Corporate Culture and Integrated Management Systems:

—— A case study of the UK Construction Industry

By

Jia Tang

Thesis presented in part-fulfilment of the degree of Master of Science in accordance with the regulations of the University of East Anglia

School of Environmental Sciences
University of East Anglia
University Plain
Norwich
NR4 7TJ

© 2003 Jia Tang
This copy of the dissertation has been supplied on condition that anyone who consults it is understood to recognize that its copyright rests with the author and that no quotation from the dissertation, not any information derived therefrom, may be published without the author’s prior written consent. Moreover, it is supplied on the understanding that is represents an internal University document and that neither the University nor the author are responsible for the factual or interpretative correctness of the dissertation.
Acknowledgement

There are a number of people to whom thanks are due for their kindly support in this project.

Firstly to Mr. and Mrs. Jarman, my friends, who has been invaluable throughout the whole project and has always been ready to take time out to help me. I am grateful for his understanding and patience and for the support that he has offered throughout these years.

I would like to thank all my tutors, especially Mat Cashmore and Jon Gurr for giving me inspirations and advice.

Thanks all the construction companies who took time to complete my questionnaire.

感谢我的父母和长辈一直给我最大的支持和鼓励。谢谢所有朋友的关心和帮助，特别是谢谢丁艺先生对我生活上的关心和电脑技术支持。
Abstract

The subject of Integrated Management Systems in terms of quality, environmental and occupational health and safety management has become of increasing interest to researchers and business alike during the last many years or so. This research was based on a review of the various models of integration found in the academic literature and used the UK construction industry as a case study, to investigate the interrelationship between corporate culture and the IMSs. In addition, a guideline of developing organizational culture towards sustainability was developed. It focuses on staff training and education, internal and external communication and staff participation.
Contents page

Acknowledgement ............................................................................................................................ 2

Abstract ........................................................................................................................................ 3

Contents page Abbreviations ............................................................................................................. 4

Abbreviations .................................................................................................................................. 5

Chapter 1: Introduction ..................................................................................................................... 6

Chapter 2: Integrated Management Systems and Corporate Culture .............................................. 11
  2.1 Management Systems .................................................................................................................. 11
  2.2 Integrated Management Systems ............................................................................................... 14
  2.3 Corporate Culture and Management Systems ............................................................................ 22

Chapter 3: Sustainable construction ................................................................................................ 28
  3.1 Sustainable development ............................................................................................................. 28
  3.2 Sustainable construction .............................................................................................................. 29
  3.3 Environmental impact- sector awareness .................................................................................... 31
  3.4 Construction industry and management systems ........................................................................ 35

Chapter 4 Research design and method .......................................................................................... 38
  4.1 Introduction ............................................................................................................................... 38
  4.2 Desk study .................................................................................................................................. 38
  4.3 Questionnaires .......................................................................................................................... 39
     4.3.1 Questionnaire design ............................................................................................................ 39
     4.3.2 Questionnaire distribution .................................................................................................. 41
     4.3.3 Questionnaire responses ..................................................................................................... 42

Chapter 5 Results and discussion .................................................................................................... 44
  5.1 Introduction ............................................................................................................................... 44
  5.2 Integrated Management System in the UK construction industry ............................................. 44
  5.3 Corporate culture and Integrated Management Systems ............................................................ 48
  5.4 Cultures changing towards an Integrated Management System ................................................ 53

Chapter 6 Evaluation and Recommendation .................................................................................. 59

Chapter 7 Conclusion ..................................................................................................................... 61

References ........................................................................................................................................ 63

Appendix 1: Questionnaire Cover Letter ......................................................................................... 72

Appendix 2: Questionnaire ............................................................................................................... 73

Appendix 3 The companies and the environmental manager contacts that the questionnaires send 80
Abbreviations

BSI: British Standard Institution
CI: Construction Industry
CIA: International Council for Research and Innovation in Building and Construction
CIRIA: Construction Industry Research and Information Association
DETR: Department of the Environment, Transport and the Regions
EA: Environmental Agency
EFQM: European Foundation for Quality Management
EMS: Environmental Management System
IMS: Integrated Management System
ISO: International Organization for Standardization
ISO/TAG: ISO Technical Advisory Group
OH&SMS: Occupational Health and Safety Management System
QMS: Quality Management System
TQ: Total Quality
TQM: Total Quality Management
UNCED: United Nation Conference Environment and Development
WCED: World Commission on Environment and Development
Chapter 1: Introduction

1.1 Introduction to research

An increasing number of companies around the world are seeing and reaping the benefits of adopting a management systems approach for managing their business risks (Young, 2002). There is no mystery about ‘management systems’. Even a sole trader will have some form of management system. In concept, a management system may be defined as ‘the organisational structure, responsibilities, procedures, practices, processes, activities and resources needed for the development, implementation, achievement and maintenance of an organization's policies and objectives’ (BS 8800:1996, API Publication 9100A:1998, AS/NZ4581:1999). Basically, any management system is a way of moving information around inside an organisation. Its job is to make sure that the right information arrives at the right place on time, so that the right decisions can be made (Sheldon and Yoxon, 1999). Businesses only survive because they have some sort of system that works. These management systems cover a number of aspects of the business including quality; environment; health and safety, as well as other less tangible areas such as reputation and company esteem.

One of the first areas to adopt a formal management systems approach was quality. Since the publication of ISO\textsuperscript{1}9001:1994\textsuperscript{2} other standards for Health and Safety (OHSAS 18001:1999\textsuperscript{3}) and environment (ISO14001:1996\textsuperscript{4}) have been published (Young, 2002). Many companies will already have other management systems in place as an accepted part of the business culture when an environmental

\textsuperscript{1} ISO is known as International Organisation for Standardization.
\textsuperscript{3} OHSAS18001:1999: international occupational health and safety management system specification (BSI, 1999).
management system or health and safety management system is brought in. Yet, with the new generation of formal systems to manage the environmental impacts of organisational activities, products and services, there are now managers who can bring to the subject the experiences and models offered by the earlier introduction of quality management systems. In all three systems there is much common ground which suggests a common approach that may make best sense in terms of resource utilization. By integrating the management systems the business benefits can be multiplied and an organisation can respond to change and anticipate or move beyond any targets before they are externally imposed (Sheldon and Yoxon, 1999).

The subject of Integrated Management Systems (IMSs) in terms of quality, environmental and occupational health and safety management is becoming increasingly seen as part of the organization’s management portfolio(for example, see Riemann and Sharratt, 1995, Shillito, 1995 and Tranmer, 1996). Karapetrovic and Willborn (1998a) note that works on the integration of ISO 9000 and ISO 14000 appeared soon after the latter was released in 1996. Since then, Integrated Management Systems (IMSs) have been discussed and written about by both quality professionals and academic researchers for a number of years. Such literature has discussed pathways to integration (Wilkinson & Dale 1999), benefits of integration and obstacles to integration (Shillito, 1995; Netherwood, 1998; Douglas and Glen 2000). A number of surveys have been undertaken on different models for implementing IMSs. On the other hand, neither the standards, nor the systems concept address corporate culture issues such as motivation and co-operation, which is a crucial enabler for the improvement of performance. Wilkinson & Dale (1999) noticed the importance influence of corporate culture within IMS, and they pointed out the various approaches by means of which integration systems could be applied in different sectors depending on the corporate culture of the organisation.
What few had apparently taken into account was the pre-existing of a culture within an organisation would have a basic influence on any subsequent formal management system; namely that the system would give a voice to the culture, not the other way around. So the cultures of individual organisations, sites or even departments can affect how a system is used. No two management systems are the same, because no two companies are the same. Scholz (1987) pointed out that ‘an organisation’s culture focuses on the values, beliefs and meanings used by its members to grasp how its uniqueness originates, evolves and operates. It has often been considered within the context of corporate strategy and organisation structure’. At the same time, traditional mechanisms for integration – hierarchies and control systems– among other devices – are proving costly and ineffective’.

Elements included in corporate culture are not always visible. Most of it, such as assumptions, beliefs, values, and norms, which direct the participants’ decision-making and behaviour occurs unconsciously (Welford, 1997). Moreover, some of elements of corporate culture are essential in IMSs implementation, such as education and training. They provide organisational members with the critical components of incorporating ecology into the corporate culture (Milliman and Clair, 1995).

Of itself, the ISO does not require any Environmental Management Systems, Quality Management Systems, Strategy System or content. It is up to companies to decide what kind of management system and structure there will be. Consequently, the organisational culture may have great influence on whether the organisation chooses an IMS or separate management systems; the degree of integrated of QMS and EMS or the kind of approach of communication with internal and external parties.

Much of the literature on IMSs has been based on individual case studies (Carter, 2000; Altus 1999; Ofori et al., 2002). For example in the construction industry
potential of IMSs have been considered since 1997 (Griffith, 2000). The UK construction industry (hereafter referred to as the CI) is a vast, complex and important industry; it produces £65 billion worth of construction work each year in the UK (Morton, 2002). There are approximately one and a half million people employed and over 160 000 CI firms in the UK (Morton, 2002). Construction affects the environment in a host of different ways. The most frequently discussed is the large amount of energy used in buildings once they are built and occupied. However the construction process itself is highly energy dependent – particularly in the manufacture and transport of materials. There is a more obvious impact; construction work of all sorts requires space and alters the character of the environment in which it exists. There are also indirect effects of the location of buildings – such as its influence on transport requirements, for example, in increasing the use of cars (also high energy polluters) to out-of-town shopping centers and office developments (Morton, 2002). In addition, the construction industry is a major user of the world’s non-renewable energy sources and minerals (Spence and Mulligan, 1995). In order to develop a sustainable, safe and efficient construction industry, CI firms is being enthusiastic to develop their EMS, QMS and OH&SMS, and also numbers of them are already have obtained or intend to obtain, ISO 9002:2002, ISO 14000 certification. A quick research on the database of EMAS website shows 166 ISO 14001 certifications have been issued to CI companies. This is 5.5% of the total of 2917 companies have been issued by ISO 14001 (www.emas.org.uk, 2003).

1.2 Aims and Objectives

With the previous outline in mind, the overall aim of this research is to investigate how IMSs have been influenced by organisational culture and how it may be affected by implementing IMSs, using a sample of the construction industry firms in the UK as a case study. The specific objectives are as follows:

1. Assess the uptake of IMSs and degree of integrated of EMS and QMS in UK
1. CI firms;
2. Evaluate the methods of implementation.
3. Assess internal and external communication approaches, including staff training, participation, motivation, and incentive systems etc.
4. Develop a guideline of culture change, which could help organization operate IMS effectively.

1.3 Structure of the Dissertation

Chapter 1: Outlines the project specifications by giving background to the subject area and state the objectives of the research and the structure used for the presentation of the dissertation.

Chapter 2: Reviews the literature in the area of integrated management systems and corporate culture. It also views the benefits and barriers of IMS and its implementation methods; corporate culture relating to the management systems

Chapter 3: Reviews the literature on sustainable construction and the environmental impact caused by construction industry. It also discusses the integrated management systems specific to the UK construction industry.

Chapter 4: Identifies the methodology used in desk study, questionnaire design and distribution

Chapter 5: Analyses the results from the questionnaires; discusses the problems which were returned and discusses the problems which the answers raise.

Chapter 6: Evaluation the benefit and also limitation of the research. At the same time recommend further study on the area.

Chapter 7: Conclusion the finding from research
Chapter 2: Integrated Management Systems and Corporate Culture

2.1 Management Systems

‘A (management) system provides order, structure and constancy of purpose’ to an organization and therefore reduces entropy (Denis, 1997). In management, entropy may be seen as the amount of disorder or randomness in a system bearing information. Denis (1997) identifies it as the common cause for management problems. The systems approach to management has been supported by international and national standards – documented agreements approved by a recognized body, which recommend voluntary rules and guidelines (Gonzalez, 2000). In the last two decades several models have been developed – at both national and international levels- for the implementation of management systems.

However, the most popular has been for ‘quality management’ of the ISO 9000 series. This ‘family of standards was firstly published in 1987, and actually a collection of several standards. These were simplified in December 2000. Figure 2.1 shows four core standards of ISO 9000:2000 and a series of supporting standard. Under the revised program, ISO 9000:2000 is the general standard that serves as an overall guide to the other standards, which provide definitions of terms. It is a basic explanation of the ISO 9000:2000 standards, which consolidates the former ISO 9001/9002/9003 standards into a single document and is now this only standard by which certification is currently assessed. It also includes further guidance for continuous improvement of internal quality management systems.
ISO 9000 series had achieved considerable success in motivating organizations to systematically address and improve product and service quality with the ISO 9000 series of standards. The United Nation Conference Environment and Development (UNCED) envisioned a similar set of voluntary standards to encourage the systematic improvement of environmental quality. In September 1996, the first of the ISO 14000 series of standards, ISO 14001, was issued. Similar to its sister standard (ISO 9000:2000), ISO 14000 series it includes several environmental management guidelines and auditing guidelines (Shows in Figure 2.2). The ISO 14001 sets the criteria for an environmental management system An environmental management system is ‘the part of the overall management system that includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy’ (EN ISO 14001. §3.5, p10).
Another issue for companies is occupational health and safety. Since World War II the speed of technological innovation has altered the workplace a lot (Altus, 1999). The rate and technical complexity of change have generated more and more regulations aimed at maintaining a safe and healthy work environment (Akass, 1994). It has been recognized (see for example: Smith, 1996; Akass, 1994) that companies may need some kind of system to manage legislation and health and safety issues in general. The development of ISO 9001 and ISO 14001 has led some organizations to look at the potential benefits of a similar route for managing occupational health and safety (Smith, 1996). In 1996 the standard BS 8800 ~ Guide to Occupational Health and Safety Management System (OH&SMS), was published. Due to a lack of professional knowledge of OH&SMS, and a greater understanding of quality and environmental management; the author proposes to focus the study on EMS, QMS and their integration.
2.2 Integrated Management Systems

Since the publications of ISO9000:2000 and ISO 14000 series, the annual ISO survey shows it rapidly spread in worldwide. Up to the end of December 2001, at least 510,616 ISO 9000 certificates had been awarded in 161 countries. Specifically 66,760 certificates had been granted in the UK. Of the ISO 9000 total, 8501 were certificates of conformity to ISO 9001:2000. The number of ISO 14000 series certificates awarded worldwide is increasing rapidly. There was a 60.57% increase by December of 2001. 36,765 ISO 14000 certificates had been awarded in 112 countries, counties including 2,722 certificated by UK organizations (ISO, 2001).

With the growth in awareness of QMS, EMS and OH&SMS, organizations are looking to the principles, structures and features of these three systems to identify common linkages with a view to integration. (Wilkinson and Dale, 1998, 1999, 2000, 2001). A study by MacGregor Associates (1996) found the integration was seen as: ‘a single top level management ‘core’ standard with optional module supporting standards covering specific requirements’. The ISO technical advisory group, ISO/TAG 12, uses the same approach to integration as MacGregor Associates, who recommend that ISO 9000 and ISO 14000 series should not be merged but be made more compatible. They also suggest that compatibility means that common elements of the standards can be implemented in a shared manner, in whole or in part, by organizations without unnecessary duplication or the imposition of conflicting requirements’ (BSI, 1998a). Integrated Management Systems (IMSs) have been successfully adopted by many UK organizations. Altus (1999) carried out a survey of companies across industrial sectors in the UK, with the objective of investigating the reasons for integration of QMS, EMS and OH&SMS by sending 200 questionnaires to organizations with both ISO 9001 and ISO 14001 certified management systems, They found that 66% of enterprises had integrated two of their management systems and 20% had IMSs comprising
their QMS, EMS and OH&SMS.

Douglas and Glen (2000) conducted a survey in small and medium-size enterprises (SMEs) and to investigate whether the certification body has been used for system integration. They also looked at the degree of integration, and took a brief look at the perceived benefits of integration. These benefits are summarized below. Similar surveys have also been undertaken by Shillito (1995) and Netherwood (1998) have also been undertaken. These studies pointed out the main benefits of implementing IMSs:

- A higher efficiency of the management system through avoiding duplication of common clauses and recognizing the interdependence of all the aspects of an organization;
- By recognizing the interdependence of all the aspect of an organisation and at the same time encouraging better communication between staff.
- By Cost reduction through means of employing fewer managers dealing with the systems and by having integrated third party audits; and
- Time saving through conducting integrated audits and by avoiding duplication of common elements.

There are additional benefits in adopting an IMS over separate issue based management systems including the following:

- Application of a consistent management process across the entire business;
- Adoption of single processes for common management system requirements thus avoiding duplication and reducing disruption management system requirements confusion and resource commitment (Young, 2002).

Barriers of implementation were also addressed by these studies and others (for example Abarca, 1998; Netherwood, 1998; Shillito, 1995):
The fact that a concurrent implementation may lead to twice or three times the opportunities of making mistakes because the more there is to deal with, the greater is the likelihood that something goes wrong (Abarca, 1998);

Reducing problems, which may occur when companies attach, for example, environmental responsibilities onto areas perceived to be of higher priority, such as quality and health and safety, instead of treating the environment as a distinct and important responsibility with its own separate budget (Nethwood, 1998); and

Corporate culture problems leading to lower performance as a result of integration of disciplines applied through different cultures (Shillito, 1995).

A number of surveys have been undertaken on different models for implementing IMSs. Wilkinson & Dale (1999) reviewed both the advantage and disadvantages of five models:

Interlinked standards through a systems approach: Karapetrovic and Willborn (1998) have suggested this model, which they believe overcomes the problems caused by the lack of clarity in the quality vocabulary. It used a seven-point decision cycle (see figure 2.3) helps to show the interrelationships between systems. They suggested integrating the requirements of ISO 9001 and ISO 14001 in every step in this model. For instance: step 4, development should consist of training, which is required in ISO 9001:2000 as 4.18.; and also training, awareness and competence required in ISO 14001:1996 as 4.4.2. Karapetrovic and Willborn (1998) believe the individual systems do not lose their identity and can still be audited and certificated in interlinked or integrated systems.

The Management Systems Evolution Model: Renfrew and Muir (1998) see the move towards an IMS as a positive step and suggest the model shown in figure 2.4 shows the trend in management systems three phase evolution,
which comprising: standardisation, rationalisation and integration. This approach starting with ISO 9001, then introduction of new standards by using ISO 9000 series and eventually implement a single management system and standard by using Quality Environment Safety Health (QUENSH).

![Diagram](image)

Figure 2.4 Management systems evolution model (Source: Renfrew and Muir. 1998)

- The ISO 9001/ISO 14001 Matrix: is based on the links between the two standards given in Annex B, Table B2 of ISO 14001 (1996) (see table 2.1) , Which ISO say has been produced ‘to demonstrate the combinability of both systems,’ where a direct link between two subclauses is an indication that they ‘are largely congruent in requirements’ (Wilkinson & Dale, 1999). This matrix model has been used by Beechner and Koch (1997), Puri (1997), and Karapetrovic and Willborn (1998); they indicate that the link between the two standards are strong for policy; organization, and structure and responsibility; management review; document control; process control, and operational control; inspection and testing/control of inspection equipment, and monitoring and measurement; records; internal audits, and training.
Figure 2.3 Simple graphical model of IMS. (Source: Karapetrovic and Willborn (1998))
### Table 2.1 Correspondence between ISO 9001 and ISO 14001

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Management responsibility</strong></td>
<td></td>
</tr>
<tr>
<td>4.1.1</td>
<td>4.2</td>
</tr>
<tr>
<td>4.3.1</td>
<td>4.3.1</td>
</tr>
<tr>
<td>4.3.2</td>
<td>4.3.2</td>
</tr>
<tr>
<td>4.3.3</td>
<td>4.3.3</td>
</tr>
<tr>
<td>4.3.4</td>
<td>4.3.4</td>
</tr>
<tr>
<td><strong>Organization</strong></td>
<td></td>
</tr>
<tr>
<td>4.1.2</td>
<td>4.4.1</td>
</tr>
<tr>
<td><strong>Management review</strong></td>
<td>4.6</td>
</tr>
<tr>
<td>4.1.3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Quality system</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2.1 1st sentence</td>
<td>4.1</td>
<td>General requirements</td>
</tr>
<tr>
<td>4.2.1 without 1st sentence</td>
<td>4.4.4</td>
<td>Environmental management system documentation</td>
</tr>
<tr>
<td><strong>Quality system procedures</strong></td>
<td></td>
<td>Operational control</td>
</tr>
<tr>
<td>4.2.2</td>
<td>4.4.6</td>
<td>Operational control</td>
</tr>
<tr>
<td>4.2.3</td>
<td></td>
<td>Operational control</td>
</tr>
<tr>
<td><strong>Quality planning</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.1 without 1st sentence</td>
<td>4.4.6</td>
<td>Operational control</td>
</tr>
<tr>
<td>4.3 part</td>
<td>4.4.6</td>
<td>Operational control</td>
</tr>
<tr>
<td>4.4</td>
<td>4.4.6</td>
<td>Operational control</td>
</tr>
<tr>
<td>4.5</td>
<td>4.4.5</td>
<td>Document control</td>
</tr>
<tr>
<td>4.6.</td>
<td>4.4.6</td>
<td>Operational control</td>
</tr>
<tr>
<td><strong>Control of customer-supplied product</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.7</td>
<td>4.4.6</td>
<td>Operational control</td>
</tr>
<tr>
<td><strong>Product identification and traceability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.8</td>
<td></td>
<td>Operational control</td>
</tr>
<tr>
<td><strong>Process control</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.9</td>
<td>4.4.6</td>
<td>Operational control</td>
</tr>
<tr>
<td><strong>Inspection and testing</strong></td>
<td></td>
<td>Monitoring and measurement</td>
</tr>
<tr>
<td>4.10</td>
<td>4.5.1 1st and 3rd paragraphs</td>
<td>Monitoring and measurement</td>
</tr>
<tr>
<td><strong>Control of inspection, measuring and test equipment</strong></td>
<td></td>
<td>Nonconformance and corrective and preventive action</td>
</tr>
<tr>
<td>4.11</td>
<td>4.5.2 1st part of 1st sentence</td>
<td>Nonconformance and corrective and preventive action</td>
</tr>
<tr>
<td><strong>Inspection and test status</strong></td>
<td></td>
<td>Emergency preparedness and response</td>
</tr>
<tr>
<td>4.12</td>
<td>4.5.2 without 1st part of 1st sentence</td>
<td>Emergency preparedness and response</td>
</tr>
<tr>
<td><strong>Control of nonconforming product</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Corrective and preventive action</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Handling, storage, packaging, preservation and delivery</strong></td>
<td></td>
<td>Operational control</td>
</tr>
<tr>
<td>4.15</td>
<td>4.4.6</td>
<td>Operational control</td>
</tr>
<tr>
<td><strong>Control of quality record</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.16</td>
<td>4.5.3</td>
<td>Records</td>
</tr>
<tr>
<td><strong>Internal quality audits</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.17</td>
<td>4.5.4</td>
<td>Environmental management system audit</td>
</tr>
<tr>
<td><strong>Training</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.18</td>
<td>4.4.2</td>
<td>Training, awareness and competence</td>
</tr>
<tr>
<td><strong>Servicing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.19</td>
<td>4.4.6</td>
<td>Operational control</td>
</tr>
<tr>
<td><strong>Statistical techniques</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.20</td>
<td>4.4.3</td>
<td>Communication</td>
</tr>
</tbody>
</table>

1) Legal requirements addressed in ISO 9001, 4.4.4
2) Objectives addressed in ISO 9001, 4.1.1.
3) Communication with the quality stakeholders (Customers).

Source: EN ISO 14001 (1996)
Integrated core standard with aligned subsystems: MacGregor Associates (1996) and ISO (ISO. 1998b) identify two different possible approaches for the development of integrated management systems standards: Aligned standards: ‘parallel management standards specific to an individual discipline, but with a high degree of commonality of structure and content’; Integrated standards: ‘a single top-level generic management standard with optional, modular supporting standards covering specific requirements’ (See Figure 2.5).

In the integrated approach, the core elements are intended to cover all systems: quality, environmental and any other management systems, which, for MacGregor Associates (1996), means that organizations must implement all systems even though this might not be their immediate plan. In the aligned approach, the common elements of each standard are similar, and it allows organizations to adopt only that part of the common elements that is appropriate to the standard under immediate consideration. Although the term ‘core elements’ is used in the integrated approach and ‘common elements’ is used in the aligned approach, they are treated as meaning the same thing.

![Diagram of Aligned and Integrated Standards](image-url)

**Figure 2.5 Aligned and Integrated Standards. Source: MacGregor Associates (1996)**
The EFQM model: The EFQM Model for Business Excellence (shown in Figure 2.6) is based on Total Quality Management (TQM), which requires a total quality approach to be implemented throughout the whole organization, and self-assessment and scoring processes emphasize the importance of deployment of the enabler criteria at all levels and across all activities in the organization.

The EFQM is intended to show that customer satisfaction, employee satisfaction and impact on society, such as stakeholder satisfaction, are achieved through leadership driving policy and strategy, the management of resources and processes, which will ultimately lead to improved/excellent business results. Leadership, people management, policy and strategy and resources and processes are seen as the key, which can ensure improved people, customer and stakeholder satisfaction and lead to improved business results.

Figure 2.6 EFQM model. Source: EFQM (1998)

---

5 EFQM stands for European Foundation for Quality Management, published in 1998, EFQM Model for Business Excellence
Also the study pointed out the various approaches should be applied in different sectors, which may depend on the corporate culture of the organization. Furthermore the later research by Wilkinson & Dale conducted in 2000 regard the corporate culture as a key issue in IMS: ‘Culture is seen as important and an enabler for the improvement of business performance, but neither the standards nor the systems concept addresses issues such as motivation and cooperation. Increasing the compatibility of the standards will therefore not overcome their failure to address culture’.

2.3 Corporate Culture and Management Systems

Culture concept appears early 1871 by Edward B. Tylor, and people began to interest in corporate culture since Clifford Geetz (1973). Since then, it has been believed be important for any management system for a long time (for example, see Egan 1993, Peter and Waterman, 1982). It can be seen as a tool for improving performance and the key to effective leadership (Brown, 1992), and Dessler (1992) believes that: ‘the leader…must promulgate the basic values, beliefs and expectations that will drive the organization…’

Corporate culture is described as anyone who has spent time with any variety of organizations, or worked in more than two or three, will have been struck by the differing atmospheres, the differing ways of doing things, the differing levels of energy, of individual freedom, of kinds of personality. For organizations are as different and varied as the nations and societies of the world… they have differing cultures- sets of values and norms and beliefs- reflected in different structures and systems (Handy,1993).

The concept of corporate culture was adopted both as an explanatory framework
with which to understand behaviour in organizations and as a critical perspective (Huczynski and Buchanan, 2001). Edgar Schein (1985) considered it in terms of three levels, each distinguished by their visibility and accessibility to individuals (figure 2.7). Such model explains organization culture is the pattern of basic assumptions which a group has invented, discovered or developed in learning to cope with its problems of external adoption and integration, which have worked well enough to be considered valid, and therefore to be taught to new members as the correct way to perceive, think and feel in relation to problems.

![Figure 2.7 Schein’s three levels of culture](image)

Culture is not always the overt behaviour or visible artifacts that one might observe if one were to visit the company. It is not even the philosophy or value system which the founder may articulate or write down in various ‘charters’ (Edgar Schein, 1985). In figure 2.7, corporate value and basic assumptions, which are located at Schein’s second and third levels and are invisible, preconscious and ‘taken for granted’. They are difficult to access. Therefore, the author focuses on investigating the surface manifestations of corporate culture, which consist of training and education; information dissemination; performance appraisal; incentive systems; staff perception and motivation. These elements are also notably influence on implementing new management systems, such as EMS, IMS (Welford, 1997).
Based on the contents of the corporate culture, Handy (1993) identifies four main types of culture to be found in organizations, which are summarized as follows (table 2.2):

<table>
<thead>
<tr>
<th>Type</th>
<th>Metaphor</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Culture</td>
<td>A web</td>
<td>Control/ power emanate from the centre; political power and entrepreneurial</td>
</tr>
<tr>
<td></td>
<td></td>
<td>energy, resource power and personal power predominate. This culture serves the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>figure head and the leader.</td>
</tr>
<tr>
<td>Role Culture</td>
<td>A Greek temple</td>
<td>Classical structure; bureaucratic nature; roles more important than the people</td>
</tr>
<tr>
<td></td>
<td></td>
<td>who fill them; position power and expertise power predominate.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This culture serves the structure.</td>
</tr>
<tr>
<td>Task Culture</td>
<td>A net</td>
<td>The focus on completing the job; individuals’ expertise and contribution are</td>
</tr>
<tr>
<td></td>
<td></td>
<td>highly valued; expert power predominates, but both personal and position</td>
</tr>
<tr>
<td></td>
<td></td>
<td>power are important; the unifying force of the group is manifested in high</td>
</tr>
<tr>
<td></td>
<td></td>
<td>levels of collaboration.</td>
</tr>
<tr>
<td>Person Culture</td>
<td>A cluster or</td>
<td>A loose collection of individual—usually professionals—sharing common facilities</td>
</tr>
<tr>
<td></td>
<td>galaxy</td>
<td>but pursuing own goals separately; power is not really an issue, since members</td>
</tr>
<tr>
<td></td>
<td></td>
<td>are experts in their own right. This type of culture serves the individual.</td>
</tr>
</tbody>
</table>

Table 2.2 Four types of culture in organizations (based on Handy, 1993)

Handy’s model considerably oversimplifies the realities of organization culture, which, more likely than not, is composed of elements of all four types. He himself admits that his typology is impressionistic and imprecise, commenting that: ‘A culture cannot be precisely defined, for it is something that is perceived, something felt’.

The ISO 9000 series and ISO 14000 series of management system standards are based on classical management theory, which emphasizes the ‘Plan, Organise, Command, Co-ordinate and Control’ (Fayol, 1949). In consequence, when adopting new management system soft approaches, such as ‘attracting’ or ‘introducing’ are needed rather than ‘pushing’ (Boiral, 1998). In other words, before deciding to work toward ISO 14001 or 9001 certification, it is important to
check the fit between corporate culture and the management system advocated by the new standard. A similar approach could be adopted when implementing IMS.

Reviewing the five models of IMS implementation, which have been discussed previously, there are few of them that take the culture issue into account. A comparative analysis of the models by Wilkinson and Dale (1999) discussed such issues (see table 2.3 as below):

<table>
<thead>
<tr>
<th>Model</th>
<th>Scope</th>
<th>Requirements for integration</th>
<th>Objectives</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO 9001/14001 Matrix</td>
<td>As required by each standard.</td>
<td>Harmonization of elements and standards.</td>
<td>Meeting certification requirements of each</td>
<td>Addition of other standards adds to complexity. Linkages open to different</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>standard. Reducing audit and administration</td>
<td>interpretations. Ignores culture.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>costs.</td>
<td></td>
</tr>
<tr>
<td>Aligned standards</td>
<td>As required by each standard.</td>
<td>Harmonization of elements and standards.</td>
<td>Meeting certification requirements of each</td>
<td>Offers potential for the addition of other standards but adds to complexity.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>standard. Reducing audit and administration</td>
<td>Ignores culture.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>costs.</td>
<td></td>
</tr>
<tr>
<td>Integrated core standard with aligned</td>
<td>Must be same for each ‘part’ of core. As</td>
<td>Harmonization of elements in core.</td>
<td>Meeting certification requirements of each</td>
<td>Core elements must be defined at the outset. Complex. Ignores culture.</td>
</tr>
<tr>
<td>subsystems</td>
<td>required by each standard for subsystem.</td>
<td>Harmonization of elements and standards.</td>
<td>standard. Reducing audit and administration</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>costs.</td>
<td></td>
</tr>
<tr>
<td>Interlinked standards through a systems</td>
<td>As required by each standard.</td>
<td>Harmonization of elements and standards.</td>
<td>Meeting certification requirements of each</td>
<td>Addition of other systems adds to complex. Ignores culture.</td>
</tr>
<tr>
<td>approach</td>
<td></td>
<td></td>
<td>standard. Reducing audit and administration</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>costs.</td>
<td></td>
</tr>
<tr>
<td>EFQM Model</td>
<td>“Total”; company wide.</td>
<td>Implementation of TQM. “Harmonization” of</td>
<td>Business excellence; improving performance in</td>
<td>Does not address ISO certification requirements.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>approach. Development of IMS models.</td>
<td>all areas.</td>
<td></td>
</tr>
</tbody>
</table>

Table 2.3 A comparison of the models discussed (Resource: Wilkinson and Dale, 1999)
An examination of the assessment criteria used by the EFQM Model for Business Excellence (EFQM, 1998) shows the extent of their involvement in shaping culture (Wilkinson and Dale, 1999). For example: The assessment of leadership, calls for the demonstration of a consistent Total Quality (TQ) culture, by examining how managers are involved in assessing TQ awareness; reviewing progress in TQ, and their commitment to the achievement of TQ. Furthermore, the policy and strategy criterion calls for an assessment of the organization’s mission, strategic direction and also the understandings and expectations that describe how the organization’s people behave and upon which all business relationships are based. These clearly show that the model is very much concerned with the assessment and shaping of the corporate culture.

Although the ISO (i.e. the ISO 9000 and ISO 14000 series standards) do not address the culture change in the organization, few studies addressed the relationship between IMSs and organizational culture has strong interactions. For example a survey conducted by Wilkinson and Dales (2000) addressed that for some companies, corporate culture and the management of culture are seen as issues which affect integration; on the other hand, some other companies see the need for control and standardized systems as important and feel that the IMSs can be used as a tool which can help to bring about change.

Elements included in organisational culture are not always visible, most of it, such as assumptions, beliefs, values, and norms, that direct the participants’ decision-making and behavior, often occurs unconsciously (Welford, 1997). Furthermore the concept of corporate culture can be understood in terms of the culture metaphor has been supported by authors such as Brown (1998) and Smircich (1983). The reason is that every aspect of an organization is a part of its culture and it is not possible to address how ‘culture’ influences ‘strategy’ of ‘technology’ because strategy and technology, together with everything else that
makes up an organisation, are elements of culture. Therefore it can be difficult to find out what the culture of a corporate is. However, carrying survey on the same sector with similar products and working process will help to cognition the culture of the organisation precisely. In consequence, this research used UK construction industry as the case study, based on the concept of different models of IMS implementation discussed previously and the common components of corporate culture (which is discussed in chapter 3), to find out the relationship between IMS and corporate culture issues.
Chapter 3: Sustainable construction

3.1 Sustainable development

Over the last three decades there has been a growing understanding of the world and its inhabitants as a single system (Turner, et al., 1993), and of the need to combine two key global aims in the development of human activities: to accelerate human development, and to remove the gross inequities present in the world today; while at the same time avoiding the depletion of the resources and biological systems of the planet to such an extent that future generations will be impoverished. (WCED, 1987)

The most publicized definition of sustainability is that of the World Commission on Environment and Development (WCED) (the ‘Brundtland Commission’, 1987). The commission defined sustainable development as:

‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’ (WCED, 1987).

The commission highlighted ‘the essential needs of the world’s poor, to which overriding priority should be given’. In other words, sustainability development must allow for an increase in people’s standard of living, while at the same time avoiding uncompensated and significant cost on future people. Economic development will inevitably cause some depletion of current non-renewable reserves. Sitarz (1993) argued that sustainability should mean more than preservation of natural resources. Sitarz (1993) proposed that ‘intergenerational equity’ requires that some of the proceeds from the exploitation and depletion of non-renewable resources should be
invested in economic assets to maintain productive capacity to meet the needs of future generations.

United Nation Division for Sustainable Development (1998) regard that ‘Industry has a key role to play in achieving the goals of sustainable development as supplier of goods and services required by society, as a source of job creation and as an active participant in community life’ As construction industries are very much at the heart of the evolution of our society, accounting almost for one tenth of the global economy (Patermann, 1999). They produce £65 billion worth of construction work each year in the UK (Morton, 2002). Construction efficiency and effectiveness affect all areas of industrial and commercial activity, competing in global markets, through the provision of both the built environment and also the infrastructure in which they operate (Stewart, 2002). There has been much effort over many years by governments and various pressure groups to encourage the construction industry (CI) to become more aware of the impact of building on the global environment, particularly through its use of energy.

3.2 Sustainable construction

‘Sustainable construction’ has been defined as:

‘Creating a healthy built environment using resource-efficient, ecologically based principles’ (Stewart, 2002)

This definition was described initially by The First International Conference on Sustainable Construction (held at Florida, USA in 1994) as a new discipline. It describes the application of sustainable development principles to the construction industry (CIRIA, 2002). These principles have been defined by the UK Government in ‘A better quality of life’ – strategy
for sustainable development in the UK (1999), as:

- maintaining high and stable levels of economic growth and employment;
- prudent use of natural resources;
- effective protection of the environment; and
- social progress that meets the needs of everyone.

These principles have been taken in the UK Government publication on sustainable construction ‘Building a better quality of life’ (April 2000) and applied to the industry to mean:

- constructing projects that are more cost-effective to produce and run because they have been constructed with less and yield more.
- constructing projects that contribute positively to the surrounding environment, using materials and systems that are easily replenished and perform better over their full life-cycle.
- promoting higher standards of living for ordinary people.

This concept has permeated all fields as research findings are translated into commitments. For instance, the Earth Summit in Rio, which highlighted many pressing concerns about human interaction with the environment. This resulted in Local Agenda 21 (United Nation, 1993). In the UK, like many other countries, this was quickly translated into policy:

‘A more holistic approach is called for, involving a comprehensive procedure to identify total environmental and social costs and alternative solutions to construction problems’. (Office of Science & Technology, 1995)

seeks to create a global framework and terminology to facilitate initiatives at national and sub-sectoral levels; and outline research and development activities.

Many suggestions are made in the literature on effective measures which the construction industry can take to address sustainability (e.g. Building, 1999, Barrie, 1999b). Building (1999, p.3) uses the phrase ‘joined up thinking’ which ‘seems to cover everything from committing the whole supply chain to making buildings more sustainable, to convincing individual firms that going green will put them into the red’. It notes that UK developers who may be keen on ‘green’ issues ‘are often thwarted by hostility from their own investors or tenants’.

Barrie (1999b) describes major green initiatives by large UK contractors (e.g. Laing and Tarmac) and clients (for example Network Rail). The contractors’ measures include: having an environmental policy and publishing an environmental statement; incorporation into the annual report of an audit of the company’s contribution to green causes; contribution to training in handling of materials and waste; undertaking environmental audits of their buildings; environmental impact assessment of some activities such as quarrying; and placing a main board member in charge of environmental issues.

3.3 Environmental impact- sector awareness

Construction is not by nature an environmentally friendly activity. Existing research suggests that construction activity is a major contributor to environmental pollution in worldwide. For example, McDonald’s research
(1996) reports that 14 million tonnes of wastes are put into landfill in Australia each year, and 44% of this wastes is attributed to the construction industry. According to Zhang et al. (2000), construction contribute environmental pollution has been increasing in China in line with its fast urban development since the early 1980s. Studies by number of authors (for example, see Spence and Mulligan, and Morton) shows there are several environmental impacts directly caused by construction activities and building materials production processes, these are discussed as follows:

Firstly, as the UK Environmental Agency (EA) has pointed out (EA,2002), The construction industry is one of the country’s largest producers of waste – producing more than 70 million tonnes of waste each year and some 13 million tonnes of that is unused or discarded building materials (EA,2002). It is three times more than the waste produced by all the country’s households put together. Figure 2.3 shows the amount of waste produced by industry, business and construction activities in the North East Region during 1999.

Figure 2.1 the amount of waste produced in North East Region during 1999 (EA, 2003)
Survey by DETR (2000) showed over 90% of non-energy minerals extracted in the UK are used to supply the construction industry with materials, yet every year approximately 70 million tones of construction and demolitions materials and soil end up as waste. However, there are activities helping the construction industry develop towards sustainability, one example is the after the Earth Summit at Rio de Janeiro in 1992 the Construction Industry Council in Britain set a number of goals for the industry including a 50% reduction of waste on sites (Powell and Craighill, 2001). According to a survey of the recovery and disposal of construction and demolition wastes in 1999, 52% of this waste was spread on sites either disposed of to landfill (EA, 2000).

Secondly, the construction industry is a major user of the world’s non-renewable energy sources and minerals, for example, timber, oil and soil (Shen and Tam, 2002). Apart from its share of fossil fuel use, the construction industry is a heavy user of several metals which have limited remaining exploitable reserves, notably lead, copper and zinc (Spence and Mulligan, 1995). Sjostrom and Bakens (1999) regard the UK construction industry as the largest single consumer of mineral and aggregate resources; it is also the principal consumer of energy resources within the UK, responsible for 40% of the total national energy use. However, a survey by DETR (2000) shows the transport of construction material and manufacture of building materials accounts for 24% of the UK’s industry energy use (See figure 2.2).

Thirdly, construction industries contribute to regional pollution through emissions of nitrogen and sulphur oxides in building materials production in a national scale and they also contribute to pollution on a global scale by the depletion of the atmospheric ozone layer, and by the emission of carbon dioxide and other greenhouse gases (Spence and Mulligan, 1995). The usual
figures quoted are that construction (both the process and the buildings) is responsible for about 50% of the emission of greenhouse gases in the UK (Morton, 2002). UK construction activities are also responsible for 20% of all commercial and industrial noise complaints (Stewart, 2002). Noise caused by construction activities not only effect human but also disturb the ecological systems. Ecological systems also may suffer damage due to the vibrations arising and release of dust, which may cause smothering of light sensitive species.

Changing land use has a direct impact on fauna and flora near to the construction site. Almost 80% of the world’s original forests have already been destroyed and of the 20% that remains nearly 40% is under threat mainly from large-scale logging to satisfy the demand for paper, construction and other uses (Morton, 2002). The part the CI can play is clear. It can ensure that the timber it uses comes from approved sources- that is, generally well managed sustainable forestry and not the cutting of ancient forest. It can reduce waste. It can use alternative, environmentally less harmful alternatives kinds of wood and at the same time it can use the most appropriate timber products for each specific purpose (Morton, 2002).
3.4 Construction industry and management systems

Along with the awareness of environmental pollution problem all over the world, all organizations in the construction industry face increasing pressures to expand their environmental awareness, improve their environmental performance and provide tangible measures of environmental safeguarding (Griffith et al., 2000). Such pressures come from clients, investors, consumers, regulatory bodies and, more generally, the public. Such pressures together with environmental regulations stimulate environmental managements into giving greater prominence to this aspect of their work towards the environment becoming consideration in the management of construction processes (Ball, 2001).

In 1992, of BS 7750: Specification of Environmental Management Systems and its counterpart ISO14001. Environmental management systems (EMSs) are beginning to be considered by construction clients as an important aspect of project evaluation and development (Griffith et al., 2000). The concepts are also being adopted by companies in the service and supply sectors. Since than, the number of ISO 14001 certification adopted by CIs are increasing the ISO survey shows the construction industry as having the fifth highest growing area for ISO 14001 certification with almost double the number of certification in 1999 as 1998 (Ball, 2001). Surveys (Griffith et al.; 2000, Ball, 2001; Ofori et al.) shows the benefits from ISO 14000 series include:

- Reduced operating costs;
- Increased access to markets;
- Demonstrated compliance with regulations;
- Improved environmental performance, include protection of non-renewable natural resources;
- Improved customer trust and satisfaction;
- Enhanced corporate image and credibility;
- Employee involvement and education; and
- Potential impact on world trade to allow competition on an equal basis.

An EMS can be quite complex in nature. Its level of complexity is principally a function of the complexity of the organization itself. The system must consider not only the environmental aspect, which are themselves influenced by a multitude of variables, but also the technological and human characteristics of the organization. For instance: An incremental approach can be less divisive to the organization while facilitating the desired and necessary culture change. Establishing an EMS therefore requires a comprehensive framework of structure and procedures and also an appreciation of the range of available skills, abilities and commitment within the organization (Griffith et al.; 2000).

In order to avoid the above problems organizations have to develop and implement an extensive and complex system. ISO 14001 suggest the sharing of organizational systems and resources, provided the existing system is itself recognized, for example, develop its EMS from QMS roots. In the other words, as additional management functions need to be accommodated, an integrated management system (IMS) can be advantageous.

A survey conducted by Griffith (2000) shows most contracting companies in UK already have an ISO 9000 certified quality system in place, while they intend to implement an EMS. The quality industry in the UK is perhaps at the leading edge of IMS developments and a small number of UK contracting organizations are currently pioneers within the construction industry (Griffith, 2000). It is recognized by author that there is little in the way of worldwide practice of IMS within the construction industry to report
at this time. Although not published at the time of writing, the CIRIA intend to report on their perspective of the early development of IMS concepts within the construction industry.

This research is designed to bridge this gap in Integrated Management Systems research, by conduct a survey in UK construction industry organizations on both the situation of IMS implementation and the corporate culture.

The study aims to examine the relationships between IMS and corporate culture that could apply to any types of organization. The research could also help organizations fitting an appropriate environmental and quality management value into its corporate culture and developing towards achieving sustainable development.
Chapter 4 Research design and method

4.1 Introduction

The methodology was designed to generate the most suitable data to achieve the aim and objectives of this research.

Two main methods of research were used. A desk study formed the basis of a scoping exercise. To acquire knowledge of the Integrated Management System (IMS), corporate culture and construction industry, through reading journals; theses and publications form certification; standardization and professional bodies, the link between these three parts were identified.

A questionnaire survey was conducted to collect the data of IMS implementation within a range of construction industries and the corporate culture of certain companies. From the findings of these two stages, it is hoped that relationships between IMS and corporate culture may emerge.

4.2 Desk study

The desk study had two primary objectives: To examine the environmental impact of construction industries and their management systems; and to examine the methods of implementing IMS and its link with corporate culture issues. The more general literature in the field of IMS was also be scanned. This process brought to light a rack of understanding of the corporate culture issues. This area was therefore targeted in using construction industry as case study. The background information was useful in design of the questionnaire and.

Part of the questionnaire was focused on the area, in which the corporate culture issues are clear and visible, such as training methods and stuff participation. by concentrating on those aspects of corporate culture which could be easily
identified it was hoped to chic it responses which were suited to the author’s purpose.

4.3 Questionnaires

4.3.1 Questionnaire design

The research technique employed for the collection of data was a self-completion questionnaire, administered to respondents via email and mail. A period of 4 weeks was allowed for the return of questionnaires.

The use of a self-completion questionnaire held several advantages. It reduced the cost and weight involved the large sample size (Bryman, 2001). Using email questionnaire enjoyed significant cost advantages over mail or personal and telephone interviews, and had the advantage of being exceptionally quick to administer.

It was acknowledged that there is a tendency for self-completion questionnaire to generate lower response rates than comparable interview surveys (Bryman, 2001). A number of techniques were incorporated into the research to make a positive reply more likely:

- A covering letter explained the purpose and the potential benefits of the research were attached to each questionnaire. It also assured the respondent of the confidential nature of all replies. To maintain the interest of the reader, the covering letter was limited to 150 words. A copy of the covering letter is included in Appendix 1.

- Baumgartner and Heberlein (1984) highlighted the lack of consensus as to whether personalized covering letters improve response rates to questionnaires. However, each covering letter was individually addressed to the respondent and emailed to the respondent’s email
address directly to give a feeling of a genuine personal interest in each respondent’s participation.

- Individuals who had failed to respond after two weeks were contacted by telephone and email in order to prompt them to participate in the research. Individuals were reminded of the importance and value of their participation in order to encourage them to complete the questionnaire.

- The use of open questions was restricted to those questions seeking to obtain information regarding the respondent’s individual perception of an issue. Closed questions might have reduced the spontaneity of their response. In order to increase clarity and ensure that respondents fully understood each question, technical and ambiguous terms were avoided.

The questionnaire was divided into two parts (refer to Appendix 2):

**Part A** of the questionnaire was focus on IMS,

As suggested by Bryman (2001) that in order to encourage responds continue to answer the whole questionnaire, it was begun with easy-answer questions. Question 1-4 consist questions of the size of the organization; the certificates or management systems organization have and how long it have been had. These 4 questions also aim to collect the baseline information about the firm.

The objective of questions 5-6 is to investigate the rate of IMS implementation of each firm and identify reasons why their company might not exploit IMS.

As discussed in Chapter 2, the European Foundation for Quality
Management model (EFQM) is only one of the 5 models, which takes corporate culture change into account during implementing IMS. The crucial objective of question 8 is to investigate the numbers of organizations that adopted EFQM.

Although there is number of studies have addressed the benefits and the barriers of IMS, question 9 and 10 is designed for further investigate the distinction between EFQM and other IMS models based on the benefits and barriers specific for the construction industry.

**Part B** of the questionnaire aimed to establish the kinds of corporate culture which exists in the firms and identify potential culture changes after implementing IMS.

Because of the some culture issues tend to be invisible, the questions were designed based on the visible contents of corporate culture which were listed in chapter 2. Furthermore, shorter questionnaires tend to achieve better response rates than longer ones (Bryman, 2001), the questions in part 2 therefore restricted to training, communication and staff participation.

In addition, respondents were also asked to indicate the other culture change that they recognized during the implementation of IMS.

However, in order to prevent respondents giving what they perceive to be the ‘socially desirable’ response, this was ascertained indirectly by adopting a variety of relevant questions. For example, questions 21-23 intend to obtain information of staff participate.

**4.3.2 Questionnaire distribution**

The sample unit was initially collated from an ISO 14001 database service
located on the IEMA website (IEMA, 2002). There are 87 organizations listed involved in construction. Because the website did not provide the contact approach of any of the organization; telephone number of individual firm has been obtained by checking yellow page and website surveys.

Bearing in mind the recommendation by Jon Gurr, who was supervising this research, telephone contact had been made to each firm in order to obtain the name and the email of the person, who is responsible for environmental management system within that firm. As the result, 6 out of the 87 construction firms have not existed; and 27 out of the 81 of construction firms refused to receive a questionnaire.

4.3.3 Questionnaire responses

On the 30th May 2003 each one of the 49 chosen organizations was sent a questionnaire with an attached cover letter by email, and 6 by post (the contacted person and email or mail address is included in Appendix 3 ). As an incentive they were informed they could receive a summary of the main findings if they responded.

In all 11 completed questionnaires were returned, which the response rate was 22% (11 out of 49), which is a bit lower then typical rate of a postal questionnaire (De Vaus, 1996). Owing to the fact that 7 of the respondents are subordinate of same headquarters — Balfour Beatty plc Group Head Office, which did not complete the questionnaire but wrote a letter explaining that it is their company’s policy to not take part in surveys and questionnaires. Also, IPS Borough Council wrote similar letter explaining that they are not allowed to answer some of the questions in the questionnaire. However, the replay by R J Maxwell & Son LTD covered the different systems in its three subcontractors, include R J Maxwell & Son
LTD North down Quarries,  R J Maxwell & Son LTD Criaghan Quarry and
R J Maxwell & Son LTD Ballymena quarry & special.

As the responses are small number, each of the 11 responses has been
chased up by email and telephone interview for further detail of the
questionnaire later on. At all events, the result was analyzed and discussed
based on the 11 responses in Chapter 5.
Chapter 5 Results and discussion

5.1 Introduction

In 2000, a small number of UK contracting organizations are pioneers of implementing Integrated Management Systems (IMSs) within the construction industry (see section 3.4). This chapter will discuss the current situation of such implementation (5.2), the relationship between the implementation of IMSs and certain corporate cultures (5.3). A suitable corporate culture change guideline, which might help organizations to fit into IMS, will be developed in section 5.4; and in the final section of this Chapter (5.5) some issues raised by this research will be evaluated.

5.2 Integrated Management System in the UK construction industry

The literature shows that few UK construction organizations have implemented IMS. However, all the 11 responses received are medium and large organizations and all of them have been certified ISO 9000:2000 and ISO 14001 during 2000-2003.

Surprisingly, the survey shows 50% of the responses have integrated Environmental Management Systems (EMSs), Quality Management Systems (QMSs) and Occupational Health and Safety Management Systems (OH&SMSs). 20% of them have not integrated any of their management systems, but they both are planning to do so in the near future. Other organizations are either adopting QMS and EMS integration or EMS and OH&SMS integration.

Notably, one of the companies addressed had partly integrated all three systems with their sub-contractors. It is not planning to move on to deeper integration. That
company emphasized that they thought that full integration is impossible. The main reason cited was the complexity of the IMS. For instance, that while some parts of IMS needs to be updated, on account of changing specific standard or changing guideline. Thus the whole system may have to be changed. Other barriers found by other organizations are listed below:

- It is probably too early to assess integration of the systems;
- Not all procedures are common to both EMS and QMS.
- Lack of suitably qualified/experienced internal and external auditors;
- Re-education of staff to the new system; and
- Culture barriers.

The data shows, in recent years, that a part of the UK construction industry is enthusiastically implementing IMS. However, large numbers of these companies are still in doubt as to whether the system is suitable for their company, or perhaps for their culture. Most of the organizations regard corporate culture as an issue, which needs to be considered during IMS implementation, but the answer of questionnaire shows it is often ignored.

![Figure 5.1 IMS implementation within UK construction industry](image)

Source: Questionnaire data

The benefits from IMS which responding organizations found are shown as follows:

- a higher efficiency in the management system
- better communication between staff
- cost reduction
- time saving
- reduce risks and increased profitability
- a better balance between conflicting objectives
- reduction of conflicts between responsibilities and relationships
- a better focus for business goals
- formalization some informal systems
- harmonisation and optimisation practices
- greater consistency between management systems
- facilitation of training and development

Although all these benefits had been addressed by those companies, their responses indicated that not all of them had yet appeared. The author considered that this is mostly due to the recently of the changes. The earliest change recorded only began in 2000. Some benefits may recognize later. On the other hand, the different approaches, which corporate adopted to implementing IMS, may also influence the kinds of benefits those organizations actually received (Wilkinson & Dale, 1999).

Of the 9 organizations that that had integrated their systems, 4 (44%) had separate auditors for both EMS and QMS systems. The remaining 5 (56%) organizations used the same auditors for both systems. However, some organizations which had not integrated their systems had cross-trained their auditors to allow them to audit both systems because they were considering integrating both systems in the future. Of the 4 organizations, which are using separate auditors, two had part combined QMS and EMS audits in small locations. 5 of the respondents believed that there was a cost benefit to having auditors trained to audit both systems. The majority of organizations sampled stated that a single auditing standard (ISO 19011) would encourage the integration of the auditing process, which, in turn, would reduce audit time, costs and disruption.
The survey also made it possible to distinguish between different patterns of organization. The options given in the questionnaire were based on the five models, which have been discussed in chapter 2. The finding of the survey shows in Figure 5.2. Nine responses had actively employed IMS within their companies (refer p44). Five of them used the *Interlinked Standards Through a Systems Model*; one used the *European Foundation for Quality Management* (EFQM) model and another organizations used combination of *Interlinked Standards Through a Systems model* and *Aligned Standard approach*. The remaining three developed their own individual methods to implement IMS.

<table>
<thead>
<tr>
<th>ISO 9001/14001 Matrix</th>
<th>Aligned Standards</th>
<th>Integrated Core Standard</th>
<th>EFQM Model</th>
<th>Interlinked Standards Through a Systems approach</th>
<th>Own method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As the data shows the *Interlinked Standards Through a Systems model* has been the most widely used of the five models outlined in chapter 2. The basic idea of this model is forming a ‘system of systems’, where the individual systems do not lose their identity and can still be audited and certificated. It allows the QMS and EMS to be related to another system in the same organization but ‘...individual systems are interlinked without relinquishing their individual identities’ (Wilkinson & Dale, 1999). It is therefore not a true integrated system as defined by the systems concept, but can be seen as interlinked. Nevertheless, the responses indicate that it may be the method most easily adopted. Within the barriers of IMS implementation identified previously in mind, the organizations that used *Interlinked Standards Through a Systems model*
believed such method can be more flexible on updating part of the system and on the subsequent incorporation of other disciplines (e.g. OH&SMS). This point of view validates the approach of Wilkinson & Dale, (1999)

Referring back to the discussion in Chapter 2, neither the Interlinked Standards Through a Systems model nor the Aligned Standards approach incorporated the effect of different organizational culture, even though most of the responding organizations (over 60%) recognized that effect of culture should be considered. Only one company used EFQM model to implement IMS. As also discussed in Chapter 2, such a model is very much concerned with the assessment and shaping of the organization’s culture and the influence that culture has in securing improved business results. So it is important to identify the corporate culture within this company and analyse its culture change in implementing IMS. These issues will be discussed in section 5.3.

5.3 Corporate culture and Integrated Management Systems

Through analyze both the past literature relating to IMS and corporate culture area (see chapter 2 and 3), show that the corporate culture issues greatly influence the IMS before and during implementation. It seems to be believed by the UK construction industry that the corporate culture issues need to be taken into account during the implementation of IMS (see section 5.2). This section will focus on whether the organizations changed corporate culture in implementing IMS.

As the EFQM model requires companies to make correlated changing of corporate culture, such fundamental concepts (shown in Table 5.1), underpin the EFQM Model towards sustainable excellence. Sustainable excellence means progress towards outstanding business economic success as an integral part of sustainable development.
Table 5.1 the fundamental concepts at different ‘organizational’ maturity stages

<table>
<thead>
<tr>
<th>Fundamental concept</th>
<th>Start Up</th>
<th>On the way</th>
<th>Mature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Results Orientation</td>
<td>All relevant stakeholders are identified</td>
<td>Stakeholder needs are assessed in a structured way</td>
<td>Transparent mechanisms exist to balance stakeholder expectations</td>
</tr>
<tr>
<td>2. Customer Focus</td>
<td>Customer satisfaction assessed</td>
<td>Goals and targets are linked to customer needs and expectations. Loyalty issues are researched</td>
<td>Business drivers of customer satisfaction needs and loyalty issues are understood, measured and actioned</td>
</tr>
<tr>
<td>3. Leadership and Constancy of Purpose</td>
<td>Vision and Mission are defined</td>
<td>Policy, people and processes are aligned. A leadership ‘model’ exists</td>
<td>Shared values and ethical role models exist at all organizational levels</td>
</tr>
<tr>
<td>4. Management by processes and Facts</td>
<td>Processes to achieve desired results are defined</td>
<td>Comparative data and information is used to set challenging goals</td>
<td>Process capability is fully understood and used to drive performance improvements</td>
</tr>
<tr>
<td>5. People Development &amp; Involvement</td>
<td>People accept ownership and responsibility to solve problems</td>
<td>People are innovative and creative in furthering organizational objectives</td>
<td>People are empowered to act and openly share knowledge and experience</td>
</tr>
<tr>
<td>6. Continuous Learning, innovation and Improvement</td>
<td>Improvement opportunities are identified and acted on</td>
<td>Continuous improvement is an accepted objective for every individual</td>
<td>Successful innovation and improvement is widespread and integrated</td>
</tr>
<tr>
<td>7. Partnership Development</td>
<td>A process exists for selecting and managing suppliers</td>
<td>Supplier improvement and achievements are recognized and key external partners have been identified</td>
<td>The organization and its key partners are interdependent. Plans and policies are co-developed on the basis of shared knowledge</td>
</tr>
<tr>
<td>8. Public Responsibility</td>
<td>Legal and regulatory requirements are understood and met</td>
<td>There is active involvement in ‘society’</td>
<td>Societal expectations are measured and actioned</td>
</tr>
</tbody>
</table>

Source: EFQM (1999)

1. **Results Orientation** is dependent upon balancing and satisfying the needs of relevant stakeholders. This includes the financial interests in the organization, people employed, customers, suppliers and most important of all, society in general. So adding sustainability value for all stakeholders will be a measure of long-term success.

2. **Customer Focus** it is necessary to have a clear focus on the needs of current and
potential customers, such as ‘Green market’ (customers wanting environmentally friendly goods). Such an element requires a clear understanding of how to deliver sustainable value to the customers of all staff.

3. **Leadership and Constancy of Purpose**: the behaviour of an organization’s leaders creates a clarity and unity of purpose within the organization and an environment in which the organization and its people can excel. It requires a maximum of people commitment and effectiveness; a clear sense of direction; and all activities aligned and deployed in a structured and systematic way.

4. **Management by processes and Facts**: the organizations perform more effectively when all inter-related activities are understood and systematically managed and decisions concerning current operations and planned improvements are made using reliable information including stakeholder perceptions. The policy and strategy criterion calls for an assessment of the organization’s mission, values, vision and strategic direction based on relevant information; implemented throughout the organization; improved communicated and updated.

5. **People Development & Involvement**: the full potential of an organization’s personnel requires the involvement of everyone and it is best released through shared values and a culture of trust and empowerment.

6. **Continuous Learning, innovation and Improvement**: organizational performance is maximized when it is based on the management and sharing of knowledge within a culture of continuous learning, innovation and improvement.

7. **Partnership Development**: an organization works more effectively when it has mutually beneficial relationships with stakeholders, builds trust, and shares knowledge, with its partners. Trust needs to move beyond the traditional relationships with suppliers, and as well as working more closely with other organizations from within the same sector. It needs to be in partnership communication with other stakeholders such as local authorities and ordinary folk. So trust helps to deliver sustainable value for all the stakeholders.

8. **Public Responsibility**: an organization needs to build on its green public image on safety, environmental friendly and confidence. Organizations therefore have to
look at the whole life of the construction work, look at the mine, the materials, suppliers, contractors, operations, disposal and recycling, it needs to maintain responsibility for the environmental consequences of the whole chain.

Such fundamental concepts are contained within the framework provided by EFQM. The aims are to help organizations carry on changing their culture (The framework is also listed in the Table 5.1). Obviously, these suggestion involves change of corporate value and beliefs; staff education and training; internal and external communication; staff participation; and incentive systems (EFQM, 1998).

According to the questionnaire and interview done by the company, which has adopted EFQM, they made a notably change in their training techniques. These are much more sophisticated. Hitherto they only used Lecture section training their new staff, and continued by notice board about changes the company has adopted. Currently, the new techniques involve case study on a best practice model, and visiting other construction sites. The content of their training and education is also deeper. For instance, companies were starting from simple environmental criteria education and developing into in- house ecological awareness and gradually raising awareness of external ecological issues. All this training and education is covered by the whole staff of the company and not just left to the person mainly responsible.

The responses of this company indicated all these changes they have made are intended to add to the sustainable value implemented by every activity of their staff. However, one of the barriers the company met during the changing is that the frequency of training increased greatly, form about half yearly (before integration) to every month (after integration). This caused a growth of documentation and cost.

In addition, the same company also made their communication techniques more open by including this information in their presentation to meeting. They have also developed a website available to public. The company has used a corporate culture
theory, which can be related to the categories given by Handy (1993) (see Table 2.2). Handy (1993) has called this kind of culture style ‘Task Culture’. The companies also intend to develop their culture to become more open style by implementing IMS, the intention of the company decision-making progress has begun to appear via middle and low position staff participation through their Health and Safety committee and appraisal (Questionnaire data, 2003).

As discussed in section 5.2, though many organizations (over 60%) believed the effect of culture should be considered during the implementing IMS, three organizations (include two that had not been planning to implement IMS) now intend to bring culture change by adopting IMS. The questionnaire data shows that of nine responses, four did not make any culture change, which applicable for IMS and of these four organizations three of them recognized that there is a need to bring about some kind of change in their culture. One of the organizations indicated that IMS sounds great in theory, but it does not work so well in fact. However, that response also pointed out that organizations have to bring about a big change to a more open culture to fit integration.

![Figure 5.3 the different aspect of culture change during IMS implementing](image)

Based on Handy’s (1993) corporate culture theory (see Table 2.2), it seems that of eleven responses, only one organization has a ‘Person Culture’ which is open. They
feel there is no needs of any culture change adapt IMS, in other words, not expect IMS to bring any culture change for their company. Two responses indicated that they are already having such a ‘Role Culture’. It can be seen from their answers that these kinds of organizations do have more difficulty in coping with integration. Eight companies indicated that they have a ‘Task Culture’, which is depends on both personal and position power. However, the latter two kinds of organizations intend to develop towards more open culture, which they believed suitable to IMS.

To summarize, the analysis of questionnaire data found:

- It is believed that is necessary to conduct some kind of corporate culture change to fit IMS implementation by most organizations.
- Such culture change should help towards a more open culture.

Corporate culture change has been regard as a challenge by organizations (data from interview). According to Brown (2000), part of the problem in coming to a reasonable understanding of how culture change is that the term change has itself come to mean a variety of different things. In order to help organizations overcome the difficulty of the culture change, a possible guideline has been developed in section 5.4.

5.4 cultures changing towards an Integrated Management System

The concepts of the corporate value and beliefs are the heart of the corporate culture (see Figure 2.7), therefore, changing them aids further culture change. IMS require corporate contain a sustainable value. However the questionnaire data shows, many construction organizations already have QMS and EMS in operation while tending towards implementing IMS. These management systems are sub-systems which serve the core business, and each individual sub-system adds its unique value to the system and its core business.
Therefore, in order to integrate such various values into a core value of an organization, the relationship of various sub-systems to an construction organization’s core system (shown in Figure 5.4) need to be clarified. It can be seen that the core business of the organization is affected by a great many internal and external influences. These influences determine the main parameters for the existence and operation of the organization. The core business can be serviced and supported by as many sub-systems as are needed.

In construction organizations, two distinct tiers of management will be developed within each sub-system. One will deliver specific management functions throughout the corporate organization; while the second will deliver specific functions are the construction project level. Essentially, the macro sub-system is established at the organization’s head office, and within this framework a micro sub-system is established for each site. The relationship between the macro and micro sub-systems is significant, systems and sub-systems must be interactive in the widest sense. There must be close compatibility between the two, as each is mutually supportive and must link in and support the core business system.
Each Sub-system has common and dedicated management elements. The Sub-system functions the project-based organization and corporate organization and adds value to the system and its core business.

Sub-system elements are enacted through sets of procedures and tasks at the corporate and project levels.

Figure 5.4 an organization viewed as sub-system elements supporting the system and its core business
As the complexity of a construction organization’s management system is, integration of each macro sub-system’s values into a core organization culture and transmission such a new values into micro systems within each site involves tremendous works for an organization. Lundberg (1985) Suggested in his culture change model (Brown, 2000) that large scale of culture change (e.g. corporate value change) should be supported by various transmission vehicles, for instance more various and intensive training approaches.

**Education and training** provide organizational members with the requisite sustainable knowledge, are among the critics arguing against incorporating ecology into the organizational culture (Milliman and Clair, 1995). Such environmental education aids the staff in appreciating new environmental criteria even if these add to their work load. Several authors (e.g. Wilkinson and Dale, 1999; Karapetrovic and Willlborn, 1998) pointed out that environmental performance is often ignored within an IMS. Heightening the environmental awareness of the staff through education could help avoiding such situation.

In the early stage of bringing sustainable value into the company’s operations, it is important to provide staff members with good reasons why these systems should be integrated. The understanding of the internal working environment of a company is of critical importance to the physical and mental health of everyone who works there. If stressful conditions such as bad lighting, ventilation, dust, noise, toxics or physical danger are not avoided, employees can hardly be asked to take creative interest in general environmental matters. Therefore, a careful balance between economic and ecological effects should be established and maintained in all aspect of the training programme (Callenbach *et al.*, 1993, Welford, 1997).

When planning the training programme, a key step is deciding the frequency and length of training sessions, and what the kind of education approach (e.g. lectures, presentation, meeting etc), however, the questionnaire survey shows organizations is
cognizant of lectures with case studies followed by visit other successful construction site are most effective in promoting learning for the different groups of organization members (Welford, 1997). Who will conduct the training is another important issue. As discussed above, the increase of staff training frequency leads to cost and documentation growth. Welford’s approach implies that companies could adopt one pre-trained officer to cover environmental, quality and health & safety training in the same training session. This can not only save costs but also provide comprehensive integrated training program.

In order to create a culture change, education should be given not only to those who are directly responsible for relevant issues, but for the whole personnel. Education should be on a continuous basis. If it is arranged as a one-shot campaign, there is the risk of slipping back to old habits as the lessons fade (Welford, 1997).

**Communication** between organizations’ headquarter and each project site, between project sites; between manager and staff, and between staff; and even between external and internal stakeholders has always been a crucial problem for a typical construction firm, construction simply could not operate without such communication (Griggith et al. 2000). External communication is mainly conducted by website. It often provides organization, creates potential competition in the ‘Green market’; builds on the green image in public awareness and at the same time tries to build on trust and confidence, so bring potential custom. The internal communication should include changes of the organization policy, strategy or any past or new decision. The methods of internal communication should be various in order to pursue staff interests in organization business and promoting staff participation.

Formulating and implementing sustainable goals will be easier if management style is cooperative and systemic (Welford, 1997). Staff and middle managers ought to be involved in integrated management development at an early stage. A higher commitment can be achieved when staff members themselves have participated in
developing the environmental programme for their company (Brown, 1998; Cole, 1995). They feel more responsible for achieving their goals when they have taken part in drafting and deciding on them.

In addition, encourage staff participation could also promote corporate culture change towards a more open style. Therefore, encouraging staff participation when implementing IMS could be achieved by discussing whether to implement, and how to implement, avoiding possible barriers and perhaps including potential solutions of these barriers with low or medium position staff. Whenever the IMS is successfully operated, staff are welcomed to give advice to improve the system; help with reports and assess potential risks. Although it is hard for large scale companies to adopt full participation of staff in vital decision-making process, such participation could be employed within each construction site.

To summarize, the change suggested above not only provide an appropriate corporate culture suitable for IMS, but aid the promotion of staff who have a desire to identify themselves with their job. At the same time staff may feel a deeper value-based meaning in their work, such as employees generate feelings of ‘doing good’ to prevent environmental pollution. Such changes can motivate employees and increase effectiveness. Such a management system together with sustainable corporate culture can help the sustainable construction concepts discussed in the beginning of chapter 3 to become achievable.
Chapter 6 Evaluation and Recommendation

Prior to this dissertation little research had been performed into Integrated Management Systems. Therefore there was a limited amount of literature available to consult before undergoing the study, confined mainly to journal articles. However, this can be supplemented is promoted by the boundary researches.

The limitations of the questionnaire were various: firstly the construction organization’s data from the EMAS website was outdated. Many organizations and branches of organization did not exist any more. So the data available for this research is further limited; in addition, the organizations information provided by EMAS website are limited, it include only the name of organizations and the postcode, and some of it are uncorrected. Therefore, the accurate contact information had to be obtained from the few existing organization’s website and the best method followed using yellow pages, followed by telephone calls to the headquarters of the firm to which the construction constrictor belonged.

Secondly, often some parts of the corporate culture data were confidential within company. The questionnaire was designed to collect the visible parts of corporate culture, which was in the public domain (refer chapter 2). Therefore, this research was limited to the surface culture that might influence IMS. However, these surface cultures have a great effect on the whole culture within an organization.

The major limitation of the questionnaire was some companies replies contained only parts of answers to the questionnaire based on their current situation. Some answers seemed to tend to be more ‘public acceptable’ than which was desired. The range of answers was also a limitation. Some answers were detailed, but others were simple, although most of the answers were chased up by telephone for more detail. Even so some companies were still avoided showing their ‘true colours’. This influenced the
depth of understanding, and worked as a constraint on the research. In addition, a large number of companies have different situations in their management systems for each of their construction sites, but only have one manager in charge of environmental and health and safety issues. Therefore the answer by such a manager cannot cover the detail of the whole organization.

In the question of the different methods companies adopted to implementing IMS, only five popular models have been listed in the option. Although three companies responded that they themselves had created other methods, they could not explain their methods in detail. Therefore the new IMS model and its influence on the corporate culture were not able to be analyzed in sufficiently detailed to permit analysis.

Due to the fact that all the companies are new to implementing IMS, numbers of companies pointed out that is too earlier to make judgments about the barriers to implementation.

To support and clarify this study, further research is necessary.

- Taking note that the culture of an organization is unique; it is necessary to conduct detailed studies within one or two companies in a same sector. Their culture and management systems need to be compared.
- Considering human resource management is often working close to creating and changing an organization culture, the relationship between such management and the IMS should be researched.
- Comparison with other sectors regarding whether the changing of corporate culture suggested in this research is also appropriate.
- The methodologies of IMS implementation should be further researched.
Chapter 7 Conclusion

This research aims to investigate the interrelationship between corporate culture and Integrated Management System (IMS). Many researches have been done about IMS, on its basic concept, potential benefit and barriers, and also on its implementation methods. Some authors (e.g. Wilkinson and Dale, 2000; Karapetrovic and Willlborn, 1998) have begun to look at the effect of the organization itself on such management systems.

Through a comparative analysis of five different models of IMS implementation and issues raised from implementing the author concludes that this work has identified that corporate culture can greatly influence an IMS on both implementation and operation. In order to access how organization culture effect an IMS, a discussion has been carried on in the basic concept of corporate culture, the types and its relations with typical management systems. Investigating organizational culture found some embarrassment, because that culture is unique for each organization,

Initiating surveys in the same company sector with similar products and working processes will help to identify the culture of an organisation more precisely. This study on UK construction industry has therefore brought some light to the situation. It also throws some light on the necessity of construction organizations implementing ISO 14001 and 9000:2000, and also the current situation of such management systems. These information obtained lead to an appreciation of the need for IMS in organizations.

To sum up, based on reviewing of literatures in these three areas, a questionnaire survey was conducted in UK construction industry. The survey confirmed the interrelationship between IMS and corporate culture, and identified that the corporate
culture change needed to fit that culture into IMS.

To help organizations overcome the difficulties of culture change, a guideline to such change has been developed, which focuses on the training programme, internal and external communication, and staff motivation and participation. These culture changes eventually enhance the incorporation sustainable values into existing cultures. In addition, this guideline may help organizations develop their organization culture towards an appropriately open style.
References


British Standard Institute, (2002), Know more about BS EN ISO 9000:2000 family of quality management system standards, Information for Schools and Colleges

British Standard Institute, (2002), Know more about BS EN ISO 14000:1996 family of environment management system standards, Information for Schools and Colleges


Carter A. (2000), Integrating quality, environment, health and safety systems with customers and contractors, Amec Process & Energy, U K,

Department of the Environment, Transport and the Regions (2000), Building a better quality of life – a strategy for more sustainable construction. Pp1-33


text, 4th Edition, Financial Times

Goffee, R. & Jones, G. (1996), What holds the Modern Company together? The short answer is culture, but which type is right for your organisation? Harvard Business Review, November-December

Gonzalez, B, B, G. (2000), A proposed model for the Integration of quality, environmental and occupational health and safety management systems. (MSc Thesis, University of East Anglia)


ISO (2000), The ISO survey of ISO 9000 and ISO 14000 certificates

ISO (2001), The ISO survey of ISO 9000 and ISO 14000 certificates- eleventh cycle: up to and including 31 December 2001


Sustainable Building Policies 28-29


Smith, D.A. (1996), Occupational health and safety and environmental management,
Croner Environmental Policy and Procedures, Special Guidance on Environmental Management, Issue No15, August 1996


Stewart, N. (2002), Towards sustainable construction - Guidance towards the attainment of environmentally sustainable development within the SME sector of the UK Building construction industry. (MSc Thesis, University of East Anglia)

Tranmer, J. Overcoming the problems of integrated management systems, Quality World, October, pp714-718


Internet reference

URL: http://www.wsu.edu/~susdev/WCED87.html (Accessed 08/07/03)

URL: http://www.un.org/esa/sustdev/sdissues/industry/industry.htm, (accessed 08/07/03)

ISO (2003), Selection and Use of the ISO 9000:2000 family of standards, [Online],
URL: http://www.iso.org (Accessed 04/07/03)

ISO (1998b), Advisory group recommends actions for greater compatibility, but no merging of ISO 9000 and ISO 14000. [Online]
URL: http://www.iso.ch/presse/presse 19.htm (Accessed 13/07/03)

ISO14001 database (2003), [Online], http://www. emas.org.uk (Accessed 20/05/03)


Appendix 1: Questionnaire Cover Letter

Dear Sir/Madam,

I am a student of the University of East Anglia and am currently undertaking my Masters dissertation, which deals with the integration of quality systems, environmental management system and corporate culture issues.

The aim of my dissertation is to be able to answer the following question:
‘Does organisational culture have an impact on Integrated Management Systems? If yes, how?
Does implementing Integrated Management Systems give the chance to companies making change of organisational culture? If yes, how?’

I very much hope that you will be able to help me with information about how your particular company deals with these kinds of issues. For the purposes of my dissertation individual companies will be treated anonymously. I would be most grateful if you could take 5-8 minutes to fill in the questionnaire I attach to this email. If you can possibly send it back to me by email before 30th of June jia.tang@uea.ac.uk it will be very helpful to me.

If you would like, I would be more than happy to send you a short summary of my dissertation including the questionnaire findings, when it is completed in August, Please just choose ‘1’ on the last page of the questionnaire.

Thank you for your help.

Yours Sincerely

Jia Tang
Appendix 2: Questionnaire

Please give your answer (e.g. a,b,c) in the bracket provided:

1. In terms of the number of employees, what is the size of your organisation?
   a) < 50            b) 50-250               c) > 250
   Answer: (    )

2. What standards are you certified to or what other management systems do you have?
   a) ISO 14001
   b) EMAS
   c) ISO 9000:2000
   d) BS 8800
   e) Other (please specify) (e.g. TQM)
   Answer: (    )

3. What year did you gain certification?
   a) ISO 14001 (        )
   b) EMAS (        )
   c) ISO 9000:2000 (        )
   d) BS 8800 (        )
   e) Other (please specify) (e.g. TQM) (         )

4. How long did it take to build up the systems?
   a) ISO 14001 (        )
   b) EMAS (        )
   c) ISO 9000:2000 (        )
   d) BS 8800 (        )
   e) Other (please specify) (e.g. TQM) (         )
5. How did you set up your environmental policy
   a) By extending the existing quality policy
   b) By setting up a separate environmental policy
   c) Other (please specify)

Answer: (   )

6. Have you integrated an environmental, quality and health and safety management system or any two of the systems above?

6a If yes, which systems did you integrated?
   a) Environmental/quality
   b) Environmental/health and safety
   c) Environmental/quality/health and safety
   d) Other (please specify)

Answer: (   )

6b If no, are you considering integrating them?

6b1 If so, which systems you would like to integrate?
   a) Environmental/quality
   b) Environmental/health and safety
   c) Environmental/quality/health and safety
   d) Other (please specify)

Answer: (   )

6b2 Please cite your main reasons for not integrating them and go on to question 12

Answer: (   )

7. When did you integrate ISO 14001 with ISO 9001/2?

Answer: (   )
8. What method did you use to integrate the management systems?
   a) European Foundation for Quality Management model
   b) Interlinked standards through a systems approach
   c) Aligned approaches
   d) The ISO 9001/ISO 14001 Matrix
   e) Integrated core standard with aligned subsystems
   f) Other (please specify or describe)

   Answer: (                  )

9. What do you find the benefits of an integrated management system to be?
   a) a higher efficiency of the management system
   b) better communication between staff
   c) cost reduction
   d) time saving
   e) reduce risks and increased profitability
   f) a better balance between conflicting objectives
   g) reduction of conflicts of responsibilities and relationships
   h) a better focus for business goals
   i) formalization some informal systems
   j) harmonisation and optimisation practices
   k) greater consistency between management systems
   l) facilitate training and development
   m) Other (please specify)

   Answer: (                  )

10. If you experienced any problems with the management system because of the integration
    please list them and why you think they have occurred?

   Answer: (                   )
11. Have you integrated the internal auditing of your existing management system?
   a) Yes  b) No
   Answer: (   )

The questions below focus on the corporate culture of your company

12. How often do you train or educate your staff?
   a) About every 3 months
   b) About half yearly
   c) About yearly
   d) About biennially
   e) Other (please specify)
   Answer: (   )

13. Has the frequency of staff training decreased since integration?
   a) Yes  b) No
   Answer: (   )
   If yes, please cite what it was (   )

14. What techniques do you use to train your staff?
   a) Lecture (formal training) section
   b) Notice board
   c) Case study
   d) Empirical (learning from practice)
   e) Tours (visiting other sites)
   f) Other (please specify)
   Answer: (   )

15. Have these techniques changed since you management systems were integrated?
16. What does your training normally include?
   a) Health and safety
   b) Occupation skill
   c) Environmental criteria
   d) In-house ecological awareness
   e) External ecological awareness
   f) Other (please specify)

   Answer: ( )

17. Does the training normally cover
   a) staff directly responsible for certain issues
   b) the managers only
   c) whole personnel
   d) Other (please specify)

   Answer: ( )

18. Does the same trainer cover quality, environmental, and health and safety training? (Please give person’s company position)
   a) Yes
   b) No
   c) Other (please specify)

   Answer: ( )
19. How is information communicated within your company?
   a) Newsletter  b) Website  c) Notice board  d) Broadcast
   e) Meeting  f) Other (please specify)
   Answer: (      )

20. Has information communication techniques changed since you management systems have integrated?
   a) Yes  b) No
   Answer: (      )
   If yes, please list what it was before integration
   a) Newsletter  
   b) Website  
   c) Notice board  
   d) Broadcast  
   e) Meeting  
   f) Other (please specify)
   Answer: (      )

21. Can the middle and low position staff participate in company’s decision-making process?
   a) Yes  b) No
   Answer: (      )
   If yes, please specify how (                  )

22. What is the frequency of the staff participate company’s decision-making process?
   a) In every decision  
   b) Only in important decisions  
   c) In relevant decision only  
   d) Not at all
23. Has the frequency of staff participation changed since your management systems have been integrated?
   a) Yes          b) No
   If yes, please list what it was before integration
   a) In every decision
   b) Only in the important decision
   c) In relevant decision only
   d) Not at all
   e) Other (please specify)
   Answer: (          )

24. What other corporate culture changes have you found since implementing your integrated management system?
   Answer: (                              )

25. May I phone or email you to follow up on some of your answer?
   Answer: (                  )

26. Would you like to receive a short summary of the dissertation?
   Answer: (                  )

END

Thank you very much for your time and help.

Jia Tang 2003
Appendix 3 The companies and the environmental manager contacts that the questionnaires send

(Listed in alphabet order)

ALFRED MCALPINE CIVIL ENGINEERING
Contacted person: David Gibson
Email: dave.gibson@alfred-mcalpine.com

ALFRED MCALPINE CIVIL ENGINEERING EXCHANGE HOUSE
Contacted person: David Gibson
Email: dave.gibson@alfred-mcalpine.com

ALFRED MCALPINE CAPITAL PROJECTS ALFRED MCALPINE
Contacted person: Mr. Arnorld
Address: Alfred McAlpine PLC, Kinnaird House, 1 Pall Mall East, London, SW1Y 5AZ

ALUN GRIFFITHS (CONTRACTORS) LTD
Contacted person: Gerald Davies
Email: sales@alungriffiths.co.uk

AMEC GROUP LIMITED (INFRASTRUCTURE)
Contacted person: Andrew King
Email: a.king@amec.com
AMEC Services Ltd
Address: AMEC Ho, AMEC way, Hadrian Road, Wallsend, Tyne & Wear, NE 28 6HL

Babtie Group Ltd
Contacted person: Ian Kikkert
Email: ian.kikkert@babtie.com

BALFOUR BEATTY POWER NETWORKS LTD
Contacted person: Mr. John Thompson
Email: J.Thompson@bbpnl.com

BALFOUR BEATTY CONSTRUCTION LIMITED CIVIL ENGINEER
Contacted person: Sally Brearley
Address: 130 Wlton, London, SW1V 1LQ

BALFOUR BEATTY CONSTRUCTION LIMITED NORTHERN BUILD
Contacted person: Colin Smith
Email: colin.smith@bbcl.co.uk

BALFOUR BEATTY CONSTRUCTION LIMITED SOUTHERN BUILD
Contacted person: Paul Woodhams
Email: paul.woodhams@bbcl.co.uk

BETHELL BUILDING SERVICES LTD
Contacted person: Terry Day
Email: terry.day@bethell.co.uk

BIRSE RAIL LTD 12TH FLOOR, LYNDON HOUSE
Contacted person: Canron Bazdanoch
Email: canron-bazdanoch@birse.com

CAPEL FENCING LIMITED
Contacted person: Cousby
Email: info@capalsasencing.co.uk

COLAS LIMITED
Contacted person: Barry Agutter
Email: barry.agutter@cobas.co.uk

COSTAIN LIMITED
Contacted person: Peter Fisher
Email: peter.fisher@costain.com

COSTAIN LIMITED KENSINGTON HOUSE
Contacted person: David Midgley
Email: david.midgley@constain.com

COSTAIN LIMITED LONDON & SOUTH EAST AREA OFFICE
Contacted person: Peter H Fisher
Email: peterh.fisher@costain.com

COSTAIN LIMITED SOUTHERN AREA OFFICE
Contacted person: Jill Sterry
Email: jill.sterry@costain.com

COSTAIN LIMITED WALES & SOUTH WEST
Contacted person: Peter Fisher
Email: perter.fisher@costain.com
COSTAIN OIL, GAS AND PROCESS LIMITED COSTAIN HOUSE
Contacted person: Iain Rothwell
Email: iain.rothwell@cogap.com

HAGS PLAY LIMITED
Contacted person: John Clock
Email: john.clock@hags.co.uk

HART BUILDERS (EDINBURGH) LTD
Contacted person: R Mclean
Email: r.mclean@hart-builders.co.uk

IPSWICH BOROUGH CONTRACTS GIPPING HOUSE
Contacted person: Steve Copeman
Email: steve.copeman@ipswich.gov.uk

KIER CONSTRUCTION DEVONPORT ROYAL DOCKYARD
Contacted person: Nigel Weeks
Email: Nigel.weeks@kier.co.uk

KIER CONSTRUCTION LIMITED CIVIL ENGINEERING DIVISI
Contacted person: Nigel Weeks
Email: Nigel.weeks@kier.co.uk

KIER CONSTRUCTION LTD T/A CIVIL ENGINEERING & KIER
Contacted person: Nigel Weeks
Email: Nigel.weeks@kier.co.uk

MACE LIMITED
Contacted person: Tanya Calderwood
Email: calderwood@mace.co.uk

MANSELL PLC T/A MANSELL CONSTRUCTION SERVICES LTD
Contacted person: Sunder Hill
Email: Sunderhill@mansell.plc.uk

McCORMICK TRACEY MULLARKEY
Contacted person: Peter Mcguckin
Email: peter@rmi.uk.com

MJ Gleeson Group Plc
Contacted person: David Tennary
Email: dtennary@mygleeson.com

MORRISON UTILITY SERVICES
Contacted person: Bill Macnamara
Email: bill.macnamara@morrisonplc.com

MOUCHEL CONSULTING LTD
Contacted person: Peter Coughtrey
Email: petercoughtrey@mouchel.com

NEATH PORT TALBOT COUNTY BOROUGH COUNCIL DIRECTORA
Contacted person: Mr. Steve Bolchover
Email: ehts@neath-porttalbot.gov.uk

NORWEST HOLST CONSTRUCTION LIMITED
Contacted person: Mr. Terry Tenketh
Address: Norwest Holst Construction Ltd, Birchwood Corporate 500, Longbarn Boulevard Birchwood, Warrington Cheshire, WA2 0XF
NOTTINGHAM CITY BUILDING WORKS
Contacted person: Tony Bateman
Email: tony.bateman@nottinghamcity.gov.uk

OVE ARUP & PARTNERS INTERNATIONAL LTD
Contacted person: David Beattie
Email: davidbeattie@arup.com

PENNINE VIBROPILING LIMITED
Contacted person: Ray Booth
Email: Ray.Booth@pennine-group.co.uk

RAYNESWAY CONSTRUCTION SOUTHERN LTD
Contacted person: Luke Bridges
Email: luke.bridges@raynesway.com

R J MAXWELL & SON LTD CARRICKMORE QUARRY
Contacted person: Ama Kennedy
Email: amakennedy@rjmaxwell.com

R J MAXWELL & SON LTD HEAD OFFICE
Contacted person: Ama Kennedy
Email: amakennedy@rjmaxwell.com

ROBINSON & MCILWAINE
Contacted person: Peter Mcguckin
Email: peter@rmi.uk.com

SHIMIZU EUROPE LIMITED
Contacted person: Brian Smith
Address: Hythe Ho, 200 Shepherds Bush Rd, London, W6 7NY

TAENAC SITUSEC
Contacted person: Gareth Hopkin
Email: gareth.hopkin@tarmac.co.uk

TARMAC NORTHERN LIMITED BARRASFORD QUARRY
Contacted person: John Sowarby
Email: querry.berresford@tarmac.co.uk

THE ROBINSON PATTERSON PARTNERSHIP LTD
Contacted person: Glenda Hall
Email: glendahell@robinsonpatterson.com

WREKIN GROUP PLC GENESIS CENTRE
Contacted person: Jonathan Bailey
Email: Jonathan_bailey@wrekin.co.uk

WREKIN GROUP PLC, Northants
Contacted person: David Steven
Email: david_stevens@wrekin.co.uk

WREKIN GROUP PLC, Shropshire
Contacted person: John Barlow
Email: john_barlow@wrekin.co.uk