UNDERSTANDING THE DETERMINANTS OF SME ISO 9000 SUCCESS: TOWARDS A CLASSIFICATION OF WORK ENVIRONMENT

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Abstract

The successful implementation of international quality standards and models can be viewed as an important key for contemporary SMEs to maintain competitive advantage. One of the most influential factors in ensuring ISO 9000 adoption is the development of a management-driven, implementation framework prior to embarking on such a strategic change process, but often such frameworks are typically developed and derived primarily from the context and experience of large organizations rather than SMEs. The aim of this paper is to investigate current research opportunities with respect to the development of a novel research classification and framework to evaluate the influence of work environment on the implementation of ISO 9000 standards within advanced engineering and manufacturing SMEs. This paper presents a comprehensive research methodology for the specification and development of a novel work environment classification, before findings from an initial industrial survey and case studies are presented and evaluated.

Keywords:
Work Environment, ISO 9000, SMEs

1 INTRODUCTION

Success within any manufacturing enterprise can be influenced by its management and administrative leadership, together with the work environment under which it operates. Higher degrees of success in applying modern administrative systems can relate to improved production efficiency and the greater achievement of quality. At the beginning of the twentieth century and thanks to the contributions of recognized quality pioneers: Crosby, Ishikawa, Feingenbaum, Juran and Deming, the modern concept of 'quality management' was developed. They then laid the base of comprehensive Quality Management Systems (QMS), which were characterized by the following key principles [1].

- Giving customers the priority.
- The quality system integrates all activities.
- Training motivates and encourages personal.
- Continuous development of the administration system.

The efforts of these early pioneers were followed by the appearance of the ISO 9000 series for the first time in 1987. It represents an International Standard aimed at institutional administrative systems and is widely recognized as a commercial requirement for successful global trade. Contemporary enterprises can now be seen to operate in diverse and complex global environments. These environments can be characterised by intensified competition, time dependence and are increasingly driven by demand for bespoke customer-focused products. Business process and technological innovations, both in design and manufacturing systems, have had a significant influence upon the competitive environment, with the notion of 'quality' as an important key.

Briscoe et al [2] propose that 'quality can be viewed as being essential to customer satisfaction and competitive success, especially within Small-to-Medium sized Enterprises (SMEs)'. In current marketplaces, enterprises now strive to integrate quality within world class manufacturing principles. Through recent years, there has emerged little consensus on a range of different definitions of SMEs, but, these are typically based upon turnover size or the number of employees. Levy [3] applied the designation to 'small and medium sized manufacturing enterprises which have 500 employees or less' and Ghobadian and Gallear [4] further sub-divided this classification into: (a) micro-enterprises, 1-9 employees; (b) small enterprises, 10-99 employees; and, (c) medium enterprises 100-499 employees. From 2005, the European Union (EU) Commission adopted Recommendation 2003/361/EC regarding the SME definition which enterprises qualify as micro, small and medium-sized enterprises (SMEs) if they fulfil the criteria laid down in the Recommendation which is summarised in the Table (1). In addition to the staff headcount ceiling, an enterprise qualifies as an SME if it meets either the turnover ceiling or the balance sheet ceiling, but not necessarily both [5].

Table 1: EU SME Definition, 2003/361/EC

Enterprise Category	Headcount	Turnover (or)	Balance Sheet total
Medium-sized	< 250	≤ € 50 M	≤€ 43 M
Small	< 50	≤ € 10 M	≤€ 10 M
Micro	< 10	≤ € 2 M	≤€ 2 M

These categorisations represent a diverse, but highly important group of enterprises and are of particular interest because the group have had to cultivate their own unique blend of capabilities in their struggle for ultimate success; overcoming skill, technology, finance, and resource barriers to growth. Within this paper consideration is placed upon use of the later definition, for which there exist 23 million SMEs in the EU, representing 99% of all enterprises, and providing a key driver for growth, innovation, employment and social integration [5].

The ISO 9000 standard can be viewed as one of the most important management concepts that have emerged in the last 30 years, with Rodriguez-Escobar et al [6] commenting that since the first version of ISO 9000 was issued by International Organization for Standardization (ISO) in 1987, its popularity has markedly increased. The first version of this standard was concentrated on quality assurance concepts, with later versions of ISO 9000:1994 forming a wider family of standards (ISO 9001, ISO 9002, and ISO 9003). This emphasized quality assurance via preventive actions and continues to require proof of compliance with documented procedures. The ISO 9000 family of standards was revised in 2000; the three previous parts of the ISO 9000:1994 version were integrated into a single standard called ISO 9001:2000

and the latest version of standards was issued on 2008. Over recent years ISO 9000 certification levels have steadily strengthened on the world and EU stages, from under 100,000 in the early 1990's to nearly 700,000 in 2004 [7]. Overarching this administrative certification, the term QMS was defined by ISO 8402 as 'organizational structure, responsibilities, procedures, processes, and resources for implementing quality management'. The QMS should apply and interact with all processes in the organisation. It begins by identifying customer needs and ends with satisfaction. Figure (1) represents the quality management process model as described in ISO 9001:2008.

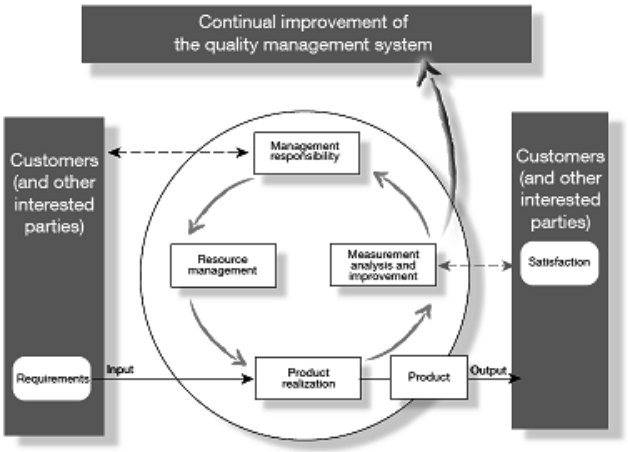

Figure 1: The ISO 9000 Process [8]

Whilst there exists a range of documented reasons for obtaining ISO certification, such as customer confidence, proposal or bid competitiveness, marketing prowess, and governmental requirements [2]; successful projects can furthermore deliver a high variety of external and internal benefits, Table (2).

Table 2: Most Commonly Stated ISO 9000 Benefits [9]

External Benefits	Internal Benefits
Access to new markets	Productivity improvements
Corporate image improvement	Product defect rate decreases
Market share improvement	Quality awareness improvements
ISO 9000 certification as a marketing tool	Definition of the personnel responsibilities and obligations
Customer relationship improvements	Delivery time improvements
Customer satisfaction	Internal organisation improvements
Customer communication improvements	Non-conformities decreases
	Customers' complaints decreases
	Internal communication improvements
	Product quality improvement
	Competitive advantage improvement
	Personnel motivation

In addition, to the stated benefits or positives, a range of obstacles or negatives may also be summarised [2]. These comprise: implementations do not yield the desired improvements to productivity, quality or profitability; recorded difference in performance to non-certified enterprises; little sales, marketing, or competitive benefit; limited quality practice enhancement; or, increases to quality costs. Withers and Ebrahimpour [10] conclude, from case evidence, that top management involvement was the most frequently cited obstacle for ISO 9000 implementation. This was followed by implementation time and system change, together with difficulties related to interpretation of the standard. Therefore, to achieve a successful implementation of ISO 9000 standards within an enterprise, top management need to consider all requirements of the standard and demonstrate their leadership commitment. Ching and Woan [11] comment that, 'the top management must always provide evidence of its commitment and ensure the quality system includes a commitment to continual improvement. The workforce may be seen an important player, and their cooperation and personal commitment to ISO 9000 systems is essential'. It is further recognised that each and every employee in an enterprise must be fully committed to the actual ISO 9000 implementation process. The collective, integrated and coordinated efforts of all fully involved staff members make for a world-class organisation. Both vision and quality policies need to be effectively communicated by management to every staff member in the organization.

For this reason, it is considered by this paper's authors that the concept of 'work environment' may be regarded as an underestimated and integral part of any successful IS0 9000 adoption process. Within ISO 9000:2005 [12], the term work environment related to the 'set of conditions under which work is performed', with conditions including 'physical, social, psychological and environmental factors (such as temperature, recognition schemes, ergonomics and atmospheric composition)'. Whilst this definition has been further refined in ISO 9000:2008 to provide, 'the term work environment relates to those conditions under which work is performed including physical, environmental and other factors (such as noise, temperature, humidity, lighting or weather)', the terminology may still seem particularly difficult for practitioners to interpret and top management to implement, measure and optimize, under the wider resource management goal of achieving conformity to product requirements. In addition, to these classifications, further ranges of other enterprise specific impacts may also be considered; e.g. job safety analysis or health and safety legislation [13]. Moreover, supplementary social and psychological factors of work environment, such as motivation, interpersonal relationships, recognition, and job security, may also be considered within the ISO accreditation process as all of them can present impact upon an enterprise's competitiveness. As such the overall goal of the research is to provide a foundation for the development of a richer and more meaningful classification of 'work environment' and to encompass this into a practical framework.

2 METHODOLOGY

This research work aims to build upon existing literature, to evaluate the effect of work environment on the successful implementation of ISO 9000. It further investigates potential solutions for the problems that may face SMEs when they are implementing ISO 9000, by developing a novel classification and integrated framework for work environment. Work environment is defined at a high-level within ISO 9000:2008 and deeper definitions [14] are commonly centred upon three primary factors: (a) Physical factors, which include temperature, noise, light, vibration, cleanliness, physical stress; (b) Social factors, that resulted from interactions between people and include religion, climate, education, peer pressure, culture; and lastly, (c) Psychological factors, that have resulted from an individual's inner needs and external influences and include recognition, responsibility, achievement, advancement, reward, job security, interpersonal relations, leadership, affiliation, self-esteem and occupational stress.

The primary investigative methodology for this work is based upon the wider hypothesis that 'the successful

adoption of the ISO 9000 standard can be positively influenced by work environment and supporting resource management'. This research aims to link together the ISO 9000 work environment definitions and their existing limitations, together with physical factors including associated workplace legislation, and established social and psychological orientated theories provided by Herzberg [15] and Maslow [16]. This work is further based upon three assumptions (below) which have been recorded, because if enterprise management cannot create a proactive climate within it, this may be reflected in efficiency reductions of their employees and hence further reductions in productivity and product quality conformity.

1. Most enterprises can implement the ISO 9000 standard successfully if they manage their financial and human resources in an appropriate way and have established quality practices.
2. Creating a supportive work environment can play a contributory role in the success of implementing the ISO 9000 standard.
3. Suitable motivation systems adopted by enterprises can help them to encourage their employees to increase productivity and improve quality. But this requires effective and successful top management to respond to their employee's requirements.

Herzberg [15] presented his research as the Motivation-Hygiene Theory, which is often also regarded as the Two Factor Theory of Job Satisfaction and Job Dissatisfaction. According to his theory, people are influenced by two sets of factors, Table (3). Herzberg's research proved that employees will struggle to achieve 'hygiene' needs (or maintenance factors) such as policy; relationship with supervisor, work conditions, salary, status, security, personal life, and relationship with subordinates because they may be adversely affected without them, but once satisfied the effect soon wears off, hence satisfaction may be seen as being temporary. Then as now, weakly managed enterprises fail to understand that employees are not always 'motivated' by addressing 'hygiene' needs. Employees are only truly motivated by enabling them to reach for and satisfy the factors that Herzberg found; that the key determinants of job satisfaction, such as achievement, advancement, development, recognition, work itself, and responsibility, represent a far deeper level of meaning and fulfilment.

Table 3: Motivation-Hygiene Theory [15]

Motivation Factors	Hygiene Factors
• Achievement	• Pay and Benefits
• Recognition	• Company Policy and Administration
• Work Itself	• Relationships with Co-workers
• Responsibility	• Supervision
• Promotion	• Status
• Growth	• Job Security
	• Working Conditions
	• Personal Life

It is further commented [14] that motivation is an intrinsic part of work environment and therefore a key to successful adoption of ISO 9000. From this recognition it may be considered that, deeper investigations need to be undertaken to ascertain employee levels of motivation in the workplace. Abraham Maslow is widely recognised as a pre-eminent expert within this field and his Theory of Human Motivation [16] provides that, 'motivations result from satisfying personal needs and expectations of work, therefore the motivation to accomplish quality objectives must be triggered by the expectation that achievement of objectives will lead to a reward that satisfies a need of some sort'. Developing improved understandings of the benefits and limitations of Maslow's work and its implications for successful work environments is proposed by the paper's authors to be a further important consideration. Maslow's hierarchy is shown in Figure (2).

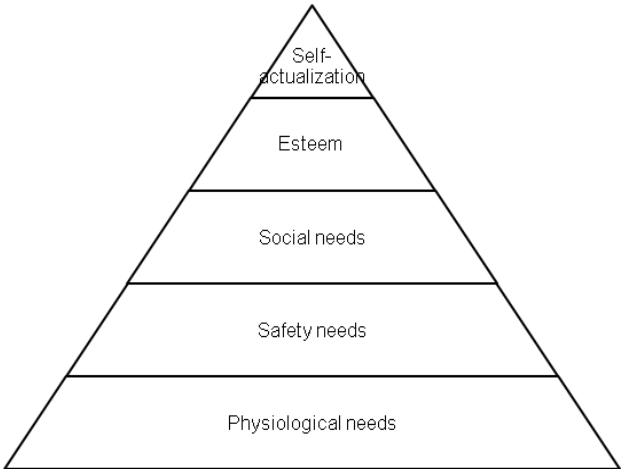

Figure 2: Maslow's Hierarchy of Needs [16]

From the surveyed literature it is acknowledged that the development of an integrated framework, based upon existing ISO 9000 definitions, appropriate Herzberg Motivation-Hygiene factors, and Maslow's hierarchy of needs, would comprise an academically rigorous foundation from which to develop an improved work environment framework. It is anticipated that this framework would then be capable of delivering higher levels of SME ISO 9000 success. The future objectives of this research endeavour should therefore comprise:

1. The pilot development of a richer definition and classification of 'work environment'.
2. An assessment, analysis and prioritization of selected work environment factors and barriers facing SMEs implementing the ISO 9000 standard.
3. The provision of a revised framework and recommendations for the implementation of ISO 9000.
4. Evaluation of the benefits to be gains from an increased focus on work environment when implementing ISO 9000 within contemporary SMEs.

The foundation of this research is centred upon a blended model, combining Bickman and Rog's [17] descriptive research, with the experimental case approach advocated by Yin [18]. From the underpinning notion proposed earlier, descriptive research in the form of a literature review, industrial survey, and case studies are to be initially utilized to examine the problematic situation. Case study research is especially appropriate for studying implementation practice and associated challenges. Several researchers [19] point out the strengths of case research, especially for allowing researchers to: a) document a phenomenon within its enterprise context; b) exploring the boundaries of a phenomenon; and c) integrate information from multiple sources. Since the main thrust of this work is related to the implementation of ISO 9000 and only they can be implemented in a real-life experimental context this approach seems clearly justified.

3 CLASSIFICATION AND FRAMEWORK DEVELOPMENT

Whilst it is accepted that many SMEs wish to implement and safeguard ISO 9000 accreditation, some hold real difficulties in adoption and maintenance processes.

Therefore, this research is centred on understanding the influence of work environment on implementation of ISO 9000 in SMEs by classification and framework development, integrating the critical success factors defined in ISO 9000, UK health and safety legislation, and the workplace theories of Herzberg [15] and Maslow's [16]. The work necessitates pilot study and assessment of current work environments in SMEs and separation of the qualitative and quantitative factors, which would constitute an evaluative scorecard or 'work environment classification' for measurement. A diverse range of Total Quality Management (TQM) frameworks are in existence, but these are not typically fit for SME purpose, tend to be prescriptive in nature, and are based upon unlimited resource. As a guide it is further recommended that SME quality frameworks should favour incremental implementation approaches and meet identified characteristics [20]:

- Systematic and easily understood.
- Simple structure.
- Clear links between elements which are presented.
- General enough to suit different contexts.
- Represent a road map and a planning tool for implementation.
- Answers 'how to', and not 'what is? TQM.
- Implementable.

The need for this exploratory work environment investigation is centred upon an identified gap in existing research, as current studies only deal with the influence of a limited range of factors on the implementation of ISO 9000 such as: commitment of management, implementation obstacles, or customer pressure. It is considered that little or no work has been undertaken by researchers targeted directly the influence of work environment on the implementation of ISO 9000.

3.1 Work Environment Analysis

According to Maslow's Hierarchy of Needs [16], people's motivation results from satisfying needs and expectations of work. Herzberg in his Motivation-Hygiene Theory [15] pointed out that their motivation factors such as achievement, recognition, responsibility and advancement are working towards increasing job satisfaction, whereas hygiene factors such as job security, working conditions, salary, and workplace relations are operating to decrease the job dissatisfaction. From the early ISO 9000 definitions of work environment, it can be proposed that there exist inter-relationships between all three definition sets, e.g. poor working conditions, such as low workplace temperatures, may adversely impact motivation and thereby, subsequently lower conformance to product requirements and overall enterprise success. Whilst, in many countries there may be rigorous workplace regulations in existence to negate operational factor extremes, such as the UK's 'The Health and Safety at Work, etc Act 1974' which aims to ensure that all workplaces meet the health, safety and welfare needs of all members including people with disabilities, it can be much more difficult to evaluate less defined terms, such as physical and environmental factors. For example UK legalisation defines that the minimum standard for temperature in offices should normally be at least 16C^{o}, but does not cover a maximum. It is for this reason that this study aims to draw together such disparate elements into an easy to use classification, from which the prioritisation and evaluation of key critical success factors can be made.

3.2 Initial Industrial Survey

To develop improved understandings of the applicability and enterprise awareness of ISO 9000 work environment concepts an initial high-level industrial survey was conducted. The developed questionnaire comprised of three main sections including: general background; ISO 9000 standard implementation; and, work environment awareness. After collection of the individual details and employer organisation characteristics within the background section of the questionnaire, the ISO 9000 question set was based upon the eight elements contained within the ISO 9001:2008 standard documentation. This was used to focus upon how enterprises regard the application of the quality principles internally and their degree of top management commitment, implementation awareness, and conformance success. The final work environment section was designed predominately using a five-point Likert scale to ascertain employee perceptions, awareness and knowledge of work environment factors and concepts. After conducting pilot survey with members of a collaborative organisation, data was collected from a further 53 employees across 14 Advanced Engineering and Manufacturing (AEM) enterprises, located in the Yorkshire and Humberside region of the UK. The criteria for enterprise selection comprised: (a) The enterprise must conform to the EU SME definition; and, (b) Each enterprise must current hold or be in the process of achieving the ISO9001:2008 quality award. All responding SMEs were held in private ownership and represented three distinct AEM groups, comprising Mechanical, Automotive and Metals. No enterprise had been in operation for more than 20 years and 12 of the enterprises had already achieved the ISO 9001 standard award within the last five years. Of the group, 9 operated internationally rather than just within the UK, and all enterprises serving both external companies and individual private consumers. All organisational structures were seen as typically hierarchical in nature with an average management to staff ratio of 1 to 9. Whilst 3 out of the 14 had achieved the UK's prestigious Investors in People award (a business improvement tool designed to help all kinds of organisations develop performance through their people), all held formal procedures for health and safety management, together with structured personal development and training procedures. 9 Enterprises could be classed as being predominately engineer or make-to-order organisations, with 1 make-to-stock and 2 of service-based orientation. One in two of the enterprises, identified a gap between the skills of current employees and those their organisation needs to meet its business objectives. Of the overall employee population, less than 5% had formal academic degree and higher qualifications. Most enterprises that identified skill gaps specified technical and engineering skills (at all levels within craft, operator, technician and professional engineering occupations). Around a third of enterprises have funded or arranged training for employees (either formal or informal, on or off the job) in the last 12 months, with enterprise size tending to be the key determinant of the propensity to train. Findings from the ISO 9000 section of the survey seem to mirror results documented by Boulter and Bendell [21]. These similarly indicated that improvement of product or service quality was a key motivating factor for enterprises to hold ISO 9000 certification, as opposed to marketing prowess. Again, all 12 enterprises which already achieved the award stated that, whilst the process was more time consuming and detailed than first anticipated, it had positively met their original implementation objectives. All implementations had been achieved in less than an 18 months period, but none of the enterprises surveyed could accurately assess the financial impact of certification success. In relation to accreditation awareness and maintenance, there existed much more mixed responses. Whilst all acknowledged the internal platform it had built would provide a valuable foundation for continued growth, 7 of the survey group noted that they held a tendency to

leave maintenance activities until re-assessment visits, at which point changes to documentation (i.e. change to revised ISO 9001:2008 version and internal conformance procedures) would be hurriedly applied. All enterprises recorded that they had seen a growing acceptance of ISO 9000 certification as a pre-requisite for trade within their individual industries. Within the employee responses and their relationship to the ISO 9000 standard and the notion of work environment, survey results showed clear differences between enterprise management and staff members. Of the 53 employee responses 16 (30%) were from enterprise managers, who in response to whether they valued ISO 9000 as an important business improvement methodology all managers strongly agreed, whilst staff recorded 11% agree, 38% neutral and 21% in disagreement. All employees (79% strongly agree / 21% agree) considered ISO 9000 to improve inter-enterprise communication and supported the secondary views that that accreditation improved team-working and process control. This survey section further comprised individual areas focusing on work environment concepts and perceptions related to the workplace, supervision, motivation and personal satisfaction. When questioned on their knowledge of the work environment concept, in relation to ISO 9000 attainment, only 7 respondents (13%) could reasonably accurately define the term, with the remainder only demonstrating limited awareness of current UK legalisation knowledge. In relation to whether or not improvements to their own personal work environment, using the ISO9001:2005 term, would deliver enhancements to enterprise quality procedures and consequently productivity, all positively agreed in favour (72% strongly agree / 28% agree). The extent of top management commitment, was another perception which was tested and again most managers indicated that there existed strong support for ISO 9000 within the organisation whereas, the staff much less so. In specific relation to more personal workplace perceptions, 48 respondents (91%) agreed that internal supervision and communication could be improved and this would increase levels of motivation. All employees were currently concerned about job security, with 81% indicating that money was not necessarily their primary motivating factor at work.

In conclusion, this limited survey presents a useful broad approach in support of the stated research aims, with the full survey results pointing to: (a) Clear differences in management / staff opinions regarding ISO 9000; (b) little internal knowledge of work environment concepts and more worryingly, reduced awareness of current workplace legislation; and, (c) If pure monetary reward is not considered to be a specific motivating factor for most respondents, what in relation to the workplace would be?

3.3 Case Study Investigation

High-level case study investigations were completed to build upon the initial survey findings and to offer a more comprehensive, first-hand understanding of the complexities of ISO 9000 implementation and its ongoing support, with respect to work environment. Yin [18] proposes that in studies where there exists a lack of defining theory, limited enquiries can be useful to represent unique cases and provide practical examinations of research questions in more natural settings. It was anticipated that by acquiring knowledge from this direct experience, the authors would be better able to develop informed understandings and to answer the posed research questions in a more meaningful way. From the SMEs surveyed, three were chosen for comprehensive study based on access, willingness to participate, and resource availability. Table (4) summarises their line of business, strategy, employee no., ISO rationale, approach, and implementation period.

Table 4: SME Case Study Perspectives

Case A	Case B	Case C
Process plant manufacture	Machine tool maintenance, service and repair	Equine transportation manufacture
Differentiation	Cost Leadership	Differentiation Focus
38 employees	22 employees	152 employees
Product quality	Service quality	Market prowess
External consultant	Production manager	Engineering manager
8 months	10 months	12 months

The case study research methodology comprised three phases: 1) Define and Design; 2) Prepare, Collect and Analyse; and, 3) Analyse and Conclude. For all three enterprises detailed investigations were carried out to enable a richer level of comprehension of the different approaches to ISO9001:2008 implementation and certification maintenance. The case studies commenced with initiation meetings between the researchers and the nominated industrial contacts, at which an executive summary of the survey findings was discussed and a program of subsequent site visits made. On collation of the primary data, formal analysis and documentation was undertaken, with completed reports supplied to the enterprises for further review and consideration. Whilst similarities in their overall business operation could be seen, the three study enterprises exhibited varying classes of ISO 9001 adoption, employee knowledge and level of implementation resource. All enterprises reaffirmed their belief that the ISO 9001 process had delivered significant impact across their business, with clear benefits derived from customer satisfaction, marketing, operational efficiencies, employee involvement, and fostering a culture of continuous improvement. Two of the three cited the main obstacle to implementation was the availability of dedicated resource to implement the necessary changes. When discussing the ISO 9001 implementations and supporting operations across the three studies, it was clear that there did exist notable communication and awareness divisions between top manager and staff. Directors and senior managers would regularly cite strategic ISO 9001 objectives and terminology, but corresponding awareness at lower organisational levels, especially contract staff, was patchy at best. In particular the SMEs further highlighted:

- Ownership for ISO 9001 resided at management or external levels, not internal director.
- Distribution of quality policies and up-to-date documentation was limited.
- Dissemination of quality responsibilities was mixed across organisational levels.
- Internal ISO 9001 audits were not formally scheduled or undertaken impartially.
- Reliance on sub-contractors to self-certify quality.
- Incomplete inspection testing for incoming materials, with non-availability of required instrumentation.
- Work environment awareness was limited to legislative compliance, through nominated Health and Safety managers, but not to quality, training or performance management systems.

3.4 Prototype Classification Design

From the investigative research, the authors concluded that the development of an integrated classification would be a valuable step forward from which to further evaluate the applicability of work environment concepts within the workplace. This would take the form of a scorecard, using

qualitative and quantitative measures, from which a work place 'health' level could be assessed and comparative indicators prioritised, i.e. impact of temperature ranges on ISO performance. To this end, the researchers are currently developing and piloting the classification within the three case study enterprises. A sample of the classification prototype is presented in Table (5).

Table 5: Work Environment Classification Prototype

Theory	Factor	Concept	Measure	Type
Maslow	Safety	Safety need is the need to feel secure and unthreatened by physical, psychological or economic harm.	From observation and employee questionnaire.	Qual.
Herzberg	Achievement	This category was used only when the position or status of the person has changed in the enterprise.	From observation and employee questionnaire.	Qual.
Work Environment Definition (ISO 9000)	Temperature	Temperature in offices should normally be at least 16Cº. If work involves physical effort it should be at least 13C º (UK H&S legislation).	Measure by thermometer instrument in different locations in workplace and during different shifts.	Quan.
-	-	-	-	-

3.5 Framework Development

To improve the attainment of ISO 9000 certification and its maintenance, a continuous assessment and improvement model, based upon Figure 3, is proposed. This could then be integrated into existing enterprise quality procedures to improve productivity levels. Efforts to further develop this classification and framework approach are current.

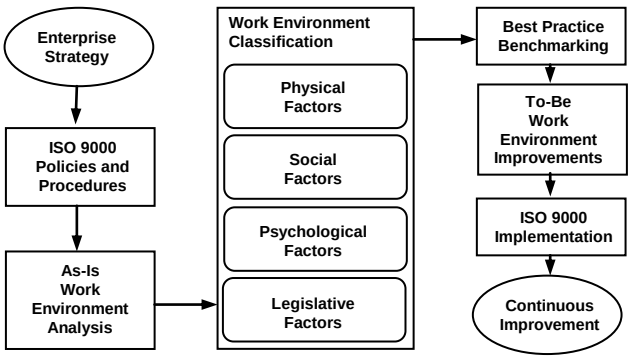

Figure 3: High-level Work Environment Framework

4 CONCLUSIONS

From this initial research study, it is concluded:

- The notion of 'Work Environment' is considered an underestimated concept within the goal of achieving successful ISO 9000 certification.
- Internal SME motivation for ISO 9000 certification can lead to improved results than those pressured by external reasons.
- The deployment of an integrated Work Environment Classification and Framework may lead to tangible improvements to ISO 9000 and SME success.
- SMEs that focus on continuous improvement will be able to change themselves and rebuild their strategies, structures, and processes. Additionally, it will also help employees to pass beyond surface change to transform the underlying assumptions and values governing their behaviours.

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