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The Organisational Environment-Behaviour Factors' Towards Safety Culture Development

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Abstract

The environment is an important agent in safety culture development. No empirical research has been conducted among the Malaysian and it is hoped that this study will contribute to the progress. This paper aims to evaluate the influence of environment – behaviour factors' towards safety culture development. Questionnaire survey and semi-structured interviews held among Grade G7 contractors ensure the richness of the data collected. The findings revealed a fairly weak internal environment of the organisations, which does not reinforce safe behaviours. Further, interviews among Senior Management, acknowledged their state of safety culture were contributed by the system established.

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1. Introduction

A sequence of events resulted in work accidents. They arise from different causes that can generally be classified as physical incidents posing hazardous situations and behavioural incidents caused by unsafe

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acts (Kartam, 1997). Controlling the physical aspects and technical hazards are not the only ways to reduce accidents. Attention must also be given to managerial, organisational, and human factors (Mohamed, 2003).

The review on the accidents accusation theories revealed that there is a shift in the emphasis on the role of management, and consider the causes of accidents are provoked among others, by actions of contractors. Thus, constraints include the influence of management, the organisational and the environmental factors that demand to be addressed in order to reduce the causes of accidents. In many parts of the world, the construction industry has a poor image in terms of accidents. The construction sector recorded an incident rate for fatal accidents, higher than any other industry as cited by Suraji (2001).

While behaviours are the elementary unit in understanding the safety culture (Faridah *et al.*, 2011), the environment is an important agent that will tend to reinforce or subvert the behaviours that are being exhibited in that environment. Despite the importance of environment-behaviour factors, no empirical research has been conducted among the Malaysian and it is hoped that this study will contribute to the progress. This paper aims to evaluate the significant of environment-behaviour factors' towards safety culture development in the context.

2. The Environment-Behaviour of Safety Culture

It is reasonable to argue that the earlier models and research sought to describe what an effective safety culture looked like and the characteristics of the organisations which exhibit these attributes rather than trying to explain how an organisation can develop such culture. The review of these models also consensus viewed safety culture at the organisational level, in part or as a wholesome. The main factors for safety culture were highlighted as the management system (IAEA, 1991; Grote and Kunzler, 2000), as organisational and external factors (AEA Technology, 1993-1994), as organisational variables that influence the work environment and group processes, and as individual behaviour (Cox *et al.*, 1997). On the other hand, a combination of three elements; the subjective psychological factors, observable on-going safety-related behaviours and the objective situational features were established by Cooper (2000).

Hence, in this research the Reciprocal Safety Culture Model by Cooper (2000) is adopted. This is due to the fact that those factors' characteristics which constitutes; the Psychological, Behavioural and the Environmental factors, allows triangulation of perspectives in the context of safety culture within an organisation. These three elements also mirrored those accidents causation relationship found by a number of researchers (Heinrich *et al.*, 1980; Weaver, 1971; Reason, 1990; Suraji, 2001). Further, the model itself promote self-regulatory processes consistent to the definition of safety culture previously established as 'The product of shared values, beliefs, attitudes, and patterns of behaviour based on a top-down approach practices that are concerned with minimizing the exposure to conditions considered dangerous or injurious to the entire group members on a self-regulatory basis' (Faridah *et al.*, 2009; 2010; 2011).

The environment plays an important role in the culture development. The behaviourists termed environmental factors as the antecedents and consequences that are related to behaviours that are exhibited within the organisation. Behaviours are the driving forces that propagate the vision of culture of the organisation in the individuals. With this respect, to influence the perception of the individual, one must try to insure that the environment presents a consistent message that establishes behavioural expectations. While behaviours may be the elementary unit in understanding the safety culture, the environment is an important agent that will tend to reinforce or subvert the behaviours that are being exhibited in that environment.

Pidgeon (1991) says that organisational culture is somewhat unique and hence considers “good safety culture” is hard to define. He further elaborated that culture can be influenced by the nation or region, technologies and tools it uses, or a particular history of success and failure it has achieved. Safety culture of an organisation may be influenced by the marketplace and regulatory setting in which it operates.

2.1 The Elements and Dimensions of Environmental Factors

Cooper (1998) considers safety management systems as environmental factors in his model of organisational safety culture. This is due to the fact that organisations are contained entities, where the efficacy of safety management systems is the key internal environmental factor. However, since safety culture is the dynamic reciprocal relationship between group member’s perceptions and attitudes towards safety (cognition); there is the presence of external influences including legislation, economics, history and climate (environment or situation). The environmental dimensions are categorised as the internal and the external factors as illustrated in Figure 1.0.

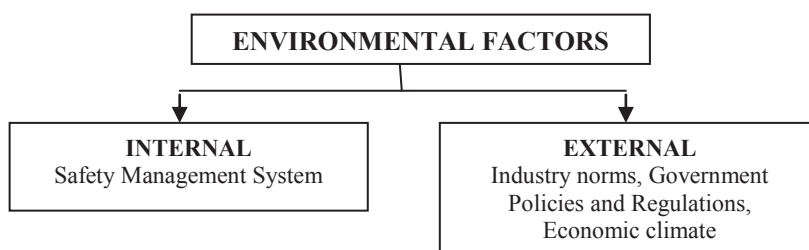


Fig.1. The Environmental Dimensions

2.1.1. The Internal Factors

The internal factors of safety management systems include those elements of an organisation’s system for management which impinge on health and safety performance. The aim of safety management systems is to prevent accidents by breaking their causal chain. The ASCNI Human Factors Study Group identified four key functions of safety management, namely policy and planning, organisation and communication, hazard management, and monitoring and reviewing safety performance (HSC, 1993). Safety management involves assessing and controlling risks, planning activities, detecting latent failures and active failures, and monitoring and reviewing performance. HSE’s (1991, 1997) reports entitled Successful Health and Safety Management (HSG65) define the principles of effective health and safety management, but do not set standards. However, they apply the principles of Total Quality Management (TQM) for safety management following the growing number of authors who highlight the links between the philosophy of TQM and safety culture (Krause, 1990; HSE, 1991; Pidgeon, 1991; Geller, 1994; Cooper, 1995; Manzella, 1997; Osbourne, 1997 as cited by Peckitt, 2000). Safety and quality are two sides of the same coin as both safety and quality management systems aim to establish explicit performance standard (Krause, Hadley and Hudson, 1990).

The fundamental basis of effective management is summarised in the simple management circle model, based on the Plan-Do-Check-Act Management Circle Model, by Deming (1986). Planning, to achieve the control of risk is the vital first step in effective safety management. Effective policies emphasise on the importance of safety for the organisation’s performance; the need to control risk and provide adequate resources; senior management’s commitment; and the need to review and improve performance. Implementing effective safety management systems require; control, communication, co-operation, and competence. Control comes from senior management setting examples to follow, taking responsibility for

safety management and continually demonstrating their commitment through deeds and words. Safety training, and related information need to be readily available and safety relevant issues should be regularly discussed. Good communications and co-operation are promoted by consulting with employees, encouraging them to express their safety views and concerns and involving them in decision-making.

2.1.2 The External Factors

Factors such as government regulations, economic conditions, competitive industry forces, and changing technology create pressure on organisations and their managers. According to Pun Kit and Hui Lp (2002), the compliance of government policies and regulations on safety operations and other occupational health and safety areas push firms to adopt safety management practices.

3. Methodology

The scope of the study was derived from the whole total population of 866 (overall total of 1,171) numbers of Grade 7 contractors listed under the Construction Industry Development Board (CIDB) Directory who undertake Building Works within the state of Selangor and Kuala Lumpur. Generally a seven likert-scale were used to measure all the dimensions (1= very weak and 7= very strong), in the Questionnaire Survey. The internal factors and the external factors are measured by 7 and 6 items respectively. With a respond of 16.67%, the assessment of the environment-behavioural factors was deduced based on the mean score.

Eleven (11) contractors' companies had participated in the semi-structured interview represented by the senior management denoted by SM1 to SM11. The interviews were conducted among Senior Management (SM) on an appointment basis held in their office. A user-friendly and practical used of *multiple-response analysis* found under SPSS 12.0 features was explored and utilised for this purpose.

4. Results and Discussions

Since the targeted respondents are the Senior Management, the majority were empowered and were highly empowered to inculcate safety culture into their organisations, whereas less than 10% reported that they are not empowered. This shows that the questionnaire survey had reached the targeted respondents.

Under environmental factors, two dimensions were investigated, the '*Internal factor*' and the '*external factors*' (Table 1). All dimensions investigated recorded alpha coefficients 0.9. None of the items under these two factors received a mean score more than 5 points, which shows weakness on these factors in the current practice.

The results revealed that the weaknesses in the Safety Management System do not create the environment that helps to reinforce safe behaviours. Behaviours are the driving forces that propagate the vision of culture of the organisation in the individuals. With this respect, to influence the perception of the individual, the environment should present a consistent message that establishes behavioural expectations. Implementing effective safety management systems require; control, communication, co-operation, and competence. Control comes from senior management setting examples to follow, taking responsibility for safety management and continually demonstrating their commitment through deeds and words.

On the other hand, the interviewees who are the senior management level were represented by the Managers' designation which makes up a total of 64% while 36% held the designation as Directors. The interviewees were asked to rate their organisation's current state of safety culture by using a scale of 1-5 (where 1 denotes very good and 5 denotes very poor). Majority (45.5%) of them rate their organisation's

safety culture as *moderately good*, 36.4% *good* and the balance of 9.1% each as *poor* and *very good* respectively. As senior managers, rating their safety culture as good and moderately good, foresee that *there was always room for improvement* (SM3, SM5 and SM11). SM10 considered himself as very good, judged by *no death cases*. SM6 and SM9 further considered good by *having a system and personnel in place*. Contrarily, SM1, SM2 and SM4 justify themselves as moderately good due to the fact that *they were client driven, past experiences dealing with accidents, and engaged in a low rise building*. However, *despite being certified with more than 1 certification and strong observable management commitment*, SM8 said that he humbly considered them as moderately good so as to motivate him to improve the situation. Looking at the regretted expression of the face and sad tone of his voice, SM7 without hesitations justify the fact of a poor safety culture was due to *discontinuity in managing safety between the top management to the sub-contractor's level, further burdensome by the limited number of Safety Officer*.

Table 1. Mean score of the environmental factors

Dimension	Items	Mean score
Internal factors	Progress on the safety management system now as compared to 5 years ago in the organisation	4.58
	Overall culture of the organisation towards safety.	4.48
	Effectiveness of the safety meetings in the organization.	4.31
	Effectiveness of the safety audit in the organization.	4.31
	Safety monitoring system in the organization.	4.30
	Safety department of the organization.	4.23
	Sub-contractors' safety management system.	3.83
External factors	Influence of the legislation and regulation enforced by the government to organisational safety culture.	4.85
	The influence of the organisational history to the organisational safety culture.	4.60
	The influence of the industry norms and standards to organisational safety culture.	4.54
	The influence of the individual background attitudes of the employees to the organisational safety culture.	4.50
	The influence of the country economic climate to organisational safety culture.	4.46
	The influence of sub-contractors' background to organisational safety culture.	4.23

Majority (32%) agreed on the *management commitment*, 24% says that it was contributed by *behavioural human factors*, and 20% feel that the *induction and training*. The *system in the organisation and the budget allocated for safety* as the contributing factors were agreed by 16% and 8% respectively. All the interviewees do agree that the presence of the enforcement officer or the inspections by the local authority *contributes one way or another to their current state of safety culture*, when probes during the interviews.

Table 2 illustrates that majority (27%) possess as specifying others, 21.6% contributed by being knowledgeable and experienced, 10.8% each says that strong commitment and leadership, 8.1% on sharing of information, 5.4% each for positive thinking, the enforcement practiced and attending meeting respectively. The majority include the *level of competency in safety* (SM1), *conducting briefing in accordance to trade* (SM2), *integrate safety during planning and dealing with IBS* (SM7), *good*

communicator who are able to translate vision into action in detail and teamwork (SM8), the behavioural actions shown (SM10), ensuring enough resource allocation (SM10) and advice during the ad-hoc visits (SM11).

When asked their opinion on whether safety culture does influence safety performance, a consensus (100%) agreement was obtained and reveals the reasoning behind that agreement. Majority (54.5%) relates *safety culture towards the enhancement of productivity*, 27.3% for *maintaining a good reputation* and 18.2% *consider it as a rule of thumb* (SM2) and associated safety culture as the *sharing of responsibility* (SM4).

Table 2. Major personal strength contributed to the current achievement

Questions	Category	Frequency	%	Specify Others
Major strength that you personally have towards the current achievement?	Strong Commitment	4	10.8	Level of competency in safety. (SM1)
	OSH implementation	2	5.4	I conduct briefing in accordance to the trade..(SM2)
	Knowledgeable and experience	8	21.6	Cooperative. (SM4)
	Sharing information	3	8.1	I am a planner to ensure that during planning, I integrate the safety elements. (SM7)
	Positive thinking	2	5.4	We are also dealing with IBS and we include safety. (SM7)
	Enforcement	2	5.4	Ok, maybe I am a good communicator; I am able to translate vision into action in detail. (SM8)
	Leadership	4	10.8	Teamwork. (SM8)
	Attended meetings held to show the concerned on safety	2	5.4	My behaviour. (SM10)
	Others	10	27.0	Ensuring enough resource allocation. (SM10) Advice during my ad-hoc visit. (SM11)

5. Conclusion

In this paper, the discussion and interpretation of the results from the methodological triangulation of two research instruments used; the questionnaire survey and the semi-structured interviews supported by literature was presented. The questionnaire survey was developed, aimed to tap the environment-behaviour factors' of safety culture quantitatively. Consequently, the semi-structured interviews were conducted to gain better insight on how safety culture was perceived within the organisations. The Senior Management though claimed to have high emphasis on their beliefs and values to certain extend, do not portray in its implementation.

A fairly weak internal environment of the organisations was discovered from the survey with all items marked a mean score of less than 5.00. Thus, the weaknesses in the safety management system do not create the environment that helps to reinforce safe behaviours. Behaviours are the driving forces that propagate the vision of culture of the organisation in the individuals. With this respect, to influence the perception of the individual, the environment should present a consistent message that establishes behavioural expectations. The environment plays an important role in the culture development. While behaviours may be the elementary unit in understanding the safety culture, the environment is an important agent that will tend to reinforce or subvert the behaviours that are being exhibited in that

environment. The results of the interviews however, justify that the safety management system established within the organisations contributed in many ways.

The external factors have a weak influence on the contractors' safety culture as revealed by the results of the survey. All items recorded a mean score less than 5.00. However, interviews among SM unanimously agreed that the presence of the enforcement officer or the inspections by the local authority contribute one way or another to their current state of safety culture.

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