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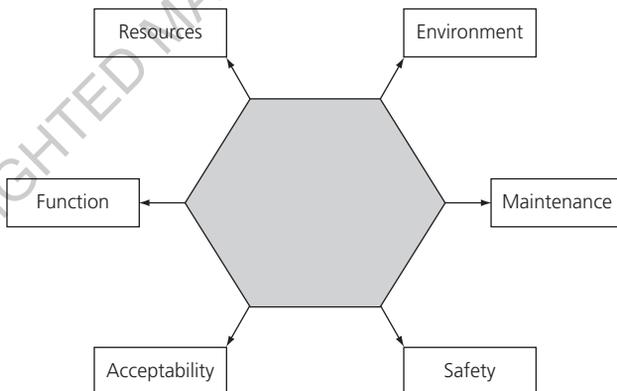
Our profession is not solely involved with the application of rules and formulae, but is one that is reliant on judgement and a broad understanding of so many facets of the natural world and the aspirations of mankind.

Civil engineering is a logical process of making judgements, which are based on some fundamental laws, rules and concepts. It is, by no means, an exact science, so the manipulation of actual or contrived facts, using equations and formulae, cannot alone provide adequate answers. Mechanistic analysis, often based on published previous best practice in codes and standards, is a fundamental tool in the design process. However, it is only a small (albeit critical) part of the whole procurement process. It is where we satisfy ourselves that the solution we are proposing will work satisfactorily under predetermined conditions.

Judgement

The majority of the procurement process involves judgement, and this requires a deep and comprehensive understanding of the many factors that influence those judgements. Engineering is a balancing of many conflicting parameters to achieve a workable solution to what is usually a complex problem. This balance can be simplistically likened to an infinitely flexible three-dimensional membrane, being pulled in all directions by a whole range of conflicting considerations (Figure 2.1).

Figure 2.1



Each of these considerations is, itself, another membrane of conflicting parameters.

- 'Function' means that the chosen solution must work (i.e. it must do what it has been decided is required – a decision that is, in itself, another membrane). This is where analytical calculations are needed. But this consideration is now of far

The ICE training scheme

The training scheme can be used by anyone who is applying for membership of ICE (MICE). As a trainee, you will enter into a training agreement with your employer. This agreement formally sets out the responsibilities of you as the trainee, your employer and ICE. An approved mentor should be assigned to you by your company; who is known as a supervising civil engineer (SCE) and plays a very important role in the scheme. Sometimes SCEs delegate some of their duties to delegated engineers.

When you join the ICE training scheme you are entering into a professional agreement between you and your company, but it is not a formal contract. The agreement sets out the responsibilities and commitments of everyone involved in the scheme.

For the duration of your IPD you are required to document your progress routinely to ensure that you focus on gaining the experience necessary to becoming a professional civil engineer. You need to produce a regular (quarterly) progress report to record your development and maintain your online development record, summarising how you are progressing with respect to each of the attributes. You will also record your development through the annual maintenance of your CPD.

Those training under agreement must now use ICE's *IPD Online* tool (Figure 4.3); more details about this can be found on the Institution's website. This records your training progress toward the nine attributes.

Figure 4.3 (Source: ICE IPD Online tool)

Initial Professional Development Online

The screenshot shows the ICE IPD Online tool interface. On the left is a user profile sidebar, and on the right is the main content area with navigation tabs.

User Profile Sidebar:

- Name:** Mx. Grad. (with a 'View details' link)
- YOUR ROLE:** Trainee
- CURRENTLY TRAINING FOR:** IEng (with subtext: 'You are eligible up to IEng. This is related to your education level. About eligibility and levels')
- ATTRIBUTE LEVELS COMPLETED:** 0
- YOUR SUPERVISING CIVIL ENGINEER:** Mx. S.C. Engineer

Main Content Area:

Navigation tabs: Summary (selected), Attributes, Document library, Help centre, Your details

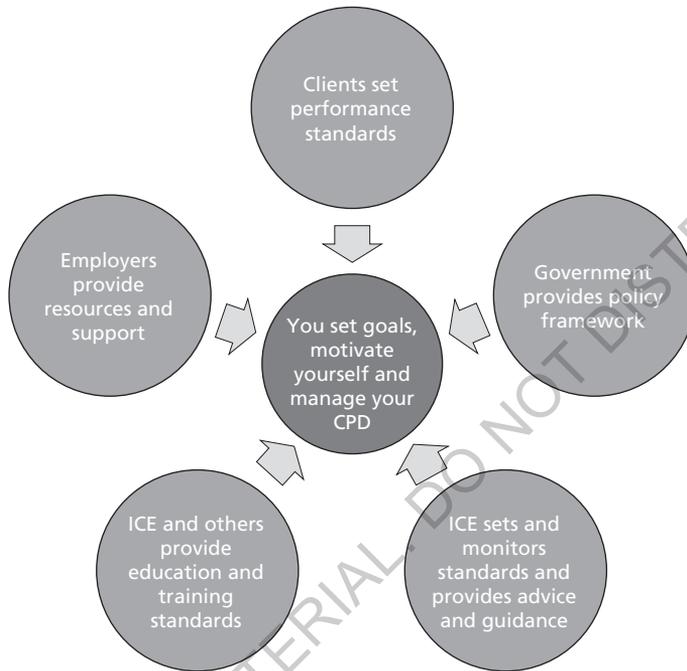
Your progress:

- Pieces of evidence submitted this year: 0
- Attributes completed to IEng level: 0
- Attribute achievement levels completed: 0/27 (27 to go!)

Your attributes:

1. Knowledge and Understanding of Engineering	CEng only	Ac
	0/3 IEng levels complete	AI E K
2. Technical and Practical Application of Engineering	CEng only	Ac

Figure 13.1 (Source: ICE (2017) *Continuing Professional Development Guidance*, Version 1, Revision 3, p. 5. ICE, London, UK)



up to date with technology, the law and public attitudes must surely be essential to our defence in this scenario.

The impact of external factors on our CPD is shown in Figure 13.1, again taken from the *Continuing Professional Development Guidance* (ICE, 2017e).

The Institution also requires members to anticipate what they might need to know in the future, by drawing up a development action plan. For those in the early stages of their career, this requires them to decide on their ambitions and career plans – what they need to learn for the next stage of their advancement, as well as keeping up to date with developments in their current role.

CPD will usually be at least partly supported by your employer, but the onus here is on the trainee and the progress made by you should be self-evident through CPD records. Just attending the courses your company arranges shouldn't be sufficient; it is surprising how many are still in 'school mode', expecting things to be arranged or sorted out for them. Prospective members of the Institution should be able to show that they actively