

We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

6,900

Open access books available

185,000

International authors and editors

200M

Downloads

Our authors are among the

154

Countries delivered to

TOP 1%

most cited scientists

12.2%

Contributors from top 500 universities



WEB OF SCIENCE™

Selection of our books indexed in the Book Citation Index
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?
Contact book.department@intechopen.com

Numbers displayed above are based on latest data collected.
For more information visit www.intechopen.com



Leadership Initiatives for Health and Safety Risk Management Systems in a Small Construction Company: A Case Study

Subashini Suresh, Chike Oduoza and
Suresh Renukappa

Additional information is available at the end of the chapter

<http://dx.doi.org/10.5772/intechopen.80697>

Abstract

The need for leadership in the construction industry has been greater due to the fact that health and safety has become an important business tool to reduce accidents to save lives and minimise injuries. This chapter demonstrates the importance and role of leadership for managing risks associated with health and safety aspects in small construction companies. A case study of an Italian family run small construction company is investigated and reported. A diagnostic tool Leadership and Worker Involvement toolkit was administered in the company. The toolkit had assessment levels (walking, running and sprinting). Analysis showed the company was at walking and running stages in various aspects. But the leadership aspiration of the company was to reach the 'sprinting' stage as a long-term target and sustain it to minimise health and safety risk. A holistic approach was developed to achieve the leadership aspirations of the company. In conclusion, the role of leadership in small companies is to understand the importance of H&S aspects and develop strategies which are then embedded in the processes of the companies to minimise H&S risks for their sustainability and competitiveness. This chapter is beneficial for professional at site, project and programme level and for leadership team.

Keywords: enterprise risk management, leadership, health and safety, risk management, small companies

1. Introduction

Every day, people die as a result of occupational accidents or work-related diseases—more than 2.78 million deaths per year, according to [1]. Additionally, there are about 374 million

non-fatal work-related injuries and illnesses each year, many of these resulting in extended absences from work. Construction is a major industry providing jobs to millions of people and contributing to individual countries and the world economy. With the construction industry being notorious for safety, this condition has compelled companies to improve their safety performance. There are at least five reasons which demonstrate the importance of safety for construction companies [2]: lack of safety; increase probability of accidents; increase human suffering through injuries; accidents leading to disabilities; and fatalities. Governments around the world have laws that require construction organisations to provide safe work conditions and adequate supervision. Lack of safety, therefore, may lead to prosecution or claims, which will become the source of extra costs and adverse publicity. When an accident happens, the morale of workers is weakened. On the contrary, accident prevention programs strengthen morale and improve on-site productivity. A good safety record and proven safety management system is a valuable marketing tool to attract new clients and support business expansion. A safe operation of workplace is considered as a moral obligation imposed by the current society, thus good safety practices are essential to improve and maintain reputation; and safety management program contributes to the financial health of construction companies by helping them avoid costs associated with accidents. An accident incurs both direct and indirect costs as well as insured and uninsured costs. Sun and Zou [3] found that an accident can cost up to a \$1.6 million. The hidden costs could be 36 times greater than the direct costs of the accident [4].

In most countries, the rates of accident and injury prevailing in the construction industry are higher than what prevails in other industries. For developed countries, Idoro [5] found that the United States construction industry currently accounts for over 22% of all occupational fatalities in the entire United States even though it employs less than 7% of the country's workforce. However, according to the UK Health and Safety Executive Warren [6], each year in the construction sector alone, 4% of workers suffer from an illness they believe to be work-related and 3% of people suffer from a work-related injury. That is 79,000 people have musculoskeletal disorders.

The situation in developing countries is worst because research studies discovered that accident and injury rates in many of the developing countries such as Kingdom of Saudi Arabia [7]; Nigeria [8, 9], Thailand [10], and Tanzania are considerably higher than in European countries [5]. Mbuya and Lema [11] are of the opinion that in most developing countries, safety consideration in construction projects delivery is not given a priority and the employment of safety measures during construction is considered a burden Enshassi et al. [12]. Also discover that in many developing countries, the legislation governing Health and Safety is significantly limited when compared with UK. They report further that there are rarely any special provisions for construction on workers' safety and the general conditions for workers are often not addressed.

Health and safety globally is enacted by varying regulations, standards, model and acts. The International Labour Organisation (ILO) publish a database of current occupational health and safety legislation globally, described in **Table 1** are countries who apply occupational health

and safety law, who is responsible for ensuring regulation, standards are being enacted and the occupational health and safety laws they are compliant with regards to training and development of their given work forces. In spite of this every 15 seconds, a worker dies from a work-related accident or disease. 317 million accidents occur on the job annually; many of these resulting in extended absences from work. The human cost of this daily adversity is vast and the economic burden of poor occupational safety and health practices is estimated at 4% of global Gross Domestic Product each year [13]. Therefore, investment in health and safety initiatives is critical to a company's sustainability and future competitiveness.

Lee and Halpin [14] discovered that in many of the countries where safety legislation exists, the regulatory authority is weak and non-existent and employers 'pay lip service' to regulations. Koehn and Datta [15] further discover that in developing countries, injuries are often not reported and the employer only provides some form of cash compensation for an injury to the employee. Suresh et al. [7] study concluded that it is possible to improve construction industry Health and Safety through effective enforcement of existing Health and Safety laws. In addition

Country	H&S regulation	H&S compliance
United Kingdom	Health and Safety Executive	Health and Safety at Work Act 1974
United States of America	Occupational Safety and Health Administration (OSHA)	Occupational and Safety Health Act 1970
Canada	Canadian Centre for Occupational Safety and Health (CCOHS)	Canada Labour Code (Labour Code), Part II and the Canada Occupational Health and Safety Regulations (OSH Regulations)
Australia	Safe work Australia	Work Health and Safety Act 2011
Russia	Russian National Centre of Occupational Health	The Labour Code 2001
Portugal	National Council for Health and Safety at Work	Occupational Safety and Health Law (L102/2009, amended and consolidated by L3/2014)
China	State Administration of Work Safety (SAWS)	Major OSH laws are Law on Work Safety, Law on Prevention and Control of Occupational Diseases, Law on Safety in Mines
Sweden	Work Environment Authority	Work Environment Act (1977:1160)
Switzerland	Secretariat for Economic Affairs (SECO)	Labour Law, the Order No. 3 on Hygiene and the Order on the Prevention of Accidents
Peru	National Council on Occupational Health and Safety	Safety and Health at work 2012
Oman	Ministry of Manpower, Occupational Health and Safety Department	Omani Labour Code 2003
New Zealand	Ministry of Business, Innovation and Employment	Health and Safety and Employment Act 1992

Table 1. Health and safety in 12 different countries.

to the company leadership team recognising the importance of health and safety especially for small companies which constitute to more than 90% in the construction industry.

Health and Safety is always considered as a management issue in which the top management team, who has the authority to allocate resources and enforce organisation's policies, plays a key role in successful health and safety management [16]. The top management team must be willing to accept responsibility for the safety of their employees and must consider safety as an integral part in conducting business. They need to announce and demonstrate their safety commitment as well as stimulate safety awareness from the rest of their employees. Therefore, a safety program or any other implementation of a safety management system must start from or be supported by top management.

2. The role of leadership for health and safety

Without management support, safety is degraded into behavioural issues, such as asking workers to work with care and to wear protective equipment. Proper behaviours are, of course, necessary, but it is important to remember that humans are prone to error. Changing people's mindset and implementing a safety management system are more important and effective to counter safety issues [17]. On the other hand, safety should not only be the responsibility of top management. Due to the complexity of the nature of safety, concerted efforts by all stakeholders, directed at all levels in the influence hierarchy are required to achieve a sustained safety improvement [18]. Everyone in the organisation must be involved and accountable. Sunindijo and Zou [19] stated that misalignment of management commitment and subordinates' actions lead to continuous unsafe conditions of work. More so the concepts of safety by the managers are not fully disseminated to their subordinated to take measures on the construction site. These attribute to lack of safety leadership [20].

Tyssen et al. [21] noted that effective leadership plays an important role in ensuring the success of construction project facing a high degree of uncertainty. A project team will either succeed or fail largely by the quality of the leadership skills of project managers. Therefore, strong safety leadership should be the key for improvement.

The roles of leadership are distinct from those of managers. Health and safety managers hold employees accountable to health and safety and typically held accountable for outcome numbers. Thus, they use outcome numbers to direct the behaviour of those who report to them. While health and safety leaders motivate others to be self-motivated and self-accountable for health and safety go beyond the call of duty on behalf of their co-workers' safety, health and well-being [22]. Health and safety leaders also hold people accountable for accomplishing proactive process activities that can prevent harm and lower injury rates.

Most of the leadership research has focused on outcomes such as productivity, profit, and worker satisfaction as their criteria, and very few research studies have looked at health and safety as a criterion for measuring leadership effectiveness. This is surprising, given that

creating a safe workplace and promoting effective leadership are key goals of most modern organisations. Yet it cannot be assumed that similar leadership behaviours will be associated with effectiveness in health and safety as with other outcomes because safety, unlike other organisational outcomes is intangible. Good safety performance culminates in non-events which are not self-reinforcing. Thus, in order to develop and sustain employee motivation for safety it is likely that leadership in construction projects will require certain communication and motivational skills, which may differ from those required to fulfil task orientated goals.

Cattell et al. [23] noted that productivity is about getting the best value from all inputs across the whole value chain and for this, there needs to be sustained improvement in leadership, culture and processes. Furthermore, Ribiere and Sitar [24] referred leadership behaviour as 'leading through a knowledge lens'. Leading through a knowledge lens gives some special characteristics since it is dealing with knowledge workers having specialised expertise, leading them can be done only by intellectual power, conviction, persuasion and interactive dialogue, it requires skills that build confidence and engagement. Therefore, leaders should establish trust and commitment that will help the knowledge organisation to achieve its business goal. Leadership initiatives for health and safety risk management systems in a small construction company is paramount as construction workers are already at a higher risk of accidents in construction than in any other industry.

3. Does size matter for health and safety?

The employees of small companies have less experience, less education and are younger than employees of large companies. Moreover, they are not conscious of the risk they confront because of their lack of knowledge and information about H&S. Lin and Mills [25] research in Australia showed that small companies did not consider they have to pay attention to H&S administratively. On the other hand, large companies consider that the H&S needs to be included in the administrative system and in all the projects developed by the company. H&S is not a priority in small companies for several reasons. First, they are economically vulnerable, which make them consider that investing in H&S is not profitable as the benefits are perceived in long term. Furthermore, owners and managers tend to take responsibility of all managerial aspects of the company, without having any management knowledge and training. Also, as the frequency of accidents is in these types of companies is low, owners tend to misinterpret these facts [26]. In order to have a more specific analysis of the size of the companies these workers belong to, the range of the number of employees followed the definition of SME from the European Union, which is used also by the UK government. In terms of quantity of employees, a SME is described as follows:

- Micro business: compound of less than 10 employees.
- Small business: compound of less than 50 employees.
- Medium business: compound of less than 250 employees [27].

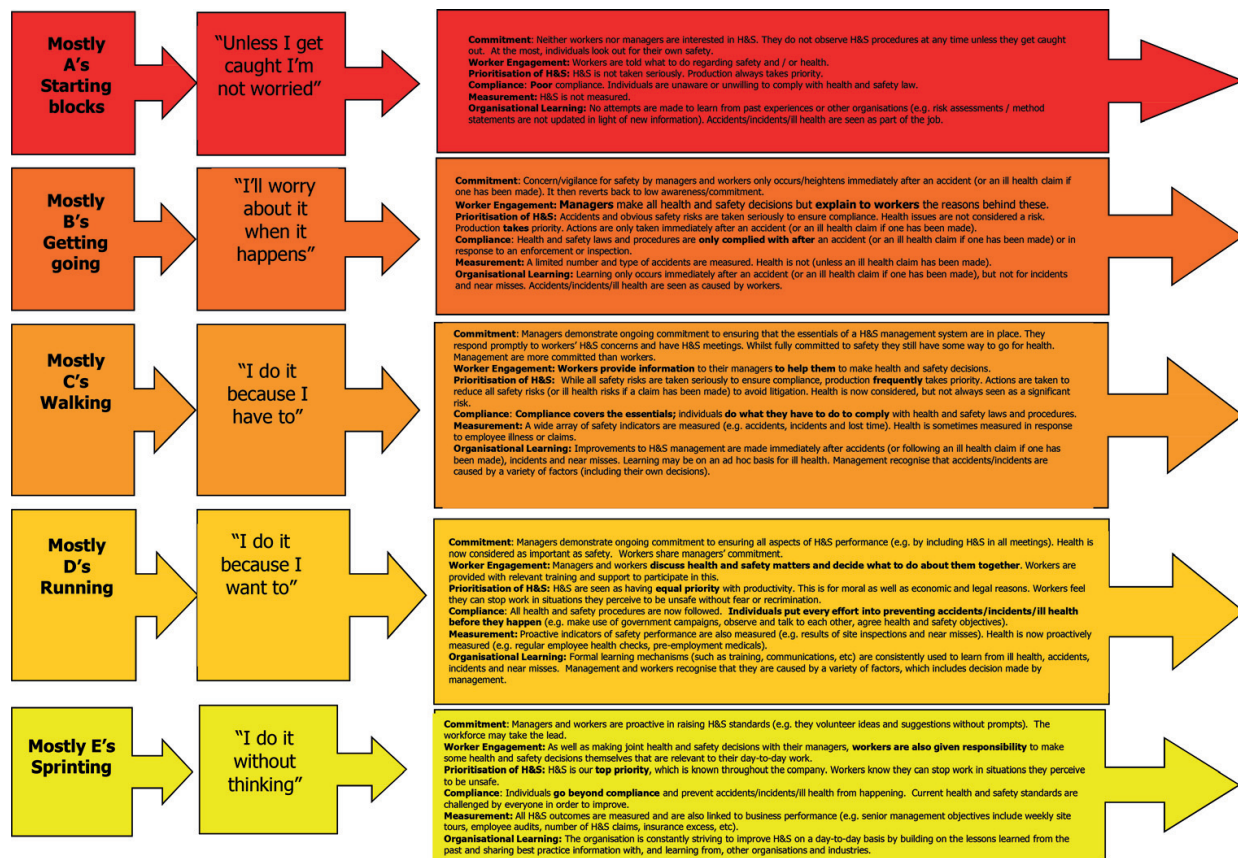
Small businesses in the UK account for 99.3% of all private sector businesses at the start of 2016 and 99.9% were small or medium-sized (SMEs). The combined annual turnover of SMEs was £1.8 trillion. Just under a fifth of all SMEs operate in the construction industry [28]. These numbers show that there is a significant presence of SMEs in the industry, thus it is important for the construction sector that these types of companies implement H&S practices in the workplace in order to diminish accidents and any other risks that affect their workforce and people around the construction site. Small and medium enterprises are being increasingly recognised as “the life blood of modern economies” [29]. Even though this was stated more than a decade ago it still stands true reflecting on the statistics. Therefore the role of leadership for H&S in a construction small company was investigated using the leadership toolkit.

4. Leadership toolkit for health and safety

The Leadership and Worker Involvement toolkit was developed by the construction industry's Leadership and Worker Engagement Forum in UK to help contractors and managers learn how to make health and safety improvements in their businesses. This contains of assessment sheet and then knowing the status and way forward (Figures 1 and 2). The assessment is in the

Building Block	Description	Statements: Which of the following applies to your organisation?
Commitment	The importance you and your workers attach to H&S.	<input type="checkbox"/> A. Neither managers nor workers are interested in health and safety at any time unless they get caught out. At the most, individuals look out for their own safety. <input type="checkbox"/> B. Concern/vigilance for safety by managers and workers only occurs/heightens immediately after an accident (or an ill health claim if one has been made). It then reverts back to low awareness/commitment. <input type="checkbox"/> C. Managers demonstrate ongoing commitment to ensuring that the essentials of a health and safety management system are in place. They respond to workers' health and safety concerns and use various means to consult with workers. Whilst fully committed to safety they still have some way to go for health. Management are more committed than workers. <input type="checkbox"/> D. Managers demonstrate ongoing commitment to ensuring that all aspects of health and safety performance are met (e.g. by including health and safety in all meetings). Health is now considered as important as safety. Workers share managers' commitment. <input type="checkbox"/> E. Both management and the workforce cooperate on health and safety matters and are proactive in raising health and safety standards, (e.g. they volunteer ideas and suggestions without prompts). The workforce sometimes take the lead.
Worker Engagement	The involvement your workers have in H&S decisions.	<input type="checkbox"/> A. Individuals are simply told what to do regarding safety and/or health. <input type="checkbox"/> B. Managers make all health and safety decisions but explain to workers the reasons behind these. <input type="checkbox"/> C. Workers provide information to their managers to help them to make health and safety decisions. <input type="checkbox"/> D. Managers and workers discuss health and safety matters and decide what to do about them together. Workers are provided with relevant training and support to participate in this. <input type="checkbox"/> E. As well as making joint health and safety decisions with their managers, workers are also given responsibility to make some health and safety decisions themselves that are relevant to their day-to-day work.
Prioritisation of Health and Safety	The attention given to H&S compared to 'getting the job done'.	<input type="checkbox"/> A. Health and safety is not taken seriously. Production always takes priority. <input type="checkbox"/> B. Accidents and obvious safety risks are taken seriously to ensure compliance. Health issues are not considered a risk (unless an ill health claim has been made). Production frequently takes priority. <input type="checkbox"/> C. Whilst all safety risks are taken seriously (or ill health risks if a claim has been made) to ensure compliance production sometimes takes priority. Health is now considered but not always seen as a significant risk. <input type="checkbox"/> D. Health and safety are seen as having equal priority with productivity. This is for moral as well as economic and legal reasons. Workers feel they can stop work in situations they perceive to be unsafe without fear or reprimand. <input type="checkbox"/> E. Health and safety is our top priority , which is known throughout the company. Workers know they can stop work in situations they perceive to be unsafe.
Compliance	How the organisation is complying with its H&S responsibilities.	<input type="checkbox"/> A. Poor compliance. Individuals are unaware or unwilling to comply with health and safety law. <input type="checkbox"/> B. Health and safety laws and procedures are only complied with after an accident (or an ill health claim if one has been made) or in response to an enforcement or inspection. <input type="checkbox"/> C. Compliance covers the essentials; individuals do what they have to do to comply with health and safety laws and procedures. <input type="checkbox"/> D. All health and safety procedures are now followed. Individuals put every effort into preventing accidents/incidents/ill health before they happen (e.g. make use of government campaigns, observe and talk to each other, agree health and safety objectives). <input type="checkbox"/> E. Individuals go beyond compliance to prevent accidents/incidents/ill health from happening. Current health and safety standards are challenged by everyone in order to improve.
Measurement	The way H&S is measured.	<input type="checkbox"/> A. No measurement of health and safety is in place (e.g. accident rates are not monitored). <input type="checkbox"/> B. Measurement of safety is limited to the number and type of accidents only. Health is not measured. <input type="checkbox"/> C. Measurements broaden to a wider array of safety indicators including accidents, incidents and lost time. Health is sometimes measured in response to employee illness or claims. <input type="checkbox"/> D. Measurement also includes proactive measures of safety performance (e.g. results of site inspections and near misses). Health is now proactively measured (e.g. regular employee health checks, pre-employment screening). <input type="checkbox"/> E. All health and safety outcomes are measured and are also linked to business performance (e.g. senior management objectives include weekly site tours, employee audits, number of health and safety claims, insurance excess, etc).
Organisational Learning	Learning from experience on H&S. Lessons learned are communicated to workers.	<input type="checkbox"/> A. No attempts are made to learn from past experiences or other organisations (e.g. risk assessments / method statements are not updated in light of new information). <input type="checkbox"/> B. Accidents/incidents/ill health are seen as part of the job. <input type="checkbox"/> C. Learning only occurs immediately after an accident (or an ill health claim if one has been made), but not for incidents and near misses. Accidents/incidents/ill health are seen as caused by workers. <input type="checkbox"/> D. Learning only formally occurs immediately after accidents, incidents and near misses (or following an ill health claim if one has been made). Learning may be on an ad hoc basis for ill health. Management recognise that accidents/incidents are caused by a variety of factors (including their own decisions). <input type="checkbox"/> E. Formal learning mechanisms (such as training, communications, etc) are always used to learn from ill health, accidents, incidents and near misses. Management and workers recognise that they are caused by a variety of factors, which includes decisions made by management. <input type="checkbox"/> F. The organisation is always striving to improve health and safety by building on the lessons learned from the past and sharing helpful information with, and learning from, other organisations and industries.

Figure 1. Leadership toolkit.



Building Blocks	Starting blocks (A)	Getting going (B)	Walking (C)	Running (D)	Sprinting (E)
Commitment	1	2	3	4	Continue to ensure that managers and workers are proactive in raising H&S standards by volunteering their ideas.
Worker Engagement	5	6	7	8	Continue to ensure that workers take the lead on H&S matters and are involved in making H&S decisions
Prioritisation of health and safety	9	10	11	12	Continue to emphasise H&S as a core company value.
Compliance	13	14	15	16	Continue to seek out proactive and innovative ways of preventing accidents and ill health.
Measurement	17	18	19	20	Continue to measure H&S outcomes and link these to business performance.
Organisational learning	21	22	23	24	Continue to make efforts to improve H&S on a day-to-day basis. Share and seek ideas from industry peers and colleagues.

Figure 2. Current H&S system.

areas of: commitment, workers engagement, prioritisation of H&S, compliance, measurement and organisational learning. There are five options for each of the areas and the participant should choose one statement which applies to their company/organisation.

Once the options are chosen in **Figure 1** the next step is to analyse the data to identify which state the company is i.e. starting block, getting going, walking, running and sprinting (**Figure 2**). Thereafter suggestions are provided how to proceed to the next level.

As part of a European Commission (EC) project this tool was administered in an Italian company which is reported in the following section.

5. Case study of a small Italian construction company

This is a company that started 60 years ago which is a family lead small construction company. There are 15 employees working and specialise in commercial, residential, school and refurbishment projects. The project cost varies from 30,000 to 2 million Euros. They undertake three types of work i.e. Skeleton 15% (foundation, column, beams and brickwork); skeleton with plaster and screed (75%) and complete building (10%).

Health and Safety legislation within the UK is established by statute law, the Health and Safety at Work Act 1974 although not a detailed act, it enables further legislation (regulations) to be passed without going back through parliament and under guidance from the European Union guidance in the form of directives. There are similarities of UK and Italian regulations. For example: PPE is called DPI. The Health and Safety Executive (HSE) implemented the Construction Design and Management Regulations (CDM 2015) with the intention to encourage the integration of health and safety into project management. A principal designer/principal contractor is appointed by the client to control the pre-construction/construction phase on projects with more than one contractor. The main duty is to plan, manage, monitor and coordinate health and safety during this phase which they are involved in.

Similarly Italians have Coordinatore per la Sicurezza. D. Lgs nr. 81/08, “a model of organisation and management” satisfies the requirement on health and safety, if it is constructed in accordance with OHSAS 18001 or with the UNI-INAIL guidelines. The regulations include

Building Blocks	Walking (C)	Running (D)
Commitment	✓	
Worker Engagement	✓	
Prioritisation of health and safety	✓	
Compliance	✓	
Measurement		✓
Organisational learning		✓

Figure 3. H&S system.

construction activities in Italy are defined by state law. A company after a firm enrolled in an institution dedicated to work should follow the provisions of the Law D. lga. nr. 81/2008. This law identifies the liable subject around the activity of work and then gives each of the roles. It also lists the minimum requirements necessary to be able to exercise (technical and professional qualification). Therefore in this study it was explored how leadership in small company implements the regulations. As a starting point, the Chief Executive Officer (CEO) and the project manager filled the leadership and workers involvement questions of the toolkit. The mean scores were calculated for the options selected which resulted in 4C's and 2D's (Figure 3). This indicated that the company was in "walking mode" and in some instances in the "running mode".

Building Block	Walking ▶ Running	Running ▶ Sprinting
Commitment	You should now be focused on gaining the commitment of your workers to H&S. Get your workers to think how their behaviour not only affects them, but also their work mates/colleagues and their family if they were to fall ill or become injured as a result of working unsafely. To encourage workforce commitment, continue to make H&S top of the agenda in all meetings, giving it due thought and attention.	Consistently demonstrate an 'open door' approach to any H&S suggestions put forward by your workers and involve them in implementing their own solutions (where feasible).
Worker Engagement	Regularly include your workers in your decisions on which solutions you choose for improving H&S. Ensure workers are trained to participate in decision making. Discuss the pros and cons of different options with them. Encourage them to come to you with their ideas. You should now be jointly making H&S decisions with your workers.	Give your workers appropriate responsibility for making decisions on H&S matters that are directly relevant to them (e.g. PPE selection; tool choices; when they have breaks, hygiene etc). Give your workers every opportunity to generate ideas on improving H&S on an ongoing basis.
Prioritisation of Health and Safety	Ensure your workers are familiar procedures. Through appropriate communication and your own actions ensure that they feel able to stop work in situations they perceive to be unsafe. Make sure you include in your communications that health matters are as important as safety matters. H&S together should be regarded as important as productivity. Develop a strong business case (i.e. cost benefits of H&S) to persuade leaders that H&S is a top priority.	As far as possible, make sure that H&S have a visible presence in all your dealings with your workers (e.g. as the first agenda item on any meeting, in all your documentation, and all your decision-making). Continue to ensure that H&S is a top priority for all leaders by progressing your business case, (i.e. cost benefits of H&S taking priority over production). H&S should now be a core company value.
Compliance	In consultation with workers, and considering previous risk assessments, start to think about what might go wrong in the future. Put preventative measures in place (e.g. signage/prompts, training, etc) following task specific risk assessments carried out with workers.	Use worker engagement and your learning from experience on H&S to identify new ways of improving the company's overall H&S. Generic and task specific risk assessments should be used on a regular basis to inform your H&S decision-making.
Measurement	Broaden what you measure to include proactive indicators of both H&S (e.g. amount of training provided, amount of discussions you have with your staff on H&S). What do these additional measures tell you about your overall productivity in relation to H&S? Consult your workers to help you decide what action to take.	Together with your workforce, continue to monitor the link between what you are collectively measuring, your company's productivity and everyone's attitudes and approach to work, (e.g. morale, job satisfaction). Continue to take appropriate action based on your findings. Set yourself and your leaders objectives to improve H&S on site.
Organisational Learning	Formal learning mechanisms should be in place (e.g. training, communication systems). Formal measures should be in place that uses worker engagement to identify and understand why ill health/accidents/ incidents and near misses happen. Modify your safety management system accordingly. Leaders openly admit to workers that their decisions play a part in H&S outcomes.	Look at what other companies of your size and type of work are doing to improve their H&S. Identify what you can learn from them and what they can learn from you.

Figure 4. Way forward H&S system.

Figure 4 shows the way forward for the company for leadership initiatives in: Commitment; Worker Engagement; Prioritisation of health and safety; Compliance; Measurement and Organisational learning. The next stage, the leadership of the company should aim is to reach the ‘sprinting’ stage as a long-term strategy.

For short term (within 6 months) the company should reach the ‘running’ stage. To enable achieve this ERM framework was proposed as part of the EC project.

6. Incorporating the enterprise risk management framework to health and safety

Analysis of the documents and focus group discussions with project team revealed that there should be a health and safety strand in the enterprise risk management framework and hence it was developed (**Figure 5**). This aspect was further taken forward and details of strategy, process and performance are looked into greater depth. This chapter discusses only the health and safety strand.

Strategy—organisational visions and objectives: as part of the strategy in any organisations H&S is paramount and must be considered. The starting point is to have a vision and objectives from the leadership team. Discussions reveal that there was no H&S policy document as part

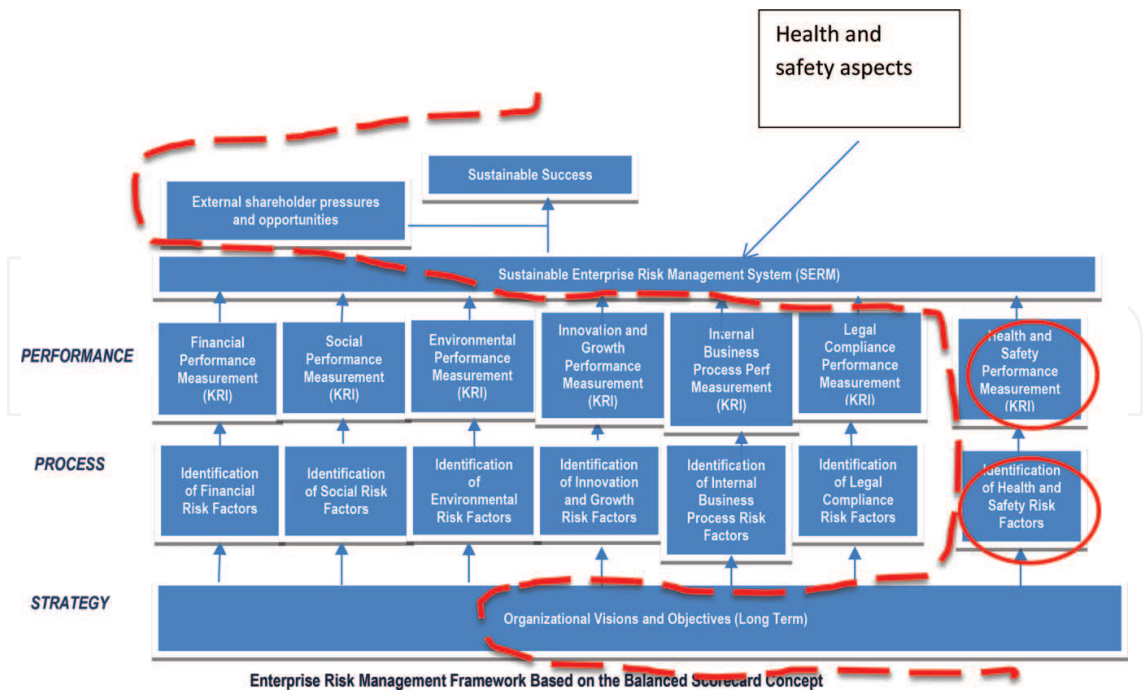


Figure 5. Enterprise risk management with health and Safety.

of the company strategy but they were following aspects on H&S within the company and in its projects. Henceforth a health and safety policy was developed and provided to the company. The policy had general and specific aspects. The nine general aspects included:

1. to provide adequate control of the health and safety risks arising from our work activities
2. to consult with our employees on matters affecting their health and safety
3. to provide and maintain safe plant and equipment
4. to ensure safe handling and use of substances
5. to provide information, instruction and supervision for employees
6. to ensure all employees are competent to do their tasks, and to give them adequate training
7. to prevent accidents and cases of work-related ill health
8. to maintain safe and healthy working conditions
9. to review and revise this policy as necessary at regular intervals

Specific aspects must relate to who takes the responsibilities (a named person within the organisation); Arrangements for Health and Safety Risks Arising from Work Activities; Consultation with Employees; Safe Plant and Equipment; Safe Handling and Use of Substances; Information, Instruction and Training; Competency for Tasks and Training; Accidents, First Aid and Work Related Ill-Health; Emergency Procedures, Fire and Evacuation; Monitoring (ensure safe working practices are followed). This partially agrees with Warren [6] who states 8 ways in which safety in the construction sector can be improved:

1. Ensure equipment has been correctly assembled and installed
2. Make sure that all equipment is properly maintained and regularly checked
3. Avoid working at height where possible and find ways of decreasing it
4. Keep all walkways, stairs, and work areas clear of debris and obstructions
5. Make sure that all materials are stored away safely
6. Provide staff with protective equipment and make sure they can use it correctly
7. Ensure all employees are appropriately trained
8. Ensure all workplace tasks are risk assessed

The H&S policy provided to the small company is comprehensive as it takes into account Safe Handling and Use of Substances; Information, Accident reporting, First Aid and Work Related Ill-Health; Emergency Procedures, Fire and Evacuation; Monitoring. The next step within the ERM is to look into the process of health and safety which is discussed in the following sections.

7. Process within the ERM system: identification of health and safety risk factors

In Italy it is based on the type of client. If it is a public sector client then Health and Safety is considered separately and the cost of the project for construction is separate. Therefore there is no negotiation on the H&S aspects whereas the cost on the construction activities could be negotiated. For example if the total cost of the project is one million Euros the cost allocated for H&S is 50,000 Euros and 950,000 Euro for the construction phase. 50,000 Euro is fixed and must be used for H&S aspects whereas there is room for negotiations in 950,000 Euro say 10–20%. In the case of private client it is a lump sum contract and the cost of health and safety is included in the total cost of project at the tender stage.

When the contract is awarded and the site is to set up there is a checklist that could be used in the construction phase to make sure aspects of health and safety are considered. This can be a document which is based on knowledge gained from previous projects. In the case study company each project has a risk assessment H&S file which identifies project specific risks and also suggests methods to mitigate risk. The issue lies whether the labours on site are able to read and write to understand the risk assessment document.

The project level has to be linked to the company level. Therefore, based on the literature review and focus group with three members (CEO, Senior project manager, project manager) in the case study company 38 risk factors were identified (**Table 2**).

This list was given to the senior project manager who had experience as developer, planner, contractor and working for a company populated the matrix. Prior to that, they have to understand the risk scale. In a scale of five the risk factors are to be identified where 1—being the least risk and 5—being catastrophic (see **Table 3**). The probability factor is not considered as it depends on the projects they are involved. Also the relationship of the risk factors for project and the company was asked. **Table 4** is a snapshot of 13 factors of the 38 risk factors. Y means it is a risk factor. Prior to discussing the risk factors it is important to look into the role of effective leaders in this context.

Edgeman et al. [30] noted that leaders are the raw material of business excellence as well as organisational failure. Some of the causes of failure are: lack of long-term management commitment; wrong people on the team; teams do not understand their work completely; team take too much; focus on metrics rather than processes; not positioning projects within a larger strategy; misunderstanding the organisation's mission, goals and objectives. Welch and Welch [31] and McEwan [32] listed seven rules for effective leaders (see **Table 5**).

Leaders can be effective in helping those involved to think creatively and discover the possibility of achieving a win-win situation only when they incorporate the interests, pronounced or latent, from the different participating groups [33]. Thus, vision formation should result from mutual influences in the collaboration. In studying leader effectiveness, Denison et al. [34] found that the most effective leaders have styles that reflect greater complexity in their thinking and variety in their behaviours. They are able to recognise paradox, contradiction,

1. Cost allocated to H&S aspects in the clients brief (CDM co-ordinator/co-ordinator)	20. Extreme task demands—example: high workloads, boring and repetitive jobs, jobs that require a lot of concentration, too many distractions
2. H&S aspects during tight project schedule	21. Social issues—example: peer pressure, conflicting attitudes to health and safety, conflicting attitudes of workers on how to complete work, too few workers
3. Checklist provided by the co-ordinator for risk assessment thorough out the project life cycle	22. Individual stressors—example: drugs and alcohol, lack of sleep, family problems, ill health
4. Checklist followed by the company for risk assessment	23. Violation of health and safety laws and regulations
5. Lack of method statement	24. Risks associated with project transport
6. Lack of DPE/PPE	25. Premises
7. Measure to prevent falling from heights	26. Defined roadways/one way system
8. Excavation activities	27. Need for reversing eliminated/minimised
9. Rebars/steel rods edge exposed	28. Roadways in good condition
10. Defective scaffolding	29. Speed bumps
11. Welfare aspects	30. Plant
12. Access to utilities (water, electricity)	31. Vehicle selection e.g. good driver access/visibility
13. Equipment condition aspects	32. Vehicles maintained in good condition—tyres/brakes
14. Equipment usage aspects—example: inaccurate or confusing instructions and procedures	33. Seat restraints fitted
15. First aid aspects	34. Reversing aids provided
16. Fire prevention measures	35. Procedures
17. Accident reporting procedures including near misses	36. Speed limits set for vehicles
18. Human error which involves mistakes	37. Vehicles chocked appropriately
19. The work environment—example: too hot, too cold, poor lighting, restricted workspace, noise	38. Reversing controlled

Table 2. Risk factors.

Scale	Classification	Explanation
1	Insignificant	Insignificant infringement of operating procedure with immediate correction, none loss
2	Minor	Low loss, <10% cost increase, <5% time increase, only very demanding applications are affected
3	Moderate	Substantial loss, 10–20% cost increase, 5–10% time increase, quality reduction requires sponsor approval
4	Major	Major loss, 20–40% cost increase, 10–25% time increase, quality reduction unacceptable to sponsor
5	Catastrophic	Enormous loss, permanent damage, >40% cost increase, >25% time increase, project end item is effectively useless

Table 3. Risk scale.

Sl. no	Welch and Welch [31]	McEwan [32]
1	Leaders relentlessly upgrade their team, using every encounter as an opportunity to evaluate, coach, and build self-confidence	Leaders should establish, implement and achieve great standards
2	Leaders make sure people not only see the vision, they live and breathe it	Leaders should be an instructional resource for your staff
3	Leaders get into everyone's skin, exuding positive energy and optimism	Leaders should create a school culture and climate conducive to learning (for everyone)
4	Leaders establish trust with candour, transparency, and credit	Leaders should communicate the vision and mission of the organisation
5	Leaders have the courage to make unpopular decisions and gut calls	Leaders should set high expectations for staff and themselves
6	Leaders probe and push with a curiosity that borders on scepticism, making sure their questions are answered with action	Leaders should develop leaders
7	Leaders inspire risk taking and learning by setting the example	Leaders should establish and maintain positive relationship with other staff members

Table 4. Seven rules for effective leaders.

and complexity in their environment, and simultaneously attend to seemingly opposing and competing requirements, such as the need for integration and differentiation, and the demand for accountability and creativity at the same time. Alternatively, Pitcher and Smith [35] examined the possibility of sharing strategic decision-making processes in teams of leaders with different leadership strengths. They concluded that top management teams that exhibit strong cognitive diversity—a balanced combination of different types of leaders—are more successful in producing long-term results, because they include diverse ideas stemming from different

Health & Safety risk factors : There are 20 key risk factors identified for Health and Safety aspects for construction SMEs. Please put "y" in the appropriate places for the table below. KRF mean key risk factor and MRF means minimum risk factor. The risk factors for project and company could be marked as "x". Please see three examples provided at the bottom of the sheet. Also for influence of KRI (key risk indicators) instructions are provided at the bottom of the table.

Risk factor	Construction company		Developer		Planner		Contractor		Connection with	
	KRF	MRF	KRF	MRF	KRF	MRF	KRF	MRF	Project	Company
Health & Safety risk factors										
1. Cost allocated to H&S aspects in the clients brief (CDM co-ordinator/co-ordinator)		Y	Y			Y		Y	Y	
2. H&S aspects during tight project schedule	Y		Y			Y	Y		Y	
3. Checklist provided by the co-ordinator for risk assessment thorough out the project life cycle		Y		Y		Y		Y	Y	
4. Checklist followed by the company for risk assessment	Y			Y		Y	Y		Y	Y
5. Lack of method statement		Y		Y		Y		Y		Y
6. Lack of DPE/PPE	Y			Y		Y	Y			Y
7. Measure to prevent falling from heights	Y			Y		Y	Y		Y	Y
8. Excavation activities	Y		Y		Y		Y		Y	
9. Rebars/steel rods edge exposed		Y		Y		Y		Y		Y
10. Defective Scaffolding	Y			Y		Y	Y		Y	
11. Welfare aspects		Y		Y		Y		Y		Y
12. Access to utilities (water, electricity)	Y		Y			Y	Y		Y	
13. Equipment condition aspects		Y		Y		Y		Y	Y	Y

Table 5. Health and safety risk factors.

cognitive perspectives and permit a more comprehensive and creative analysis of strategic alternatives. Therefore it is necessary to have H&S measurement performance matrix.

8. Performance—health and safety measurement performance

Thiveos [36] noted that leaders with responsibilities for health and safety concerns in their organisations rely on technology solutions to manage training, certification, incidents, observations, records, documents, risk assessment, corrective actions, inspection, monitoring, auditing, and to provide results-oriented performance metrics to stakeholders. Furthermore, Kelloway et al. [37] identified the 10 different health and safety leadership actions including: expressing satisfaction when jobs are performed safely; rewarding achievement of safety targets; continuous encouragement for safe working; maintaining a safe working environment; suggesting new ways of working more safely; encouraging employees to openly discuss safety at work; talking about personal value and beliefs in the importance of safety; behaving in a way that demonstrates commitment to safety; spending time to demonstrate how to work safely; and, listening to safety concerns.

In the EC project a Balance Score Card (BSC) concept developed by Kaplan suggests that we view the organisation from four perspectives, and to develop metrics, collect data and analyse it relative to each of these perspectives were adapted. Therefore the identified health and safety risk factors were mapped with the four perspectives i.e. financial, clients, business process and learning and growth. These are further classified as: Financial (cash flow, profit, stock turnover, turnover claim); clients (client satisfaction, new client, client loyalty); business process (quality of services, number of errors; percentage of delivered project; average hourly cost of labour); learning and growth (resources spent in training; workers satisfaction; number of prestigious project; resources spent in research).

From the analysis of **Table 6** it clearly indicates that health and safety risks factors fall into learning and growth of the company within which works satisfaction is ranked as high and medium risk (8 major + 6 medium + 1 minor = 15 risk factors) followed by business process related to quality of services (5 major + 3 medium = 8) and clients related to client satisfaction (4 major + 3 medium + 1 minor = 8). Thereafter is the financial aspect (4 major + 1 medium + 1 minor = 6) related to profit followed by business process related to number of errors (2 major + 3 medium + 1 minor = 6).

It is interesting to note that financial aspects comes third whereas the learning and growth comes first therefore it does not surprise why small and medium enterprises pay less attention to health and safety aspects. Especially activities on a project or in a company are going well i.e. no accidents or fatality and/or no inspections on site. However, it is revealing that violation of health and safety law and regulations have an impact on all the four aspects of BSC (financial, clients, business process and learning and growth). This is an important finding from this case study which informs professional at site (operatives/site trainees), project and programme level (site/project/programme managers) and for leadership team (directors/board members) regarding the attention that H&S needs to be given.

Risk factor	Influence of KRI	Financial	Clients		Business process		Learning and growth	
		Profit	Client satisfaction	Client loyalty	quality of service	n. of errors	% of delivered project	Workers satisfaction
2. H&S aspects during tight project schedule	4	Y			Y			Y
6. Lack of DPE/PPE	4	Y			Y			Y
7. Measure to prevent falling from heights	4	Y	Y		Y	Y		Y
8. Excavation activities	4	Y						Y
10. Defective Scaffolding	4							Y
16. Fire prevention measures	4				Y			Y
• Individual stressors – example: drugs and alcohol, lack of sleep, family problems, ill health	4		Y			Y		Y
19. Violation of health and safety laws and regulations	4	Y	Y	Y	Y		Y	Y

Risk factor	Influence of KRI	Financial	Clients		Business process		Learning and growth	
		Cash Flow	Client satisfaction	New client	quality of service	n. of errors	Workers satisfaction	
1. Cost allocated to H&S aspects in the clients brief (CDM co-ordinator/co-ordinator)	3		Y		Y	Y	Y	
4. Checklist followed by the company for risk assessment	3		Y		Y		Y	
9. Rebars/steel rods edge exposed	3							
12. Access to utilities (water, electricity)	3							
13. Equipment condition aspects	3	Y	Y		Y	Y	Y	
15. First aid aspects	3							
17. Accident reporting procedures including near misses	3			Y				
• The work environment – example: too hot, too cold, poor lighting, restricted workspace, noise	3					Y	Y	
• Extreme task demands – example: high workloads, boring and repetitive jobs, jobs that require a lot of concentration, too many distractions	3					Y	Y	
• Social issues – example: peer pressure, conflicting attitudes to health and safety, conflicting attitudes of workers on how to complete work, too few workers.	3					Y	Y	

Risk factor	Influence of KRI	Financial	Clients		Business process		Learning and growth	
		Profit	Client satisfaction		n. of errors	Resources spent in training	Workers satisfaction	
11. Welfare aspects	2	Y	Y		Y		Y	
14. Equipment usage aspects - example: inaccurate or confusing instructions and procedures.	2					Y		

Table 6. Balance score card with high, medium and minor risk factors.

9. Conclusion

The construction sector is characterised for having the largest numbers of accidents and health deterioration among all the working sectors. Companies must also have a health and safety system which has the strategy, process and performance aspects. Irrespective of the size of the company there should be a health and safety policy. This leads to providing health and safety manual at the construction site which has the risk assessments. The companies should make sure the employees on the site are able to read and understand the associated risks which will enable them to implement it. In addition, it is important for construction stakeholders to invest in health and safety strategies.

The first step is to assess at what level the company is i.e. starting, get going, walking, running and sprinting from six building blocks. They are: commitment, workers engagement, prioritisation of H&S, compliance, measurement and organisational learning. Thereafter apply the ERM which includes strategy, process and performance to enable to achieve sustainable company success. In the case study company eight risk factors stood out of the 38 identified which had influence on financial, client, business process and learning and growth. All the eight risk factors contributed to workers/professional satisfaction. They are H&S aspects during tight project schedule; Lack of DPE/PPE; measures to prevent fall from heights; measures during excavation; using defective scaffolding; providing fire prevention measures; individual stress and violation of regulations.

In small companies leadership must have health and safety policy which clearly publicise and states the values behind health and safety standards and procedures through simple ways such as posters and the repetition of goals such as everyone going home safely at night. Therefore, in conclusion leadership for H&S risk management is paramount for a survival and sustainability of small companies.

Acknowledgements

The authors would like to express their gratitude to the European Commission for granting the project and also to the company which supported us. This enabled us to write the book chapter.

Author details

Subashini Suresh*, Chike Oduoza and Suresh Renukappa

*Address all correspondence to: s.subashini@wlv.ac.uk

University of Wolverhampton, Wolverhampton, UK

References

- [1] ILO. Safety and Health at Work ILO Geneva, Switzerland. 2018. <http://www.ilo.org/global/topics/safety-and-health-at-work/lang-en/index.htm> [Accessed: 18/06/2018]
- [2] Reese CD, Eidson JV. Handbook of OSHA Construction Safety and Health. 2nd ed. London: CRC Press; 2006. ISBN 1420006231
- [3] Sun ACS, Zou PXW. Understanding the true costs of construction accidents. In: Proceedings of CIB World Congress; 11-13 May 2010; Salford, Greater Manchester, UK. 2010
- [4] Hughes P, Ferrett E. Introduction to Health and Safety in Construction. Oxford, UK: Butterworth-Heinemann; 2016
- [5] Idoro GI. Effect of mechanisation on occupational health and safety performance in the Nigerian construction industry. Journal of Construction in Developing Countries. 2011; 16(2):27-45
- [6] Warren. How dangerous is the UK construction industry? 2017. <http://www.jelfgroup.com/blog/2017/insurance/health-safety-dangerous-uk-construction/> [Accessed: 20th March 2017]
- [7] Suresh S, Alghanmi I, Mushatat S, Olayinka R. Examining the satisfaction level of construction workers on safety management in the Kingdom of Saudi Arabia. Journal of Construction in Developing Countries. 2017;22(1):97-113

- [8] Idoro GI. The effect of globalization on safety in the construction industry in Nigeria. In: Proceedings of International Symposium on Globalization and Construction, School of Civil Engineering, Asian Institute of Technology; November; Bangkok, Thailand. 2004
- [9] Idoro GI. Contractors' characteristics and health and safety performance in the Nigerian construction industry. In: Proceedings of CIB World Building Conference on Construction for Development; 14–18 May 2007; Cape Town, South Africa. 2007
- [10] ILO. Thailand Occupational Safety and Health in the Construction Industry. 2005. Available: <http://www.ilo.org/public/english/region/asro/bangkok/download/background/osh/conth05.pdf>
- [11] Mbuya E, Lema NM. Towards development of a framework for integration of safety and quality management techniques in construction project delivery process. In: Proceedings of the First International Conference of CIBW107 – Creating a Sustainable Construction in Developing Countries; 11-13 November 2002. 2002
- [12] Enshassi A, Choudhry RM, Mayer PE, Shoman Y. Safety performance of subcontractors in the Palestinian construction industry. *Journal of Construction in Developing Countries*. 2008;**13**(1):51-62
- [13] ILO. Safety and health at work. 2017. <http://www.ilo.org/global/topics/safety-and-health-at-work/lang-en/index.htm> [Accessed: 20th March 2017]
- [14] Lee S, Halpin DW. Predictive tool for estimating accident risk. *Journal of Construction Engineering and Management*. 2003;**129**(4):431-436
- [15] Koehn E, Datta NK. Quality, environmental, and health and safety management systems for construction engineering. *Journal of Construction Engineering and Management*. 2003;**129**(5):562-569
- [16] Anton TJ. *Occupational Safety and Health Management*. 2nd ed. New York: McGraw-Hill; 1989
- [17] Lingard H, Rowlinson S. *Occupational Health and Safety in Construction Management*. Oxon, UK: Spon Press; 2005
- [18] Gibb A, Haslam R, Hide S, Gyi D, Duff R. What causes accidents? Proceedings of the Institution of Civil Engineers (ICE). 2006;**159**(6):46-50
- [19] Sunindijo RY, Zou PXW. CHPT construct: Essential skills for construction project managers. *International Journal of Project Organisation and Management*. 2011;**3**(2):139-163
- [20] Martin H, Lewis TM. Pinpointing safety leadership factors for safe construction sites in Trinidad and Tobago. *Journal of Construction Engineering and Management*; 2014;**140**: 2-2014
- [21] Tyssen AK, Wald A, Spieth P. The challenge of transactional and transformational leadership in projects. *International Journal of Project Management*. 2014;**32**(3):365-375

- [22] Daniels AC, Daniels JE. Measure of Leader. Atlanta, GA, USA: Performance Management Publications; 2005
- [23] Cattell K, Flanagan R, Jewell C. Competitiveness and productivity in the construction industry: The importance of definitions. In: Conference Hosted by the Construction Industry Development Board, South Africa. 2003. pp. 25-35
- [24] Ribiere VM, Sitar AS. Critical role of leadership in nurturing a knowledge supporting culture. Knowledge Management Research & Practice. 2003;1:39-48
- [25] Lin J, Mills A. Measuring the occupational health and safety performance of construction companies in Australia. Facilities. 2001;19(3/4):131-138
- [26] Champoux D, Brun J. Occupational health and safety management in small size enterprises: An overview of the situation and avenues for intervention and research. Safety Science. 2003;41:301-318
- [27] European Commission. SME Definition. 2017. http://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_en [Accessed: February 2017]
- [28] BIS. UK Small Business Statistics. 2017. <http://www.fsb.org.uk/media-centre/small-business-statistics> [Accessed: March 2017]
- [29] Ghobadian A, Gallea D. Total quality management in SMEs. Omega. 1996;24(1):83-100
- [30] Edgeman RL, Dahlgaard SMP, Dahlgaard JJ, Scherer F. On leaders and leadership. Quality Progress. 1999;32(10):49-54
- [31] Welch J, Welch S. Winning. USA: Harper Business; 2005
- [32] McEwan. Seven Steps to Effective Leadership. Thousand Oaks, CA: Corwin; 2003
- [33] Huxham C, Vangen S. Leadership in the shaping and implementation of collaboration agendas: How things happen in a (not quite) joined-up world. Academy of Management Journal. 2000;43(8):1159-1175
- [34] Denison DR, Hooijberg R, Quinn RE. Paradox and performance: Toward a theory of behavioral complexity in managerial leadership. Organizational Science. 1995;6(5):524-540
- [35] Pitcher P, Smith AD. Top management team heterogeneity: Personality, power, and proxies. Organizational Science. 2001;12(1):1-18
- [36] Thiveos. Predictive Enterprise risk management [MBA dissertation]. Canada: Athabasca University; 2009
- [37] Kelloway EK, Mullen J, Francis L. Divergent effects of transformational and passive leadership on employee safety. Journal of Occupational Health Psychology. 2006;11(1):76-86

