within its area of expertise.
- **Reservation of title:** use of the name of the profession may be restricted to those people who are appropriately qualified.
- **Reservation of function:** certain activities are restricted to people with appropriate qualifications
- **Software Development as engineering:**
 - designing and building things that must work properly, that is, must meet a set of predetermined requirements concerning their functionality, their performance, and their reliability;

- the process of designing and building the object must be completed within specified constraints of time and budget.
- **The Status of Engineers**
 - USA: extreme form of regulation; some states forbid software engineering
 - UK: anyone can be an engineer and do engineering
- **International Recognition of Engineering Qualifications**
 - EU: if you're qualified to practise your profession in one country of the EU, you are qualified to practise it in any country of the EU.
 - Washington Accord: Australia, Canada, Ireland, New Zealand, the UK and the USA decided that the standards and procedures are similar enough for them to recognise degrees from others.
- **Compulsory Registration of Software Engineers**
 - Not realistic in UK - impossible to enforce; software development could go underground
 - Implementation of critical software should be under the control of a registered software engineer.

Critical system - system whose failure could result in physical injury or death.

Chapter 3: Bodies in Computing

- **The development of Professional Bodies**
 - USA first with IEEE-CS and then ACM
 - UK follows with BCS, equivalent to ACM and its own IEE

Professional Conduct

- Code of Conduct: standards of behaviour that members of the body are expected to follow in their professional life
 - Public Interest
 - * carry out pro duties with care and diligence;
 - * point out consequences if their opinion is ignored.
 - Duty to Relevant Authority (employer/school/client)
 - * avoid conflicts of interest: husband/wife contract;
 - * avoid misrepresentation: lie about competencies;
 - * avoid passing confidential stuff without permission.
 - Duty to Profession
 - * what is expected of members to uphold the reputation and good standing of the profession
 - Professional Competence and Integrity
 - * keep their professional skills up to date;
 - * encourage those who work for them to do the same;
 - * follow appropriate codes of practice and other standards;
 - * not to claim to be competent in areas where they are not.
- Code of Practice: best way to practise your profession

Education

- own system of professional examinations and grants approval to suitable organisations that provide courses to prepare students for them.
- accredits degree programmes offered by institutions of higher education.
- sets the syllabus for a range of vocational qualifications and accredits training organizations to provide the associated short courses.

Professional Examinations

A route by which those who had acquired professional skills in computing as a result of their experience could have these skills recognized and thus qualify for professional membership of the Society.

Three stages: the Certificate, the Diploma, and the Professional Graduate Diploma.

Accreditation and exemption

The typical situation for the BCS is that a university wishes to have several of its degrees accredited. It prepares a substantial submission to the Society. Detailed descriptions of the courses are required, as well as copies of recent examination papers and final-year student projects. A panel from the Society then visits the university to talk to the staff and students and inspect the facilities.

Short courses

Through its Information Systems Examination Board (ISEB), the Society offers a substantial range of qualifications achievable through short courses. The courses are intended as training courses for staff working in the industry.

Continuing Professional Development

The systematic maintenance, improvement and broadening of knowledge and skill and the development of personal qualities necessary for the execution of professional and technical duties throughout the individual's working life.

All members of the Society receive a copy of the Society's monthly publication, The Computer Bulletin.

The advancement of Knowledge

The Royal Charter of the BCS states very specifically that one of its objectives is to advance knowledge of computing. Indeed, when the Society was founded in 1957, this was its main concern. One of the first actions of the BCS when it was formed was to establish The Computer Journal.

Membership Grades

The BCS has three major membership categories: standard grades, professional grades and chartered professional status. Membership in the professional grades requires degree level qualifications in IT or substantial experience. For chartered professional status, both degree level qualifications and substantial experience are required.

The criteria for membership in the professional and chartered professional grades are flexible but, for that very reason, they are complicated. The descriptions given below are very much simplified and the BCS web pages should be consulted for precise and up-to-date information. Membership at any level requires a commitment to compliance with the Society's Code of Conduct.

The standard grades

Affiliate, Companion, Student and Associate.

The professional grades

There are two professional grades: Member and Fellow.

The chartered professional grades

In order to qualify for Chartered Professional status within the BCS, you must be a Member or Fellow holding the BCS Professional Graduate Diploma including the project or an honours degree that gives you full exemption from the BCS examinations and you must have five years of relevant professional IT work experience.

Official Advice

Professional bodies are widely regarded as the source of the most authoritative advice on their disciplines. It is normal therefore for them to be consulted by the government about changes in the law as it affects the discipline or is affected by it. This consultation may extend over a period of several years, as happened, for example, when the BCS was consulted over the EU Directive on Data Protection and the 1998 Data Protection Act.

Chapter 4: Organisations

Depending on the circumstances, the business may be operated as a sole trader, a partnership, a cooperative, or a limited company.

Sole trader

A sole trader is an individual who runs their own business. - no legal formalities - if the income of your business is large enough, you will need to register with Customs and Excise for VAT - liable for all debts of the business

Partnership

If a group of people carry on a business with a view to making profits, and the business is not a limited company, then the law will treat them as being in a partnership.

- liability of the partners is unlimited
- partners are jointly and severally responsible for the liabilities
- mainly used in professions such as the law, medicine or architecture

Cooperatives

They are important in fields such as agriculture and enjoy a special legal status.

Limited Companies

There are three principles that are fundamental to the concept of a limited liability company:

- The company has corporate legal identity - it is a legal person, completely separate from the people who work in it or the people who own it.
- The ownership of the company is divided into a (usually large) number of shares. These shares can be bought and sold individually. The people who own these shares are known as the members of the company or shareholders.
- In the event that the company incurs debts or other legal liabilities, the owners of the company have no obligation to pay these. The most that shareholders stand to lose is the money they paid for their shares.

The UK recognizes two main types of limited company, the *public limited company (plc)* and the *private limited company*. The essential difference is that a plc can, if it so wishes, offer its shares for sale to the public, but a private limited company cannot.

It must provide details about itself to Companies House, where they are available to the general public, and these details must be kept up to date. It must produce annual accounts and an annual report.

Until the middle of the 19th century, the only way to create a limited company was through an Act of Parliament or the issue of a Royal Charter, both very slow and expensive routes.

Constitution of a limited company

In order for a company to be registered, it must have a constitution. This consists of two documents: the *memorandum of association* and the *articles of association*.

Memorandum of association

- name of the company
- country registered
- objects of the company - type of business company will engage in
- liability clause - liability of members is limited
- company's share capital and the number and nominal value of its shares

Articles of association

More complicated and technical - number of directors, how directors are appointed and removed, what their powers are, what happens when new shares are to be issued, what process is required in order to modify the articles, and so on.

Default is *Table A*, companies only specify how theirs changes.

Directors

Represent employees and shareholders. A director who has an interest in a contract made with the company must disclose this interest to the board of directors.

Directors are required to keep themselves aware of the company's financial position and not allow it to continue to incur debts when they know or should have known that the company will be unable to repay them. If they fail to do this, a court can make them personally liable for the company's debts.

Secondly, the directors are responsible for drawing up the company's annual report, including its accounts, and for filing this report with Companies House.

Thirdly, the directors are responsible for ensuring that the company complies with all relevant provisions of the law.

Many companies have both *executive* directors and *non-executive* directors. Executive directors are normally also employees of the company, with specific responsibility for certain areas of its activities. Non-executive directors are directors who act in an advisory capacity only.

The *company secretary* is legally responsible for keeping the various records that the company has to maintain and for submitting various statutory returns to Companies House in Cardiff.

Setting up a company

A limited company is created by a group of people each agreeing to subscribe a certain amount of money to set up an organization to pursue some stated goal and to register the organization as a limited company in accordance with the law.

In the UK, the process of setting up a limited company is straightforward and it can be done quite quickly and cheaply. The commonest way of setting up a company is to buy an 'off-the-shelf' company.

Non-Commercial Bodies

Statutory bodies – set up by act of Parliament e.g. local unitary authorities. Royal Charter: sets up free-standing bodies that are independent of the state, e.g. Universities

Not-for-profit organisations (often established as companies limited by guarantee)

– Charities – Professional organisations: BCS, Institute of Physics – Political Parties

Chapter 9: Structure and management

Arranging the activities of the enterprise in such a way that they systematically contribute to the enterprise's goals.

Organization Chart - How the organisation is structured showing lines of control and responsibility.

Structures

- Simple structure
- Functional structure
- Divisional structure
- Matrix structure
 - There is a need for strong functional specialisation e.g. fluid dynamics, control specialist, engine specialist in an aircraft manufacturer.
 - People are permanently employed in one department and get line management from there.
 - There is also a need to coordinate projects and so day-to-day work is allocated by a project manager who is attempting to deliver the project.
- Team-based structure
- Boundaryless organization
- Mechanistic organization
- Organic organization

Chain of command – The management principle that each person should report to at most one boss.

Span of control – The number of people a manager can have under their direct control.

Authority - The manager's right to give orders and expect them to be carried out.

Responsibility – The obligation to perform assigned activities.

Power – The capacity to influence decisions (individually or collectively).

Line authority – The authority of a manager has over someone who is below them in the chain of command.

Staff authority – Positions that have some authority to assist managers, e.g.

- Health and safety – have the authority to stop some operations
- Human relations – authority to control practice of hiring, firing, promotion, this authority ensures the company is not open to litigation by employees.

Types of Power

- Legitimate: Power based on position in the organisational structure
- Coercive: Power based on fear
- Reward: Power based on the capacity to deliver something of value
- Expert: Power based on training, skill, expertise

Authority and Responsibility

- Authority can be delegated but responsibility cannot.
- Delegation is often the most efficient way to organize.
- Make a delegated task clear with clear completion criteria.
- Delegate - but remember the responsibility is not delegated.
- Know what to delegate.
- It is important to think about how much discretion is needed to carry out a task (and the delegated person may not have that).
- Responsibility should not be greater than Authority.
- Authority should not be greater than Responsibility.
- Accountability has to do with demonstrating results. . .
- Employees should not delegate work to their managers.

Departmentalisation

- Functional: Grouping of activities by the functions performed by group
 - airline scheduling, hotel reservation, sight-seeing
- Product: Grouping of activities by the product or product category the activities produce
 - football, tennis, golf
- Customer: Grouping of activities around the categories of customers served by the activity
- Geographic: Grouping of activities by the geographical region served
- Process: Grouping of activities by the work flow carried out or by the flow of customers

Organizational Network

– Individuals are the unit, networked into groups.

Informal Networks

– Relationships and cooperations that do not follow a formal structure and chain of command – more flexible personally negotiated.

Formal Organizational Network

- A network designed with particular characteristics e.g. diversity of background, coverage of necessary expertise.

Electronic Organizational Networks

- Using remote collaboration technologies to carry communication...