

Figure 11.4 Value management process.

to assess risk and develop risk registers. However, there is increasing interest in a more generic interpretation of the risk management process. Since the mid-1980s many authors have suggested that the management of construction projects, large or small, benefits from a greater understanding brought about by the application of risk management techniques. Heightened awareness of risk is evidenced by a broad range of guidance documents for practitioners undertaking risk management procedures, e.g. CIRIA (Godfrey, 1996), HM Treasury (1997), Association for Project Management (1997), Institute of Civil Engineers *et al.* (1998), BSI (2000) and RICS (2000). Perry and Hayes (1985) were among the first authors to recognise the benefits that risk management might bring to the construction industry. They concluded that risk and uncertainty were not the sole preserve of large capital projects, but that factors such as complexity, speed of construction and location also contributed to the inherent risk within a project. They identified a three-stage process that comprised:

- Identification;
- Analysis; and
- Response.

A recent risk management study (Wood and Ellis, 2003) revealed that a broad range of clients, e.g. developers, pharmaceutical and oil companies, banks, insurance brokers, government organisations, transport and utilities, were demanding risk management studies. The latter, in particular water, gas and power, adopted rigorous procedures as a matter of routine.

Risk identification

Commonly, risks are identified in workshops or by interviewing key project stakeholders. Those that surface may, for example, include buildability, health and safety, or logistics. On occasion, at this stage in the process, Probability Impact Analysis charts are used to gauge the expected impact of these risks and the probability of them occurring. However, almost certainly, risk registers are developed that identify the members of the project team who are to be held responsible for mitigating the effects of the risk should they occur. It is widely recognised as an important stage in the risk management process, as it leads to a greater understanding of the project.

Risk analysis

Flanagan and Norman (1993) provide a useful classification of risk analysis techniques, namely, decision trees, sensitivity analysis and probabilistic analysis. The former, based on a series of either/or decisions is seldom used in practice, unlike sensitivity analysis which often finds application at feasibility stage. However, it is the latter which is most widespread. With the aid of risk management software, Monte Carlo simulation considers the likely impact of risks in combination. Programs such as @Risk, Primavera and Crystal Ball are all capable of generating probability distributions, and illustrating the likely effect of risk variables on the economic return of the project, typically involving between 1000 and 5000 iterations. Rarely will these calculations be attempted during the workshop, but the findings are nearly always presented in a report for project team members.

Risk response

Crucially, it is at this stage that action is taken to mitigate risk. Once again, Flanagan and Norman present a model of the process, suggesting that responses may take the form of risk avoidance, transfer, reduction or retention. Yet the distinction between risk reduction and transfer is by no means clear. Rather than classify responses under a series of discrete categories it is helpful to plot the various responses to risk on a continuum (Fig. 11.5) to illustrate the inter-relationships that exist.

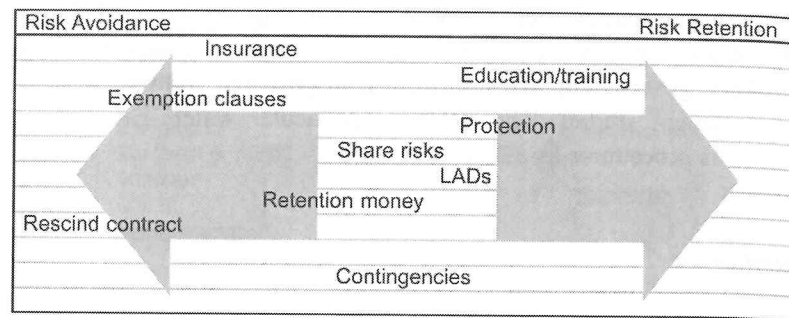


Figure 11.5 Risk response continuum.

Collaborative workshops

Phillips (2002) recognises the considerable potential of a value methodology in promoting a group thinking process. As discussed earlier, both value and risk management approaches rely principally on workshops, which draw together key project stakeholders and encourage participants to reflect on issues that impact upon organisational and project success. These workshops provide what Phillips describes as a very powerful, 'fast tracking' consensus development tool, that aids the transfer of business culture and practice and has the ability to overcome adversarial relationships, resulting in a team approach that leads to joint ownership and a commitment to the end product.

Similar benefits are acknowledged by Bovis Lend Lease during the management of a major capital investment programme for BP (Locke, 2002). Not only were significant value enhancements secured, but they were also able to focus the team on the overall project Vision and Charter through the involvement of all project stakeholders, rather than the contract. The following benefits are cited:

- Long-term relationships work to the advantage of both parties and their associates.
- It provides a catalyst to align objectives, change culture, improve value through innovation.
- Mutual benefit is based on respect and co-operation.
- It builds and maintains the relationship.
- It facilitates bold decision making and change management.

Summary

There appears to be widespread agreement that value management, risk management, supply chain management and partnering all seek to achieve the same overall goals. That is:

- to make projects better value for money;
- to make projects less risky; and
- to make projects that can more reliably deliver client goals.

Yet there is also a view that the vast majority of projects that are built only meet the true functional requirements of the client by pure chance. Value management has greatest impact at the inception stage of a project, but it is widely regarded as being under-utilised – risk management is more dominant. Only when these services are viewed as being central to the project delivery process are construction clients likely to achieve best value.

There is little doubt that value and risk management will increasingly contribute to project success, but much will depend upon achieving real cultural, organisational and attitudinal change and openly and maturely dealing with the realities of buyer/seller relationships within a market economy. Put another way, it is extremely important for all organisations within the supply chain to be able to move towards collaborative approaches, which more effectively balance business relationships and commercial issues.

Student activity

An Employer (E) wishes to construct a state-of-the-art leisure complex. A site has been found, a scheme design has been prepared and funding to a set level based upon contemporaneous 'pre-lets' has been secured.

E needs to move quickly in order to exploit the particular leisure 'niche' before competitors act and capture a larger share of the market.

A pilot project has been constructed elsewhere in the country, upon which the scheme design has been based. It is known by Contractor C, via contacts among sub-contractors involved, that the pilot was completed successfully, although some eight weeks late and significantly over budget. It is also known by C that, although the pilot was completed some eighteen months previously, the final account had not been resolved and there were numerous contractual disputes.

C has tendered in competition with the original contractor who constructed the pilot and there is little between the bids in terms of cost. However, E is faced with the following difficulties:

- Both bids significantly exceed the current budget.
- The spatial requirements of the development appraisal will not fit within the existing scheme design and a substantial redesign is necessary.
- There is no time to redesign from scratch and re-tender, since the development appraisal demands an earliest possible start to trading.

C's was not the most competitive tender, however, and E elected initially to negotiate with the original contractor. Evidently the negotiations did not proceed

satisfactorily, however, and E has approached C with a view to trying to negotiate a contract for the construction of the facility.

C's dilemma

C realises that they have an opportunity to negotiate a sizeable contract with an employer who is committed to proceed with a project which will, from day one, be subject to wholesale re-designs leading to a substantial variation account, inevitable delays and disruption to progress, which will lead to loss and expense claims.

On the other hand, C wishes to avoid the disputes, preserving his relationship with E and with his sub-contractors and freeing up his valuable technical resources soon after practical completion. People have said that, by improving relationships between the parties, this can benefit everyone involved: C and his sub-contractors will improve their margins; E will receive his building on time and at a reduced cost and the designers will be left to concentrate upon key issues and increase their productivity accordingly. These people are surely heads-in-the-clouds academics and know nothing of the real world!

Question: How is it done?

Chapter 12

Managing Innovation in Construction

There is consensus among governments, researchers and within the construction industry that a relationship exists between an organisation's efficiency or profitability and its ability to innovate (DTI, 1998; CRISP, 1997; CIC, 1993; Egbu, 1999a, 1999b, 2001a). Innovation is viewed as a major source of competitive advantage and is perceived to be a pre-requisite for organisational success and survival (Egbu, 1999a).

'Innovation is the successful exploitation of an idea, where the idea is new to the unit of adoption' (Egbu, 2001a, p.1). Innovations come from many different sources and exist in many different forms. There is a dichotomy between radical and incremental innovation. Innovation can be radical, in response to crisis or pressure from the external environment, but it can also be incremental where step-by-step changes are more common. Moreover, a common typology distinguishes product and process innovation. Product innovation describes that, where a new product is the outcome, it is seen to focus on cost reduction by obtaining a greater volume of output for a given input. Process innovation denotes innovation where the process by which a product is developed is exposed to new ideas and therefore leads to new, often more sophisticated methods of production. It describes new knowledge, which allows the production of quality superior output from a given resource. From the perspective of sources of organisational innovations, there are emergent (from within), adapted/adopted and imposed innovations.

Rothwell (1992) has developed a historical model tracing the evolution of innovation models since the 1960s. His 'five generations of innovation' model explains the transition from the simple, linear models to the complex and interactive models of innovation. In Rothwell's (1992) fifth generation model, innovation is perceived as a multi-faceted process that requires intra- and inter-firm integration, through extensive networking. Similarly, Wolfe (1994) noted that '... Innovation is often not simple or linear, but is, rather, a complex iterative process having many feedback and feed-forward cycles' (Wolfe, 1994, p.411).

In essence, innovation can be viewed as a process of inter-linking sequences from idea generation to idea exploitation that are not bound by definitional margins and are subject to change. Therefore, it is necessary to understand the complex mechanisms of this process and the context in which the innovation takes place.

Challenges associated with managing innovations in organisations

The dynamics of innovation, which have become increasingly intensive, result in high levels of risk and uncertainty arising, for example, from difficulties associated with accessing, transferring and assimilating knowledge that is external to the organisation. These externalities include the heterogeneity of the knowledge sources which are important to innovation; technological complementarities (including those between product and process innovations); cumulativeness, path dependency and incrementalism; compatibility between innovations; user-producer relationships; inappropriability; and bounded rationality.

The following are some of the main challenges that were observed in a study of four innovative UK construction organisations, Egbu *et al.* (1998).

- The inability to link innovation strategy to the wider organisational business strategy.
- Managing the uncertainty and risks associated with innovation (e.g. risks associated with design and buildability of construction projects, technological risks, financial risks, contractual risks and increased exposure to litigious claims, safety risks, risk of complete failure of the innovation).
- Difficulties associated with being able to scan and search the environments adequately to pick up and process appropriate signals about potential innovation.
- Lack of resources and competencies associated with making strategic selections from potential alternatives and triggers for innovations and implementing the chosen innovation.
- Getting members of the organisation to 'buy-into' and support the innovation idea (commitment of the rank and file).
- Difficulty in getting the market to take up the innovation (opportunism and the readiness of the market for the innovation).
- Difficulty in getting the Building Regulators to accept the innovation (e.g. design and the eventual product).
- Difficulty associated with auditing and measuring the benefits associated with innovation.
- Difficulty in understanding and putting in place an appropriate culture for innovation.
- Difficulty in maintaining innovative advantage over the competition once innovation has been implemented.

The innovation strategies of organisations are, however, strongly constrained by their current position and core competencies as well as the specific opportunities open to them in future. In other words, organisational strategies for innovation are 'path-dependent', as is discussed in the next section.

Knowledge management and innovations: building and maintaining capabilities

The ability to innovate depends largely on the way in which an organisation uses and exploits the resources available to it. A vital organisational resource, at the heart of innovation, is knowledge (Nonaka and Takeuchi, 1995). Knowledge is fast overtaking capital and labour as the key economic resource in advanced economies (Edvinsson, 2000). There is a growing acceptance, in competitive business environments and project-based industries, that knowledge is a vital organisational and project resource that gives market leverage and contributes to organisational innovations and project success (Nonaka and Takeuchi, 1995; Egbu, 1999a, 2000).

Knowledge management (KM) is emerging as a vital activity for organisations to preserve valuable knowledge and exploit the creativity of individuals that generates innovation. Knowledge management is important for a number of reasons. Knowledge management is 'the process by which knowledge is created, captured, stored, shared and transferred, implemented, exploited and measured to meet the needs of an organisation' (Egbu *et al.*, 2001). It is important because the rise of time-based competition as a marketing weapon requires organisations to learn quickly. It is important because of the globalisation of operations and because of the growth in the number of mergers and take-overs where multiple organisations must share knowledge in a collaborative forum. In project-based industries the situation is even more complex. Project-based organisations are characterised by short-term working contracts and diverse working patterns. Knowledge management is important in this context because it brings together diverse knowledge sources from different sections of the demand and supply chains achieving cross-functional integration. Understanding how organisations manage knowledge assets for improved innovations is important. There is, however, a paucity of empirical research on KM and its impact on innovation, especially in project-based industries, such as construction (Egbu *et al.*, 1998; Winch, 1998; Gann, 2000).

Knowledge management is highly associated with innovation because of its ability to convert tacit knowledge of people into explicit knowledge (Nonaka and Takeuchi, 1995; von Krogh *et al.*, 2000). This is grounded in the notion that unique tacit knowledge of individuals is of immense value to the organisation as a whole, and is the 'wellspring of innovation' (Stewart, 1997). Given the close connection between knowledge possessed by personnel of the firm and the products and services obtainable from the firm (Penrose, 1959), it is generally accepted that a firm's ability to produce new products and other aspects of performance are inextricably linked to how it organises its human resources. Grant (1996) and Hall (1993) have argued that it is tacit rather than explicit knowledge that will typically be of more value to innovation processes. Yet, tacit knowledge is knowledge that cannot be easily communicated, understood or used without the 'knowing subject'. The implication of the above discourse is that knowledge management that focuses on creating network structures to transfer only explicit knowledge will be severely limited in terms of its contribution to innovation and organisational and project success.

Construction organisations need to determine their positions in terms of processes, services, products, technologies and markets. Since an organisation's innovation strategies are constrained by their current position, and by specific opportunities open to them in the future based on their competencies, construction organisations will need to determine their technological trajectories or paths. This will involve due cognisance of strategic alternatives available, their attractiveness and opportunities and threats, which lie ahead. The organisational processes that an organisation adopts in integrating the transfer of knowledge and information across functional and divisional boundaries (strategic learning) is essential and needs to be consciously managed. As competitive advantage and financial success are bound up with industry dynamics, it is necessary to place strategic change in a competitive context and identify what kinds of changes lead to strategic innovation, and when these changes result in benefits for the organisation.

Core capabilities and competencies are difficult to imitate and provide competitive advantage for organisations. Leonard-Barton (1995) suggests that core capabilities are built through a knowledge building process that is clustered around four learning styles – present problem solving, future experimenting and prototyping, internal implementing and integrating, and external importing of knowledge. Grant (1995) sees resources and capabilities as keys to strategic advantage and notes that organisations must build and maintain capabilities if they are to innovate. Similarly, for Teece and Pisano (1994), an important capability is the expertise to manage internal and external organisational complementary resources. Through collaboration and by forming long-term relationships, construction organisations are able to learn from projects and transfer knowledge to an organisational base and along supply chains.

Innovation might be thought of as a process of combining existing knowledge in new ways, often termed 'resource combination' (Galunic and Rodan, 1998). Resource combination depends on a cognitive process of 'generativity', which is the ability to form multipart representations from elemental canonical parts (Donald, 1991). This cognitive integration or 'blending' is at the heart of the creation of novelty. Since generativity is in essence a combinatorial process, the more knowledge that we collectively accumulate, the more opportunities there are for the creation of innovative ideas (Moran and Ghosal, 1999; Weitzman, 1996).

Organisational innovations and strategies: critical success factors

A variety of factors have been identified as influencing the rate of innovations in organisations. This can be seen through different schools of thoughts and perspectives. The individualist perspective, which is grounded in social psychology, is predicated on the assumption that the individual is the source of innovation. They are the 'champion[s]' (Madique, 1980) or 'change agents' (Rogers, 1983) in an organisation. In contrast, the structuralist perspective hinges on the idea that the

structure and function of an organisation is the fundamental dynamic of innovation. There is, however, a highly charged debate about what components of an organisation have a bearing on innovation and how they are determined. For example, the link between organisational size and innovative capacity is fiercely contested. Some suggest that larger organisations are more innovative, while others stress that a company's size does not matter (Rothwell and Dodgson, 1994). It is also assumed that the organisational characteristics such as structure, strategy and longevity play a central part in organisational innovations. The structural variables of centralisation, formalisation, complexity and stratification have been shown to have contrasting effects at the initiation and implementation stages of the innovation process (the so-called 'innovation dilemma'). Low levels of centralisation and formalisation, and a high level of complexity facilitate the initiation stage of the innovation process. The implementation stage is facilitated by high centralisation and formalisation and low complexity. The consensus view is that a high level of stratification inhibits innovation, because it leads to over preoccupation with status and insufficient freedom for creative thinking. The consensual view points out the deleterious effect on creativity of the 'elevator mentality' of organisations dominated by rigid vertical relationships and 'top down dictate'. Similarly, 'an organic, matrix and decentralised structure could provide the creative individual with freedom sufficient to be creative'.

It is therefore important to take a more multivariate approach to understanding organisational innovation. The integration of both the individual and organisational levels of analysis to achieve a synthesis between action and structure should be encouraged. Attempts to incorporate these diametrically opposed concepts have influenced developments in process theory. The process perspectives on innovation need to recognise the unpredictable and dynamic nature of innovation. It is therefore a complex process with cognitive, social and political dimensions that should be understood in particular organisational contexts.

Van de Ven *et al.* (1989) have argued that there is the need to create an organisational culture by definition of aims, embodying purpose through structure and systems, defending integrity of organisation and ordering internal conflict. For Tatum (1987), a climate favourable to innovation must be achieved by committing resources, allowing autonomy, tolerating failure and providing opportunities for promotion and other incentives. It therefore follows that an organisation must be flexible enough to facilitate the innovation process.

Leadership is an organisational responsibility. The value of institutional leadership is useful in the creation of structures, strategies and systems that facilitate innovation and organisational learning. It should build commitment and excitement, collective energy and empowerment (Van de Ven *et al.*, 1989). Innovation responds to market demands and technological progress. Therefore, the climate of the market has a significant influence on the innovation process. A turbulent environment, where the organisation is in crisis, is likely to induce the adoption and implementation of radical innovations. From the discussion so far, it has been stressed that innovation is a complex, context-sensitive social process. No one best

strategy exists or is suitable for managing innovations in every organisation. However, any meaningful innovation strategy should have unequivocal support from the top. Its objectives need to be communicated and be accepted by the rank and file within the organisation. An innovation strategy needs to sit naturally within the overall strategy of the organisation. In addition, it is important that it is monitored and reviewed as appropriate.

An organisation's competitive advantage can come from various sources such as its size or assets. In a study of four innovative UK construction organisations, however, Egbu *et al.* (1998) observed that construction organisations are able to gain competitive advantage by innovating through their dynamic capabilities – by mobilising knowledge, experience and technological skills. In the main, these have been achieved through one or a combination of the following:

- focusing on a particular market niche;
- novelty – offering something which no other organisation can;
- complexity – there are difficulties associated with learning about their processes and technologies, which keep entry barriers high;
- stretching the basic model of a product/process over an extended life and hence reducing overall cost;
- continuous movement of the cost and performance frontiers;
- integrating the person and the team around the product and service.

Although the building of dynamic capabilities or core competencies is vital for organisational innovations, it is, however, important that core competencies do not turn into 'core rigidities', especially when established competencies become too dominant and important new competencies are neglected or underestimated.

The issues of culture and climate are vital when considering conducive organisational environments for innovation as indicated earlier. In studying the four innovative construction organisations, Egbu *et al.* (1998) observed that certain characteristics associated with culture and climate were favourable to innovation. These are:

- The support from top management and the presence of a strong 'innovative champion'.
- 'Flexibility in the lines of communications', allowing top-down, bottom-up and lateral communications within organisations.
- A risk tolerant climate, where it is accepted that lessons could be learned through mistakes.
- A climate where people genuinely feel valued and people feel some form of 'ownership' or involved with the innovation.
- A sharing culture where there is openness and willingness to share information, experience and knowledge across project teams and the organisation.
- A climate where people feel secure in their jobs.

Measuring innovation success

Organisations innovate for many reasons. There are also different drivers that fuel innovation. Organisations might innovate to increase profit share, to enter a new market, to be a leader or first follower in the market, for reasons of status, etc. Organisational strategies for innovation differ from one organisation to another. Similarly, the approaches which organisations put forward for measuring their innovation success, as well as the time frame for judging innovation success, differ greatly. What is perceived to be a highly successful innovation for one organisation may not be seen to be so by another. There are organisations that choose to exnovate after a few years after the release of their innovative products or solutions. There are some that might measure the success of their innovation after a few years. It is therefore important to understand the *modus operandi* of an organisation involved in innovation before the judgement is made as to whether the organisation is successful at innovation or not.

There is still an on-going debate about whether many construction organisations are innovative or not, and whether construction is less innovative than other industrial sectors. Organisations and industrial sectors are impacted on by different constraints and they handle these differently. Understanding the innovation trajectory that an organisation embarks upon gives a better understanding as to whether the organisation has been successful at innovating or not.

The innovation strategies of organisations are strongly constrained by their current position and core competencies, as well as the specific opportunities open to them in the future. In other words, organisational strategies for innovation are 'path dependent'.

The extent to which an organisation is successful in innovation can be measured through different variables. These include:

- The percentage of profit/sales derived from the innovative product/solution.
- The number of new products/solutions introduced over the last 1 to 5 years.
- The number of new/innovative ideas generated within a given period during the course of innovation.
- The average number of man-hour input per new product/solution.
- The average time to market of the innovative product/solution.
- The level of satisfaction of the client/customer of the innovative product/solution.
- The average failure rate of the innovation (during developmental stage, for testability and robustness of the product/solution).
- The extent to which innovation planning is linked to overall organisational strategy.
- The extent to which there are formal mechanisms to capture and share learning associated with the innovation.
- The extent to which the workforce is involved in innovation, supported, recognised and adequately rewarded.

Construction organisations are, in the main, project-based organisations. Networking, Communities of Practice (CoP), story telling, coaching, mentoring and quality circles are important mechanisms for sharing and transferring tacit knowledge in project environments. These should be considered, encouraged and promoted more by construction personnel. Communities of practice are needed to encourage individuals to think of themselves as members of 'professional families' with a strong sense of reciprocity. The human networking processes, which can encourage sharing and the use of knowledge for project innovations, are important. Leaders of construction organisations and projects should also espouse 'the law of increasing returns of knowledge' as a positive way of encouraging knowledge sharing. Shared knowledge stays with the giver while enriching the receiver.

Intuitive knowledge is managed by valuing individuals and not by being heavy-handed through project 'controlled processes'. It is folly to believe that any project organisation can make people have ideas and force them to reveal intuitive messages or share their knowledge in any sustained manner. An individual's intuitive knowledge cannot be manipulated in any meaningful way or controlled without the individual being willing and privy to the process. The process of trying to manipulate or control intuitive knowledge in fact creates their destruction. The issues of trust, respect and reciprocity are vital elements of a conducive environment for managing tacit knowledge. It is through these that individual members of the project can be motivated to share their experiences and exploit their creativity. Leaders of construction projects and organisations would need to recognise, provide incentives and reward knowledge performance and sharing behaviour patterns. Leaders should also take action on poor knowledge performance. The regular communication of the benefits of knowledge management is important in sustaining the co-operation of project team members. A variety of ways exist for doing this, including regular meetings, project summaries, project memos and through project GroupWare/Intranet facilities, where they exist. Every project strategy for KM should consider the training, recruitment and selection of project team members (e.g. sub-contractors and suppliers). It should also pay due cognisance to the team members' competencies, requisite knowledge and their willingness and effectiveness in sharing knowledge for the benefit of the organisations and projects. In addition, the 'absorptive capacity' of the parties involved in the knowledge sharing processes is vital.

Knowledge management and improved innovations: issues of strategy, process and structure

Knowledge management impacts upon organisational and project innovations in many complex ways through a host of inter-related factors. An understanding of these factors and their contribution to innovations is important for the competitive advantage of project-based organisations.

A good internal organisational structure, expressed through the strategies,

processes and culture of an organisation, is one that is flexible but supportive of the ideas propounded by employees. The organisational structure should respond just as effectively to external pressures. For example, Drucker (1995) claims that hierarchical structures become deficient in turbulent environments. In contrast, structures determined by core competencies can adapt to chaotic external pressures more easily. Such competencies should be flexible to meet new customer demands or exceed expectations (Prahalad and Hamel, 1990). Quinn (1985) asserts that excessive bureaucracy can stifle innovation because of, for example, the amount of time it takes to approve every idea. While in small organisations this may require minimal bureaucracy, in larger, more complex organisations the process is always cumbersome. Organisational structures need to sustain equilibrium between creativity and formal systems. Bureaucracy can inhibit spontaneity and experimentation and thus threaten the innovation process. However, bureaucratic structures may also assist the 'rapid and continuous transformation of ideas into superior products' (as cited in Bennett and Gabriel, 1999, p.217).

While the centralisation of an organisation's structure for decision making can create a definite medium of control, a more informal and flexible structure is desirable for knowledge generation (Bennett and Gabriel, 1999). Woodman *et al.* (1993) assert that flexible structures encourage better internal communications and a more change-friendly climate where ideas and knowledge are shared freely.

As aforementioned, the tacit knowledge of the individual is an essential component of organisational success. However, such knowledge is often guarded by those who are reluctant to transfer this 'power' from an individual level to the organisational level (Cole-Gomolski, 1997). Therefore, the employee must be sufficiently motivated to share their knowledge, through incentives. Byrne (2001) argues that the organisational structure should play a part in the encouragement of knowledge sharing. He contends that motivation is a key facilitator of loyalty and trust amongst employees and eventually fosters continuous learning.

Every manager has a vision of the organisation that they work for. The importance of expressing this vision to the rest of the organisation is paramount. Sullivan (1999) argues the need for a long-term vision to be incorporated into the corporate strategy of the company. This is only achievable if the context of the organisation is fully understood. Sullivan (1999) identifies three key areas that should be understood. First, what are the real features of the business, i.e. the core competencies? Secondly, what is the external context, such as the socio-political and economic forces of change and their particular impact on the company? Finally, what is the internal context, e.g. the strategy, culture, performance, strengths and weaknesses of the company? In sum, Sullivan asserts the need for effective management of a company's capabilities, e.g. management of portfolio (intellectual property and intellectual assets), competitive assessment and human capital management. This has the potential for improving organisational innovations leading to competitive advantage and market leverage.

Project-based industries, including the construction industry, are undergoing pressure to compete in new ways. Strategic planning and the need for growth are

seen to require organisations to develop firm-specific patterns of behaviour, i.e. difficult to imitate combinations of organisational, functional and technological skills (Teece *et al.*, 1997). These unique combinations create competencies and capabilities and occur as the organisation's intangible knowledge is being applied in its business behaviour, especially in the value-adding business process. Competitive advantage stems from the firm-specific configuration of its intangible knowledge. The development of core competencies or capabilities creates an environment of strategic thinking, in which knowledge and ideas are key.

Managing knowledge and organisational learning for innovations

Much of the literature on innovation focuses on the need to establish the right kind of organisational culture. Patel *et al.* (2000) stress that it would be a mistake to underestimate the importance of cultural factors in the adoption of KM and organisational learning. More specifically, Tatum (1987) emphasises that a climate favourable to innovation must be achieved by committing resources, allowing autonomy, tolerating failure and providing opportunities for promotion and other incentives. Thus, an organisation must be flexible enough to facilitate the innovation process (Zaltman *et al.*, 1973).

As innovations, especially radical or 'rule breaking' innovations, are associated with challenging thinking, unlearning as well as learning, entrepreneurial organisations appear to need general learning capacity. The ability to learn from others, from the organisation around oneself and from one's own past, is a critical element in making progress.

In order to establish a knowledge-based organisation there needs to be a supportive organisational culture. The cultivation of a 'learning organisation' is an essential requirement for knowledge managers. If an organisation develops a learning culture there is scope for both formal and informal channels of 'dialectic thinking', where individuals develop their individual capabilities through positive experimentation (Bhatt, 2000). Further theories about organisational culture favour the evolution of a 'community of practice' where social interaction of employees cultivates a knowledge sharing culture based on shared interests, thus encouraging idea generation and innovation (Adams and Freeman, 2000).

In all organisations, the politics of knowledge sharing is an issue. Employees and employers from diverse backgrounds often come into conflict over important decisions. It has been suggested that manipulating these tensions to achieve 'creative abrasion' is a strategy to maximise innovation (Leonard and Strauss, 1997). However, it is a challenging task that involves disciplined management. Leadership is an inherent part of organisational culture, but it also extends into areas of strategy and structure. According to Van de Ven *et al.* (1989) leadership is an organisational responsibility. They emphasise the value of institutional leadership to create the structures, strategies and systems that facilitate innovation and organisational learning. Organisations should build commitment and excitement, collective energy

and empowerment. Sullivan (1999) argues the need for a managerial commitment to the long-term strategic vision of an organisation and the motivation to achieve the goals set out. Moreover, empowering employees to generate and share knowledge is the task of management. For example, implementation of rewards and punishment schemes are stimuli for successful KM (Scarborough *et al.*, 1999). Motivating employees to share the knowledge they have involves good people management, where obtaining trust is itself an incentive. The establishment of a psychological contract between employer and employee, for example, is a constructive approach to developing a knowledge-sharing culture (Scarborough *et al.*, 1999).

If knowledge management is to have any real impact on the way construction organisations do business, then it has got to be about making radical changes in the way organisations use knowledge. Knowledge has to be 'made productive'. Managers have critical roles to play in making knowledge productive, in knowledge development and in the exploitation of knowledge for innovative performances. Deepening the understanding and analysis of managers' interest on knowledge is vital to understanding how knowledge management can contribute to improved strategic formulation. For organisations, it is important to make KM an integral part of strategic decisions on profitability and competitiveness of the organisation. In this regard, establish at all levels of the organisation a strategic intent of knowledge acquisition, creation, accumulation, protection and an exploitation of knowledge. The linkages between strategic management and human value need to be carefully examined, and so does the role of a KM orientation in adequately supporting successful strategies. Organisations also need to determine appropriate mechanisms for the effective capture, transfer and leveraging of knowledge. Communication infrastructure needs to be established within and between the different departments and strategic business units (SBU). This should support and enhance the transfer of ideas but at the same time not limit the potential for creativity and the questioning of actual activities that are needed to understand the challenges in the wider environment, and may be a source of new solutions to problems.

Knowledge management is about mobilising the intangible assets of an organisation, which are of greater significance in the context of organisational change than its tangible assets, such as information communication technologies (ICT).

While information technology is an important tool for a successful organisation, it is often too heavily relied upon as a guarantee of successful business. Edvinsson (2000) contends that such tools as the Internet are merely 'enabler(s)' and that the true asset of an organisation is the brainpower of its workforce. He stresses that it is the intellectual capital of an organisation that is the key to success (as cited in Dearlove, 2000, p.6). Thus, KM is not just about databases or information repositories. 'In computer systems the weakest link has always been between the machine and humans because this bridge spans a space that begins with the physical and ends with the cognitive' (McC Campbell *et al.*, 1999, p.174). Notwithstanding this, the important role of information communication technologies in knowledge (especially for explicit knowledge) capture and retrieval, and their implication for

innovations in the construction industry has been well documented (Egbu and Botterill, 2002; Egbu, 2000).

E-business initiatives and the construction industry

The introduction of the Internet and Internet-related technologies has affected the rules of conducting business (Cannon, 1996; Kalakota, 2001). These technologies now introduce electronic business or e-business opportunities to organisations. Some construction organisations are in the throes of embracing the Internet as a core element of their business strategy.

E-business allows organisations to transfer their business processes on-line to collaborate in real time, internally and externally, with their clients. Our early findings have indicated that the application of e-business initiatives in construction organisations is limited to the use and exchange of information along the construction supply chain (Ribeiro and Henriques, 2001). Moreover the construction industry is slow in taking up e-business initiatives compared with other industries, such as the manufacturing, automotive and aerospace industries.

E-business involves any 'net' business activity involving telecommunication networks that transform internal and external relationships to create value and exploit market opportunities, driven by new rules on the connected economy (DTI, 2000, 2002b; Turban, 2000). The implementation of e-business essentially requires appropriate knowledge assets to be readily available with appropriately trained personnel, hardware and software in place. E-commerce refers to conducting electronic transactions, which is the buying and selling of goods and services on-line (Turban, 2000). This allows organisations to purchase products and services on-line from their supply chain partners. There are three main types of e-commerce – business to consumer (B2C), business to business (B2B) and consumer to consumer (C2C). E-business refers to a broader definition than e-commerce.

Developments in the Internet and e-business are constantly changing and some construction organisations are now realising the benefits associated with e-business as a core element of their business strategy. E-business has the potential to cause significant change in economic activities within the construction sector, by impacting substantial improvements in products and processes. It can also help by reducing transaction costs and extending market reach by allowing round-the-clock trading. It also helps with economy and the speed of construction business and enriches interdisciplinary relationships and organisational culture (Bogdanov, 2001; UKonline, 2002).

With the advent of Internet technology, there is now more room for organisations to compete locally and globally. The widespread electronic linking of individuals and organisations has created a new economic environment, in which space, time and size are less limiting factors (Barnes and Hunt, 2001; Kalakota, 2001). E-business initiatives provide the channel for conducting business as part of an individual's or group of individuals' day-to-day work in decision-making (Fahey, *et*

al, 2001; Malhotra, 2002). It could help achieve three important goals, which are: superior external performance, including marketplace and financial returns, superior internal operating performance through operating efficiencies, and an enhanced quality of life for individual members of the organisation.

Some of the processes which KM and e-business can facilitate in the construction industry include the timely exchange of appropriate and accurate information/knowledge assets to the right person(s). This includes tenders, enquiries, quotes, dispatch notes, invoices, credit notes, valuations and site instructions.

For e-business initiatives to be effectively applied, integration must be implemented throughout the organisation and with external business partners. It enables effective partnering, leading to reduced costs and increased benefits. Some specific tangible benefits that can be achieved by e-business in this way are:

- Tender distribution costs can be cut significantly.
- Tender entry time can be dramatically reduced.
- Invoice registration costs can be reduced.
- Re-keying errors, delays and disputes can be avoided.
- Construction organisations can procure materials, plant and any other resources cheaper and better deals can be sought that may be necessary to perform their business outside of their traditional supply chain. Tender documents can be placed on the Internet and contractors and sub-contractors can price them and return them to the issuing authority. This can be achieved without the use of paper and without delays in delivery.

Challenges facing organisations in using the Internet for business activities

E-business initiatives offer the platform for new forms of market place strategy models for construction organisations. However, the main challenges facing construction organisations in using the Internet to commercialise their business assets are associated with cultural, social, organisational, legal and technical issues. These include the following:

- The change of organisational culture to embrace e-business as a core element of business strategy.
- A constantly/rapidly changing organisational culture of business partners (clients, customers) to cope with changing market conditions.
- The inability to cope with the fast changing tools that are offered on the market. This includes the cost of purchasing and the cost of training to use the tools.
- The management task of aligning business strategies, processes, and applications quickly, correctly, and all at once.
- Agility is the key to survival in the new economy but construction organisations are slow to respond to changes.

- The lack of strong and decisive business leadership with the lack of foresight of future business trends.
- The lack of technical expertise available within organisations, especially small and medium sized enterprises.
- The cost of acquiring Internet-based software and hardware tools to facilitate their business processes.
- The uncertainty and risks of changing from the 'old' business model to the 'new' business model. The uncertainty of doing business on-line, due to the recent failure of dot.com companies. This has made the construction industry, already a high risk industry and very conservative, unwilling to take further risks.
- The legal aspect associated with contractual liabilities of on-line procurement of goods and services.
- The security of on-line procurement.
- The ability to spot trends quickly and create effective business strategies.
- Technology shifting power to the buyers (consumers) as e-business changes the channels through which consumers and businesses have traditionally bought and sold goods.

In order to overcome these challenges, first, there must be a clear vision for change from the top management. Secondly, the organisation must define its business processes and develop a 'business model' that suits the organisational needs for implementing the new method of doing business using the Internet. Thirdly, there must be appropriate awareness and training provided for the employees of the organisation. Should the organisation lack adequately trained personnel to implement the e-business strategy, the organisation can employ skilled personnel as part of the organisation, or engage consultants to provide this service. Alternatively, the organisation may source technological expertise and tools by forming an alliance with members of the supply chain, who may have these systems operating in their organisation. In this way, the organisation can benefit from the successes of the integrated system. This may help improve the rate of organisational learning, thus helping the organisation to make the transition within a relatively short time.

Without an effective strategy in place, it will be difficult for any organisation to implement e-business strategies effectively in a satisfactory and sustainable manner. Effective knowledge management practices also play a vital role in the implementation of e-business initiatives. Today, an organisation's success depends largely on its ability to innovate and integrate new technologies into service offerings. It will be practically impossible to be innovative without proper KM implementation strategies. KM will help executives become proficient 'trend-spotters' when implementing e-business initiatives. A new generation of e-business organisations must be imaginative in order to change the value proposition radically, within and across their industries (Kalakota, 2001, p.65). Furthermore, any initiatives addressing e-business without a proper KM strategy will soon expose the inability to cope with market demand. It is important to understand what e-business has to offer, and how

KM plays an important role in identifying appropriate knowledge assets. This helps to identify suitable e-business tools and strategy for trading over the Internet.

Summary

Organisational innovations play a vital role in organisational success. Innovation depends on strategic priorities of construction organisations. Knowledge management is about the process by which knowledge is created, captured, stored, shared and transferred, implemented, exploited and measured to meet the needs of an organisation. The development of a knowledge management strategy, a supportive organisational structure and culture, and the introduction of appropriate IT, will all contribute in some way to the implementation and exploitation of innovation.

E-business initiatives offer construction organisations the opportunities for new forms of market place strategy models for construction organisations. Organisations that previously conducted business activities during traditional hours can now conduct those procurement activities online 24 hours a day, 7 days a week, 365 days a year. Some of the benefits of e-procurement systems include removal of the intermediaries along the supply chain, thus allowing significant reduction of cost of materials and tighter integration of supply chains. The indirect benefits that drive e-procurement processes include reduced time to market products, growth of the market presence and an increase of quality of products and associated services, an improved forecast of delivery dates and market transparency.

Discussion and questions

Assume that you are a director of a large construction company and a champion of a new radical process innovation emerging from within the company. How might you structure the implementation of this innovation in order to ensure that the minimum possible disruption is made to the structure and culture of the organisation, while fully exploiting the innovation for your organisation's competitive advantage?

Innovation is about managing chaos. It is also about serendipity. There is no one single theory that best describes the management of all innovations in organisations. Do you agree or disagree with this statement? Discuss, giving examples from a construction industry context to support your arguments.



Chapter 13

Managing Supply Chains and Construction Networks

Supply chain management (SCM) is a concept that has flourished in manufacturing, originating from Just-In-Time (JIT) production and logistics. The benefits of collaborative rather than adversarial working relationships within and beyond the organisation, increased market competition, the declining incidence of vertical integration and increased market competition have been offered as reasons for the growth in supply chain management in the last two decades.

The supply chain has been defined as the 'network of organisations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer' (Christopher, 1992).

However, the construction industry has been slow to employ the concept. Issues of interfaces and interdependence in construction are exacerbated by the traditional rigid separation between parties codified in the extant competitive procurement and commercial practices of the industry. In the construction industry, established approaches to procurement, management of materials supply contracts and subcontracting are generally based on aggressive bargaining between buyer and supplier over issues of price, delivery date and payment date, conducted in an atmosphere of legalistic mistrust (Latham, 1994; Egan, 1998). Again, contracts introduce rigid divisions of labour, which cut across critical processes, units of work, and information flow. Moreover, since contracts are released according to a strictly chronological logic, the supply chain is excluded from the earlier phases of the work and cannot provide any contribution either by proposing innovative solutions or by identifying critical interdependencies and issues.

The nature, types and importance of supply chains in construction

There are different types of supply chain management. First, there are development issues including order information transparency, reduction in variability within supply chains, synchronising of material flows, management of critical resources and configuration of the supply chain (Lin and Shaw, 1988). There are strategies for SCM, including the establishment of stable partnerships, modular outsourcing of components, design for suitability for manufacture, flexible manufacturing

technologies, evolution of the supply chain with the product life cycle, and information acquisition and sharing. There are also levels of SCM that can be distinguished, including initial partnership (e.g. building good relations with suppliers and distributors), logistics management, and a real, genuine continuous improvement of all aspects of the entire chain (Giunipero and Brand, 1996).

The supply chain encompasses all those activities associated with moving goods from the raw materials stage through to the acceptance of the product or service by the end-customers. This includes sourcing and procurement, production scheduling, order processing, inventory management, transport, storage and customer service; and all the information systems necessary to support and monitor these activities.

Successful supply chain management co-ordinates and integrates all these activities into a seamless process.

A model of SCM in construction

In the UK construction industry, there exists a 'myriad of construction supply chains' (Cox and Ireland, 2002). The construction industry is characterised by the following major supply chains: construction 'integration', professional services, materials, equipment and labour. These supply chains display significant overlap. Figure 13.1 illustrates the key generic supply chains that are required in the integration and delivery of a typical solution.

During the construction process, the end customer will appoint the construction firm and professional services where needed. Within the generic supply chain, the construction firm plays the major 'integrating' role for all upstream supply chains. Subcontractors also play a vital role in supply chains. This is increasingly the case, given the rise in subcontracting in construction in the last two decades. For each individual element of a construction project, there will be a requirement to source from the respective labour, materials and equipment supply chains. Procurement professionals sourcing from these chains also play a significant role.

It is difficult to quantify the exact number of constituent supply chains that have to be integrated into a typical project; such a project does not exist because of its unique project-specific properties.

Mechanisms used to set up successful collaborative relationships – implementing SCM in construction

Supply chain management is a long, complex and dynamic process. Its implementation requires a thorough understanding of the concept. It is also seen as closely dependent upon the ability to create, manage and reshape relationships between individuals, organisations and networks within the supply chain. Supply chain management requires considerable commitment and resources, and takes time to develop. It also provides difficulties for and challenges to parties within the chain.

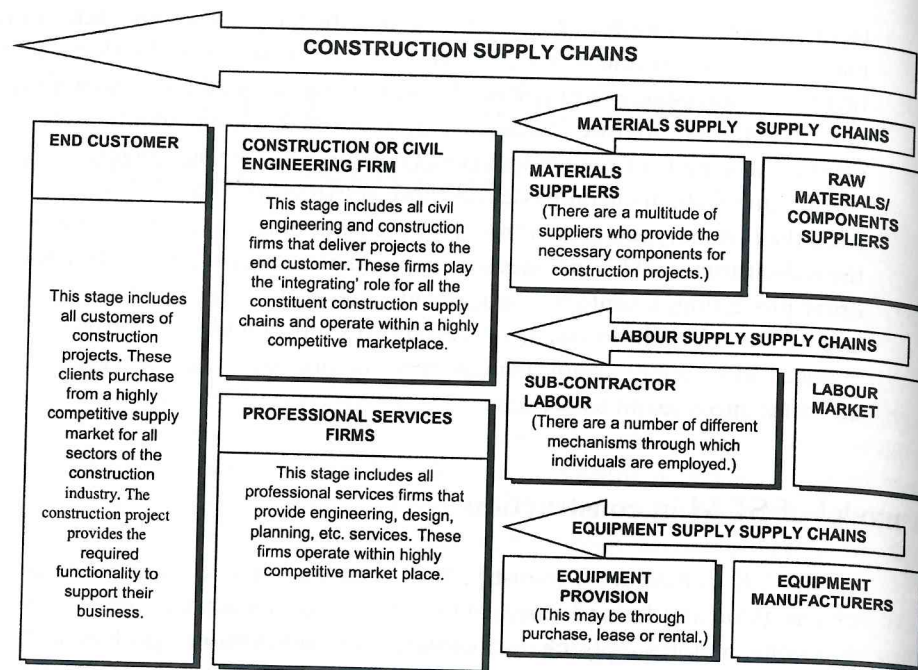


Figure 13.1 The myriad of construction supply chains (source: Cox and Ireland, 2002).

These can include a lack of common purpose, multiple or often hidden goals, power imbalances, different cultures and procedures, incompatible collaborative capability, over dependence, and a continuing lack of openness and opportunistic behaviour (Saad *et al.*, 2002).

Supply chain management has to be introduced progressively and under control, paying due cognisance to the following issues:

- identifying key strategic supply chain partners;
- sharing plans and visions;
- learning from each other;
- being less confrontational;
- becoming proactive rather than reactive;
- exploring joint initiatives and being receptive to change;
- setting SMART objectives for marketing, operations and financial performance.

It is also advantageous, in the chain, to appoint a champion who will have a very positive commitment to the process and its success.

Partnering

For over a decade, partnering as a concept in construction has been promoted within the design and construction community as an effective means of improving

the industry's cost effectiveness, profitability, and responsiveness to client needs and expectations. It offers a new paradigm for building owner and construction industry relations. Adopting a partnering approach, all parties agree from the beginning in a formal structure to focus on creative co-operation and teamwork in order to avoid adversarial confrontation. Working relationships are carefully and deliberately built, based on mutual respect, trust and integrity.

Partnering involves two or more organisations working together to improve performance through agreeing mutual objectives. It also provides a way of resolving any disputes and commits parties to continuous improvement, measuring progress and sharing the gains.

In the construction industry, the partnering approach can be project specific (for an individual project, project partnering) or strategic partnering (for more than one project). The early ideas on partnering centred around three main principles: agreeing mutual objectives; making decisions openly and resolving problems in a way that was jointly agreed at the beginning of the project; and aiming to achieve measurable improvements in performance through incentives. The progression towards the adoption of the principles associated with supply chain management is more evident with the emergence in the late 1990s of the 'second generation' style partnering, which includes a strategic decision to co-operate by the key project partners (Bennett and Jayes, 1998). The second generation partnering often places greater emphasis on a more holistic approach based on a wider range of performance criteria in addition to time, quality and cost and acknowledges the strategic importance of such longer-term business relationships.

Partnering is increasingly being seen as a way of developing a culture based on greater co-operation in longer-term relationships (Bresnen and Marshall, 2000), and a way of addressing the industry's fragmentation and lack of integration. Cox and Thompson (1997) have however argued that partnering is still largely misunderstood throughout much of the industry and is therefore not as unified a concept as many of the other forms of procuring facilities in construction. There is also a number of different perceptions of partnering. It is often used to describe the negotiation that takes place in other forms of procurement, such as two-stage competitive tendering, which again causes misunderstandings, further devalues the concept and has engendered a cynical view of it in the industry. It is suggested that whilst partnering has been used to considerable effect by regular, frequent and more informed clients in more routine and repetitive projects, its impact in the case of infrequent clients and unique, one-off projects is clearly more limited.

To date, most partnering has focused on developing collaboration in upstream relationships between regular and frequent clients, consultants and main contractors (Bresnen and Marshall, 2000), with less involvement of organisations such as specialist and trade subcontractors downstream in the process.

Three core principles underpin the partnering relationship: commitment, communication and conflict resolution. The benefits attributable to partnering include the following:

- Improved communications.
- Better working environments.
- Reduced adversarial relationships.
- Less litigation.
- Fewer claims.
- More repeat business/long-term relationships.
- Improved allocation of responsibility, improved value engineering, and decreased schedules.
- Better control over safety and health issues.
- Reduced exposure to litigation through communication and issue resolution strategies.
- Increased productivity because of elimination of defensive case building.
- Lower risk of cost overruns and delays because of better time and cost control over the project.
- Increased opportunity for innovation and implementation of value engineering in the work.
- Potential to improve cash flow due to fewer disputes and withheld payments.
- Improved decision-making that helps avoid costly claims and saves time and money.

Partnering is a proactive process aimed at prevention prior to dispute. For partnering to have its most effective results, all construction team members should participate in the development of the partnering strategy for the project. A partnering workshop should be conducted during the early stages of the contract process.

To ensure partnering success, the following concepts should be considered and incorporated into the process:

- *Commitment.* Commitment to partnering must come from the top management of all construction team members who have a stake in the project and are called stakeholders.
- *Early involvement of stakeholders.* Owner representatives, design professionals, general contractors, subcontractors and local officials need to be part of the evolution of the framework of the partnership charter.
- *Equity.* Every stakeholder's interests must be considered in creating mutual goals. There must be a commitment to satisfying each stockholder's requirements for a successful project by using win-win thinking.
- *Development of mutual goals/objectives.* At a partnering workshop, the stakeholders should identify all prospective goals for the project in which their interests overlap. These jointly developed and mutually agreed goals may include achieving zero injuries during construction, value engineering savings, meeting the financial goals of each party, limiting cost growth, limiting review periods for contract submittals, early completion, minimising paperwork for the purpose of case building or posturing, no litigation, and other goals specific to the project.

- *Implementation.* Stakeholders should develop strategies together for implementing their mutual goals and the mechanisms for solving problems.
- *Continuous evaluation.* In order to ensure implementation, the stakeholders should agree to plan for periodic joint evaluation based on the mutually agreed goals. This will ensure that the plan is proceeding as intended and that all stakeholders are carrying their share of the load.
- *Timely responsiveness.* Timely communication and decision making will not only save money but can also keep a problem from growing into a dispute. Since every project is unique and the particular stakeholders for each project will vary, the process should be tailored by and for the stakeholders for each project. A partnering process can be developed for any type of project and any size of project.

The following points may guide the partnering process.

- Educate your organisation.
- Make partnering intentions clear.
- Commitment from top management at the start.
- Conduct the partnering workshop.

Prime contracting

Prime contracting was selected as the model for procurement of construction and maintenance services for the defence estate in the 1997 Strategic Defence Review when it was decided that a more effective and efficient process was required for the billion pounds a year that the MoD spends on its estate.

Prime contracting is a fundamentally different approach to the traditional MoD works procurement system. Put simply, a single high value 'prime' contract for delivery of property management services is placed with one company/consortium with payment linked to performance and innovation. The prime contractor will co-ordinate and actively manage his or her supply chain (i.e. the sub-contractors) and ensure that lower-tier sub-contractors are all working to the same objectives of meeting standardised targets and improving efficiency.

This may be compared with the traditional method of estate maintenance procurement, which involves many contracts and many contractors (some more capable than others) which are expensive to operate (due principally to duplicated overheads) and difficult to manage. Under this system there is insufficient incentive for the contractors or their subcontractors to improve their performance. Consequently there is, generally speaking, a lack of long-term vision. Prime contracting will address that deficiency in long-term planning and vision as the prime contractor will be able to view the estate as a whole over the long term and plan the resources accordingly. Furthermore DHE (MoD, Defence Housing Executive) expects the prime contractor, during the contract, to generate savings through, for example,

reduction in their and their supply chains' costs, standardisation of procedures and the use of their bulk purchasing power.

Prime contracting has been used effectively for high value complex equipment procurement projects for many years and now it is being tailored, commensurate with government policy, to the defence housing requirement.

Prime contracting offers significant advantages in terms of providing an overall single point of responsibility, the co-ordination of a pre-appointed supply chain, the principle of whole service procurement, economies of scale, collaborative working and the adoption of an output specification of requirements. The initiative also emphasises the importance of 'soft issues' such as the ability to manage costs, market awareness, innovation, trust and flexibility.

In the UK, prime contracting contracts have been phased across regions. Regional Prime Contracting, Phase One covers Scotland. Regional Prime Contract South West (RPC SW) is the second of five phases in the implementation plan. Phase Three is planned to cover the South East, Phase Four will cover Central England and, finally, Phase Five will cover the East. The programme will see the whole estate let under the new arrangements by the end of 2005.

Benefits are expected to arise through prime contracting as a direct result of proactive management by the prime contractor. These benefits include:

- Easier fault reporting (via a free phone number to a call-centre).
- Appointment agreed with the occupant.
- A quicker, flexible service for routine repairs.
- Consistent approach across all estates in England and Wales.
- Continuous improvement and innovation.
- Greater emphasis on quality control and checking as a direct result of a reduction in bureaucracy.

A government policy initiative to improve works contracting mandates prime contracting as the preferred solution where PFI (Private Finance Initiative) is not an option.

Public private partnerships (PPP) and Private Finance Initiatives (PFI)

Public private partnerships (PPPs) are a generic term for the relationships formed between the private sector and public bodies often with the aim of introducing private sector resources and/or expertise in order to help provide and deliver public sector assets and services. The term PPP is used to describe a wide variety of working arrangements from loose, informal and strategic partnerships to design build finance and operate (DBFO) type service contracts and formal joint venture companies. The present UK Government's commitment to PPPs recognises that neither central nor local government in isolation will be able to finance all the investment needed in the country's public sector infrastructure.

PPPs move away from the doctrinal approaches of the past that saw successive governments believing that either the public or the private sector was automatically best. Now, for both central and local government, who does what will be judged, in future, solely on how services are delivered and whether such services are high quality and good value for money for the local community.

The Private Finance Initiative (PFI) is a form of PPP. PFI refers to a strictly defined legal contract for involving private companies in the provision of public services, particularly public buildings. The Private Finance Initiative (PFI) was a creation of the UK Conservative government in early 1992 – but it has been enthusiastically embraced by the present UK Labour government. Governments and local authorities have always paid private contractors to build roads, schools, prisons and hospitals out of tax money.

PFI is also, principally, a form of contracting or procurement. Under a PFI scheme, a capital project such as a school, hospital or housing estate, has to be designed, built, financed and managed by a private sector consortium, under a contract that typically lasts for 30 years.

The private consortium will be regularly paid from public money depending on its performance throughout that period. If the consortium misses performance targets, it will be paid less. The public sector is looking to the private sector for expertise, innovation and management of appropriate risks. The private sector is looking for business opportunities, a steady funding stream and a good return on its investment.

The characteristics of PFI schemes are:

- A long term service contract between a public sector body and a private sector 'operator'.
- The provision of capital assets and associated services by the operator.
- A single 'unitary' payment from the local authority, which covers investment and services.
- The integration of design, building, financing and operation in the operator's proposals.
- The allocation of risk to the party best able to manage and price it.
- A service delivery against performance standards set out in an 'output specification'.
- A performance-related 'payment mechanism'.
- An 'off balance sheet treatment' for the local authority so that any investment delivered through the project does not count against borrowing consents.
- Support from central government delivered through what are known as 'PFI credits'.

To make a success of a PPP requires new attitudes and skills in order to identify when a partnership route might be best for the public and then to make it happen in practice. Similarly, for the partnership to work each party must recognise the objectives of the other and be prepared to build a good, long-term relationship.

A PPP approach may provide better value because it brings economies of scale. An organisation whose core function is to manage and maintain properties nationwide might be able to bring greater expertise to the task than would a single local authority acting in isolation. A PPP may lead to a more vigorous use of assets to deliver benefits to both parties to the agreement. A PPP forged through negotiation may deliver value for money because the competition process provides a spur to the private sector to perform and step forward with their optimum solution. It may also bring in additional expertise or finance that the private sector has developed on a global scale. But benefits are not automatic from PPPs; they only result from well-planned and rigorously appraised schemes.

Public private partnerships (including the Private Finance Initiative), can provide the public sector with better value for money in procuring modern, high quality services from the private sector. The key to a successful PPP deal is the partnership negotiated between the procurer and the supplier.

The attraction of PFI for the government is that it avoids making expensive one-off payments to build large-scale projects that would involve unpopular tax rises. Also, as the risk of PFI projects is technically transferred to the private consortium, it does not show up as increased public borrowing in the Government's accounts.

According to the NHS plan, more than 100 new hospitals will be provided using the PFI by 2010. In 2001–02 the PFI accounted for 9% of public investment.

However, critics claim that, as with any form of hire purchase, buying a product over a long period of time is more expensive than buying it with cash up front. They point out that governments can borrow cash at a cheaper rate than the private sector.

There is also a question mark over how much risk is genuinely transferred to the private sector, given the Government's record of bailing out private companies managing troubled public services. Growing concern has recently been expressed amongst experts about the cost of PFI. Public sector accountants claim that hospitals and schools would be cheaper to build using traditional funding methods. The national audit office described the value-for-money test used to justify PFI projects as 'pseudo-scientific mumbo jumbo'.

Unions point out that the main way private firms involved in PPPs and the PFI achieve 'efficiency savings' is through cutting staff wages. They point to a two-tier workforce created in public services run by private companies, when former public sector workers on terms and conditions protected by law work alongside poorly paid new joiners with no such protection. Even the Labour Party's favourite think-tank, the Institute of Public Policy Research, which had argued that there should be no restriction on the private provision of public service, has since expressed doubts about PFI. It said that there was little evidence so far that the PFI offered increased value for money, especially in providing new schools and hospitals. However it will take at least a further 20 years, when the first PFI contracts have been completed, before the real cost of PFI can be judged.

Discussion and questions

Effective supply chain management provides benefits to construction organisations. However its implementation raises a host of challenges. Discuss this statement.

Discuss the risks and gains associated with PFI and PPP projects, especially in the context of such projects lasting for up to 30 years?

Chapter 14

Personnel Management and HRM

Personnel management or human resources management?

The department which supports line management in dealing with employees and employment relationships has traditionally been called *personnel management*. In the mid-1980s, the term *human resources management* (HRM) started to take over. This coincided with an important change in thinking, in which the role of personnel management shifted from one of mediating between employees and senior management, to one of supporting corporate strategy by integrating business goals and people management (Pemberton and Herriot, 1994).

As these authors point out, the emergence of HRM seemed to offer a lifeline to personnel staff 'who had long felt undervalued by line managers'. The low status of personnel work had arisen from the view of some people, especially line managers, that personnel management was little more than a clerical job – keeping the people records straight and adding little value.

But *human resources* is the language of slave owners of the eighteenth century who treated labour as a disposable resource. Pemberton and Herriot argue that HRM needs a radical re-think that takes it back to its roots. Its strategic role should be based in its established position as broker between senior management and employees, bridging the gap between business concerns and employee needs, in a way which shows how people's potential can best be unleashed for the benefit of both business and employees. This view recognises that people cannot be treated as simply a factor of production. They are at the heart of the organisation and the management of people is more central to business success than the management of materials, money or plant. People can act on resources in a way that resources cannot act on people. For these reasons, the term personnel management is preferred, despite the widespread use of HRM.

Construction personnel

Because much of its work is one-off and it lacks a factory base, construction is labour intensive compared with most industries. Its personnel costs are high in relation to total costs. This is another reason why labour remains an important asset, especially in the building sector of the industry, and effective management of

people is a key part of every manager's job. Personnel specialists are increasingly employed to support and advise managers.

Even when construction is capital intensive, as in many civil engineering projects, the management of people is still a critical factor. Studies have repeatedly shown that differences in productivity between companies, and even between departments within a company, cannot be solely explained by variations in manufacturing methods. Rather, they result from differences in the way people are managed.

Technology has made the human factor more important, not less so. Disasters show the negative aspect of this – how human error is magnified as technical scale increases. Technology is no protection against people's mistakes or poor judgement. Understanding human behaviour and how to deal with people is therefore a crucial aspect of management.

Personnel management is often misunderstood and undervalued in the construction industry. This is because personnel work is not very 'visible' and its contribution to the business is difficult to measure. Also, it evolved in a piecemeal and somewhat haphazard way, so that it can lack a clear identity.

Moreover, many aspects of personnel management are not easily separated from general and production management, and rightly so! One of the prime tasks of management is to use people's skills effectively. In this sense, all managers are personnel managers and should work within a well thought-out personnel policy.

The personnel function

Personnel departments hardly exist in many construction firms, but the personnel function is present in every firm. It is the process of channelling human energy and skills into achieving business results. Almost every manager is involved in this.

As organisations have become larger and more complicated, work has been broken down into more manageable, specialised jobs. The jobs which are labelled personnel management are those which specialise in designing and operating systems and procedures for recruiting, employing and developing people.

Because of fluctuations in workload, high labour turnover and casual employment, personnel practices and policies have tended to lag behind those of most industries. Also, the industry includes many small firms that cannot afford to employ full-time personnel staff. However, someone still has to do the personnel work. Normally it will be other managers – line managers concerned with production or general management. Some do the personnel work well, but others admit that they neglect this part of their role because other tasks fill their time. These other tasks seem more urgent or important, or appear to have a more direct impact on productivity. The growing body of legislation on employment and other personnel issues has gradually forced organisations to take the personnel function more seriously.

Even among larger firms which do employ personnel staff, there is no typical personnel department. The form it takes usually reflects the firm's special personnel

problems. For instance, most large civil engineering companies have operated safety policies and employed safety officers for many years, because they recognised that they had a safety problem. Similarly, some firms were running training schemes long before the industrial training legislation. Like the football clubs, they had recognised the value of intensive training for getting the most out of their human assets.

Conversely, labour relations have been comparatively good in building, so most firms have not felt the need to employ industrial relations specialists. They have been slow to formulate written labour policies and procedures for consulting with workers and unions.

In nearly every case, firms have concentrated on those aspects of personnel management which have helped them solve their particular problems. Some construction companies, mainly the larger ones, have eventually rationalised their personnel work and brought it under the control of a single manager or director. When this has happened, personnel management has been able to offer a more integrated and long-range contribution to the running of the business. Figure 14.1 shows a possible structure for a well-developed personnel department.

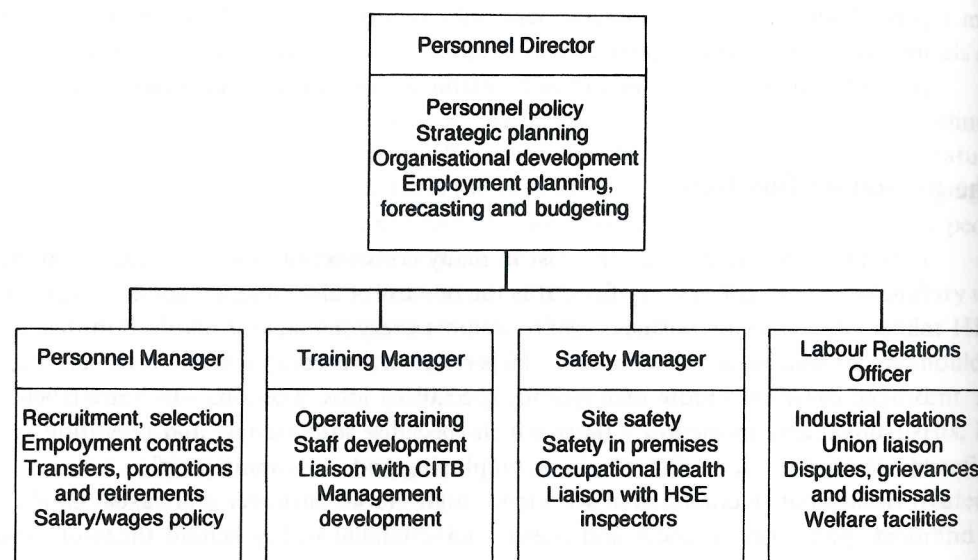


Figure 14.1 Example of a personnel department structure.

The tasks of personnel management

The main areas of personnel management are:

- Employment planning
- Staff development
- Health and safety
- Industrial relations and employment.

These are dealt with in the remaining chapters. However, a well-established personnel department will become involved in other issues, such as:

- Strategic planning
- Organisational development
- Employee remuneration
- Counselling.

These issues are discussed later in this chapter.

Some of the tasks are more strategic than others. For instance, personnel managers increasingly take part in budgetary control and produce staffing budgets. This is important in an industry which relies heavily on labour.

But personnel staff contribute to many day-to-day tasks as well, such as induction, dismissals, grievance handling and advice on pay. The personnel manager has to balance the immediate and tangible operational problems – which can be very time-consuming – with the long-range, more nebulous concerns of senior management.

If the strategic tasks of personnel management are neglected, its potential will not be realised and it will indeed become little more than a clerical function. At its best, personnel management contributes to the overall running of the business, helping managers to use their most important asset to the full.

Personnel policy

A firm which has a system of personnel procedures is likely to have a sound personnel policy. The more people-orientated firms will try to ensure that the policy reflects the needs and ambitions of employees. This means that social as well as economic goals have to be considered when formulating and reviewing company policy. Each company's policy will reflect its particular priorities and problems.

An example of a personnel policy statement for a large construction firm is given below.

Personnel policy statement

This policy recognises that the successful achievement of the company's objectives of profitability and development depends on its ability to provide employees with satisfying and rewarding employment.

The policy will be implemented in accordance with generally accepted employment practices and current employment legislation and the need to avoid unfair discrimination of any kind.

General policy

- (1) All employees will be kept informed of the company's practices and policies and of the terms and conditions of their employment.

- (2) The company will establish and maintain suitable procedures through which employees can express their views on all matters affecting their employment.
- (3) The company will create and encourage an atmosphere of mutual understanding and co-operation, in which all personnel feel a sense of involvement and freedom to express constructive views to management.
- (4) Procedures will be established, and made known to employees, governing disciplinary action and the rights of employees to raise grievances and disputes with management.

Employment policy

- (1) The company's recruitment and selection procedures will take account of the need to match individual abilities and preferences to the post concerned.
- (2) The performance standards expected of employees and their progress towards achieving them will be made known to them by their managers.
- (3) Wherever possible, posts will be filled by internal promotion, unless existing personnel are unable to provide the necessary expertise.
- (4) The company will offer alternative employment to, or terminate the employment of, employees who, after adequate warning and the opportunity to improve their performance, fail to reach the company's standards.
- (5) The company will comply with all statutory requirements regarding the employment and termination of contract of all employees.

Staff development policy

- (1) All managers will keep themselves informed of the career expectations and training needs of their employees and will counsel them as necessary.
- (2) Regular appraisal of all employees will be undertaken in order to identify individual development needs and career potential, and to help employees make their best contribution to the company, whilst obtaining maximum job satisfaction.
- (3) The company will provide suitable opportunities for staff development, having regard to individual needs for promotion and increased responsibility, subject to the availability of suitable training opportunities.
- (4) The company will assist and encourage employees who wish to obtain relevant technical, professional and management qualifications.

Industrial relations policy

- (1) The company will recognise the right of a union to represent and negotiate on behalf of a specific group of employees, providing a majority of those employees wishes to be so represented.
- (2) The company will encourage employees to become members of recognised trade unions. Where practicable, such unions will be those taking part in collective bargaining in the industry.
- (3) The company will comply with agreements and procedures established by collective bargaining and contained in relevant working rule agreements.
- (4) The company will operate conditions of employment no less favourable than those provided by competitors.
- (5) Every attempt will be made to maintain good relations and provide proper facilities for consultation and co-operation with union representatives.

Remuneration and employee services policy

- (1) The company will remunerate employees and provide benefits at a level commensurate with performance and responsibility, having regard to current legal requirements, government policies and market forces.
- (2) The company will adequately insure all employees during the period of their service.
- (3) All personnel will be given assistance in periods of sickness or hardship. Pension arrangements on retirement will be on terms no less favourable than those offered by competitors.

Health and safety policy

- (1) The company will maintain a high standard of safety and health and take every practicable step to safeguard the health and safety of its employees.
- (2) The company will comply with all statutory health, safety and welfare requirements.
- (3) The company will provide a high standard of welfare facilities for employees.

Strategic planning and organisational development

One of the strategic jobs of personnel management is to take part, with other managers, in a continual analysis and review of the organisation's structure, culture and operations. The personnel manager can help to develop personnel forecasting and budgeting techniques and to improve administrative functions, as well as supplying forecasts of staffing needs, labour availability, wages budgets, and so on.

Personnel managers can play an important part in identifying the strengths and weaknesses of the organisation and assessing the effects of social, legal, economic and other changes. Personnel staff can help to develop and implement strategies and timetables for organisational change to ensure that the organisation survives and becomes better at doing the things it is designed to do. To achieve this, the personnel manager may recommend improvements to the structure of the organisation, its departments and work groups. He or she will advise on management style, job designs and organisational 'climate'.

The climate of the firm is difficult to analyse, but some measure of it can be obtained by seeing how conflicts are resolved, how people are treated and what levels of trust, co-operation and participation exist. These factors are important, for they can affect efficiency and hence the profitability of the business.

Personnel managers may have more skill – or simply more time – than line managers, for monitoring the organisation and the match between its tasks and people. Because they are not directly involved in operations, they can be more objective.

Employee remuneration

Personnel staff can help the firm to develop effective payment systems and to review them to cope with outside influences, such as government policy, the labour market

and wage agreements with the unions. The personnel manager must know how national and local agreements affect the company's employees and see that they are applied.

A salary structure must be established for the many employees not covered by national wage agreements. Guidelines must be laid down for salary increases, benefits and incentives, and how to link these to staff performance.

A system may have to be developed for assessing the relative worth to the company of different people and jobs. This could involve *job evaluation* and *merit rating* techniques, where aspects of a job or an employee's performance are ranked, classified or given a points rating, on which remuneration can be based. In *productivity bargaining* employees agree to make changes in work practices which will lead to greater efficiency in return for improved pay, benefits and working conditions.

Personnel staff may also be asked to produce inter-firm comparisons of salaries and benefits, so that the company continues to offer conditions that will attract the right calibre of employee.

Counselling

Counselling has often been associated with being ill – 'If I need counselling I must have something wrong with me' (Wright, 1998). However, as Wright points out, if words such as 'coaching', 'mentoring' and 'dealing with difficult staff' are used, people become far more comfortable. Today the term counselling is more popular, as in 'investment counselling' and 'career counselling'. Managers have increasingly recognised that counselling their employees is an important part of the personnel function, although their powers over subordinates sometimes makes counselling difficult or impossible.

Personnel staff may be in a better position to counsel employees because there is no 'authority barrier' between them.

Counselling methods are rooted in psychotherapy and owe much to Carl Rogers, who pioneered client-centred therapy in the United States. Rogers (1951) stressed the importance of certain qualities in the counsellor, especially:

- *Empathy* – the counsellor tries to see the problem through the eyes of the 'client', the person being helped.
- *Genuineness* – the counsellor is honest, sincere and puts up no facade.
- *Congruence* – the counsellor uses his or her feelings and is open with the client.
- *Acceptance* – the counsellor regards clients as important and worthwhile, whoever they are and whatever they have done.

These qualities must be conveyed. The person being helped must experience them to benefit from the relationship with the counsellor.

Counselling skills are not easy to separate from general social skills, but

experience of counselling has helped clarify our understanding of how warm, trusting relationships develop between people (Hopson, 1984). Counselling embodies the belief that individuals benefit and grow from this kind of relationship and that, properly managed, it helps the individual to become more independent.

Counsellors are unlikely to be successful if they cannot see other people's viewpoints, have radically different values, are poor listeners, make harsh judgements too easily, are unable to be 'open', get emotionally involved, or feel they have to put on an 'act'.

Hopson argues that once counselling relationships have been established, clients will be willing to talk through and explore their thoughts and feelings. This process helps them clarify their difficulties and uncertainties, and to explore options for changing their situations. Given support, people are likely to become more prepared for, and capable of, dealing with their problems.

Unless counselling is properly managed, there is a risk that it may encourage clients to become dependent on their counsellors. They turn to their counsellors every time they have a problem. So, counselling must try to build self-reliance.

Administration and records

Construction firms whose personnel procedures are well developed will have reliable records, providing information for planning purposes and for employee administration. These records must comply with the data protection legislation.

Most firms need records of:

- personal information about employees (such as experience, qualifications, health and the name of a person to contact in the event of illness or accident);
- staffing levels and productivity;
- wages and overtime;
- absence, sickness and accidents;
- statutory requirements and returns.

Personnel staff will be responsible for developing and using suitable methods of data collection, storage and retrieval, including the use of computer-based information systems. They will have to interpret and present information in the way that best facilitates decision-making and control.

Sometimes these tasks lead to a proliferation of records without achieving the intended results. Care is needed to ensure that personnel administration remains a means to an end and does not become a tiresome ritual.

Summary

Human resource management is the term many businesses now use to describe personnel management. HRM embodies the unsatisfactory notion that employees

are a resource – a factor of production. In construction, the terms personnel management and personnel manager are still in widespread use.

The personnel function is present in every firm, but a personnel department will normally be found only in the larger firms which can afford to employ specialists. Personnel management has been prone to conflicting assessments, because its contribution to production is not always visible. But in companies which recognise that people are their primary asset, personnel management plays a key role.

The main tasks of personnel management are to obtain and retain employees of suitable calibre, to develop their potential and to help the organisation to manage people effectively. Some personnel tasks are more long term than others and the manager must try to balance immediate demands with more strategic issues. An experienced personnel specialist can help senior management to keep the organisation in tune with changing demands and conditions.

Exercise

Johari Window

Jo Luft and Harry Ingrams (who devised the window in this exercise) believed that we can all enhance our sense of self and get to know ourselves and others better if we take the risk of disclosing ourselves and if we are prepared to hear other people's assessment of us.

Working in groups, each member should complete the Johari Window in Figure 14.2, giving examples in each separate 'pane'. Which window(s) were the most difficult to complete and why?

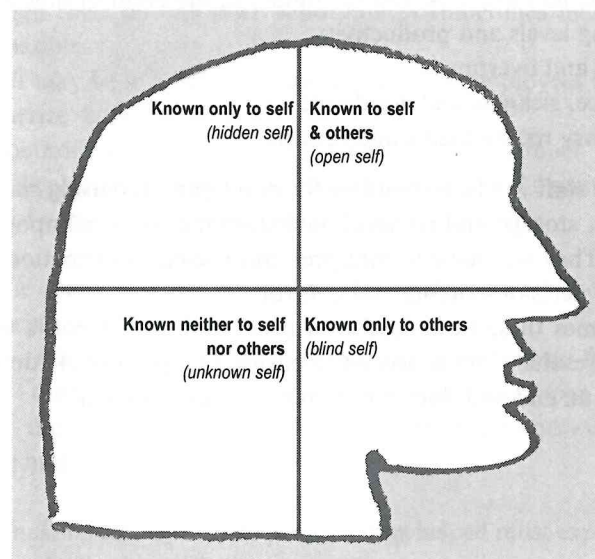


Figure 14.2 Johari Window (adapted from Evenden and Anderson, 1992).

Chapter 15

Recruitment and Staff Development



Employment planning

The purpose of employment planning is to maintain an adequate supply of suitably experienced labour. This can be a major problem for an organisation, especially in the construction industry. The scope for such planning in construction firms varies, but broadly involves the following.

- Analysing and describing jobs and preparing personnel specifications.
- Assessing present and future staffing needs.
- Forecasting labour supply and demand, and preparing budgets.
- Developing and applying procedures for recruiting, selecting, promoting, transferring and terminating the employment of staff.
- Complying with the requirements of employment legislation.
- Assessing the cost effectiveness of employment planning.

Contractors need forecasts of future staffing requirements and the likelihood of meeting them, but the task is extremely difficult. Both future workload and the labour market are highly unpredictable. Most firms have to be satisfied with cautious, short-term predictions and hope that trends don't change too much. However, failure to attempt any forecast of future workload and labour needs leads to staffing problems and organisational inefficiency.

Organisations need people of the right calibre doing the right jobs. This demands reliable recruitment and selection procedures, followed by mentoring, training and monitoring of individuals' career progress.

Staff selection has always relied heavily on judgement and hunch, sometimes based on little more than a short, badly-planned interview. Yet there are other selection methods which can help.

Group problem-solving sessions are sometimes used to assess candidates' skills. They enable selectors to judge how applicants contribute to teamwork and cope with pressure. To build up a realistic picture of the applicant, as many selection methods as possible should be used.

Forecasting and budgeting

Forecasts of future labour needs and the likelihood of achieving them should take account of:

- Natural wastage due to retirement and labour turnover.
- Promotions, creating vacancies at lower levels.
- The company's plans for growth, diversification, etc.
- The availability of labour having the necessary skills in the right location.

One of the problems in forecasting is obtaining reliable information. Managers are often reluctant to make predictions and may be sceptical of forecasting, believing it to be a waste of time. Careful data collection and analysis, including a review of existing personnel, are essential for forecasting both the demand for labour and its supply.

Some of the information must come from outside the firm. The state of the labour market can be assessed from published statistics and help can be obtained from job centres and recruitment agencies.

Employment plans must remain flexible. Events rarely turn out as planned! The demands for the firm's work may fluctuate unpredictably. Economic trends may go into reverse, or technical innovations may force the firm to review its methods. Such changes don't invalidate planning. On the contrary, uncertainty makes planning all the more important if the firm is to survive. Every construction firm needs an accurate picture of its labour force and the labour market. Unfortunately, only the larger companies will have the resources to produce it.

Present labour force

Many operatives are employed on a temporary basis, from project to project, but technical, clerical and managerial staff will be more stable. The firm needs to know quite a lot about its present employees. It helps to have:

- *A skills analysis*, showing where the firm's strengths and weaknesses lie. One person leaving or absent through sickness can create serious problems if no one else has the same skills.
- *A succession plan*, showing who can take over if someone leaves the company. This particularly applies to more senior posts.
- *Training plans*, specifying what training is needed by employees. This will usually be carried out in conjunction with some kind of appraisal scheme.
- *A labour turnover analysis* for each occupation, indicating problems like excessive losses in one department or specialism.

In construction, where there is a rapid movement of labour, the stability of the workforce can be monitored using the ratio:

$$\frac{\text{Number of employees with one year's service or longer}}{\text{Number of employees one year ago}} \times 100$$

The level of detail in such planning will vary from firm to firm.

Employment planning will help an organisation to know if it is overstaffed in some sections and understaffed in others. This makes it possible, with retraining, to transfer employees from one part of the business to another, rather than dismissing and recruiting staff. Whatever the picture, the firm will inevitably have to look outside for some of its labour needs.

External labour supply

There is a lot to consider when assessing the external labour supply, including:

- *Local population profile*. Its density, distribution and occupational composition.
- *Pattern of population movement*. This is important if the people coming into or leaving the area are in the occupations the firm needs to tap.
- *Career intentions of local school and college leavers*. Whether there are suitably trained young people wanting careers in construction.
- *Local employment levels*. How particular occupational groups are affected by the demand for labour.
- *Level of competition for recruits*. Whether the firm is able to attract people of the right calibre.
- *Patterns of travel and local transport arrangements*.

These factors are especially important when a contractor is starting up in a new area.

Producing the plan and an action programme

Mullins (2002) points out that a reconciliation of the supply and demand data not only forms the basis of the plan but of a *personnel action programme*. The latter is the starting point for increasing, decreasing or changing the composition of the workforce, through recruitment and selection, training and staff development, transfers, redeployment and redundancies. Figure 15.1 shows some key relationships between the processes involved. A vital part of planning is the setting of target dates for achieving these actions. In larger firms, computer programs are used to model the organisation's personnel planning options.

Planning for projects

Project staffing must be planned too. The manager must forecast project workforce requirements, taking into account the availability of various kinds of labour (including sub-contract labour), the need to avoid sharp fluctuations in staffing levels and the overall resource pattern for the project.

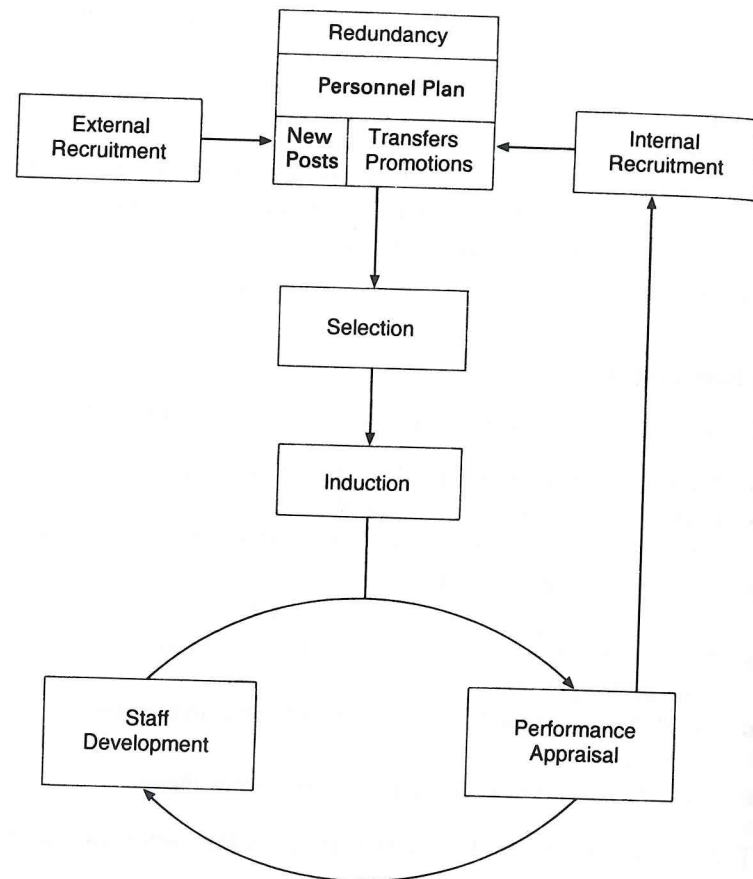


Figure 15.1 Matching people to jobs: some key processes.

Even when unemployment is high, certain types of labour may be in short supply and the organisation may have to train people to meet its needs. A shortage in just one trade or occupation may make nonsense of a contract programme and add considerably to the project duration or cost. Recognising such problems at the outset can lead to better balancing of work and reduce peak labour needs.

Site labour should be built up and run down in a planned way, avoiding sudden changes in the numbers of each trade on site. This means scheduling project activities so that cumulative needs do not exceed the labour available and do not fluctuate too much. Such planning will not guarantee high productivity or good labour relations, but its absence can lead to poor performance and strained relations.

The number of employees that can work simultaneously on a project without productivity falling is limited, but there should not be too much reliance on overtime to make up for labour shortages. Regular overtime is usually expensive and output during overtime working is often lower than that achieved during normal hours.

Recruitment

Job specifications

Before recruiting an employee, the job requirements should be carefully analysed. The purpose of the job should be questioned and whether it might be better to transfer someone from elsewhere in the organisation or reallocate parts of the job to other employees. A vacancy may still emerge from this exercise, but it may bear little resemblance to the job of the previous post-holder, and other jobs may have been rationalised or enriched in the process. For this reason, it is important to draw up an accurate job specification at the outset.

Normally a job specification includes:

- a description of the job;
- a specification of the kind of person likely to do the job well.

Producing a job specification is not a one-off exercise. Jobs change for technical, legal and organisational reasons. In construction, some jobs are more easily defined than others. The work of a plasterer is fairly stable and can be easily measured, but the site manager's role is more difficult to assess. Management work can vary considerably from project to project and it is more difficult to define criteria for assessing it.

However, job specifications are time-consuming to produce and can discourage flexibility. People may be unwilling to do work which is not in the specification. Unions may use these documents to enforce demarcations which are inconvenient and costly to the employer. In construction, the one-off nature of projects means that jobs have to be adaptable and job specifications may therefore be ignored. At best, they are difficult documents to draft and large firms may employ specialist job analysts if they want them prepared properly.

Job descriptions

Typically, a job description will contain some, if not all, of the following details:

- The title of the job
- The title of the job holder's manager
- The job location
- The purpose of the job
- A description of the job content
- A list of responsibilities
- Details of subordinates (if any)
- Standards of performance expected
- Working conditions
- Prospects.

If a firm intends to take job specifications seriously, it must give some thought to standardising the words with which it describes objectives, tasks and responsibilities. If a word is used in different job descriptions to mean different things, much of the value of the description is lost. A job description is only a means to an end. A compromise, therefore, must be reached between a comprehensive but unwieldy description, and a vague summary which makes it hard to distinguish one job from another.

Personnel specifications

These describe the kind of person likely to perform a job well. They are often difficult to produce and the help of a skilled job analyst may be needed when attempting this task for the first time. Various schemes have been developed for analysing personal characteristics and skills, and these usually centre around headings like:

- *Physical characteristics.* Such as strength, health and appearance.
- *Education.* Schooling, further education and qualifications.
- *Job experience.* Previous employment, responsibilities undertaken.
- *Intelligence.* Ability to think analytically, capacity for difficult mental work.
- *Interests.* Inclination towards social, practical, physical or intellectual activities.
- *Personal qualities.* Such as reliability, self-confidence and ability to work with others.
- *Special skills.*

Other breakdowns include factors like impact on others and motivation, but the ability to think creatively is often neglected!

The kind of analysis used will depend very much on the job. Some attributes, such as physical strength, are important for manual construction jobs but not for technical or clerical ones.

Recruitment procedures

The purpose of recruitment is to bring jobs to the attention of job seekers and persuade them to apply. Most firms use several recruiting methods, depending on the type of job. The more common methods are described below.

Personal introductions and contacts

This method has been widely used in the construction industry and with some success. But it cannot be relied on to produce the right applicants at the right time.

Vacancy lists outside premises

This method is used on some construction sites. It is an economical way of advertising vacancies but the information may not reach the right people.

National press advertising

This reaches large numbers of people looking for jobs, but only a small proportion of readers will be suitable or interested. Much of the effort and cost of national advertising are wasted.

Advertisements in the technical press

These reach a specific group and there is less waste. A minimum standard of applicant is more assured. However, some publications are infrequent, causing delay.

Advertisements in the local press

These are mostly read by local people seeking local employment. This may be satisfactory for routine jobs, but may be inappropriate for more specialised posts, for which a wider range of applicants is sought.

Job centres

These can produce applicants quickly and, with computer back-up, from a wide area. They tend to produce applicants who are unemployed, rather than employed people who are looking for a change.

Commercial employment agencies

These have become quite popular in some areas, notably London, and for certain kinds of vacancy. They reduce the administrative burden on the employer, but can be expensive.

Management selection consultants

These are mainly used to obtain applicants for senior posts, often in confidence. The consultant's skills should ensure that a high calibre of applicant reaches the final stage of selection. Again, this service is expensive and not always reliable.

Visits to educational establishments

Some of the larger construction firms regularly visit schools, colleges and universities, to seek out potential employees. This method only produces new entrants to the industry but is a sound, active way of exploring the labour market. It also provides an opportunity to put across a favourable company image.

Recruitment Web sites

On-line employment databases have become a convenient means of reaching a construction industry audience (Figure 15.2). Databases can be searched by job title, location, name of employer or agency, and users are able to enter their own profile and experience to enhance their chances of finding a job.

Internal advertisement

Many construction firms try to fill more senior posts from within the organisation. They prefer senior staff to have had experience of the organisation's methods and culture. This does, however, exclude able outsiders who might bring new ideas and enthusiasm to the business.

Personnel selection

Selecting people for jobs is a very important process. For the applicant, it could be one of the most important events in his or her life. Choosing the right person for a job is not easy. In the past, selection has relied a great deal on experience and judgement, and the results have not always been successful. Firms have tried to take some of the guesswork out of selection by using a wider range of techniques and by giving those involved more training. Personnel selection is only a small part of most managers' jobs and there is a lot they can learn about selection techniques, if given specialist guidance.

The selection process involves the use of:

- Biographical information
- Interviews
- Selection tests and questionnaires
- Group methods
- Work try-outs.

Because the content of jobs differs, it is not always necessary or appropriate to use all these methods but, as a rule, the more techniques used, the more reliable the process is likely to be. This is because each method has different strengths.

Biographical information

Information about the candidate's experience and personal history can be obtained from either a carefully designed application form or curriculum vitae (CV), and from references or testimonials.

The application form provides a basis for comparing applicants and usually gives a reasonably factual summary of what an applicant has done. It will not, however,

The screenshot shows the 'totaljobs.com' website in a Microsoft Internet Explorer browser window. The address bar shows 'http://www.totaljobs.com/jobseekers/construction_new.asp'. The page features a navigation menu with options like 'MY TOTALJOBS', 'HELP', 'HOME', 'FOR RECRUITERS', and 'POST A JOB NOW'. Below this, there are buttons for 'FIND A JOB', 'REGISTER YOUR CV', 'JOBS BY EMAIL', 'GET ADVICE', and 'KNOW YOUR STUFF'. The main content area is titled 'Construction search' and displays '6671 construction jobs listed'. It includes a 'Step 1 - What type of job are you looking for?' section with various job categories and checkboxes, such as 'Engineers (all)', 'Site engineers', 'Surveyors (all)', 'Building surveyors', 'Managers (all)', 'Project managers', 'Building services', 'CAD technicians', 'Buyers/procurement', 'Foremen', 'Electrical engineers', 'Civil engineers', 'Quantity surveyors', 'Estimators', 'Site managers', 'Contracts managers', 'Highways Engineers', 'Site agents', 'Planners', and 'Graduates'. There is also an 'Optional keywords' section and a 'Step 2 - Where do you want to work?' section with a dropdown menu for 'Please Select...' and a 'Multiple selections' button. A 'Step 3 - What order do you want to see jobs in?' section offers options for 'by closest match first' and 'by date advertised'. The page also includes a 'search tips' link, a 'SEARCH' button, and a 'to top' link. At the bottom, there is a 'Cookie warning' and a footer with copyright information for 'The Potential Job Board Company Limited 2004'.

Figure 15.2 Recruitment web site.

indicate how well he or she has done it. Moreover, applicants will emphasise the details they consider most relevant to the job and play down those which are inappropriate or which suggest they may be unsuitable. Occasionally, a questionnaire is used to obtain more depth of information about the candidate's background and experience. Failing this, applicants should be encouraged to give extra information on separate sheets. Application forms are often poorly designed, allowing too much space for some kinds of information and far too little for others.

The organisation can either ask applicants to fill in an application form or invite them to submit a curriculum vitae. The CV has the advantage that it is tailored to the applicant's background and experience. From the organisation's point of view, comparing applicants will be difficult because they will structure their CVs in different ways.

References are a useful source of biographical data if used with care. The referee must be honest and should be familiar with the individual's recent work performance. Many people are reluctant to give unfavourable references and tend to play down the applicant's weaknesses. Selectors should be aware of such biases in references and testimonials. Some companies devise a detailed questionnaire so that the referee has to make specific judgements about the applicant, but this is a time-consuming task and not very popular with referees.

Clearly, biographical details are important in selection, but they should be interpreted with care. Some of the information they contain may not be reliable or relevant to the job.

Interviewing

Interviews are used almost universally in staff selection, although they vary from a casual conversation to a lengthy interrogation. The applicant may be faced with a single interviewer or a panel of interviewers. The strength of a panel interview of, say, three selectors is that a more balanced approach is possible. The one-to-one interview is often more relaxed than the panel kind, but its effectiveness as a selection method relies on one interviewer's ability and judgement. However, panel interviews are often rather formal, making it hard to create rapport with the applicant, who may then have difficulty in talking freely. The success of a panel interview relies a lot on the chairperson's skill in managing the progress of the interview and controlling the others.

There may be more than one interview, especially for senior posts. The purpose of the first interview is to short-list the more promising of the applicants.

The interview can vary in level of formality. One way of describing this formality is the extent to which the interview is structured or open. In a structured interview, the interviewer usually follows a checklist of questions designed to give an overall picture of the applicant in fairly factual terms. The open, unstructured interview does not rely on set questions and the selector tries to get applicants to talk, to find out about their attitudes, motivation and so on.

A combination of these two approaches often gives a good balance between the

two kinds of information. Some interviewers prefer to start informally to establish some rapport with the applicant, before switching to a more formal approach to elicit particular information.

Choosing the right questions and giving the candidate the opportunity to answer fully are probably the most important features of an interview. Unfortunately, these features are frequently missing. Questions that merely elicit a yes/no response are unlikely to throw much light on the applicant's suitability. The interviewer should try to ask open-ended questions which force the applicant to give more comprehensive answers. With careful preparation, the outcome of the interview is likely to be more positive.

The interviewer may record ratings of each applicant against the main selection criteria. These may appear in a job specification. Without such ratings, it is difficult to compare candidates from memory after hours of tiring interviews, especially if they have been held over several days. Yet, there is often a fear among interviewers that strict adherence to a scoring system hinders individuals' judgements. Such concerns are understandable but can be largely overcome once again by detailed planning and preparation.

Selection tests and questionnaires

Many of these are psychological tests which give quantifiable answers. The appeal of using them is that some objectivity is possible and applicants' scores can be compared. They are quite widely used in the UK for many types and levels of selection, especially in large organisations. The British Psychological Society (2003) identifies two broad categories of test:

- *Measures of typical performance.* Tests designed to assess dispositions, such as personality, beliefs, values and interests and to measure motivation or drive. They tend to take the form of self-report questionnaires and do not have right and wrong answers.
- *Measures of maximum performance.* Tests designed to measure ability, aptitude or attainment. Such tests consist either of questions with right and wrong answers or tasks that can be performed more or less well.

The construction and refinement of a psychological test is a lengthy and technical process. The value of a test depends on the care with which it has been constructed, administered, scored and interpreted. Used correctly by people trained in administering them and interpreting their results, tests can provide useful information about job applicants, but their use by untrained people has caused concern.

Psychological testing is a form of measurement, but is different from the measurement of physical qualities like length or weight. A test score can only indicate one person's standing relative to others in respect of the attribute being assessed. A

score can only be evaluated by comparing it with scores of an adequate sample of the population to which the person belongs. The process of collecting representative scores from different groups is called the *standardisation* of the test. This is an important stage in test construction. Tests vary in their validity and reliability, i.e. the extent to which a test measures what it is supposed to measure and gives consistent results.

Group methods

With this technique, groups of applicants are brought together to discuss a topic or investigate a problem. The theme may be chosen from current affairs or from the firm's business activities. This is a very difficult and stressful task for the applicants who are being asked to co-operate with their rivals!

Selectors observe the group at work to gain insights into applicants' social and problem-handling skills. For instance, it is possible to see whether an individual:

- puts forward ideas effectively;
- adopts a leading or following role;
- persuades others to listen to his or her ideas;
- gets on well with people;
- copes with conflicting views within the group.

Typically, a group session might focus on a broad organisational issue, like productivity, or something specific, such as recycling. Simple discussion exercises will provide the selectors with information about applicants' attitudes. Specific, problem-centred exercises can give valuable information about applicants' skills.

These exercises may take less than an hour, or considerably longer. The selectors analyse each candidate's contribution, taking into account the number and quality of his or her inputs to the group and whether they were well communicated and positive. The extent to which the individual helps the group to make progress with the problem, or prevents it from doing so, may be a useful indicator of the candidate's future performance, if appointed. Aspects of the applicant's personal approach and outlook on life may become apparent, as well as certain qualities, such as self-confidence and initiative.

Selectors should be aware that applicants may not behave normally during the group encounter, which is artificial and sometimes very stressful. Some applicants may perform better under pressure, but many may not achieve their usual performance. This is an important limitation of group methods, for it may discriminate against able candidates who only perform well when they have settled down in the job and are not under pressure. For some jobs, particularly in management, the ability to work under pressure and influence comparative strangers, may be an important quality. Selectors should, however, still be aware that an individual who leads in one group may adopt a quite different role in another.

Work try-outs

Also called work sample testing or proficiency testing, this technique requires the job applicant to perform a task or tasks relevant to the job. In the case of, say, a tiler or mason, typist or engineer, straightforward tasks can be set – fixing some tiles, typing a letter, and so on – and the applicant's performance judged. It is difficult to set a proficiency test of this kind for a managerial job, where performance depends on detailed knowledge of the job and on establishing a working relationship with a team. However, an attempt to introduce this method into managerial selection has taken the form of decision-taking, in-basket exercises, in which applicants tackle simulated managerial or administrative tasks.

Staff development

The terms *staff development* and *human resources development (HRD)* are now used by personnel specialists to describe a range of activities wider than those traditionally linked with education or training. They recognise that learning takes place all the time, as people experience new situations and cope with fresh problems. Learning is not confined to the classroom and, indeed, the most important learning often takes place elsewhere. In staff development, the focus is on *changing* people rather than just teaching them.

Most construction firms acknowledge the need for staff development, but they differ markedly in how they think it should be done. Some firms spend a lot of money and even set up their own development programmes. Other firms simply carry on their business, believing that employees will develop themselves, learning by their experiences and mistakes. There is some validity in this approach too.

Performance appraisal

Performance appraisal is the regular review of the way employees are performing in their jobs. In construction, these reviews are carried out with varying degrees of commitment. In most firms, appraisal techniques are not used. Only among larger firms are formal appraisal schemes likely to be found.

Appraisal objectives aren't always clearly defined and a single scheme may serve several purposes, such as:

- Agreeing performance targets for the next period.
- Identifying employees' strengths and weaknesses, so that training needs can be defined.
- Telling employees how well they are doing.
- Counselling individuals about their job performance, problems and career development.

- Identifying employees with promotion potential.
- Providing employees with the necessary training or development to ensure they can meet the agreed objectives.

There are a number of problems with appraisals. It is difficult to select suitable criteria for the review and to design valid and reliable assessment methods. The manager's ability to make accurate and consistent judgements of subordinates depends on many factors. Many managers are reluctant to carry out appraisals. Specific problems include:

- *Central tendency* in rating employees' performance, where managers are reluctant to give either very favourable or very bad reports, especially the latter.
- *Recent behaviour bias*, where the manager is influenced by the most recent actions of the subordinate.
- The manager's *lack of experience and skill* in forming judgements from observations.
- *Inconsistency in assessment standards*, so that some individuals are appraised more harshly than others.
- *Difficulty in defining the factors* being assessed.
- *Inadequacies in rating scales* and whether managers know how to use them reliably.
- *The purpose of the appraisal* and how the appraiser feels about it. A single appraisal cannot be reliably used for different purposes. Managers tend to vary their assessments depending on the purpose of the appraisal. For instance, the rating given for assessing an employee's salary increase may differ from that given if the purpose is to decide whether or not to make the individual redundant.

External factors also make appraisal difficult, such as the frequency with which a manager can observe subordinates at work. For instance, a chief surveyor, responsible for five surveyors who spend most of their time on different sites, will see comparatively little of their performance.

A case study in staff appraisal

Aker Kvaerner is an international oil and gas engineering and construction group with the capability and resources to undertake some of the world's most challenging projects on behalf of oil companies. Their innovative Personal Performance Programme (P3) is an extension of the traditional appraisal process, which seeks to improve and recognise the performance of all employees.

Crucial to the success of P3 is that everyone understands how their performance contributes to the success of the company, through clear responsibilities and accountabilities for meeting aligned and agreed objectives. The appraisal process is perceived to be a forum for open and honest communication, the setting of development opportunities and recognition of achievements that contribute to both personal and company success.

P3 is a continuous process that is designed to maintain open two-way communication between employees and their team leader. There are three stages in the P3 process:

- The *Defining Review* takes place in the first two months of the year. Individual accountabilities and objectives are agreed and team deliverables aligned with the company's business plan and strategies.
- *Interim Review* meetings are held throughout the year. Feedback on employee performance is provided together with discussions on improving future performance.
- The *Final Review* is a year-end discussion during which the performance for the year is discussed, agreed and recorded.

In practice, the Final Review and Defining Review are amalgamated into one review (see Figure 15.3). It is a natural process to review performance for the previous year and then move on to discuss responsibilities, objectives and individual development needs for the forthcoming year.

There are several performance dimension ratings available for the team leader and options for comments:

E	M	O	Explanation
X			Exceeds expectations in the given dimension
	X		Meets expectations in the given dimension
	X	X	Meets expectations but could pursue further development
		X	Has an opportunity for development

E – Engineers, M – Managers, O – Operatives.

Tangible outcomes of the P3 process are a Development Action Plan and Personal Development Plans. The primary objective of the former is to encourage employees to identify and reflect on work-based development opportunities, which are of maximum benefit to the employee and the company.

The latter recognises employees' long-term ambitions. As such the Development Action Plan is a 12 month snap-shot which contributes to the Personal Development Plan.

Some people claim that formal review meetings are unnecessary, as there should be a continuous dialogue between manager and subordinate. However, other pressures often make it difficult for manager and subordinate to sit down quietly and discuss matters. The formality of the review forces them to tackle the problem thoroughly. Nevertheless, the difficulties inherent in appraisals have led to widely varying opinions about their value.

A special problem with appraisals is how to measure the effect of external factors. The employee's relationship with the manager and with colleagues, and the demands of the job, are just a few of the factors affecting performance.

Appraisals can be one-sided, focusing on the employee's strengths, weaknesses and training needs. A more constructive approach might be to look at a task and ask the work group how they tackled it as a team. What made it easy or difficult

Personal Performance Programme (Managers and Engineers)			
Employee Name		Current Position	
Employee Number		Time in Position	
Date joined company		Review Period	
Project/Department		Defining Date	
Location		Final Date	
1. Roles, Accountabilities and Objectives			
A. Duties and responsibilities: <i>describe scope of work and accountabilities</i>			
B. Objectives: <i>list of key deliverables, measures and targets established</i>			
C. Supplementary Input:			
2. Performance Development			
Identify developmental issues and plans relating to current role			
Does employee desire a career discussion?			
Has a Personal Development Plan been created?			
3. Performance Dimensions			
Teamwork	E	M	O
Customer Focus	E	M	O
Communication	E	M	O
Decision making	E	M	O
Continuous improvement	E	M	O
Planning	E	M	O
Ethics	E	M	O
Other	E	M	O
4. Performance Review			
A. Final: <i>summarise on how well roles and objectives were met. Highlight achievements and benefits. Describe areas for improvement and reasons for any performance gaps.</i>			
B. Development: <i>Comment on employee performance against established plan</i>			
5. Agreement			
Employee signature:	Date:		
Supervisor signature:	Date:		
Supervisor Line Manager:	Date:		

Figure 15.3 Personal performance programme (condensed).

for them? What did they learn from it? This sort of appraisal could become part of *organisational review*. In this climate, people would feel less threatened and be more willing to discuss difficulties. The approach would be especially apt in the context of self-managing teams.

Education and training

The words *training* and *education* are often used rather loosely to describe a variety of ways of helping people become better at their jobs. Education can mean the narrow process of learning a fixed syllabus in order to pass an examination. It can also mean the broad process in which an individual's whole outlook on life is shaped by a succession of varied experiences. The term training usually refers to learning a specific task or job, the skills and behaviours of which can normally be quite precisely defined.

Educational objectives are harder to express in behavioural terms because the learning is often complex and the results difficult to measure. Educational objectives can be expressed in vague, abstract terms, concerned with improving the learner's understanding and self-awareness. The emphasis is on future potential as well as present performance. In a sense, education is person-centred, whereas training is job-centred.

This difference is very apparent when one compares the training of a crane driver with the objectives of a degree course in construction management. Many training objectives are short-term. Indeed, some can be achieved in a few days or even hours. Educational objectives, on the other hand, are long-term and may take months or even years to achieve.

The methods used in training are usually more *mechanistic* than those used in education. Mechanistic learning relies a lot on stimuli and responses, reinforced with plenty of practice, whereas the more *organic* methods of education are less easy to control. They are concerned with developing the individual, and the outcomes are difficult to predict or measure.

Training is essentially practical and job-related. Most of the learning is about work methods, skills and procedures within a firm, trade or profession. Educational activities are broad-based and more conceptual, aimed at developing the individual's critical faculties.

However, these differences should not mask the fact that both education and training are concerned with human development. They are complementary and they overlap. Almost every training activity has some educational impact on the learner, just as many educational programmes help the learner to do a job better. The educational element in the training of an engineer or commercial manager will, however, normally be greater than in the training of a scaffolder or joiner.

Systematic staff development

The Construction Industry Training Board (CITB) report, *Managing profitable construction*, argues the case that construction companies with higher skills make more money, complete more projects on time and have more satisfied clients. Put simply, 'Today's skills will not make tomorrow's profit' (CITB, 2000). It is a view widely accepted by leading construction industry bodies such as the Construction Industry Council, by government sponsored initiatives such as the University for Industry and by Higher Education institutions. However, staff development continues to be given low priority and tackled in a piecemeal fashion, without looking at long-term needs. The result is that time and effort are wasted.

Effective staff development is most likely to be found in firms that recognise its potential for improving company performance.

Systematic staff development involves the following processes.

Identifying development needs

The underlying goal is to make the firm more efficient by making its employees more competent. But it is important to realise that some development objectives are short-term, whilst others are long-term. The organisation needs a supply of reliable, skilled people – operatives, engineers, buyers, and so on – to maintain its present workload. People need to learn the skills for dealing with current projects, because these are the foundation of long-term success.

But the firm also needs people who can steer it into the future; people with the knowledge and skills to recognise new opportunities and to develop and exploit them – people who are adaptable and innovative. Training has always tended to focus on current needs, but the emphasis is steadily switching to preparing people to cope with the future, where different knowledge, attitudes and skills will be needed.

Employees, particularly senior professionals and managers, will increasingly need to understand creativity and creative problem-solving techniques; and they will need a knowledge of future studies methods (see Chapter 10). Training employees in these areas has often been neglected in the past.

The types of development needed and the people needing them must therefore be analysed. Different groups will have different needs.

Planning development programmes

Plans should relate to specific objectives, reflecting the differences between the present and desired knowledge and skills of staff. Thought must be given to how best to meet training needs, keeping in mind any constraints. Development programmes should be flexible enough to meet the specific needs of individuals, provide a timetable for learning activities, and specify where they will take place.

Implementing development activities

Development programmes must be realistic. The award of a new contract may mean that a manager who was to attend a training programme is no longer available. On-site methods of training are usually flexible enough to cope with this kind of problem, but most external courses are not. Efforts must be made to ensure that the methods, content and timing of development activities meet the needs of both the firm and participants. Records should be kept of the progress made by learners so that the programme can be changed if it is too difficult or too easy, or is in some way failing to meet participants' needs.

Evaluating programmes

It is now common practice to evaluate development programmes and incorporate the lessons learned in future activities. Kirkpatrick's (1960) systems-orientated approach remains influential, comprising four levels:

- *Reaction.* Participants are asked what they think about the training they have received. End of course questionnaires or so-called 'happy sheets' are most frequently used by course trainers.
- *Learning.* Changes in participants' knowledge may be quantified using pre- and post-test questionnaires. Such methods, however, are open to criticism for failing to take account of unexpected outcomes and unintended consequences (Smith and Piper, 1990).
- *Application.* This level, which seeks to determine the extent to which learning has been generalised to the work situation, necessarily involves more complex instruments in order to measure behaviour change and improved job performance.
- *Results.* Although this is arguably the most important stage, as the evaluation considers the benefit of training to the organisation, it becomes increasingly difficult to determine the overall impact of the development programme.

A longitudinal evaluation of a novel computer-aided project management training package illustrates the variety of instruments available to the trainer (Ellis *et al.*, 2003a). The problem of collecting valid data during the later stages of evaluation, i.e. Application and Results, is overcome by the use of a self-efficacy evaluation instrument, that measures the participants' self-confidence in being able to complete a task successfully. However, the development of tools such as this is time consuming and relies upon the commitment and support of senior managers to ensure that evaluation is taken seriously.

Approaches to staff development

Staff development has improved over the years, but many development activities have remained rather conventional, with heavy reliance on passive learning, using

lectures and other teacher-centred activities. The tutor is expected to know what staff need to learn and how to teach them, putting them through formal courses or programmes of instruction. The content of these has often been rather rigid and general, with the tutor controlling the learning.

The learner is mainly passive; he or she doesn't need to know how to learn, only how to be taught. It is assumed that an engineer, manager or joiner needs to know the same things as other engineers, managers or joiners. Little attention is paid to the *differences* between individual jobs and people.

Regretably, too many courses still assume that the learner:

- is willing to be dependent on tutors;
- respects tutors' authority and trusts their expertise;
- views the learning as a means to an end (such as a diploma);
- accepts a competitive relationship with other learners.

Under these conditions, the learner is expected to do little more than listen (sometimes uncritically) to the tutor, take notes, remember facts and, sometimes, pass examinations.

There is growing concern about this approach, for there is little evidence that it really helps to achieve industry's future supply of competent staff. Many industries have started to move away from the traditional approach, searching for ways of making staff development more active and realistic. Some construction firms followed this trend, but the industry has been rather slow to adapt.

Under various titles, like *work-based learning* and *experiential learning*, attempts have been made to bring about such changes as:

- Shifting the emphasis from the content of learning to the learning process.
- Stressing skills and attitude formation, instead of facts.
- Shifting some of the learning from the classroom to the workplace.
- Stressing skills for coping with new situations, rather than for maintaining current practices.
- Altering the tutor's role from subject specialist to 'facilitator', helping participants to take responsibility of their own learning.

Here, the role of the tutor includes mentoring, providing trainees with resources and acting as a catalyst. Instead of acting as subject expert – telling people what they need to know – the tutor concentrates on creating an effective environment for learning. People learn something because it helps them solve a problem or do their jobs better. They learn at their own speed and have access to resources that complement their preferred learning style.

These approaches do not suit all learners as they demand greater discipline, but many people like it. It brings more learning into the workplace where it can be readily related to real problems and realistic circumstances. It means that tutors increasingly meet the learners on the learners' own ground.

Staff development methods

Coaching and learning from experience

People learn a great deal at work by trial and error and by seeing how others cope with problems. Watching others and taking advice from them are valuable ways of acquiring knowledge and skills. There is no problem of transferring what has been learned from training situation to workplace.

On the other hand, experience can be misleading. Coaching means helping people at work to assess their own performance, think through their difficulties and find suitable solutions. Many people have a contribution to make in coaching others, but the learner's own manager is often in the strongest position, having regular contact with the learner and detailed knowledge of the individual's work.

Construction industry managers value coaching and learning at work, but many managers find it difficult to coach their subordinates effectively, either because of lack of time or because they lack the necessary skills.

Computer-aided learning and beyond

Information technology and telecommunications are playing an important part in education and training. They enable vast amounts of information to be placed at the learner's disposal and can be used interactively to help people develop new skills. But, more importantly, the telecommunications revolution is set to revolutionise all kinds of learning and change the face of training and higher education.

Provision already ranges from the powerful but relatively static standalone CD-Rom to hybrid authored teaching packages and dynamic Internet-based virtual learning environments. However, computer-aided learning (CAL) should not be regarded as a panacea for all training and educational delivery. There is concern among academics that resource issues related to initial development costs, on-going maintenance, administration and institutional support are major obstacles to the uptake of CAL.

What is clear is that so-called e-learning is an exciting development, which offers huge potential both for widening access and promoting an interactive learning environment (Ellis *et al.*, 2003 a,b). Whilst the emphasis in higher education has been towards giving students responsibility for their own learning, care must be taken to ensure that the pedagogic issues associated with these new technologies is carefully thought through. Failure to do so might otherwise lead to disillusionment and foster the belief that CAL is 'second best' education.

Projects and assignments

A wide range of projects and assignments are used in both college courses and in-company training programmes. Companies have used work-based projects for many years in their management development programmes. If carefully designed,

projects and assignments are really valuable. They involve the learner – whether student or employee – in actively tackling real-life problems, developing useful skills and learning about processes and procedures in organisations.

One of the strengths of such activities – their realism – is a potential weakness. Learners, immersed in real activities, may not critically analyse their experiences and actions, so that their learning becomes superficial or even misleading. The process therefore needs to be managed by tutors or mentors who really understand what learning from experience is about.

Another problem with assignments and projects, when used in company training programmes, is that they may be undertaken on top of a normal day's work. It is not uncommon in management training programmes for learners to find that they have quite ambitious projects to tackle, but insufficient time to carry out the work. The company must make allowance for this and the tutor or mentor should help the learner to set priorities and exercise time management.

Lectures

The lecture has been widely used in education and training. It has some value for imparting knowledge and changing attitudes, but its contribution to skills training is limited. A major criticism of the lecture is that it requires the learner to be mainly passive.

Many of the functions of a lecture can just as easily be achieved by giving the learner a book or article to read. However, good lectures can give a quick overview of an unfamiliar subject and guide the learner's private study. They give the learner a chance to ask for clarification; books cannot. The lecture may have some 'inspirational' value, although a good book can usually provide this too.

Role-playing and simulation

These techniques are valuable for changing people's attitudes, helping them to see other people's viewpoints, and developing their problem-solving and social skills. The activities usually happen off-the-job but are designed to reproduce the work setting as closely as possible. A useful feature of role-playing is that learners can be asked to 'be themselves' or to adopt another role, thus gaining insights into other people's points of view. Again, feedback is essential, from the tutor, other role-players and, sometimes video recordings.

For role-playing and simulation to be effective, the following would apply.

- The activity used must provide a realistic scenario.
- The activity must be designed to meet different participants' needs, which will not all be the same.
- The trainer must prepare the learning activity thoroughly.
- A clear briefing must be given. Any constraints or rules of the game should be explained.

- The trainer must know how to evaluate participants' performance and should give them feedback.
- The trainer should use video facilities, where appropriate, to provide additional feedback and should help participants interpret that feedback.

A balance needs to be struck between a structured and open learning experience. Some structure may be essential but excellent learning can also occur when there are no objectives and no rules. A lot depends on the group and their perceptions of the activity, the task they are involved in and the whole training set up.

Mentoring

Mentoring describes ways in which one person can help another to learn from their work. It is a process which is quite well established in management development, but it can be valuable in most kinds of staff development or training. The mentor acts as:

- *Role model* (sometimes called a *competence model*) – providing vision and inspiration, setting expectations of performance and demonstrating professional behaviour.
- *Instructor* – passing on knowledge, insights, wisdom or perspective to another or providing challenging tasks or ideas.
- *Coach* – making suggestions for improvement, offering encouragement, building self-awareness and self-confidence, and providing feedback on the learner's performance; helping when things go wrong.
- *Counsellor* – actively listening to the learner's difficulties and offering suggestions.
- *Assessor* – helping to evaluate the learner's performance so that suitable credit can be given either towards a qualification or career advancement.

The use of mentoring increased during the early 1990s, spurred on by a fast-growing interest in learning in the workplace, or *work-based learning*. Clearly, the success of mentoring depends on the skills of the mentor and on his or her relationship with the learner. Among the many skills mentors need are the ability to:

- help people change their ideas, attitudes, values and behaviour;
- encourage planning, analysis, experimentation and increasing autonomy;
- show positive regard for people, even when things go wrong;
- empathise with and show understanding of people's feelings;
- deal effectively with negative behaviour or mistakes;
- give learners scope to think and decide for themselves.

Although it seems obvious that mentoring should include giving advice, this should be done sparingly. Learners can become too dependent on the mentor. They can

only learn to become truly independent and think for themselves if they make the most of their own decisions. The mentor should therefore avoid taking over problems and solving them for the learner. In particular, the mentor should encourage the learner to set his or her own targets and goals (Fryer, 1994b).

Selecting an appropriate mentor with the skill, time and authority to facilitate learning support is a key consideration. The mentor is often the manager of the person being trained, though this is not always appropriate or desirable.

Disadvantages of the manager mentor include:

- Lack of frankness in the relationship particularly where a formal appraisal mechanism exists.
- Managers having insufficient time owing to pressure of other commitments.
- Problems caused where disciplinary action is required against the mentee.

However, the mentor's inability to facilitate learning opportunities because of insufficient authority or resources vested in them is solved at a stroke if the manager acts as mentor, though it may still not be possible to provide all that the mentee would desire (Keel, 1995).

Management development

The education and training of managers has expanded rapidly since the 1950s, accompanied by a startling growth in the numbers of management colleges, business schools and courses. Impetus for this came partly from industry and government and partly from professional bodies, such as the Chartered Management Institute and the Foundation for Management Education.

During the period of expansion, many management development programmes were rather conventional. They often embodied the concept of the 'ideal manager' centred around the basic management functions. Their approach reflected what Handy (1975) called an *instrumental* philosophy, which sees learning as deductive, proceeding from theory to application. Teaching tends to be expository. Inductive thinking and creativity are the province of the teacher and researcher; the manager is concerned with deduction and application.

Handy contrasted this approach with what he called an *existential* view. This focuses on helping people to formulate their own ideas and develop their unique talents. Existential tutors tend to talk of teaching people rather than subjects, of giving feedback rather than examinations, of progress rather than achievement, and of general aims rather than specific objectives.

New approaches to management development, such as action learning, embody much of this philosophy. Action learning was largely pioneered in management courses by people like Reginald Revans. Techniques like role-playing and simulation have been widely tested on managers, because of their value in developing interpersonal, problem-solving and information-handling skills.

Two reports, *The Making of British Managers* (Constable and McCormick, 1987) and the so-called Handy Report, *The Making of Managers* (Handy, 1987), were important position statements on management development as the UK approached the 1990s.

Enrolments on business and management qualification courses continued to grow rapidly during the 1990s and in response to these two reports the Management Charter Initiative became the lead body for management occupational competence standards (Brown, 1999). Brown believes that employers have increasingly used formal qualifications as a vehicle for management development, linking them to company strategy. However, corporate in-house qualification programmes, whilst sometimes viewed as being inward looking, offer opportunities to:

- contextualise learning;
- tailor content to the specific needs of the company;
- foster team-working within the company;
- gain the support of senior managers;
- improve the administration and monitoring of the programme.

A recent example of innovative management development is described in Box 15.1.

The practice of downsizing, to create leaner, flatter structures in organisations, has in many cases resulted in real shortages of managerial expertise. McClelland (1994) suggests that this has created a need for a more strategic approach to management development. Brown (2003) defines strategic management development (SMD) as:

Management development interventions which are intended to enhance the strategic capability and corporate performance of an organisation.

The purpose of SMD is to ensure that, despite management shortages, competent managers are identified and mobilised in pursuit of business goals.

Continuing professional development (CPD)

All employees need to regularly update their knowledge and skills and learn new things. But the need is perhaps greatest in the professions, whose members are affected by numerous and substantial developments in technology, legislation, contracts and many other areas. These developments can be highly complex and take time to assimilate. This has led the major professional institutions in the construction industry to collaborate in finding more reliable ways to provide continuing professional development for their members.

The focus of CPD must include both the short-term and long-range development needs of employees. Development activities can take many forms, ranging from one-day courses to job rotation at work, from distance learning to working party

Innovation in management development

Since 1993, the Shepherd Group and Leeds Metropolitan University have collaborated to develop postgraduate courses specifically for Shepherd employees. The courses develop competence, skills and knowledge related to the specialist needs of the group and individual needs of the student. Different courses have been delivered for construction managers, quantity surveyors and mechanical and electrical engineers.

The company selects the participants for the courses and decides the core content of the modules according to its business needs. External consultants and Shepherd employees, who are experts within their own field, deliver the lectures and workshops. The University provides specialist tutoring, assesses the participants' work and has a role in ensuring that academic quality standards are maintained.

Using work-based projects and reflective practice assignments each participant is able to tailor the learning experience to their current knowledge and future work needs. The flexibility of the research and assessment allows students to focus in on an aspect of their work, gathering information and investigating issues in detail. Through the study delegates reflect on their practice, become more aware of the strengths and limitations of alternative approaches and develop a high level of understanding within a specific field. Presentations, group-work and discussions during the course help to explore topics, exchange information and generate ideas. Group discussions also have an impact on the individual, increasing their awareness of different perspectives and encouraging greater reflection when engaging in their own personal study. The course has fostered the development of informal networks allowing employees to seek advice and information from colleagues in different parts of the country. Such interaction encourages the knowledge exchange required to develop a true learning organisation.

The programmes are highly successful with many students achieving postgraduate Certificates, Diplomas and Masters awards from Leeds Metropolitan University. Increasing national interest in work-based learning means that innovative programmes like this are likely to become more popular. The Shepherd Group has received national training awards for its in-house management development programme.

Box 15.1 A unique management development programme.

membership. The main concerns are about the effectiveness of these CPD activities and their costs. There has still been rather heavy reliance on short, updating courses, delivered in conventional ways; and employers have to ask themselves whether a one-day conference costing £250 per delegate and comprising a dozen specialists giving a series of short lectures, has really led to any significant behaviour change or

skill learning among their staff. CPD needs to shift more of its focus towards life-long learning and encourage learning interventions which actively involve people and don't have them passively listening to others.

Construction Industry Training Board (CITB)

The CITB is a non-departmental government organisation and is the National Training Organisation (NTO) for construction. It is largely funded by an employment levy that is set by parliament every year. The levy is calculated by applying percentage rates to payments to directly employed personnel (currently 0.5%) and payments to labour-only subcontractors (currently 1.5%). Research suggests that firms that directly employ staff are more likely to invest in training for these staff than firms that employ subcontractors. Hence the levy is a fair way for the costs of construction training to be shared between the entire sector (CITB, 2003a).

The CITB (2003b) has a three pronged approach to combating the industry's skills shortage:

- to provide training grants and support to encourage employers to take on apprentices and train existing staff on-site;
- to match young people interested in a career in construction with the best training route for them;
- to actively promote construction careers in schools.

In October 2001 the government announced that NTOs would be phased out and organisations would be asked to form Sector Skills Councils (SSC). As well as delivering qualifications and meeting the basic skills needs of the industry, SSCs will be more strategic bodies. The CITB has become a Sector Skills Council and is known as CITB-Construction Skills.

Summary

Helping employees to achieve their maximum potential is a central activity of the business. Staff development is necessary to maintain existing levels of skills in the business, but it becomes vital when the organisation has to keep pace with change.

Implementing staff development is difficult, costly and hard to evaluate. Benefits are seldom 'visible' in the short-term and are obscured by other changes in the longer term, so long-range planning of development coupled with an act of faith, are essential. Firms differ in the degree of formality with which they tackle staff development. Some, like the farmer, simply encourage their employees to grow; others put them through tightly-structured programmes of instruction.

The development process begins with performance appraisal, in which employees' achievements are reviewed and training needs identified. Development plans are put

into action using a wide range of approaches and methods. Increasingly, the methods favoured are those which involve the employee in active, problem-based learning, undertaken at least partly within the realistic setting of the workplace.

New approaches to development concentrate on helping employees to learn appropriate skills and attitudes; they encourage them to take charge of their own development, learn how to identify their own goals, and locate the means for achieving them; they emphasise the need for flexible learning provisions, which can be tailored to the individual's needs and preferences.

CAL in all its many guises offers huge potential, but care must be taken to ensure that exciting new multimedia educational and training packages do not ignore important underpinning pedagogic design issues.

If the firm has a personnel department, one of its responsibilities will be to advise on training priorities, help produce development plans and secure the resources for meeting them. Increasingly, staff development activities will be integrated with the broader processes of strategic management and organisational development. They will focus on helping employees to manage change and improve organisational performance in a turbulent environment.

Mind map tasks

Developed in the 1960s, mind maps provide a quick way of getting your thoughts and ideas down on paper. Using words, symbols or images, mind maps can be used to take notes, plan essays, aid revision or assist in problem solving. Write your main idea in the centre of a sheet of paper, draw lines between key concepts and add further 'branches' as you develop each train of thought (LMU, 2003). Simple but powerful!

Construct a mind-map to represent the key issues associated with employment planning. Consider how you might use the map to highlight inter-relationships between complementary concepts.

Chapter 16 Health and Safety



Safety

Construction sites are dangerous places. The industry remains one of the most dangerous in the UK. The fatal injury rate of 4.2 compares unfavourably with the all industry average of 0.88. Roughly, 80 people die (Table 16.1) on construction sites every year (more than in all the manufacturing industries put together). In the last 25 years, 2800 were killed on construction sites or as a result of construction activities. Many more have been injured or made ill. In the Health and Safety Executive's reporting period 2001/2002, there were about 4600 major injuries and a further 9700 'over three-day' reported injuries in construction (HSE, 2003). These figures include employees and self-employed persons.

The main causes of deaths and major injuries (Table 16.2) are:

- Falling through fragile roofs and roof lights.
- Falling from ladders, scaffolds and other work places.
- Being struck by excavators, lift trucks or dumpers.
- Overturning vehicles.
- Being crushed by collapsing structures.

In June 2002, The UK Government launched an initiative entitled *Revitalising Health and Safety in Construction* (HSE, 2002). This is designed to inject new impetus into the health and safety agenda, 25 years after the Health and Safety at Work Act 1974. There have been other recent initiatives to address the poor safety record of the construction industry. The area of 'competence' is probably where the most visible cultural change has been seen. The industry continues to work towards a fully qualified workforce, and the Construction Skills Certification Scheme (CSCS) and other equivalent training schemes are already being recognised as a minimum industry standard. In *Accelerating Change*, the Strategic Forum states that the move to a fully qualified workforce 'will have a major impact on the number of avoidable accidents caused by a basic lack of site awareness'. From the end of 2003, contractors are not allowed on to sites of members of the Major Contractors' Group (MCG), part of the Construction Confederation (CC) without a relevant training certificate. Of course, the delivery of this objective would depend upon

Table 16.1 Number of fatal injuries to workers and members of the public 1991/92–2002/03(p) (a)

	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00	00/01	01/02	02/03(p)
Employees	83	70	75	58	62	66	58	47	61	73	60	57
Self-employed	16	26	16	25	17	24	22	18	20	32	20	14
Members of the public	6	5	6	5	3	3	6	3	6	8	5	5

Table 16.2 Percentage of fatal injuries to workers by kind of accident 1996/97–2002/03(p) (a)

	96/97	97/98	98/99	99/00	00/01	01/02	02/03(p)
Falls from a height (b)	56%	58%	60%	52%	44%	46%	46%
Struck by moving vehicle	11%	6%	12%	6%	16%	14%	7%
Struck by moving/falling object	12%	15%	12%	21%	10%	16%	15%
Trapped by something collapsing or overturning	7%	5%	5%	2%	17%	5%	7%
Other	14%	16%	11%	19%	12%	19%	24%
Total number of injuries	90	80	65	81	105	80	71

(a) Reported to all enforcing authorities.

(b) Falls from a height include falls from up to and including 2 metres, over 2 metres and height not known.

(c) Non-fatal injury statistics from 1996/97 cannot be compared directly with earlier years due to the introduction of revised injury reporting requirements (RIDDOR 95) in 1996.

(d) The definition of a non-fatal injury to a member of the public is different from the definition of a major injury to a worker.

(p) Provisional

Source: <http://www.hse.gov.uk/construction/index.htm> [HSE, 2004]

co-operation across industry as many of the site workers are employed by the sub-contractors.

Revitalising Health and Safety in Construction (HSE 2002) identified the drivers for improved performance in Health and Safety, a key aspect of Respect for People, not only as industry-wide leadership, leadership within businesses, client leadership, and corporate responsibility, but, most importantly, the economic levers of socially responsible investors (SRI) and the costs and availability of insurance.

Some, like the Highways Agency, have built improved health and safety into their own overall procurement strategy. *Revitalising Health and Safety* (HSE, 2002) accepts that making changes to improve health and safety also improves 'bottom-line' performance: profitability, productivity and quality. This recognises that step changes in process and attitudinal change impact on everything. OGC Procurement Guidance Nr. 10: *Achieving Excellence through Health and Safety* (HM Treasury, 2002) requires all government departments to be able to relate health and safety

performance to overall business performance. Further, the government procurer is encouraged to favour suppliers and procurement routes that have the greatest impact on health and safety.

People, culture and organisational processes are at the heart of health and safety in construction. Any business case must be understood within the context of different organisational characteristics. The need to establish the business case for Respect for People is also called for. While the business case, established in 'best practice' exemplars is important, other issues such as capability and capacity of organisations to change, needs to be addressed. The HSE, in *Changing Business Behaviour: Would Bearing the True Cost of Poor Health and Safety Performance Make a Difference?* (HSE, 2002) discussed a 'social cost' of health and safety failure and this must be considered.

Against this background, managers have to take their safety responsibilities very seriously and it was not surprising that the Construction (Design and Management) Regulations 1994 (CDM Regulations) were introduced, in an attempt to bring a more comprehensive and strategic approach to construction health and safety.

Construction managers must take every reasonable step to protect the health and safety of employees, comply with statutory requirements and improve standards wherever they can. Economic pressures to cut project times and costs militate against this, but managers must make health and safety a high priority. They must encourage responsible attitudes to health and safety and increase people's awareness of the dangers.

This involves the use of many management skills and techniques discussed earlier in this book, including the following.

- Clear communication.
- Good organisation.
- Persuasion and education.
- Rewarding employees for safe practices (operant conditioning).
- Setting realistic targets for employees to achieve, under appropriate working conditions.

Attitudes to safety

The attitudes of construction workers and managers towards safety is undoubtedly a major factor in the poor accident record of the industry. Many managers see construction as a rough job for tough, self-reliant people. Some of them believe that building to tight deadlines at low cost is incompatible with high safety standards.

Construction workers accept that their work is demanding and risky, although they usually underestimate the risk. Group norms may cause individuals to ignore safety measures for fear of appearing cowardly or weak to their workmates.

Some managers and workers try to avoid complying with safety regulations and sometimes make collusive arrangements to avoid them. In one instance, employees were given a bonus to undertake hazardous work without safety equipment, on a

Sunday, when it was known that neither the safety officer nor safety representative would be present (Shimmin *et al.* 1980).

Although examples like this may be uncommon, the use of bonus payments to increase productivity encourages workers to take short cuts and skimp on safety measures. For these workers, the benefits of risk-taking seem to outweigh the potential costs.

It will need more than legislation to make construction safer. Attitudes in the industry have to change. This includes clients' and designers' attitudes towards safety. The CDM Regulations 1994 were intended to bring about attitude change as well as compliance. Certainly there is evidence that clients are taking the health and safety performance of contractors more seriously when awarding construction contracts.

The Health and Safety Executive (HSE) has played an important part in attitude change. For instance, it has argued the case that clients should expect to pay a 'safety premium' on construction; that if a rock bottom price means that people will die or be injured, then the price is too low. The HSE has also helped to change attitudes by arguing that safety measures can be cost-effective. This is because the costs resulting from accidents and fatalities can be higher than the cost of preventive measures.

Team approach to health and safety: the CDM Regulations 1994

To persuade the whole construction industry, including its customers, to take site safety and health more seriously, the EC introduced, in 1992, the Temporary or Mobile Sites Directive, which has been implemented in the UK as the CDM Regulations 1994. The regulations require clients and all the members of project teams to work together to maintain health and safety standards on projects.

The regulations place duties on clients, designers, other professionals, contractors and site workers, so that health and safety must be planned and managed through all stages of a project. Specialist contractors and self-employed sub-contractors must co-operate with the main contractor and provide relevant information about the risks created by their work and how they will be controlled. Under the regulations, all employees on sites should be better informed and have the opportunity to be more involved in health and safety.

Despite efforts by the HSE to promote the regulations, there has been considerable opposition, not least among the professions. Alexander (1995) has argued that the regulations add another costly layer of bureaucracy, leading to confrontation and legal battles, rather than making construction sites safer.

The CDM Regulations apply to all notifiable construction work and to non-notifiable work that involves five or more people on site at any one time. They also apply to all design and demolition work.

The regulations identify the role of *planning supervisor*, the person with overall responsibility for co-ordinating the health and safety aspects of the design and planning stages and the early stages of the health and safety plan and the health and safety file. Clearly, all parties to the project need to understand their obligations and

the HSE has published an approved code of practice to aid the implementation of CDM Regulations (HSE, 1995, revised 2002).

Health and safety plans and files

CDM requires that a detailed *health and safety plan* be drawn up before site work begins. There must be a pre-tender safety plan, available to contractors tendering for work. This must identify, among other things, the risks to workers as far as these can be predicted at the tendering stage. The main contractor, once appointed, must draw up a health and safety plan for the construction phase. This must include all the arrangements for managing health and safety throughout the construction stage.

The planning supervisor is responsible for ensuring that a *health and safety file* is compiled during the progress of the work. This is a record for the client/user and identifies the risks that have to be managed during maintenance, repair or renovation. The client must make this file available to anyone who will have to work on any future design, building work, maintenance or demolition of the structure.

Formal enforcement of the CDM Regulations

The Health and Safety Executive said that it would help the industry to cope with the introduction of the CDM Regulations, by giving advice and visiting major clients, professional practices and larger contractors. However, the Executive made it clear that formal enforcement would be used where there was a high risk of accident or ill-health (Nattrass, 1995). Nattrass gives examples of where HSE might issue Improvement Notices – or possibly Prohibition Notices. They include:

- Failure by a client to appoint a planning supervisor in an obviously complex or risky project.
- Failure by a designer to provide adequate information at the design stage.
- Failure by a client to ensure an appropriate construction phase plan has been prepared before construction begins.
- Failure by a principal contractor to cover obviously high risk aspects in a construction phase plan.

These examples clearly demonstrate the HSE's intent to ensure that all parties play their role in maintaining health and safety standards on projects. Interestingly, the growth in project partnering arrangements will complement this process, health and safety being one of the areas of common objectives.

High-risk activities

Some occupations are more risky than others. Not surprisingly, steel erection and demolition account for many fatalities and serious accidents. Collapses of false-work, scaffolds, hoists and cranes also account for many injuries and deaths. But

trades like painting and decorating are also hazardous, because of poor workplace access and inadequate working platforms.

Some of the most dangerous activities identified over the years are given below.

Steel erection

Common accidents involve falls from structures and access ladders, collapse of partially-erected structures which are unstable, and materials or tools being dropped from a height. Steel erectors have traditionally resisted wearing safety belts, a problem made worse by lack of anchorage points. Erectors may also be unaware of the extent to which partially-erected structures are stable or unsafe. To prevent accidents from materials falling from structures, barriers and warning notices must be used to limit access beneath steelwork during erection.

Demolition

Accidents include premature collapse of unstable, partially-demolished structures and materials falling from structures (often outside the site boundary, injuring passers-by). Lack of information about the structural character of a building being demolished has been a serious problem, but in 1995, it became compulsory to prepare health and safety files for buildings to comply with the CDM Regulations 1994. This should help to reduce this problem in the future.

Scaffolding

Poor working practices in the erection, maintenance and dismantling of scaffolds have to some extent been overcome by better training. Failure to tie scaffolding and mobile scaffold towers into structures has caused many collapses.

Refurbishment projects can pose special problems, as clients may not wish to have scaffold fixtures penetrating window openings, disrupting user comfort and property security. On multi-contractor sites, the principal contractor must co-ordinate the use of scaffolds and ensure that modifications are carried out competently and inspections performed regularly.

Excavations

Collapse of the sides of unsupported excavations and sudden collapse of structures adjacent to excavations are among the hazards. Uncovering toxic material and striking electric cables are dangers during digging and working in excavations. Unfenced or poorly protected excavations pose risks not only for employees but the public, especially children.

Falsework

Temporary structures aren't always designed as carefully as permanent ones, because they are temporary. This is more of a problem for smaller contractors who lack staff with good engineering expertise. Some of the worst accidents in the industry's history have involved collapses of large, temporary structures to bridges and viaducts.

Maintenance

Because maintenance operations are often short-term, short cuts are taken, like skimping on access equipment. More attention to maintenance at the design stage can reduce such problems, by including proper access ways, cradles and anchorage points for safety equipment in the permanent structure.

Roofwork

Most accidents involve operatives falling from unguarded edges of roofs or falling through roofs that lack loadbearing strength. Roofers often ignore the statutory requirements and work without roof ladders, edge barriers and crawling boards, etc. Injuries commonly involve not only roofers but other trades working on roofs.

Site transport

Many serious accidents are caused by heavy goods vehicles and earth-moving equipment. A lot of incidents happen whilst vehicles are reversing. Other causes are poor site layout, careless unloading, tangling with overhead power lines and people riding on vehicles in insecure positions.

Painting

Painting has a poor safety record. Work proceeds quickly, requiring access equipment to be moved frequently. Safety precautions are neglected to avoid delays. Painters often receive minimal supervision and have little expertise in the use of cradles and access towers. Painting also has its own health risks. Some specialised paints emit toxic and inflammable vapours, causing problems mainly when working in confined, badly ventilated spaces.

Health

The occupational health record of the industry is as bad, if not worse than its safety record, but finding means to measure this and monitor progress is not easy. However, in 2001/2002, it was estimated that 137,000 people whose current or most recent job in the last 8 years was in the construction industry suffered from an illness

which they believed was caused by or made worse by the job. In 1995, it was estimated that over 1.2 million working days were lost as a result of work-related ill health (HSE, 2003).

Safety hazards have overshadowed the health risks to construction workers. This is partly because employers and employees have not been fully aware of the health risks and partly because of an attitude among some employers that health is the worker's own responsibility. Moreover, health hazards are difficult to control because site conditions are so variable.

There have been relatively few systematic studies of the health of construction workers, but the main hazards are known. They include dusts, toxic substances, radiation, vibration, noise, changes in atmospheric temperature and pressure, and inadequate welfare and hygiene.

Whilst occupational health hazards are becoming more widely understood, many new materials and processes are exposing employees to fresh health risks. Fortunately, employers are beginning to realise that safeguarding workers' health makes economic as well as human sense.

The industry is aware of the established hazards such as working with lead paint and in compressed air, but other risks have remained hidden. Asbestos, especially the blue type, has received a lot of attention in the industries producing it (mining, milling and processing) but the risks to construction workers handling asbestos were neglected for a long time.

It only became widely known in the 1970s that prolonged exposure to dusts from silica and certain hardwoods can cause serious lung disease. Handling wet concrete and mortar can cause skin complaints like dermatitis, whilst welding and oxyacetylene burning can create toxic fumes.

The structure of the industry, fragmented into many small units, has aggravated the problem because health safeguards often rest with small firms who cannot afford occupational health measures. These firms might, however, be able to agree to share such facilities (Health and Safety Executive, 1983).

Employees have shown little concern for their own health and many new employees are unaware of the risks. Many workers develop rheumatic and arthritic conditions after long exposure to cold and wet weather, because they wear inadequate clothing.

The industry has undoubtedly neglected occupational health issues in the past in comparison with other industries, which have provided much better facilities. This situation is partly a result of the temporary nature of the industry's production base. The position is improving and legislation is helping ensure that at least some of the occupational health problems are tackled. Relevant regulations include the COSHH Regulations 2002, the Workplace (Health, Safety and Welfare) Regulations 1992 and the Personal Protective Equipment at Work Regulations 1992.

Many ailments occur too frequently in construction workers to be explained by non-occupational factors. These include lung cancer, respiratory diseases, stomach cancer, muscle and joint conditions, arthritis and dermatitis. Unfortunately, statistics rarely indicate the causes of these illnesses. Many chronic, slow-developing

diseases do not become noticeable for years, by which time they are seldom traced back to their causes.

Many hazards not only affect workers directly involved in risky operations, but others doing harmless jobs nearby. On multi-contractor sites, control is especially difficult.

One of the implications of the Health and Safety at Work Act 1974 is that the industry needs to focus on the general well-being of its workers and not just on preventing accidents. This concern should include the mental and physical welfare of employees and should recognise that many health problems arise from a combination of factors inside and outside the workplace. Changes in work patterns and family life have put more pressure on people. To cope with this, they often eat, drink or smoke too much. This may reduce the effects of stress but exposes them to other health hazards. Many physical and mental illnesses are linked, so a broad approach to health seems essential. In the late 1970s and early 1980s, many medical people were beginning to turn their attention from ways of curing ill-health to strategies for promoting *positive health*.

Control of Substances Hazardous to Health Regulations 2002

The purpose of the COSHH Regulations is to protect employees from the dangers of hazardous substances, such as solvents, glues, cement, plaster, bitumen, fillers, and brick and silica dust. Lead and asbestos are covered by separate regulations.

The regulations require employers to identify the substances employees may be exposed to, assess the hazards they may cause and eliminate or control the risks. They must provide suitable training and monitor the effectiveness of their control measures. Wherever possible, employers should not rely on the use of personal protective equipment as the foremost method of minimising exposure to a hazardous substance.

Employees must take reasonable steps to safeguard themselves from risk, including the use of protective clothing and equipment, reading instructions and COSHH information sheets, adopting safe working practices and familiarising themselves with emergency procedures.

Physical health hazards

Dusts

Dusts from many sources are a prominent hazard in construction. Particles less than 5 microns in diameter pass through the body's defences into the lungs or stomach, affecting the body in various ways. Silica and asbestos dust can permanently damage lung tissue, whilst lead in dust (from rubbing down lead paintwork, for instance) is absorbed into the lungs and enters the blood stream, causing poisoning.

Silicosis is caused by inhaling small particles of quartz-containing stone. Asbestosis, lung cancer and mesothelioma (tumour of the lining of the chest or abdominal

cavity) are potential diseases for de-laggers and demolition workers. Even the hazardous blue asbestos or crocidolite, seldom used in new work, is still encountered in demolition and alteration projects.

Cement dust, especially with chemical additives, is a respiratory hazard, although dust levels are usually low, especially if ready-mixed products are used. The risk of cement burns and dermatitis is greater.

Many other dusts irritate the throat and eyes, damage the lungs or poison the body. They include dusts from some untreated hardwoods, as well as timbers treated against rot and insects. Particles of fibre glass, resin-based and plastic fillers, and bricks and blocks which have been cut, can also be harmful.

Toxic fumes

Lead poisoning has become less common, but can still occur during welding, cutting or burning off old lead-painted structures. The lead in fumes is readily absorbed into the body. This has been a hazard for demolition workers. It is less of a problem in new work, but organic chemicals are creating fresh hazards all the time. Building services operatives are at risk from welding, flame-cutting and lead-burning fumes.

The use of internal combustion engines in confined spaces puts people at risk from carbon monoxide poisoning. Paint solvents and cavity-insulation materials can give off toxic fumes. Stringent precautions are needed when using solvents and other chemicals, especially when working in an enclosed area. A forced ventilation system may be needed.

Vibration and noise

The use of vibratory tools can give rise to numbness of the fingers, commonly known as 'white finger' or 'dead hand', and to general systemic effects, such as weakness. The first sign is usually whiteness in the fingertips and numbness when the hands are cold. Some workers are more susceptible than others, but all employees at risk should be given information about the condition. It can slowly spread to other parts of the circulatory system. Severe numbness and weakness, after long exposure to vibration, can cause accidents as well as health problems.

Noise can cause hearing damage, the risk depending on the noise level and length of exposure. Drivers of heavy machines and operators of drilling equipment powered by air compressors are at serious risk, especially if the work is confined, as in tunnelling. There has been considerable progress in reducing noise problems through the use of acoustic enclosures, muffles and ear defenders.

Skin troubles

Individual reactions to substances vary considerably but cement, tar, bitumen, paints and varnishes, some woods (especially hardwoods), epoxy and acrylic resins, solvents, acids and alkalis, are common causes of skin diseases. Tar warts, for

instance, are a form of cancer which can become serious if not diagnosed and treated.

Operatives should be made aware of the hazards and encouraged to use protective gloves, barrier creams and skin cleansers. Workers often use solvents and strong detergents to remove chemicals from the skin and unknowingly substitute one source of skin trouble for another.

Dermatitis is quite prevalent among construction workers. Its signs include reddening and blistering of the skin. Early treatment is important.

Radiation

Radiation from lasers and from non-destructive testing and welding is an increasing risk for construction workers. Protection from ionising radiations, such as X-rays, is very important. Although the work should be undertaken by qualified operatives, the manager must ensure that unauthorised personnel stay away from the restricted area.

Local exposure to radiation results in reddening or blotching of the skin, whilst acute general exposure may cause nausea, vomiting, diarrhoea, collapse and even death. Prolonged exposure to small doses can cause anaemia and leukaemia.

Laser beams can damage the skin and particularly the eye. The lens of the eye focuses the intense light on the retina, causing burning. Since lasers are likely to be used increasingly in surveying and other construction operations, their use must be properly supervised.

The effects of many of these hazards can be reduced if the recommendations of the Personal Protective Equipment Regulations 1992 are followed.

Effective communication and managing health and safety

Effective communication of health and safety (H&S) and workforce involvement in health and safety are critical to effective health and safety management. Construction requires a focus on inter-specialisation communication and the need for teamwork, flexibility and co-ordination making strong demands on the communication requirements. Multi-lingual and multi-cultural worksites raise further communication issues.

Effective communication of health and safety could be achieved by well planned, two way communication between management and employees and by involving staff in the development and implementation of health and safety systems, such as training, writing procedures, hazard spotting and workplace risk assessment. Forms of communicating health and safety include H&S notice boards, H&S site inductions, safety briefings (tool box talks), a formal suggestion scheme and safety committee meetings.

Recent HSE sponsored research (Anumba *et al.*, 2002) entitled *Health and Safety*

in *Refurbishment Involving Demolition and Structural Instability* identified three different stages across which the communication of project information and of health and safety requirements has to be organised.

- *First level – client's team.* The communication of design information and of any assumed demolition sequence developed by the structural engineer is vital for the preparation of the pre-tender health and safety plan. This may also result in modifications to parts of the design or in the implementation of specific safety procedures in the pre-construction health and safety plan.
- *Second level – between designer/structural engineer and contractor.* Project information has to be communicated in detail in order to share the engineering knowledge acquired during the design stage. Communication between designers and contractors during design changes is also fundamental. The exchange of information has to be mutual because contractors, through their experience and skills, may add additional considerations to the project. If assumed demolition sequences have been developed they have to be explained to the contractor. The contractor may modify them adding the demolition method selected and the related plant and equipment.
- *Third level – contractor/sub-contractor's team.* Project information has to be communicated to the workforce and the site manager has to ensure that they understand site rules and health and safety procedures related to the activities they are going to undertake. Workers have also to be adequately instructed about not taking any initiative that has not been authorised by site managers.

The case studies conducted during the study showed examples where project information can be better communicated through drawing-based method statements. Instructions can be given to workers through regular briefings; because the instructions to be given to site workers need to be clear and concise (especially to overcome language barriers) and they have to capture the attention of the audience; drawings and pictures are strongly suggested.

The nature of the industry with temporary worksites and sub-contracting presents some challenges in securing workforce participation and warrants more complex communication systems. In an information communication technology era, newer forms of communication are becoming evident, including the Internet and mobile phones.

The common law on health and safety

Since the early 1970s, the important changes in the health and safety at work law have been statutory. However, the common law is important too, as it is the foundation of statute law and gives employees recourse to damages if they are injured or contract disease in the course of their work.

Employers have common law liabilities towards both their workers (personal liability) and third parties (vicarious liability).

Personal liability

An employer who fails to take reasonable care to ensure the safety and health of an employee can be sued for damages in the civil courts, but only if the employee has suffered an injury or loss. This contrasts sharply with the system imposed under the Health and Safety at Work Act 1974, where criminal proceedings can be taken if safety standards are breached, even if no-one is hurt.

Injured workers can only claim damages if the injury happened during the normal course of their work. This would include, for instance, injury caused in a motor accident whilst a worker was being driven to site in the firm's minibus. One employee successfully claimed damages when he got frost-bite driving the company's unheated van!

The employer only has to take 'reasonable care' and is not expected to be over-protective to workers or guarantee their safety. In one case, the court refused damages to a worker injured in a rush to get to the works canteen. The employee has to show that the employer's failure to take reasonable care caused the accident and that it would not have happened otherwise.

The responsibility for accidents cannot always be attributed solely to employer or worker. If both are partly to blame, the damages awarded are reduced by the amount of the worker's contributory negligence. Contributory negligence can apply when a worker is partly to blame for the extent of an injury, even though he or she didn't cause the accident. An example would be an operative working below scaffolding who neglects to wear a hard hat and is struck on the head by a falling object. The courts are, however, generally reluctant to penalise employees for this kind of negligence.

Vicarious liability

An employer is responsible for the negligence of employees if they cause injury or loss to another employee or a third party. The injured person can sue both employer and employee, but has the sometimes difficult problem of proving that the employee caused the injury during the 'normal course of his employment' (Field, 1982). If a mobile crane runs over the architect who is inspecting the site, there will be little difficulty in bringing a claim. But if the crane driver borrows his employer's lorry to fetch his lunch box from home and runs down the architect on a public road, proving the employer's vicarious liability will be more difficult.

In *Conway v. George Wimpey* (1951), the employer was not held liable for the injuries received by a hitch-hiker who was given a lift in a company lorry. The giving of the lift was not for the purposes of the employer's business and was in contravention of company rules.

However, it is hard for the employer to guard against such liabilities, even outside working hours. In *Harvey v. O'Dell* (1958), an employer was held liable for injuries to an employee who was riding on the back of the storekeeper's motorbike, returning to site from their lunch at a local café. Because the employer had not made

proper eating arrangements on this 'outside' job, the trip to the café was held to be 'incidental' to their employment.

Occupiers' liability

Under the Occupiers' Liability Acts 1957, 1984, employers have a liability to ensure that all premises on which their business is being conducted are reasonably safe places for employees, visitors and persons other than visitors. This obligation is important for sub-contractors working on a main contractor's premises and for main contractors working on a client's premises.

Employers must be aware that their duty extends, for example, to trespassers and they must take reasonable care that non-one is injured, for instance, by a guard dog. A special concern is the safety of children, and contractors have to take precautions to prevent children entering construction sites, during or after working hours, where they are at risk. This requirement is underlined in the CDM Regulations 1994.

The Health and Safety at Work etc. Act 1974

Every employer has a common law duty to take reasonable care of employees and anyone else who may be injured as a result of the employer's activities. However, common law does not require the employer to prevent accidents from happening – it simply establishes liability if they do.

Because of this, many statutes have been passed making the employer take positive action to prevent accidents in the workplace and promote the well-being of workers. An employer who fails to comply with the statute law may be criminally liable for dangerous practices even if no accident has occurred. An example of this would be the persistent use of unguarded machinery. Acts like this have included the Mines and Quarries Act 1954, the Factories Act 1961 and the Offices, Shops and Railways Premises Act 1963. Each dealt with one industry or part of an industry.

In 1972, the Robens Committee reported that there should be one piece of legislation, covering all employees in all industries, providing preventive health and safety policies and involving workers in the making of health and safety policy.

The outcome was the Health and Safety at Work etc. Act 1974 (HSW Act). It brought about some fundamental changes. Unlike previous statutes which applied to places like factories, mines and offices, the 1974 Act emphasises the responsibilities of people – employers and employees. It covers virtually all employees.

The Act also protects other people who may be affected by an employer's activities and imposes obligations on the manufacturers and suppliers of equipment and materials.

The powers of the health and safety inspectors were widened by the Act, which also aims to increase awareness of the need for safe and healthy workplaces.

The employer's duties

Under the HSW Act, employers have a duty to protect workers' health and safety and must, so far as is *reasonably practicable*:

- provide and maintain safe systems of work and plant;
- ensure safety and absence of risks to health in using, handling, storing and transporting materials, tools or components;
- give health and safety information, instruction and supervision as needed;
- provide safe, healthy workplaces and access to them;
- provide employees with a safe, healthy working environment, and adequate welfare facilities.

As well as being responsible for premises over which they have direct control, employers have to provide a safe system of work when employees are working in other people's premises. This is important in the refurbishment or alteration of buildings or structures.

The employee's duties

Employees have a duty to take reasonable care for the health and safety of themselves and of other people who may be affected by what they do or fail to do. They must co-operate with their employers over statutory safety provisions. An employee must not interfere with safety measures or misuse health or safety equipment.

Drake and Wright (1983) point out that if employees neglect their duties under the HSW Act, they could be fairly dismissed under the provisions of the employment legislation.

Safety policy

Every firm must prepare a safety policy, keep it up to date, and bring it to the attention of employees. The policy must be in writing, except for firms employing less than five people. Their safety policy can be oral. The HSW Act does not dictate the content of the policy. Its aim is to encourage firms to work out solutions tailored to their own health and safety problems. However, the Health and Safety Executive publishes guidelines. If a serious accident occurs, the employer's safety policy will often be the starting point of the inspector's investigation. Workers' safety representatives may also take a careful look at the policy.

Most safety policies for construction firms begin with a general statement of intent and then detail the responsibilities of the various levels of management. A policy should set standards and specify how they will be achieved. Companies employing more than 20 workers must appoint a safety officer, who will assess risks and organise the firm's safety measures.

The safety policy should define responsibilities for:

- monitoring the firm's safety activities;
- maintaining contact with sources of advice, such as manufacturers, employers' federations and the Health and Safety Executive;
- organising health and safety training;
- responding to the work of safety representatives and committees.

The policy should explain how these responsibilities will be carried out. This will reflect the scope of the firm's work and should include:

- procedures for dealing with risks, including inspections, plant maintenance and guarding of machinery;
- precautions against special risks created by the firm's work;
- accident reporting and investigation procedures;
- provision and use of protective clothing and equipment;
- safe routines for introducing new equipment, materials and methods;
- emergency procedures for dealing with explosion or fire;
- arrangements for communicating with workers about health and safety matters;
- a system for identifying safety training needs and implementing training;
- inspections, audits and other arrangements for checking health and safety measures.

Administration of health and safety legislation and standards

The HSW Act created the Health and Safety Commission (HSC) and the Health and Safety Executive (HSE). Broadly, HSC formulates policy and HSE implements it. The aims of HSC/E include:

- defining a *framework of law and standards*, in particular by proposing reform of existing legislation and participating in standard-setting in the European Community and with other international bodies;
- promoting *compliance with the 1974 Act* and related measures, particularly through inspection, advice and enforcement, thus protecting employees and the public from safety and health risks;
- *investigation of accident and health problems* and related activities, including assessment, research and information services.

A full description of HSC/E aims and activities can be found in the Commission's annual reports (see, for instance, HSC, 1995a).

Role of the health and safety inspectors

There are about 20 HSE area offices in the UK, each of which has a construction team. The inspectors give advice as well as enforcing the legislation affecting construction operations. Consultants are employed to advise on specialist problems.

Although the inspectors are thinly spread in construction, they have considerable powers and can:

- enter premises (including construction sites) at any reasonable time or, if there is a hazard, at any time;
- take with them a police officer, if obstruction is expected;
- direct that the premises or part of the premises be left undisturbed while investigations are carried out;
- make any examinations and investigations, and take whatever measurements, recordings, photographs or samples they need;
- require any involved person to give information, answer questions and sign a declaration;
- inspect or take copies of any relevant document, such as a record or register, or an entry in such a document;
- require any other person to provide assistance.

In addition, inspectors are given any other powers necessary for exercising their duties. They can give information to employees or their representatives to keep them informed about health and safety matters. This may be information about the employer's premises or activities, or about any action the inspectors have taken or intend to take. The same information must be given to the employer.

If an inspector considers that the statutes have been or are likely to be contravened, he or she can serve an *improvement notice* on whoever is responsible. This requires that the problem be remedied within a specified time.

If there is a risk of serious personal injury, the inspector can prevent or stop an activity by issuing a *prohibition notice*. This can take immediate effect or can be deferred if, for example, the hazardous operation is not due to commence straight away. Prohibition notices can stop all work on a site, but more often they apply to specific operations. A notice can be served on an individual if, for instance, he or she is not wearing eye shields whilst using a grinding wheel.

Over 2500 notices were served by construction inspectors in the year 1994/95. About 2200 of these were immediate prohibition notices (HSC, 1995b). Inspectors can prosecute employers and employees and the penalties include fines and imprisonment. In the period above, about 500 convictions were obtained following proceedings by construction inspectors.

The Construction Industry Advisory Committee (CONIAC)

The Health and Safety Commission created advisory committees to look at the particular problems facing the major industries. CONIAC is the committee for construction. Its aim is to give the industry a chance to help identify areas where action is needed and to contribute to practical solutions.

CONIAC working parties have looked at problems like attitudes to safety, the

wearing of safety helmets, health and safety in small firms, and the contribution of the design team and client to site safety.

An early concern of the committee was the provision of guidance on safety policies, and it published a guidance leaflet *Safety Policies*, in 1982.

A further CONIAC initiative was *Site Safe 83*, a campaign aimed at bringing about a permanent change in attitudes to safety by creating greater awareness. One of the worries is that, despite campaigns like this, the safety message is not getting through to small firms (HSE, 1983).

In the 1990s, CONIAC was particularly active in the development of the CDM Regulations and their implementation. The committee has had to tackle fears within the industry and its professions that the regulations would create unacceptable bureaucracy and extra work.

Construction regulations

Whilst the HSW Act deals with general duties, there are also detailed regulations which apply to construction. In particular, the Construction (Health, Safety and Welfare) Regulations 1996 (CHSW Regulations) have replaced the bulk of the earlier Construction Regulations which came into force in the 1960s. They don't, however, replace the Construction (Lifting Operations) Regulations 1961. These were dealt with in a separate consolidation of all the UK lifting legislation, the Lifting Operations and Lifting Equipment Regulations 1998.

The CHSW Regulations consolidate, modernise and simplify the earlier requirements, completing the implementation of the EC Temporary or Mobile Sites Directive 1992 and concluding the updating of health and safety in the construction industry. They apply to most construction work and reflect the particular processes, working practices and hazards of the industry, which are wide ranging and complex. Their scope is broad and they give protection to everyone who carries out construction work, and to people other than employees who may be affected by such work.

Whereas the CDM Regulations provide a framework, within which parties to a project can exercise judgement about what is reasonably required, the CHSW Regulations are prescriptive, targeting specific hazards, systems of work, competencies and so on. They can provide a ready-made agenda for drawing up a Health and Safety Plan under CDM (Joyce, 1995).

The CHSW Regulations 1996 cover, amongst other things:

- Safe places of work and safe access to and from work places.
- Prevention of falls; safety of scaffolding, ladders, harnesses, etc.
- Protection of workers and others against falling objects/materials.
- Avoidance of collapse of structures.
- Safety measures for excavations, cofferdams and caissons.
- Safe arrangements for traffic routes, vehicles, gates and doors.

- Prevention and control of emergencies.
- Provision of welfare facilities for washing, changing, resting, etc.
- Training, inspections and reports, and site-wide issues.

The Lifting Operations and Lifting Equipment Regulations 1998 cover the safe use of lifting appliances, including hoists, cranes and excavators; safe workloads, etc.

Other regulations which affect construction include the so-called 'six-pack' regulations, introduced in 1992 to satisfy EC Directives. These are:

- The Management of Health and Safety at Work Regulations 1999
- Workplace (Health, Safety and Welfare) Regulations 1992
- Provision and Use of Work Equipment Regulations 1998
- Personal Protective Equipment at Work Regulations 1992
- Manual Handling Operations Regulations 1992
- The Health and Safety (Display Screen Equipment) Regulations 1992.

Although most of these regulations have wide application, the Workplace (Health, Safety and Welfare) Regulations have only limited relevance to construction (Francis *et al.*, 1995).

There are many other regulations which affect construction and apply to other industries as well. These include regulations dealing with control of pollution, explosives, asbestos, flammable liquids and gases, woodworking machinery, abrasive wheels and noise at work.

Safety representatives and committees

Under the Safety Representatives and Safety Committees Regulations 1977, recognised trade unions can appoint as many safety representatives as they see fit. This flexibility is to allow for the extent of a site, local conditions, the groups of operatives to be covered, the number of unions on the site and any special features, such as shift working. The recognised unions are those which take part in collective bargaining in the industry.

Procedures for appointing safety representatives and safety committees have been agreed through the major national joint councils and are embodied in the national working rule agreements.

Site safety representatives should normally be employed by the main contractor and should have been with the firm, or a similar one, for two years. The employer is required by law to give safety representatives paid time off to carry out their safety duties and undergo safety training. The employer must help safety representatives, by providing equipment like dust and noise meters.

The national joint councils for building and civil engineering have approved a basic training scheme, designed to enable safety representatives to carry out their duties properly.

An employer must set up a safety committee if two or more safety representatives make a written request for one. The employer must consult with the unions party to the national working rules who have members on the site, and make arrangements for the committee, taking account of sub-contract employees on site. Safety committees give representatives a chance to meet management on an equal footing. Committees normally comprise equal numbers of workforce and management representatives.

Functions of safety representatives

The role of the safety representative is to:

- inspect the workplace, or that part of it to which his or her appointment refers, at three-monthly intervals, or more frequently if there have been substantial changes in site conditions;
- investigate potential hazards and look into employees' complaints;
- investigate dangerous occurrences and examine the causes of serious accidents involving deaths, broken limbs, loss of eyesight, and so on, or anything that results in prolonged absence from work or permanent damage to a worker's health;
- receive information from the Health and Safety Executive and its inspectors, and view relevant documents belonging to the employer, except individual medical records which are confidential; any dispute about disclosure of information can be referred to the industry's joint machinery;
- discuss with the employer issues arising from investigations and general matters of site safety, health and welfare;
- represent employees at safety committee meetings, where applicable.

Safety representatives are not legally responsible for health and safety on sites. They cannot be held liable under civil or criminal law for anything they do or fail to do whilst acting as safety representatives. They are, however, liable as operatives when carrying on their normal trade.

Functions of safety committees

The main functions of safety committees are to:

- monitor working arrangements on site with regard to health, safety and welfare;
- help develop site safety rules, safe systems of working and guidelines for especially hazardous operations;
- study accident trends and safety reports;
- investigate the causes of serious accidents;
- examine matters raised by safety representatives as a result of their activities.

The work of safety committees must be properly publicised to all workers and copies of the minutes of meetings made available to everyone. The HSE has recommended that on non-union sites, management should take the initiative in setting up safety committees.

Protective equipment

Employers must provide operatives with special clothing and equipment, such as the following:

- Protective clothing for working in rain or snow, and for working with asbestos products, when adequate ventilation cannot be provided.
- Respirators for working in dangerous fumes and dusts, where proper ventilation cannot be provided.
- Eye shields or protectors when cutting or drilling concrete, bricks, glass and tiles, shot blasting concrete, welding or using hand-held cartridge tools.
- Ear protectors for any noisy operation, especially when using woodworking machinery.

The Personal Protective Equipment at Work Regulations 1992 (known as PPE), part of the series of health and safety regulations which implement EC Directives, were amended in 1994, 1999 and 2002 and replace a number of old and excessively detailed laws. PPE covers safety helmets, gloves, eye and ear protection, footwear, safety harnesses and waterproof, weatherproof and insulated clothing. Self-employed operatives also have a duty to obtain and wear suitable PPE where there is a risk. Training is important; employees must know how to use equipment effectively. Equipment must also be properly maintained and properly accommodated when not in use. These regulations do not apply when PPE is provided under certain other regulations, such as the COSHH and Noise at Work Regulations.

Many of the regulations are difficult to enforce and the manager must be alert. The wearing of safety helmets is covered in the national working rules. Operatives must wear hard hats wherever there is a risk of head injury. Staff not covered by the working rules are usually required by their conditions of employment to wear safety helmets and protective clothing.

Noise should, where possible, be reduced at source using sound-reducing covers, exhaust muffles and screening. Ear defenders should be a last resort. Regular maintenance can help cut down noise. Special care is needed when operatives are exposed to noise for long periods, even a whole day. Workers at risk from adjacent operations may need ear or eye protection too.

Summary

In spite of a modest downward trend in injuries and deaths in the early 1990s, construction work remains very hazardous. The occupational health risks to

construction workers also continue to cause concern. An underlying problem is that safety, health and welfare have not been taken seriously enough in the past. This was partly an attitude problem, linked with employees' perceptions of the industry, and partly ignorance of the risks.

Legislation has been necessary to prevent employers and employees skimping on health and safety either for convenience or to cut time and costs. The HSW Act 1974 was a major breakthrough, creating the Health and Safety Executive with its inspectorate and imposing wide-ranging duties on employers and employees. Other legislation has made detailed provision for construction health and safety, reflecting the industry's unique work processes and problems.

The most important development in the 1990s was the implementation of the Construction (Design and Management) Regulations 1994 which aim to tackle the underlying causes of the industry's poor record. They place substantial responsibilities and functions on clients, designers and other professionals involved in construction projects. The role of planning supervisor has been created to ensure that health and safety are considered from inception to completion. The regulations require all those involved in a project to collaborate in planning, co-ordinating and managing health and safety throughout all its stages.

Although many of the industry's health risks are now better understood, there is still a lot of scope for improving occupational health measures. One of the problems is that ill-health resulting from construction work may not show up for years or even decades, making it difficult to link cause and effect.

The HSE and its Construction Industry Advisory Group have tried to tackle the issues of health and safety in smaller firms, where lack of resources, expertise and reduced levels of supervision make it difficult to enforce statutory or even commonsense measures to protect employees, self-employed operatives and the public.

Discussion and questions

Discuss the role of 'culture' and 'people' as important factors to consider in managing health and safety in construction.

Discuss the role of communication in improving health and safety management in construction.

Chapter 17 Industrial Relations

The construction industry has enjoyed a good industrial relations record. Relationships between employers and unions have mainly been quite informal, with few major disputes. Construction firms have operated simple labour policies, with few written rules and procedures. Some people believe that industrial relations have been good because construction work is varied and interesting. Others attribute it to the fragmentation of bargaining power caused by the industry's structure and employment policies.

However, since the 1960s the industry has had to take industrial relations more seriously, because of the employment legislation and, to a lesser extent in the 1990s, union pressure on larger projects. Managers have realised that labour relations means much more than coping with isolated disputes and strikes. It involves a whole range of problems stemming from the relationship between management and the workforce.

Usually there is some conflict of interests between the two, which can become apparent in various ways. Grievances can show up as action by individual employees, such as absenteeism, bad timekeeping, restriction of output and even sabotage. If dissatisfaction is widespread, conflict may become organised. Stop-pages, overtime bans and working to rule are forms of organised conflict, although these were less common in the early 1990s.

In UK industries, between the mid-1940s and mid-1960s, power in the unions gradually shifted down the line to the shop stewards. Unofficial strikes became common.

The accent has since shifted and the legal position of individual workers has improved considerably. Employees are now better protected by statute and have less need to turn to their unions to fight for their basic rights. The unions therefore have more time to engage in productive discussions with management.

In 1963, employees were given the right to receive the main terms and conditions of their employment in writing. In 1965, the system of redundancy payments was started and 1968 saw the first legislation covering race relations at work. Job security improved in 1971, when employees were given the right not to be unfairly dismissed and in 1975 laws appeared covering sexual discrimination at work. Following entry into Europe, Britain has acquired laws on equal pay (1970) and union consultation prior to redundancy (1975). In 1974, the

Health and Safety at Work etc. Act brought practically all employees under the same safety code.

There are different opinions about how far the law should intervene in industrial relations, or whether it should intervene at all. Despite the increase in legislation, the backbone of British industrial life is still the system of collective bargaining, which is more flexible and responsive to change than the law. However, the law does provide a framework – a floor of rights – on which bargaining can be based.

Many techniques are used to regulate industrial relations, ranging from joint consultation and site bargaining to job enrichment and human relations training. Some activities are aimed at settling disputes, whilst others are intended to prevent them arising.

The downward trend in industrial action since the early 1970s seems to reflect not only developments in employment law, but a number of other changes, including government measures to restrict union power, rising levels of unemployment and changes in union tactics (Langford *et al.*, 1995).

Employers' associations

Most employers' associations have several functions, of which industrial relations is usually an important one. They may also act as trade associations and provide their member companies with a wide range of legal and commercial advice. They also represent the interests of employers in dealings with government committees.

In the construction industry, these associations are usually known as *employers' federations*. There are a large number of federations representing specialist trades within construction. Over the years, some have merged, thus strengthening their resources and their bargaining power.

Construction Confederation

The Construction Confederation is the leading representative body for contractors, representing some 5000 companies who in turn are responsible for 75% of the industry's turnover. Formerly known as the Building Employers Confederation, the confederation comprises six organisations:

- National Federation of Builders
- Civil Engineering Contractors Association
- Major Contractors Group
- National Contractors Federation
- British Woodworking Federation
- Scottish Building.

As well as providing services to member firms, it deals with major issues beyond the scope of individual companies, such as political and economic

pressures on the industry. It also exerts influence on the UK government and the European Union on behalf of its members. In recent years, the Construction Confederation has been involved in debates and contributing to policies in areas such as: agency work directives, aggregates levy, the black economy in construction, cowboy builders, corporate killing proposals, EU procurement rules, insurance premiums for construction firms, late payments and retention.

The Federation of Environmental Trade Associations (FETA)

This is the recognised UK body that represents the interests of manufacturers, suppliers, installers and contractors within the heating, ventilating, refrigeration and air conditioning industry. It is split into four principal Associations: BFCMA, BRA, HEVAC and HPA.

- British Flue and Chimney Manufacturers Association (BFCMA)
Represents factory-made chimney products.
- British Refrigeration Association (BRA)
Represents manufacturers, wholesalers, distributors, contractors and end-users of refrigeration plant.
- Heating, Ventilating and Air Conditioning Manufacturers Association (HEVAC)
Represents manufacturers and distributors in all sections of the Heating, Ventilating and Air Conditioning Industry
- Heat Pump Association (HPA)
Represents leading companies in the field of heat pump technology, using waste heat (from the ground or water) and turning it into heating and cooling.

Apart from the services it provides for its members, the FETA is involved in international activity via the European Partnership for Energy and Environment. They also compile market statistics for air conditioning, air distribution and refrigeration equipment.

Trade unions

The role of a trade union is to promote the interests of its members, mainly by negotiating better terms and conditions of employment. Some unions are *craft* or *general* unions, representing one or more groups of craft workers or labourers. Others are (or attempt to be) *industrial* unions, representing the interests of all workers in a particular industry. Over the years, there have been many mergers between unions as they have struggled with difficult problems and attempted to strengthen their bargaining power.

Union of Construction, Allied Trades and Technicians (UCATT)

The general aim of the union is to promote the social and economic well-being of its members and of construction workers generally. It is strongly committed to strengthening free collective bargaining and has tried to achieve the position of industrial union for construction workers. Whilst many now recognise UCATT as the principal building union, others are yet to be convinced.

UCATT was formed when several building trades unions, going through a crisis of survival, decided to amalgamate. A merger in 1970 brought together the Amalgamated Society of Woodworkers, the Amalgamated Society of Painters and Decorators, and the Association of Building Technicians. UCATT was completed in 1971 by a merger with the Amalgamated Union of Building Trades Workers.

UCATT had a difficult time at first, but it did prevent the disintegration of trade unionism in the industry caused in large measure by the growth of labour-only subcontracting (the lump).

UCATT is the UK's principal trade union specialising in construction; with 125 000 members spread throughout England, Wales, Scotland and Northern Ireland. UCATT also organises building workers in the Republic of Ireland.

In 1996, the union initiated discussions with the major contractors, aimed at moving self-employed operatives back to direct employment. This coincided with the Inland Revenue clampdown on the employment status of the holders of 714 and SC60 tax certificates.

UCATT, it seems, has started to make progress on a fully registered workforce following the launch of the Construction Skills Certification Scheme in 1995. A skills register for building workers was one of the key demands of UCATT during the previous two decades as a means of stamping out the cowboy element of the industry which has prospered as a result of casualisation.

As the UK's premier trade union specialising in construction, UCATT is at the forefront of negotiations concerning pay, terms and conditions of employment with employers in all the main agreements covering the construction industry.

Transport and General Workers Union (TGWU)

The TGWU came into being in 1922 with the amalgamation of 11 unions. This general union has grown at an astonishing rate, more than 70 unions having joined it, making it the largest union in Britain. Since the early 1960s, its influence has spread across nearly all occupational interests, including building and civil engineering.

The union has seats on the National Joint Council for the Building Industry but has less influence than UCATT in the building sector. But in civil engineering, the TGWU tends to dominate the bargaining scene on the union side.

The TGWU is primarily a labourers' union and has strong support among unskilled and semi-skilled construction workers. It has made some progress in expanding its representation of craft trades.

General, Municipal, Boilermakers and Allied Trades Union (GMB)

A signatory to both the building and civil engineering working rule agreements, the GMB has about 20 000 civil engineering and building-related members, mostly public sector employees. They represent about 2.5% of the union's total membership.

The union has received media praise for 'its enlightened approach to industrial relations' and its expertise on health, safety, recruitment and their EC regulatory backdrop. In 1994, the union was involved in an innovative 'partnership deal', in which four unions were invited to join a European-style consortium, led by Hochtief, Siemens and Costain, in a bid to build and operate the high speed Channel Tunnel Rail Link.

In 1995, the GMB launched a recruitment campaign aimed at the half a million plus directly employed and self-employed construction workers who are not currently in a union; and it negotiated with major contractors bidding for design-build-finance-operate contracts to discuss drawing up new working agreements covering both construction and operation.

Collective bargaining

The Trade Union and Labour Relations (Consolidation) Act 1992 describes collective bargaining as negotiation between one or more trade unions and employers associations, relating to one or more of the following:

- Terms and conditions of employment.
- Engagement, non-engagement, termination of employment or suspension.
- Allocation of work or duties of employment.
- Matters of discipline.
- Workers' membership or non-membership of a trade union.
- Facilities for trade union officials.
- Machinery for negotiation or consultation.

In the building sector, collective bargaining between the employers and unions takes place through the National Joint Council for the Building Industry (NJCBI). This body evolved from earlier negotiating councils in 1926 and gives equal representation to employers and unions.

Bargaining usually centres around two types of agreement, which can be made at national, regional, local or site levels:

- *Substantive agreements* relate to wages, conditions, allowances and holiday entitlements.
- *Procedure agreements* relate to methods for resolving disputes and differences, and cover other matters like redundancies, dismissals and union representation.

Agreements can sometimes include elements of both. For instance, site stewards may negotiate a bonus scheme (substantive) in which arrangements for agreeing revised bonus targets are laid down (procedural).

Substantive agreements also deal with such matters as overtime rates, special rates, pension schemes, apprenticeships and paid leave of absence. Because employees have to travel to sites or work away from home, travelling, subsistence and lodging allowances are also an important part of the wage.

The two main building employers' associations – the Building Employers Confederation (now Construction Confederation) and the Federation of Master Builders (FMB) – have been competing with each other in the labour relations field. The FMB is the UK's largest body representing quality and standards within the building trade. With over 10 000 members they have helped to facilitate over £200 million-worth of trade in 2003. The Construction Confederation represents employers' interests on NJCBI and is arguably a more influential association in industrial relations. The FMB has tried to represent smaller builders in labour relations but has had difficulty in gaining suitable representation on the NJCBI.

As the UK's only trade union specialising in construction, UCATT is at the forefront of negotiations concerning pay, terms and conditions of employment with employers in all the main agreements covering the construction industry.

Lack of unity on the employers' side is largely caused by the wide range in size among building firms, from the small, local maintenance and jobbing builders to the large, international contractors.

When its attempts failed in the late 1970s to gain representation on the NJCBI, the Federation of Master Builders reached an agreement with the Transport and General Workers Union to set up an alternative joint negotiating body, the Building and Allied Trades Joint Industrial Council (BATJIC). This fragmented the industrial relations system of the industry still further. BATJIC's first national agreement was published in 1980.

The unions have problems too because of the wide spectrum of skills and tasks they represent. The principal craft union, UCATT, is comparatively weak compared with the labourers' main union, the TGWU, and this has made it difficult to agree a sound wages structure in the industry. National negotiations take place against a backdrop of conflicting interests within and between the unions.

National working rule agreements

Some contractors have direct collective agreements covering wages and conditions, but most follow one of the national working rule agreements. These are formulated through collective bargaining at national level. A few contractors operate outside any agreement and offer a 'catch rate' based on local supply and demand for labour.

In construction, the National Working Rule Agreement for the Building Industry is the outcome of many years of negotiation. It establishes minimum rates of pay,

conditions and hours of work of the building trades and for unskilled and semi-skilled operatives. There are regional variations for some rules.

The Construction Industry Joint Council (CIJC) agreement sets rates of pay for around 600 000 construction workers on the country's major building and infrastructure sites. This agreement covers a substantial number of operatives in the industry.

The rule also covers a host of areas, including agreement in the costs of the travel of operatives to work. When travelling to a place of work which is more than 6 kilometres (3.73 miles) from home, workers employed under the Working Rule Agreements of the National Joint Council for the Building Industry (NJCBI) and the Civil Engineering Construction Conciliation Board (CECCB), or their successor from 29 June 1998 the Construction Industry Joint Council (CIJC), are entitled to receive the following allowances:

- (1) a daily fares allowance, on a scale revised annually, for each kilometre (0.62 miles) or part kilometre in excess of the first 6 kilometres, and
- (2) a daily travelling allowance for each kilometre (0.62 miles) or part kilometre in excess of the first 6 kilometres.

Where transport is provided free by the employer, only the travelling allowance ((2) above) is payable. Such travelling allowances are equivalent to travelling time payments, and are taxable in all circumstances. Fares allowances ((1) above), however, are not regarded as taxable, provided they are paid at the rates currently in force, and may be paid in full.

Negotiation in bargaining and conciliation

Effective negotiation depends on a mix of toughness and friendliness, formality and informality. Appeals for reasonableness and co-operation are among the approaches used in bargaining. Negotiators who have reasonable goals often do better than those with extravagant goals. Some understanding of the other party's problems and viewpoint is essential if satisfactory agreements are to be reached.

Maddox (1988) identifies six steps in a negotiation:

- The parties take some time to get to know each other.
- Each party states its goals and objectives in general terms.
- Negotiations are started; specific issues are presented and discussed.
- Conflicts emerge; each side tests how far the other will give way.
- Issues are reassessed and there is a move towards compromise.
- Agreement is reached and affirmed.

Experienced negotiators often rely heavily on friendly, behind-the-scenes talks and sometimes the final agreement is carefully stage-managed, so that neither side loses credibility with its members.

Employee participation and industrial democracy

Employee participation and industrial democracy are approaches to the empowerment of people, a concept outlined in earlier chapters. The potential gains include greater employee commitment and satisfaction; and enhanced decision-making – leading to higher productivity and improved competitiveness. The underlying issue is raised *expectations*. The general rise in education standards, coupled with other social changes, have led many employees to expect closer involvement in the decisions which affect their working lives.

There are several approaches to employee participation. Employers generally favour methods which involve employees at an individual or small group level and with issues close to the work face. Most EC member states have some statutory provision or agreed systems for employee participation at the workplace. Thus, employees participate in quality circles, joint committees on work processes, TQM initiatives and so on (Farnham, 1993). Germany has the most institutionalised system of workplace participation, embodied in the process of *co-determination*.

But, as Farnham points out, unions prefer the more global approach of collective bargaining, promoting a concept closer to industrial democracy. UK employers are generally not keen on the idea of collective bargaining which shifts its focus towards corporate decision-making. True industrial democracy goes beyond collective bargaining and involves employees in the corporate management of their organisations, as in the appointment of worker directors.

These concepts can be difficult to apply in construction because of its employment practices – employee mobility, casual employment, use of self-employed labour and labour-only sub-contractors. These practices mean that many employees are not sufficiently committed to one employer to have any sustained interest in participation.

One technique which can work in such situations is joint consultation. A committee is usually set up by the employer and unions as a forum to bring representatives of management and the workforce together, usually in equal numbers. Membership can change as people move on. Mostly, joint consultation focuses on workplace issues like methods of working and work flow, standards of work, targets and incentives, and job restructuring. It rarely deals with strategic issues like marketing decisions, investment plans and capital financing.

Effective consultation can create enough employee involvement to satisfy the needs of most construction workers and also be valuable for exchanging information, feedback and ideas about a wide range of issues. For professional and managerial staff, who may have a greater sense of being stakeholders in the business, other approaches to participation are needed.

Employment and workplace relations

Contracts of employment

A contract of employment can be oral or in writing, but most contracts these days are in writing and the Employment Protection (Consolidation) Act 1978 requires that, within 13 weeks from the commencement of employment, an employer must give an employee a written contract of employment, stating:

- the names of the employer and employee and the date on which employment began; and, if any previous employment counts towards continuous service, the date on which the continuous period of employment began, must be given;
- the title of the job;
- the wage rate or pay scale, or method of calculating pay;
- the intervals at which the employee is to be paid (e.g. monthly, weekly);
- details of hours of work;
- holiday entitlements, including public holidays and holiday pay;
- details of any sick pay and pension rights;
- the length of notice the employee is entitled to receive and obliged to give, to end the contract;
- whether there is a contracting out certificate for the State Pension Scheme.

Instead of supplying a written statement, the employer can refer to a document containing these details, but it must be accessible. Usually, this document will be an agreement arrived at by collective bargaining and this is the case for construction workers covered by national working rules.

The contract of employment should outline the relevant disciplinary rules or refer to a document containing them. It should also specify a person to whom the employee can appeal if he or she has a grievance. Written particulars need not be given to employees who work less than 16 hours a week.

A contract of employment states the *terms* and *conditions* of an individual's employment. The terms are bilateral – part of the agreement between the employer and the worker. The conditions are unilateral. They are rules or instructions imposed by the employer. The firm can change a condition at any time, but a term can only be changed if both parties agree.

Terms are usually stated in agreements (including collective agreements) and in certain statutory provisions. Conditions are usually found in the firm's procedures, rules and job descriptions.

Terms and conditions can easily be confused, because they often relate to the same aspect of employment. For instance, a term of contract is that the worker is entitled to, say, four weeks' annual holiday. It is a condition of contract that he or she has to take one or more of those weeks in the winter. A term will specify that employees work 37 hours a week, but it is a condition that they start work at 8 a.m. and finish at 4.30 p.m.

Express and implied terms

Express terms are those stated in the agreement between employer and employees. They cover pay, bonus payments, working hours and overtime, etc. However, such terms have to be interpreted realistically.

An *implied* term is one which is not expressly stated, often because it is so obvious that the parties did not think it necessary to mention it. Terms may be implied from accepted practices in an industry or by the terms contained in national agreements.

Discrimination and equal opportunities

Legislation has helped remove *some* of the discriminatory behaviour and inequalities of opportunity, reward and treatment which have been prevalent in many industries, including construction. But it has not achieved enough; a fundamental change of *attitudes* within the industry and society is needed. This has begun to happen, but there is a long way to go. Attitudes towards men's and women's roles and about issues like race and disability are deeply rooted in the patriarchal systems of Western society and influence the *culture* of construction. Attitudes and norms of behaviour are passed on from generation to generation through the complex processes of socialisation and education, by parents, teachers, the media and so on (Srivastava and Fryer, 1991).

So, even today, many male construction personnel continue to have very traditional views of men's and women's roles and some still view women predominantly in the roles of homemaking and child rearing. This is very disturbing when one considers that the education system should have embraced discrimination and equal opportunities issues a generation ago when important legislation on discrimination came into force in the 1970s (see below).

Discrimination based on inappropriate attitudes has been responsible for the so-called 'glass ceiling' which has prevented many women, black people and people with disabilities from being promoted to senior positions in most industries, not just construction. Women, black people and disabled people are also under-represented on construction courses. For instance, scarcely an eighth of construction students are female. Architecture fares better; about a third of its students are women.

It is more difficult to comment on the effects of sexual orientation on employment opportunities, since gay, lesbian and bi-sexual people don't necessarily disclose their sexual orientation. But it is clear that some employers and co-workers are prejudiced towards this group and that discrimination may occur if a person's sexual orientation is known to his or her manager.

For a host of reasons, women and other under-represented groups often don't find construction careers appealing, except for certain professions like architecture and landscape architecture. So, fewer members of these groups enter the industry and, when faced with discrimination in the workplace, very few reach the most senior positions.

The cost of this problem is that the construction industry is deprived of a huge

number of talented people who could be attracted to it. The problem is now well defined, particularly in the area of women in construction, but is still a long way from being resolved.

Legislation has attempted to eliminate discrimination and promote equality of treatment but with limited success. Statutes include:

- The Equal Pay Act (Amendment) Regulations 2003
- The Rehabilitation of Offenders Act 1974
- The Sex Discrimination Act 1975
- The Race Relations Act 1976 (Amendment) Regulations 2003
- The Disability Discrimination Act 1995.

European law is increasingly subordinating UK legislation and the EC has adopted a number of Directives on equal opportunity matters, including equality of treatment and equal pay. The Equal Treatment Directive, for example, outlaws discrimination on the grounds of sex in recruitment and selection for jobs, working conditions, and training and promotion opportunities.

In 1994, the Employment Department (now the Department for Employment and Learning) published *Equal Opportunities: Ten Point Plan for Employers*, which offered advice on how to provide equality of opportunity to ethnic minorities, women and people with disabilities. The ideas also have relevance to ex-offenders and other groups. It is important to recognise that there is more at stake than equal *opportunities* – there is a real need for equal *treatment* in every aspect of employment relationships.

Women in construction

Andrew Gale has carried out some pioneering work since about 1987 and has made a thorough analysis of the factors influencing the employment of women in construction. Valuable work has also been done by several other researchers, notably, Clara Greed, Angela Srivastava and, more recently, Andrew Dainty.

Gale (1995) points out that discrimination against minority groups can occur in several ways – for instance as earnings differentials or occupational segregation. An example of the latter is the presence of many more women in clerical jobs than in engineering or management. He also reminds us of J. F. Madden's concept of cumulative discrimination, whereby current discriminatory behaviour is caused and sustained by the impact of previous discrimination (whereby, for instance, men occupy nearly all the top management jobs).

Discrimination against women embodies a number of stereotypical views about them – that they cannot do heavy work, that they won't like the rough conditions on site, and so on. There is little foundation to these beliefs, yet it prevents many women from enjoying successful careers in both construction management and the trades. Gale cites evidence that this is an international problem, not unique to the UK – and he refers to a study by a female construction company director who found that even

employers who claimed to favour employing women did not employ any women at all in trade or manual jobs.

Srivastava (1996) found that even though individuals and organisations claimed to be encouraging women to enter construction, there remained many obstacles to women's full participation – including being in a minority, the behaviour of co-workers and the attitudes and behaviour of managers. 'Being in a minority' is more important than it sounds. Somehow the absence of a 'critical mass' of women in a work group can make it very hard for the few who are there to achieve equal treatment and have their input to the team taken seriously. Dainty (1998) observes that target recruitment can be effective in attracting women to the industry. However if women are to remain in the sector, he suggests that efforts must be made to ensure an equitable workplace environment (Dainty *et al.*, 2001).

Unless there is a significant change of attitudes towards women and other groups who are under-represented in the industry, no real change in behaviour and organisational culture within construction will take place. The industry will continue to waste valuable human assets and perpetuate, often unwittingly, unlawful discrimination. Change in provision of facilities is important too. For instance, under the Disability Discrimination Act 1995, employers are expected to take any reasonable measures to remove barriers to equal opportunity in their recruitment and employment practices. So, for example, an employer would find it difficult to reject a disabled job applicant on the grounds that there was no suitable access to the workplace, if the problem was the absence of a ramp which could reasonably be constructed adjacent to the steps.

Disciplinary procedures

Guidelines for a sound disciplinary procedure are given in an ACAS code of practice. The code is not legally binding but describes the kind of employment practice which an industrial tribunal would look for if considering a claim for unfair dismissal.

A disciplinary procedure should normally:

- be in writing;
- state the categories of employees it applies to;
- provide for matters to be dealt with quickly;
- describe what actions may be taken;
- state the level of management which has the power to use particular penalties;
- make sure the employee knows a complaint has been made and is able to state his or her case in the presence of a union representative or colleague;
- provide that no employee is dismissed for a first breach of discipline, except for gross misconduct;
- ensure that disciplinary action is not taken until the circumstances have been fully investigated;

- give the employee a full explanation of any penalty imposed and a right of appeal, specifying the procedure.

Disciplinary procedures vary from firm to firm. They usually allow for two spoken warnings before the offender is finally warned in writing. The accent should be on helping the individual to improve, rather than on punishment.

Gross misconduct should be defined in the rule book and contract of employment. Usually it includes theft, drunkenness and insubordination, although it can be difficult to decide how dishonest, drunk or disobedient an employee must be, before his or her misconduct becomes gross.

The manager should always have a witness who can testify that a warning has been given. The employer should keep a full record of disciplinary actions and warnings, because the firm may later have to contest a claim of unfair dismissal.

Grievance and disputes procedures

A system also has to be provided for employees' complaints. Without this, minor irritations can grow into major disputes.

A *grievance procedure* normally deals with individual complaints, whereas a *disputes procedure* applies to group complaints. In both cases, the procedure should be in writing, stating where complaints should be directed and a point of appeal if conciliation fails. It should allow aggrieved employees to be accompanied by union representatives or colleagues when complaining to management and should set time limits for resolving the complaint. Full details should be recorded.

Difficult disputes involving a group of workers may be referred to an outside body if agreement cannot be reached. ACAS will help, and the Construction Confederation has its own conciliation service which its members may try first.

Dismissal

A dismissal can take place in three ways:

- The employer terminates an employee's contract of employment, with or without notice. If the employee resigns, this is not normally a dismissal. In *Elliott v. Waldair (Construction) Ltd* (1975), an employee drove a heavy lorry. It was thought that this work was too hard for him, so he was told to drive a smaller van. He resigned because his overtime earnings would have fallen. It was held that the order to drive a different vehicle did not constitute a dismissal.
- The employee terminates the contract, with or without notice, because of the employer's conduct. This is sometimes called a 'constructive dismissal'.
- The employee is employed for a fixed term. Dismissal takes place if the term expires without being renewed, although certain fixed-term contracts are excluded.

Fair and unfair dismissal

When a genuine dismissal has taken place, it is often necessary to establish whether or not it was fair. The Employment Protection (Consolidation) Act 1978 identified five grounds for fair dismissal:

- *Lack of ability or qualifications for the work.* The employer must act reasonably and may be expected to give the employee the opportunity to make good the deficiency in skills or qualifications.
- *Misconduct.* This would include theft, unreasonable lateness or prolonged absence from work. The employee's conduct outside work may also give grounds for fair dismissal if it could harm the employer's business.
- *Redundancy.* Employers must, however, show that they have acted fairly in deciding who to make redundant, have considered providing alternative employment, and have consulted the unions if applicable.
- *The employee would be breaking the law if he or she continued working.* If, for instance, a lorry driver has had his or her driving licence taken away and the employer cannot find other work for the driver, the dismissal would be fair.
- *Any other substantial reason.* This usually involves commercial reasons. In *Farr v. Hoveringham Gravels Ltd* (1972), it was a company rule that employees must live within reasonable distance of the works. They dismissed a manager who had moved to live 44 miles away. It was held that the dismissal was fair because someone in his position might be called out in an emergency.

Termination of contract

Selwyn (1980) identified five ways in which a contract of employment may end, without it amounting to a dismissal:

- *Resignation.* The employee clearly and unambiguously gives notice of his or her intention to resign.
- *Constructive resignation.* The employee acts in a way which shows that he/she no longer intends to be bound by his/her contract.
- *Frustration of contract.* It becomes impossible for the employee to continue working. This would include, for instance, the employee being sent to prison.
- *Consensual termination.* The parties agree that the contract will end if certain events happen. A civil engineer was given a year's unpaid leave of absence to attend a course. It was agreed that if he did not return at the end of the period, his contract would be ended.
- *Project termination.* A person is employed only for the duration of a project.

Summary

In its broader sense, industrial relations covers every aspect of the relationship between employer and employee. This relationship has always been an uneasy one, although construction has had better employee relations than most industries.

Since the 1960s, employers have been under pressure to take labour relations more seriously, partly because of quite a rapid shift in attitudes to work and towards employers, and partly because of a string of new employment laws aimed at improving employees' basic rights. Amongst other things, employees have the right not to be unfairly dismissed and not to be discriminated against on grounds of married status, race, sex and trade union membership. They are entitled to safe, healthy working conditions, time off for public duties, and financial and other help if made redundant.

Since the management of people is central to business success, managers must handle industrial relations skilfully. The techniques used range from collective bargaining at industry level, to local bargaining and grievance handling on site.

In construction, collective bargaining is quite fragmented, because there are many employers' federations and unions, representing numerous occupational skills. This creates many anomalies in wage rates and conditions and there is a need for rationalisation.

Individual employers have to comply with substantial statutory requirements on employment, including provisions relating to employment contracts, discrimination, disputes, disciplinary rules, redundancies and dismissals.

The 1990s saw a wider acceptance of the need for equality of treatment of employees and job applicants, and the stamping out of discriminatory practices. Many organisations have tried to implement an equal opportunities policy, although there are still many obstacles to overcome. One of these is the attitudes of people, in particular of some senior managers whose positions themselves resulted from discriminatory selection procedures in the past.

Discussion and questions

Discuss the challenges that organisations face in dealing with ever-changing legislation – legislation that necessarily impacts upon construction employees and activities.

What are key issues that organisations must address with regard to industrial relations between employers and trade unions?

Chapter 18

Managing Quality and Environmental Impact

The management of quality and environmental impact have become linked in many managers' minds. This is partly because similar approaches to quality and environment standards are identified in the relevant British and international standards and partly because, in the minds of many senior managers, the issues of quality and environment are major threads in the strategic thinking which is expected to guide most organisations into the twenty-first century.

These two subjects share another important feature – their success is rooted in the management of *people*. Ultimately, the improvement of environmental and quality standards depends on the attitudes of managers and employees and their commitment and willingness to change. Technical innovation and organisational change will largely fail, unless people believe in the changes and actively pursue them.

The Construction Industry Research and Information Association (CIRIA) began a research project in 1996 to examine current construction industry practices for integrating the management of quality, environmental impact, and health and safety.

Recent studies on quality management include the works of Barrett (2000) on systems and relationships for construction quality, and Battikha (2003) on highway construction. In addition, Toakley and Marosszeky (2003) have reviewed and established research needs in total project quality.

Quality management

Managers have always been responsible for the quality of goods and services produced by their teams. In this sense, there is nothing new about quality management. But the emphasis given to delivering quality more systematically and in every aspect of the business has certainly grown over the years. This is a reaction to at least three factors:

- Poor quality in components, production processes and service to clients.
- The impact, during the 1980s, of BS 5750 *Quality Systems* and its international successor, the ISO 9000 series.
- A reduction in clients' tolerance of poor quality.

Total quality management

TQM is not the only approach to quality management, but it has been an influential one. Quality guru W. Edwards Deming described TQM as 'the Third Industrial Revolution', despite the fact that quality control ought to be part of every manager's job. Schmidt and Finnigan (1992) have called it 'a new paradigm of management'. Whilst they agree that the elements of quality assurance are well known to managers, Schmidt and Finnigan argue that it is in *combining* the elements that a new way of thinking about managing organisations arises. They also cite a 1989 report by consultants Coopers and Lybrand, comparing TQM with traditional management thinking. The move to the TQM approach has included:

- *Quality definition* – a shift from product specifications to fitness for consumer use.
- *Quality control* – a shift from post-production inspection to building quality into the work process.
- *Errors* – a shift from tolerance of margins of error and wastage to no tolerance (right first time).
- *Improvement* – a shift from technological breakthroughs to gradual, continuous improvement of every function.
- *Problem-solving and decision-making* – a shift from unstructured to participative and disciplined decisions, based on reliable data.

TQM also recognises the concept of the *internal* customer, something missing from conventional management thinking.

TQM is really a business philosophy based on commitment to customer satisfaction; it involves organising the business to deliver consistent customer satisfaction by careful design of products or services; and creating systems that deliver the chosen quality standards reliably. The growth of global markets and tough international competition will ensure that quality remains high on the organisational agenda, but the *overt* expression of quality concerns in concepts like TQM may recede, as thorough quality assurance procedures become routine – internalised in the culture and management systems of the organisation.

Sadgrove (1994) stresses that benchmarking should focus on measurable items. In construction, this could include the number of complaints from clients and building users and the percentage of work (by value) that fails inspection.

Benchmarking

Many firms have introduced benchmarking. It involves studying the best practices and achievements of competitors and others in the field – and adopting them as standards for improving the company's own performance. Benchmarking can be integrated with TQM or used as part of any quality system. It can include looking at the processes in, and product/service features of, other industries. Indeed, this is

sometimes where the most creative improvements can be found. So important is this activity in a highly competitive environment that organisations may set up a research department to do their benchmarking activities.

Tackling quality management in construction

The Construction Quality Forum was set up in 1993 to help the UK industry compete with its counterparts in other countries. All sectors of construction are represented in the forum, whose information on defects and failures in design and construction is fed into a computerised database developed by the Building Research Establishment (BRE).

BRE figures published in the mid-1980s attributed 90% of building failures to problems arising during design and construction. Interestingly, these were mainly 'people' related problems. They included:

- Poor communication.
- Inadequate information or failure to check information.
- Inadequate checks and controls.
- Lack of technical expertise and skills.
- Inadequate feedback leading to recurring errors.

Clients' *perceptions of quality* are also very important. Clients quite often assess quality in terms of how they experience the building in use, rather than its components and assembly.

Gaining the industry's acceptance of formalised quality management and processes has not been easy. Certification under the 1987 version of BS 5750 was almost obligatory in many sectors by 1990, but the UK construction industry has been slow to adopt quality assurance. Compared with countries like Germany and Japan, UK construction had a lot of catching up to do in the early 1990s. The situation started to change when some firms began to see the competitive advantage they might gain through BS 5750 certification. The first construction firm to win a British Quality Award was the John Laing Group, in 1991.

However, many firms that experienced quality assurance inspections perceived little, if any, improvement in the services they were offering. Indeed, many firms (including clients) argued that BS 5750 was unsuitable for construction. The industry report *A strategy for quality management systems in the construction industry*, found ten important features of construction work which differed from those embodied in the British Standard. At least one major property developer publicly questioned the relevance of BS 5750 to building, pointing out that it was based on repetitive manufacturing practices, not one-off construction projects. The developer claimed that quality assurance should begin by examining the way a business works, not by imposing a set of predetermined work practices (but most quality managers would start this way anyway). As Baden Hellard (1993) pointed out, the construction industry has tended to misunderstand the procedures

embodied in the quality standards. It has viewed BS 5750 (and the International Standard ISO 9000, developed from BS 5750: 1979 and reflecting eight years' subsequent experience of its operation) as being about paperwork systems and certification, whereas the focus is on improving the overall performance of the business.

So, some companies hesitated to become involved, seeing quality standards as an obstacle to business efficiency, forced on them directly by government or indirectly by clients, especially public sector clients. Baden Hellard argued that total quality management can improve *all* aspects of design and construction, if it starts at the top, which is with the building *client*.

Another argument against adopting the British Standard was that it focused on achieving *consistent* standards or *minimum* standards – not necessarily *high* standards. But the proponents of BS 5750/ISO 9000: 1987 argued that the standard did lead to higher quality, because it required organisations to thoroughly examine existing work practices and procedures before any changes were introduced. And the EC standard, developed from ISO 9000 for the service industries, contains a module specifically written for construction consultants. The ISO addresses four areas which are important in achieving long-term high quality in construction – management of human resources, business development, sub-contracting and the importance of feedback.

Nearly all other sectors of UK industry have recognised the importance of quality management and have installed quality management systems. Defining and implementing quality management is more difficult in service industries like construction; and in professional practices, it can be even harder to define and implement quality assurance, because there is no *tangible* product directly attributable to one practice. A practice will try to improve on the skills and competencies it offers its clients, but these are not always easy to measure. The results that the practice achieves are often intertwined with, and will partly reflect, the strengths and weaknesses of other contributors to the project.

A further difficulty is that while price remains a major criterion on which tender decisions are based, firms can continue to argue that the cost of formal quality systems cannot be justified. A powerful counter-argument is that greater efficiency resulting from quality systems *reduces* a firm's unit costs and increases its competitiveness.

Industry action

There is a further benefit. Quality management techniques can help reduce contract conflicts which have been one of the most damaging problems in the industry. CIRIA examined this problem in 1990 and 1991. It argued that current forms of contract do not encourage full use of quality assurance systems. As architects and engineers are under pressure to take on quality management, CIRIA also looked at how it may have a knock-on effect on these professions' conditions of engagement. At the same time, the former Building Employers Confederation took a close look at

how it could involve itself and its members more directly in quality management and in developing suitable systems.

Other industry bodies have since contributed to the quality debate. For instance, the joint review of the industry (Latham, 1994) stressed the importance of better quality management. The report called for measures to raise construction standards (such as fairer construction contracts; better procurement practices like partnering; and standardisation and modularisation throughout the construction chain) and improved management and professional training. In an effort to implement these recommendations, the Construction Round Table (representing major public and private sector clients) formed a partnership with the then National Contractors Group to look at a raft of improvements aimed at changing the culture of construction.

Quality benefits

An important approach to obtaining business, from which some professional practices and contractors can benefit, is to sell on quality and not on price, as many successful businesses already do. Many companies in other industries have found it a better policy to go for a higher value-added product or service, than for a low cost, low quality product or service.

Since the industry has long complained about having to cut prices to win contracts on tight margins, perhaps there is a lesson to be learned about the industry attempting to persuade clients that it pays to pay a little more – and get a building that gives more satisfaction and incurs lower running costs. But, importantly, higher quality does not necessarily mean higher costs. There are costs associated with poor quality, examples of which are:

- The management cost of handling clients' complaints.
- Inspecting the work concerned.
- Making good faulty work.
- Replacing sub-standard materials and components.

These costs can be incurred during and after completion of a project. Repair work carried out when a building is in occupation can be difficult and expensive. If these costs are taken into account, improving quality doesn't automatically mean adding to building cost; the reverse may be true. Peters (1989) claimed that in manufacturing industries, putting right poor quality work absorbed as much as 25% of a firm's resources. In service industries, he argued it could account for as much as 40% of total costs, which is quite staggering. It must also be remembered that one of the purposes of quality assurance systems is to improve efficiency. If this succeeds, there should be long-term cost reductions.

Interestingly, housebuilding is a success story in the quality field. The NHBC's third-party quality assurance certification, which has operated successfully for a number of years, gives customers a legal guarantee of the building's performance

and quality standards, and insurance cover against deficiencies or building failure (Griffith, 1990).

Attitudes to quality

One of the critical factors in achieving effective quality and implementing good quality control is employees' attitudes towards it. Frequently, employees lack commitment to quality and this shows up in the level of rejects, customer complaints, repairs under warranty, and so on. In construction, it shows up as bad work, long snagging lists and user dissatisfaction. The industry has to realise that quality comes from people – employees who care and are committed. And people will only care about quality if their managers do – and this means managers and professionals paying attention to quality all the time and being proud of what they are doing. As Peters and Austin (1985) put it 'quality is an all-hands-on' proposition. Or in the words of John Laing's quality director, Phillip Ball, 'quality management is all about people – how they work, how well they communicate and how well they develop and implement a process of continual improvement in their every day activities'.

In the end, perhaps, the achievement of total quality management will depend on whether the industry can replace confrontation and conflict with a philosophy of teamwork and co-operation (Baden Hellard, 1993), a thought echoed in the report *Constructing the team* (Latham, 1994).

Installing a quality management system

The essence of a quality management system is that quality is managed in ways which are clearly identified, well documented and efficiently planned, implemented and controlled. So, introducing quality management involves setting up procedures, if these do not already exist, and providing documentary evidence that quality targets are being achieved (see Box 18.1).

It also means that everyone involved must be trained in quality control methods and that there should be incentives to implement the quality control procedures. Peters (1989) suggests that incentives can be extended to suppliers (and therefore sub-contractors), who are paid the premium rate for high quality materials/work, but a lower rate for sub-standard goods and services. Whether or not quality reward systems are being used, contractors are certainly paying much more attention to assessing their sub-contractors and suppliers, monitoring and recording their performance, and listening to their ideas. Some contractors provide training seminars in quality management for their sub-contractors.

It has long been known that incentives can undermine quality because they usually focus on the *quantity* of work achieved. What hasn't been so widely appreciated is that staff performance appraisal and other forms of employee evaluation can affect quality too. Deming (1986) recognised, for instance, that staff

Introducing quality assurance

Induction and training of staff in quality assurance matters
 Thorough analysis of existing processes and routines
 Development and documentation of new processes
 Trials of new systems
 Modification of systems following trials
 Implementation of modified processes

In addition, if accreditation is sought

External audit of systems and procedures
 Amendments to meet auditors' requirements

Box 18.1 Introducing quality assurance.

appraisal often lays stress on short-term performance, discourages long-term planning, demolishes teamwork and encourages rivalry. Deming felt that these directly worked against the achievement of quality.

Most companies wanting to install a quality management system appoint a quality manager, often called a quality controller in smaller firms. The design of the quality system usually involves the know-how of a number of people, so a quality group may also be set up. Because an important role of the quality standard is to define responsibilities for quality assurance, this must be built into the documentation of processes and systems.

Three kinds of *auditing* are used in quality management – internal auditing to regularly review achievement in relation to quality targets; auditing of suppliers and sub-contractors; and external auditing by a certification body if the organisation wishes to be certified to ISO 9000. Part 1 certification is for design and production; ISO 9000 Part 2 certification is for production only. A further kind of audit, known as a second party audit, occurs when a client visits the company or its site(s) to assess its quality systems.

Certification under the current quality standard, BS/EN/ISO 9000: 1994 requires organisations to demonstrate that their systems are capable of meeting customer requirements through:

- Effective systems, procedures and working methods.
- Clear communication systems.
- Clear lines of responsibility.
- Thorough documentation of all systems.
- Control of documentation and clear procedures for change.
- Satisfactory training.
- A clear system for auditing quality procedures.

Quality culture

However, as Drummond (1992) points out, one must not forget that the quality standard is just a means to an end; it is the quality that counts, not the systems. The quality standard is simply a basis for a quality *culture* in an organisation. Systems must be built on – and are no substitute for – a quality culture or philosophy. A quality management system must become part of the mind-set of everyone in a firm, practice or project team. This is built on self-respect, pride and dedication in every aspect of the organisation. Indeed, the best quality systems recognise the notion of the internal client, so that departments treat one another as customers and try to observe similar quality criteria to those which apply to their external clients. And importantly, as Drummond points out, a quality culture is not about fanatical workforce commitment, but about abandoning outdated business and management assumptions. Implementing quality systems forces managers to develop a deep understanding of processes within the firm and the difficulties employees face. Employee commitment should follow.

Quality manual

A key document in implementing quality assurance is the quality manual. There is no standard manual; one has to be written to meet each organisation's operating procedures and type of work. The manual normally includes:

- a summary of the firm's policy on quality, suitable for uncontrolled distribution to potential and existing clients;
- an enlarged version of the above, describing the quality management systems and procedures, by department or function as appropriate;
- the firm's detailed operating procedures and standard forms, including purchasing specifications and product or service specifications.

This information may be split into two or three manuals – a systems and a procedures manual and perhaps a work instructions manual (Sadgrove, 1994). The systems manual is a strategic document which may be used by marketing staff in bid presentations to potential clients. Quality system records and forms, together with documents such as codes of practice, may also be bound together in a further manual.

Control of quality depends on the manual being realistic. A manual which is too vague or idealistic is largely useless; and so are operating procedures and work instructions which are over- or under-specified.

Quality control also depends on the existence of objective criteria, such as strength and stability, durability, dimensional accuracy and environmental performance – and on the clear identification of responsibilities of the people involved. If quality cannot be measured in a fairly objective way, improvement will be difficult to achieve. Tom Peters insists that the measurement of quality should be carried out

by the people or department doing the work, not by inspectors or auditors, who may cause the process to become bureaucratic and may become the focus for arguments over the interpretation of quality control data.

Perhaps the most important requirement for effective quality control is senior management commitment. Quality must be high on the agenda for such managers and they must have the tenacity to carry on the campaign for high quality, whatever the difficulties.

Quality in service organisations

Construction is a service industry and the quality of a service is less tangible than that of a product. The criteria which clients use to judge a service are often highly subjective. Indeed, Drummond cites evidence that there are elements of service quality that have little to do with either the service itself or the style of its delivery. What one building user views as a comfortable working environment, another will find unbearable. What one client judges as sociable, informal behaviour, another will view as discourteous or impudent.

Building owners and users will consider objective factors such as the specification of the building's components, but many aspects of the building will be judged much more on their subjective responses. Examples include: whether the individual *feels* that the internal environment is comfortable, bright and pleasing; whether the individual *judges* the air conditioning to be satisfactory; whether the internal finishings meet the occupants' *expectations* (with all the subjective overtones of taste, status and self-esteem).

There is also the level of client satisfaction or dissatisfaction which goes beyond the fitness for purpose of the building itself. It relates to the quality of the *delivery* of the service. Effective management of the service delivery of design and construction processes is vital. The interaction which takes place between providers and clients crucially affects clients' perceptions of quality.

The client's evaluation of service quality will be raised if the industry's professionals demonstrate competence, trustworthiness and dependability; show their concern for, and understanding of, the client's needs; and exhibit considerate, friendly and enthusiastic behaviour. The client's perceptions of a contractor or private practice will depend on *consistency* of service and the *confidence* this engenders. But first impressions also count. Research has shown that the initial contacts have a lot of influence on subsequent relationships. The concept of partnering addresses many of these issues.

The industry might do well to examine US achievements in TQM. Schmidt and Finnigan (1992) summarise the success factors in US award-winning TQM companies as follows.

- A very high level of management leadership and commitment.
- Supportive organisational structures and roles.
- Quality-orientated tools and processes.

- Tailored education programmes.
- Innovative reward strategies.
- Full and continuing communication.

In addition, total quality managers:

- give priority to customers' needs;
- empower, rather than control, their team members;
- emphasise improvement, rather than maintenance;
- encourage co-operation rather than competition;
- train and coach, rather than direct and supervise;
- encourage and recognise team effort;
- learn from problems, rather than minimising them;
- choose suppliers on the basis of quality, not price.

Environmental impact

Business and the environment

Quality has always been somewhere on the management agenda, but the environment has not. Years ago, managers could take a largely 'closed system' view of their organisations and ignore environmental factors almost totally. But this has all changed. Today, business survival is largely about understanding the external environment and how it affects the organisation's performance.

This environment is complex. It includes all the interrelated events, changes and decisions taken in the systems of society (some predictable, but many not) which directly and indirectly influence markets, productivity, competitiveness and so on; and it includes the physical environment, and customers' and society's expectations for the future of the natural environment. More importantly, it includes our growing understanding of the long-term damage that organisations are doing to natural systems and the high probability that this damage is irreversible and will, at some point, lead to global ecological changes.

Bennis and his colleagues (1994) have underlined the importance of reassessing conventional business assumptions and beliefs and moving them towards the goal of sustainable development. This requires a major shift in people's attitudes and behaviour. Only when this happens and senior managers commit themselves and their teams to a new business philosophy, will organisations meet the environmental challenge. A few examples of the economic and business assumptions and beliefs needed for sustainable development are as follows.

- The purpose of businesses should be to satisfy all human needs, with minimum consumption of scarce resources.
- The interests and needs of future generations, and of other communities, must not be jeopardised for short-term economic interests.

- Business operations should enhance the environment, rather than damage it, and contribute to ecological balance.
- The well-being of all the other stakeholders in a business is as important as that of its equity shareholders.
- Businesses do not own all the resources they use; they hold them in trust to make the best possible use of them on behalf of society.

In construction, the refurbishment sector is well-placed to meet some of the criteria for sustainable development. The building is, in effect, recycled or re-used and, with good design and management, keeps its consumption of virgin materials and manufacturing energy to a minimum. It also recycles land, extending the useful life of areas already 'de-natured' and reducing demand for green field sites. New build is a different story and many hectares of green space are put under concrete or tarmac every day in the name of progress.

Environmental management and construction

Both the construction and property industries must play a responsible role in managing the environmental impact of development, because the problems stem both from building operations and buildings in use. Infrastructure projects, particularly roadbuilding, also have significant environmental repercussions. The issues affect planners, project owners, designers, project managers, construction managers, material producers and manufacturers, sub-contractors, facilities managers, building users, local authorities, regulatory bodies and others whose decision-making has an impact on natural systems.

New approaches to procurement, such as partnering, reinforce the point that environmental responsibility is a shared one and must be tackled collectively. Solutions to major environmental impact risks can only be achieved through multi-professional, and even pan-industry, collaboration.

By the beginning of the 1990s, most major projects throughout Europe were subject to an environmental assessment and increasing numbers of construction organisations were thinking hard about drawing up environmental policies and plans. They did this in response to new and proposed environmental legislation and because they could see a slow but unstoppable shift in client and public concern about the environmental impact of buildings and the building process (Fryer and Roberts, 1993).

By 1991, a number of construction industry organisations were carrying out research on environmental issues and the actions needed. CIRIA set up the Construction Industry Environmental Forum in collaboration with BRE (the Building Research Establishment) and BSRIA (the Building Services Research and Information Association) to promote awareness and understanding of environmental issues in the industry. At about the same time, BSRIA began a major research study aimed at producing and encouraging the adoption of an environmental code of practice for building services.

More recently, CIRIA started a multi-disciplinary research project to review the industry's practices in the context of ISO 9000 (Quality Systems), ISO 9004 (Environmental Management), the Construction (Design and Management) Regulations and the Health and Safety at Work Act. Important research into specific environmental problems is also being undertaken by many university departments and other organisations with research capabilities.

The effects which buildings and construction processes have on the environment can be stated fairly simply, but the issues are in fact complex and interrelated. CIRIA grouped the issues under these headings:

- Energy use, global warming and climate change
- Resources, waste and recycling
- Pollution and hazardous substances
- Internal environment of buildings
- Planning, land-use and conservation
- Legislation and policy issues.

Recognising the breadth and severity of these environmental imperatives, organisations like the Construction Industry Council are responding to the call for better environmental management. It is at the level of individual firms, especially the smaller ones, that reaction has been slow. The climate in which many of these firms are struggling to survive is an *economic* one.

Construction managers have a special responsibility for the efficient use of energy and resources, waste management and recycling, avoidance of pollution, land contamination and danger from hazardous substances – all within the context of new environmental legislation and their companies' increasingly visible environmental policies.

The construction industry is under increasing pressure to reflect on and assess its impact on the environment and take concerted action. This requires integrity and commitment on the part of all the industry's professions and a thorough understanding of the issues and the burgeoning European legislation, to which whole books can be devoted (see for instance Griffith, 1994).

Environmental management systems

Until the early 1990s and the enactment of the Environmental Protection Act 1990, few construction organisations had taken the environmental impact of their operations seriously. By 1996, when the Environmental Agency was launched, the situation had changed, but was still far from ideal. Client pressure and the publicity given to BS 7750: *Specification for Environmental Management Systems* (1992), contributed to some shift in attitudes. Some firms began to understand the importance of *sustainable development*, a concept which stresses using resources of energy and materials in a responsible way, so that future generations can benefit from them too.

The Environment Act 1995 set up the Environment Agency. The agency amalgamates the National Rivers Authority, HM Inspectorate of Pollution and some 80 Waste Regulation Authorities in the UK. The 1995 Act makes the polluters of land liable for the costs of its remediation, a responsibility which cannot be ignored by the construction industry. Environmental law is a growing and enormously wide-ranging subject, the bulk of UK legislation now emanating from EU proposals and regulations (Francis *et al.*, 1995).

ISO 14000, which is an international standard series for promoting environmental protection and sustainable development, was introduced in September 1996. It specifies the requirements and procedures for establishing an environmental management system. Few construction companies have actively pursued certification to this standard despite having an obligation to implement it, as the services and products they produce directly impact upon the environment. CIRIA's (2000) Report C533 on *Environmental Management in Construction* provides practical assistance to companies in the construction sector that are considering, or already tackling, environmental management. Other studies that provide useful information in the same area are those of Zhang *et al.* (2000) and Walker (2000).

Environmental management policy and strategy

Environmental management involves designing or revising an organisation's practices, processes and structures so that it can achieve its core objectives in an environmentally responsible way. Any company taking its environmental obligations seriously must start with a policy which relates its core business objectives and strategies to its environmental aims. Such a policy must be flexible, because firms differ markedly and their circumstances change (Griffith, 1994). But unless the policy informs the organisation's business strategy, it is unlikely that effective environmental performance will be achieved. In addition to the requirements of environmental legislation, clients increasingly enquire about the environmental policies of the construction firms and practices with whom they enter contracts, so it is realistic to expect that in future the existence of a sound environmental policy and strategy will be a key factor in a firm's competitiveness (Fryer, 1994a).

BS 7750/ISO 9004 provides guidance for a firm wishing to introduce a management system for improving its environmental performance. The standard parallels EC environmental standards and shares many of the management principles embodied in the quality standard BS/EN/ISO 9000. The main building blocks are now in place to allow a full and positive relationship to develop between corporate objectives and environmental needs.

Sustainability has really emerged as an important management issue. This is partly fuelled by ISO 14000. Issues such as the triple bottom line, which focuses on company profit performance (economic issues) being balanced by demonstrating performance on delivering value to society (social issues) while improving the ecological environment (environmental issues), are gaining currency and providing ample challenges for construction organisations. The report by the International

Council for Research and Innovation in Building and Construction (CIB) – Publication 237: Agenda 21 on Sustainable Construction provides a detailed overview of the concepts of sustainable development and sustainable construction from environmental, social and economic perspectives. It also addresses the main issues and challenges of sustainable construction.

Environmental action planning

Practical guidance on formulating an environmental plan are given in the Institute of Management's action checklist No 19, *Taking Action on the Environment*, published in 1996. The checklist advises firms to:

- secure top management commitment;
- identify the environmental laws and regulations;
- designate a senior manager to be responsible for environmental affairs;
- establish and communicate a clear policy;
- work out the environment-business link;
- carry out regular audits;
- develop a procedures manual;
- start an environment training programme;
- publicise environmental objectives internally and externally;
- build in measures and controls;
- communicate environmental benefits internally and externally;
- involve employees to gain their commitment.

As is so often the case in management, effective communication, consultation and training – to encourage appropriate attitude change and to gain the commitment of employees and other stakeholders – are key factors in the successful implementation of management plans.

Environmental impact assessment

Also known simply as environmental assessment (EA), environmental impact assessment is a set of procedures for measuring the probable environmental effects of a project before it is allowed to start. The principles of EA are not new and have been practised in the oil, gas and petro-chemical industries since the early 1970s (Griffith, 1994).

The UK construction industry is affected by an EC Directive aimed at ensuring that all major projects – public and private – are the subject of an environmental assessment before consent is given. The DoE introduced a system in the late 1980s for ensuring that projects conform with the EC Directive and the major output of the EA process is an environmental statement prepared by the developer and submitted to the competent authority – usually the planning authority – ideally *after* prior consultation with that authority, which can provide the developer with valuable advice and information (Roberts, 1994).

Environmental and quality auditing

Many larger organisations have introduced an auditing process for both their quality management systems and environmental management systems. An audit is a systematic, periodic evaluation of a management system in an organisation to assess its effectiveness in meeting key objectives and statutory requirements. The frequency of audits, the procedures used and the methods of reporting need to be carefully thought through. They will probably differ from organisation to organisation.

There is no statutory requirement for auditing, but many firms see it as an essential part of responsible business operation, contributing to the regular review of the organisation's strategy and, where appropriate, being integrated with procedures imposed by statute, such as the COSHH regulations and other health and safety legislation (Roberts, 1994).

Steps to be taken in quality or environmental auditing include the following.

- Setting audit objectives.
- Deciding on the scope of the audit.
- Defining its baseline.
- Selecting an audit team.
- Collecting evidence and information in relation to audit objectives and means of assessment.
- Assessing and evaluating audit results.
- Publishing the results.
- Developing an action plan for change and improvement.
- Monitoring the effectiveness of action taken.

Summary

Since about 1990, quality and environment have become two of the most frequently used words in management. The setting up of both quality and environmental management systems is seen as a high priority in many forward-looking organisations which want to survive and prosper in the global marketplace. Both systems are recognised as having strategic importance and both have necessitated a major shift in attitudes among employees and managers, with accompanying changes in organisation structures and cultures.

Quality is not a new concern for the manager. Quality assurance has always been a recognised management function. What has changed is the emphasis placed on quality in every aspect of an organisation's activities and the formalisation of quality assurance procedures. The first is a result of concepts like TQM, aimed at changing the philosophy of businesses; the second follows from adoption of the new quality standards.

Environmental impact, on the other hand, is a relatively new issue for most managers. Not many people in industry and the professions had given it serious

consideration prior to the World Commission on Environment and Development in 1988, the so-called Brundtland Report. Now, the construction industry, like other sectors, is under pressure to respond to demands from clients, governments and other groups to demonstrate commitment to sustainable development; and to meet new standards and statutory requirements emanating from EC directives. The introduction of environmental assessments prior to approval of all major development projects has put environmental protection right at the forefront of planning and development. All the parties involved in the construction and property industries will have to play a part in achieving new environmental standards.

In future, excessive formality in quality management systems, which has beset some firms as they grappled with the new quality standards, may recede. Their quality procedures may become absorbed into the culture, corporate plans and operational routines of their businesses and ways may be sought to remove the bureaucracy which such systems can spawn. The future of environmental management systems is not yet clear. Governments are more likely to legislate on environmental issues than they are on quality, except where the latter affects health and safety. If organisations don't meet new environmental standards, governments may bring about change through further statutes.

Because quality and environmental impact can both impinge on health and safety, a likely development is the integration of management systems used by firms to deal with these three areas. As many of the procedures used are already similar, this is a logical development which will improve efficiency.

Discussion and questions

Effective total quality management provides benefits to construction organisations. However, its implementation raises a host of challenges. Discuss this statement.

The services and products produced by Envirobabes Ltd, a large construction company, directly impact upon the environment. The director of Envirobabes is planning to make an important presentation to the stakeholders and the city, on the implementation of ISO 14000 by the company and the efforts that the company is making in managing the triple bottom line of economic, social and environmental issues of sustainability. Discuss the main issues which the director needs to consider for an effective presentation in terms of breadth and depth of coverage.



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