

**Strategy to Enhance Competitive Advantage based on
Implementation of Health Safety Environmental
Management**

Abstract

Performance of health safety environmental (HSE) has been tightly demanded by stakeholders (customer, government, public, NGO, employee) and become essential factors of organization's competitive advantages. Consistent implementation of top management commitment, process management and human resources management should have given high HSE performance leading to improving customer satisfaction, legitimacy and reputation from which better financial performance can be gained. The research aims to investigate effects of the three constructs, namely top management commitment, process management and human resources management to its EHS performance and subsequent effects to organization's competitive advantage and financial performance. The study uses descriptive and quantitative statistical methods involving 119 companies of which SEM is used to parse linkages between factors. The results show that the strategic model can enhance competitive advantage strongly and affect weakly financial performance.

Key words: competitive advantages, performance of health safety environment, management system, financial performance

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INTRODUCTION

Occupational health and safety incidents and environmental pollution are inevitable risks faced by any organizations. In Indonesia, reported accidents in year 2010 showed alarming figure in which 86,693 occupational accidents occurrences consisting of 1,965 deaths, 31 permanent disabilities, 3,662 functional disabilities, 2,313 partial disabilities and 78,722 full recovered. Whilst, environmental accidents reached to on average 70 cases every year and predicted to increase from year to year reaching up to 50-70 percent. These environmental cases are resolved in courts, others ended up in sanctions given to 'polluters' either as criminal or administrative sanctions. Other drawbacks experienced by the polluting companies from temporary or permanent banning to operate are lost of business opportunities and damaged reputation.

At the same time, pressures from stakeholders are increasing from years to years. Government in many countries play dynamic roles in issuing and enforcing tighter HSE

(Health Safety Environment) regulations in order to reduce HSE accident occurrences. As well as, surrounding communities demand for free from nuisances impacted by environmental pollution (water, air, soil, flora, fauna, noise, odour, vibration) and from increasing safety risks as a result of companies' operations. Investors, bankers and insurance companies put environmental and OHS performance in their financial evaluation and investment decision-making. To make it worse, employees through industrial relationship mechanism require for safe and healthy working place.

Organizations have struggle to address these demands by means of applying what required by regulations and international standards into their HSE management practices. However, high number of Occupational Health Safety (OHS) accident and environmental pollution suggest only that there are gaps between the stakeholders' expectation (government, society, customers, employees, NGO) to today's organizations level of management achievement. Causing factors to the problems might be lacks of top management commitment, no management system to ensure consistency of HSE processes, separated HSE aspects from the main business, weaknesses in the human resources management. Other than that, there are opinions that contribution of environmental and OHS performance, when achieved, has not guaranteed to give competitive advantage and financial benefits except spent internal resources.

In that current reality of external surrounding characterized as dynamic, complex and continuously demanded should have encouraged companies to put environmental and OHS issues as part of company strategy. Companies should have strategy in executing their HSE management for which they can utilize the 'threats' as competitive advantage leading to financial strength instead as burden weakening overall performance. This condition pushes necessity to a research investigating existence or non-existence of elements influencing to environmental and OHS performance as well as their effect to competitive advantage and financial.

The purpose of this study is to examine impacts of management commitment, process management and human resource management to the degree of HSE performance. Furthermore, it has purpose to see subsequent effects of HSE performance to companies' competitive advantage and financial performance.

LITERATURE REVIEW

GEMI (2005) claims that there is solid evidence that HSE performance contributing to shareholder value as tangible and intangible benefits. Tangible performance can be noted as rate and severity of incidents, percentage of regulation compliance, concentration of pollutant in environmental media (water, air, soil), number of occupational health cases. Intangible performance is non-measurable indicator such as company growth contributed by organization management execution including brand equity, human resource capital and strategy execution (Hoffman, 2000). GEMI (2005) makes an illustration of interlinkage between shareholder value in the following drawing:

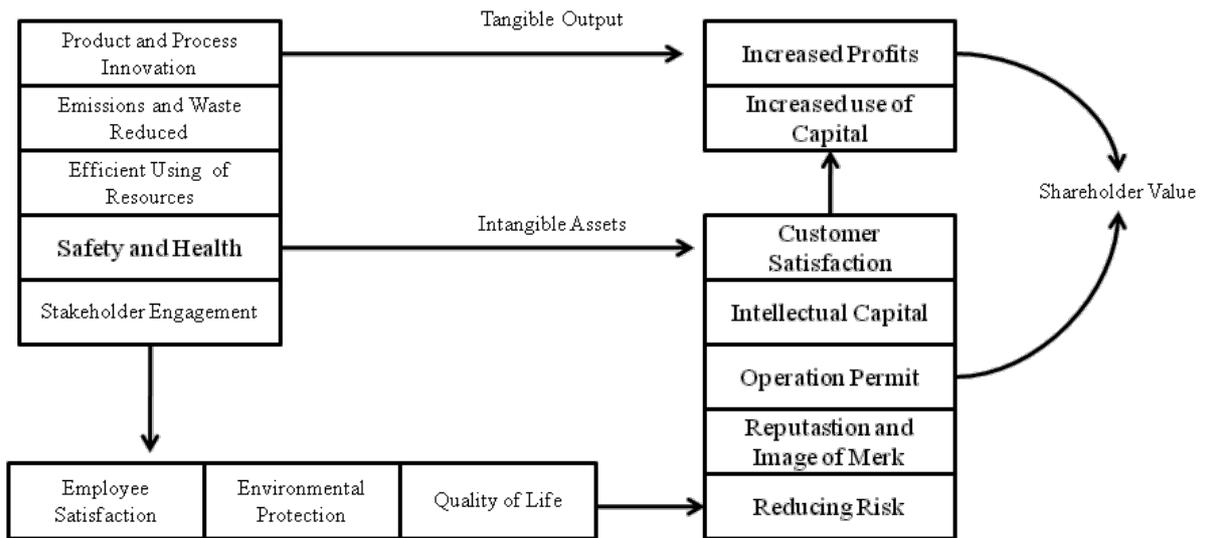


Figure 1 Interlinkage Between Shareholder value and HSE Performance (GEMI 2005)

The above model shows that HSE management is capable of creating product and process innovation, reducing waste emission, conserving natural resource, protecting safety and health, and engaging stakeholder involvement. These lead to two outputs, which are tangible and intangible asset. Tangible asset is related to an increase in profit and capital utilization. Intangible asset includes customer satisfaction, relation of customer, corporate culture, operation permit, reputation and brand image, risk reduction, and intellectual capital (Fernandez, 2002).

Non-financial performance has advantages as it focuses on the intangible asset that drive most of the stakeholder value and a predictor of better future condition. Doyle (2004) states that Intangible asset comprising of R&D, knowledge, intellectual right and personnel skills, a world-wide network and brand are the main keys for the creation of company welfare. Srivastava et al. (1998), Doyle (2004), Porter and Van der Linde (1995) agree that intangible asset can be utilized in strategy to win competition and give long-term benefit. A supporting fact to these opinions is that ratio of market value to book value of companies listed in the Fortune 500 is around 3.5. This means that more than 70% lay on the intangible asset (Srivastava et al. 1998).

Integration between OHS and environmental management

Integration of environmental management and OHS (occupational health safety) management means how well the environmental management blended with OHS management. Management elements defined in EMS ISO 14001:2004 and OHSAS 18001: 2007, which both are most adopted management system, can be integrated. The system is built on the basis of PDCA cycle as depicted in the following table. Putting in different perspective, this clauses structure can be regrouped into human sub-system and process sub-system referring Agarwal (2002) who summarized that management is consisted of process and social dimension. In this reseach, HSE management system elements are regrouped into three constructs: Management commitment, Human resource management, and Process Management as shown in the following table.

Table 1 Regrouping management system into three constructs

Cycle	Clause	Term	Dimension	Subsystem
<i>PLAN</i>	4. 2	HSE Policy	Man in top position	Management

				Commitment
	4. 3. 1	Risk analysis	System or process	Process management
	4. 3. 2	Regulation identification	System or process	Process management
	4. 3. 3	HSE objectives	System or process	Process management
<i>DO</i>	4. 4. 1	Responsibility and authority	Social	Human resource management
	4. 4. 2	Competency, awareness, training	Social	Human resource management
	4. 4. 3	Communication, Participation, Consultation	Social	Human resource management
	4. 4. 4	Documentation	System or process	Process management
	4. 4. 5	Document control	System or process	Process management
	4. 4. 6	Operational control	System or process	Process management
	4. 4. 7	Emergency preparedness and response	System or process	Process management
<i>CHECK</i>	4. 5. 1	Monitoring and measurement	System or process	Process management
	4. 5. 2	Compliance evaluation	System or process	Process management
	4. 5. 3	Corrective action	System or process	Process management
	4. 5. 4	Record control	System or process	Process management
	4. 5. 5	Internal audit	System or process	Process management
<i>ACT</i>	4. 6	Management review	Man in top position	Management Commitment

Source: ISO 14001 (2004) and OHSAS 18001 (2007)

Commitment of Top Management

The success of the management system depends on commitment from all levels and functions of the organization, and especially from top management (ISO 14001: 2004). HSE performance is dependent upon top management decision as long as he or she has agreed on values and his/ her strategic decision. Agyem-Bediako (2007) studied that high top management commitment is present in multinational companies, nonetheless since the commitment represented in the safety policy was not implemented effectively it did not reduce injury rate. Rowley (2009) revealed similar results in which there is not a direct link between the respective top leadership practice and incidence rates. She suggested, though, that activities of numerous managers throughout organization have a more direct impact on safety performance than the activities of the top leader, who does not have frequent and personal contact with employees. The leader communication style, in particular, gave direct effect to safe plant operation (Golberg, 2003). It is concluded from these research that management commitment and how it presented affects other elements of organization (hypothesis 1 and hypothesis 2).

Process and Human resource management

Management consists of system dimension and social dimension (Agarwal, 2002). System dimension relates to integrated ideas, things and personnel, which is comprised of complex combination of activities, authorities and correlation among working process, methods, technical and environment. The social dimension means human and their interactions. For instance, a procedure to handle HSE complaints stipulate a process in term of actions to document HSE complaints, evaluate their validity, investigate root causes and finally solve the problems. Obviously, these processes need human resource to run them.

Human and process factors have affected each other since one relies on the other to accomplish an activity. Dekker (2002) quoted in Wallace (2005) summarized two occupational safety views: first view is a traditional human error as reason for accident and

second view is human error as only a symptom that might be caused by safety system. Cai (2005) investigated an interesting phenomenon happened in construction companies, which had comprehensive safety program (a process dimension) but did not achieve expected high safety performance. The study showed that safety culture (social dimension) involving social element of organization plays a mediating role in affecting the safety program and subsequently on safety performance. In this study, it is hypothesised that human resource and process have non-recuperative relationship (hypothesis 3 and hypothesis 4).

Strategy in executing HSE management

Croft Kan *et al.* (2006) states that a corporation in solving their environmental problems is divided into two poles. One side takes environmental investment as cost to balance between environmental worries and economical and the other side considers it as moral obligation. His study showed that motivation to competitive advantage, legitimacy and CSR is encouraged by 1) pollution control investment generates economical benefit, 2) when other party do them, 3) obligation to duties and responsibilities. Menguc *et al.* (2010) undertake research to answer two question regarding interactive effects between internal and external forces to proactive environmental strategy and its effects to company performance. His research result showed that proactive environmental strategy moderated by government regulation intensity and customer sensitivity to environmental matters. Proactive environmental strategy is a construct containing two dimensions, which are pollution prevention and top management support to environmental protection. Moon (2005) proved that forces to do pollution prevention are growned from quick benefit shown from process efficiency in compared to implement environmental management system ISO 14001.

HSE Performance

Researchers have shown interest on high HSE performance effects to other aspects of organization elements. Godbey (2006) suggested that improving behaviour-based safety has given positive effect to other organizational variables such as productivity and quality. Alexopoulos *et. al.* (2011) provided empirical findings, which reveal that improved environmental performance is a potential source of competitive advantage leading to more efficient processes, improvements in productivity, lower costs of compliance and new market opportunities. Garland (2005) quoting Miles & Covin (2000) and Menon & Menon (2000) present research result revealing that public relation focusing on corporate environmental initiatives can be used as competitive advantage and financial and lead to company reputation. Effect of HSE performance to competitive advantage and financial performance is put into hypothesis 7 and 9 respectively.

Competitive advantage

Competitive advantage is a superior performances above of its competitors for which company has to make differentiation to itself from the perspective of current and future customer (Porter, 1990). Elements of competitive advantage on environmental issues can be interpreted as company motivation to competition, legitimacy (licence to operate), CSR (economic, environmental, social, human rights, society) and reputation (Croft Kan *et al.*, 2006). Moon and Kyung-hee (2005) found that big companies and companies having close relationship with customer tend to participate in environmental protection program to increase *green image* for which strengthen competitive power in market. The study result further show that participation in environmental protection is not always correlated with intensity in capital investment, financial performance, public pressure, and government pressure.

Although, being competitive is major contributor of organization business sustainability and inherent performance, it is always interesting to know how this competitive advantage improves financial performance. Peters (2007) showed that there is statistically correlation between CSR and company performance. Company does not only enhance its financial power by investing and having CSR reputation, but superior reputation significantly contribute to superior competitive advantage (company performance is measured relative to average of industrial performance). Oeyono et al (2011) investigated effect of Indonesian companies' CSR consisted of core indicators as follows: economic, environmental, social, human rights, society, and product responsibility. The study revealed that there is a positive relationship between CSR and profitability, although it is weak (18 per cent for EBITDA and 16 per cent for EPS). Hypothesis 8 stipulates relationship of competitive advantage to financial performance.

Financial performance

Traditionally company performance is measured from financial parameters such as *Return on Asset (ROA)*, *Return on Investment (ROI)* atau *Return on Sales (ROS)* (Fernandez 2002). Impact of HSE management system to financial performance has not been confirmed since there is not any single pattern of the impact. Some researcher found that it has given positive impact, whereas others have not and the rest have been just neutral. Watson et al. (2004) found that EMS implementation does not negatively impact a firm's financial performance. Zhao (2006) proved that implementation of EMS reduce ROA (Return on Asset) and ROR (Return on Revenue) but it has not effect to OPR (Operating Revenue). Noh's (2012) research results indicated that profitability variables (ROA1, ROA2, ROS, Stock price, and Tobins Q) show immediate positive abnormal effects after firms applied for the certification, while the market benefit variables (Sales growth rate and Sales/Assets) show gradual improvements.

Whilst, Moneva and Ortas (2009) analysed environmental and financial performance of a sample of 230 European companies using a partial least squares model (PLS) which support the idea that enterprises obtaining higher rates of environmental performance shows better financial performance levels in the future. Stanwick and Stanwick (2000) investigation showed that high financial performers had higher incidences of environmental policies and/or environmental commitments than low performers of which the highest commitment is owned by medium performers. Kim (2012) studied on heavy pollution industries cannot reach to certain relationship due to heterogeneity of firms examined.

PROBLEM FORMULATION

The re-structure of HSE management system as mentioned above is presented in Figure 1. The model shows that Management commitment affects, both Process management defining sequences of activities and Human resources defining who does the operations. Interaction of the three constructs results in the HSE performance to affect Competitive advantages and Financial performance. There is always a dicotomy whether the management weakness come from human factor or system one. The research addresses this issue by putting a non-recuperative relation between the latent of Process management representing system dimension and latent of Human resource management representing human dimension.

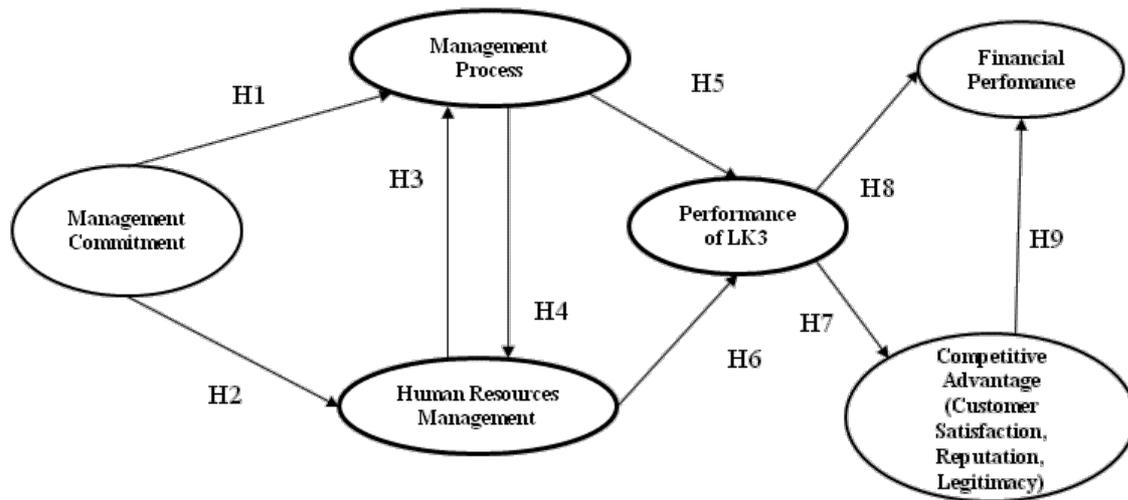


Figure 2 Framework of Thought on the Strategic to Enhance Competitive Advantage on the Basis of HSE Management

The above framework consists of nine (9) relationships from which nine propositions are formed. Thus, hypothesis tested are as follows:

- H1: Management commitment has positive effect to Process management
- H2: Management commitment has positive effect to Human resource management
- H3: Human resource management has positive effect to Process management.
- H4: Process management has positive effect to Human resource management.
- H5: Human resource management has positive effect to HSE performance.
- H6: Process management of HSE has positive effect to HSE performance.
- H7: HSE performance has positive effect to Competitive advantage (customer satisfaction, customer complaint, reputation, award, legitimacy and external relation)
- H8: HSE performance has positive effect to Financial performance.
- H9: Competitive advantage (customer satisfaction, customer complaint, reputation, award, legitimacy, external coordination) has positive effect to Financial performance.

METHODOLOGY

Respondent of the research is companies operating in Indonesia spreading in Java, Sumatra, Sulawesi and Papua comprising of oil and gas, mining, pharmaceutical, chemical, textile, petrochemical, electronics, electrical, basic metals, machinery and shipping. Sample is collected using purposive sampling method from a list of organization has implemented either EMS ISO 14001, PROPER (Indonesian environmental performance rating), OHSAS 18001, SMK3 (Indonesian safety performance rating), etc.

Primary data collected since July to September 2012. Respondent representing the company is top management, management representatives for certified organizations or HSE managers. Population of the research is around 700 companies that have implementing either one or integrated of Environmental management system (for instance, ISO 14001, PROPER) and OHS management system (for instance, OHSAS 18001, SMK3). Number of sample collected is around 119.

The research uses descriptive *Structural Equation Model* (SEM) which function to test the statistical model as depicted in Figure 3. SEM analysis is an analysis based on Confirmatory Factor Analysis (CFA), a method that combines correlation analysis, regression

analysis, traffic analysis and factor analysis (Suharjo, 2007). Measurement scale used is *Likert* scale at 5 (five) points, of which score 1 is defined as Very disagree (Very bad), score 2 as Dissagree (Bad), score 3 as Neutral, score 4 as Agree (Good) and score 5 as Very agree (Very good).

Definition of the research variabel is as follows:

Commitment management is a measure of reaction and actions taken by top management in the implementation of HSE management system. In this research, management commitment latent consists of 5 (five) indicators: management makes statement on the importance of HSE management (X1), management gives examples on HSE practices (X2), management approves budget on HSE (X3), management gets involved (X4), and management makes decisions on HSE issues (X5).

Process management is any activity or series of activities to convert input to be a more valuable output. The process is sub-systems configuring the overall management system. It is grouped into 16 (sixteen) indicators: conducting risk analysis (Y1), defining HSE objective (Y2), evaluating compliance level (Y3), wearing PPE (Y4), controlling risk (Y5), applying procedures (Y6), applying HSE permit (Y7), applying Engineering control (Y8), applying 3R-Reuse, Recycle, and Recovery (Y9), Integrating into main processes (Y10), Substitute high risks (Y11), Eliminate critical hazards (Y12), Monitoring process and performance (Y13), Auditing HSE management (Y14), Applying emergency preparedness and response (Y15) and Controlling contractors and suppliers (Y16).

Human resource management is any activity to manage human related aspect of the organization. It consists of 8 (eight) indicators: Defining responsibility and authority (Y17), Defining HSE structure (Y18), Determining personnel competency (Y19), Providing training (Y20), Improving awareness (Y21), Conducting continuous meeting (Y22), Encouraging participation (Y23) and Handling external communication (Y24).

HSE Performance is a measure of both positive and negative output of HSE management implementation. Latent variable of HSE performance covers 4 indicators, which are frequency environmental incident (Y25), frequency of OHS incident (Y26), level of compliance to regulations (Y27), and overall HSE performance (Y29).

Competitive advantage is a company performance beyond average or above its competitors due to it is capable to create difference from the perspective of customer today and in the future. In this research, it consists of 6 indicators. These are increased customer satisfaction (Y29), reduced or none of customer complaint (Y30), increased reputation (Y31), receiving award from external parties (Y32), Legitimacy to operate from stakeholders (Y33), and good cooperation with stakeholders (Y34).

Financial performance is a measure of company management achievement in financial terms. In this study, financial performance consists of the following indicators: Increase in selling volume (Y35), Increase in net profit (Y36) and Return on Asset (Y37). The results of activities of an organization or investment over a given period of time are the sales performance. It can be measured by the total dollar amount collected for goods and services provided. Net income can be calculated by subtracting expenses from revenue. In terms of reporting revenue in a company's financial statements, different companies consider revenue to be received or recognized different ways.

RESULTS AND DISCUSSION

This section discusses relationship pattern of the six latent variables to obtain a complete picture of how the process happens and how the relationship affects HSE performance, competitive advantage and financial performance. The structural model analysis is associated with evaluation of coefficients or parameters that indicate a causal relationship or effects of the latent variables to other latent variables.

The test results can be seen in Figure 4 below.

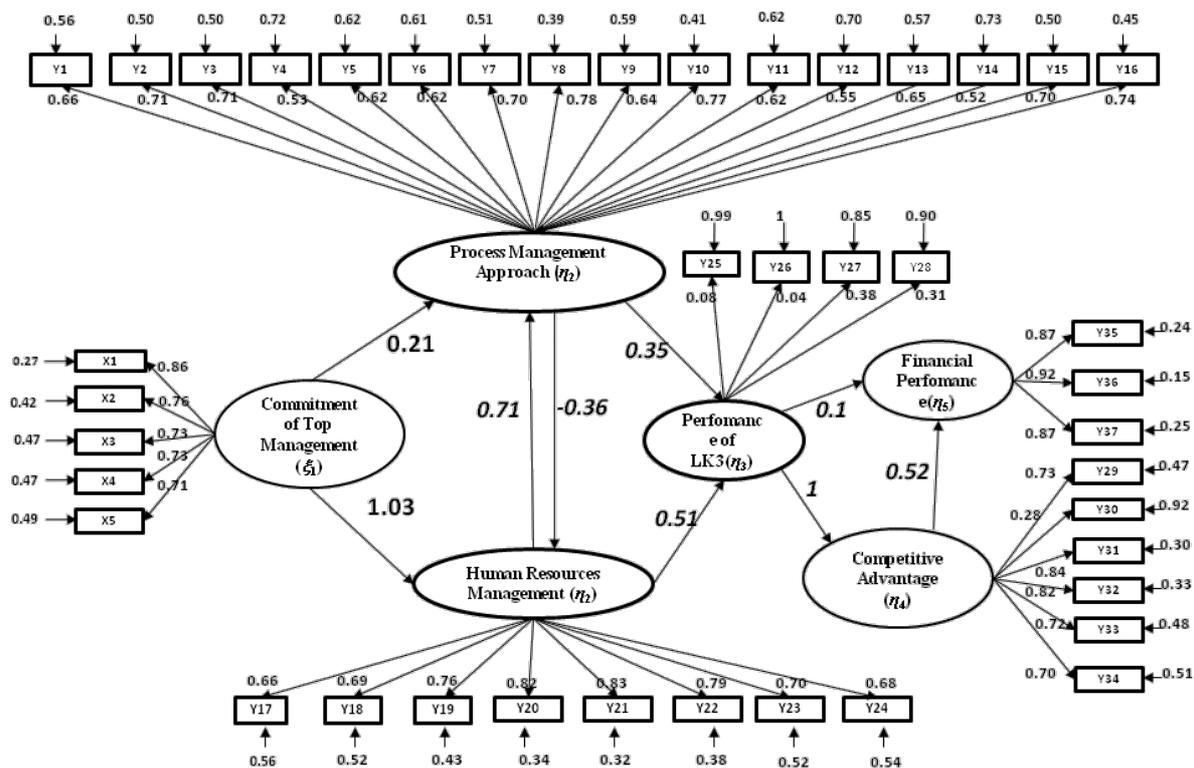


Figure 3 Structural and Measurement Model Test Result

The hypothesis tested in this model (H_0) is the matrix of the same population covariance sample matrix ($H_0: S=S$) and ($H_1: S \neq S$). H_0 is accepted which means that the structural model (variance model) can be used to predict the structure (population variance) from the value of Chi-square (χ^2) and RMSEA. H_0 is accepted if P-value (χ^2 test) higher than 0.05 or RMSEA less than 0.08 (Joreskog 1998 in Kusnedi 2008). The test result to the model yields P-value = 0.000 (< 0.05) and RMSEA = 0.065 (< 0.08). This means that overall empirical model can be adopted as accordance with the criteria set by Joreskog et al. (1998), although the P-value less than 0.05. Since it is accepted statistically, therefore model coefficient can be used as estimator of contributing value or effect of exogenous latent to endogenous latent variable.

Analysis of Relationships

Table 2 summarizes the measurement analysis result of model. The significance tests of the loading factor paths show that all have T value $>$ T minimum (1.96 at $\alpha = 0.05$) which mean that all correlation is defined as significant. These all correlations fit with the data.

Table 2 Measurement analysis

Hypothesis	Correlation	Loading Factor	T value
1	Management commitment → Process Management	0.21	2.10
2	Management commitment → Human resource management	1	11.32
3	Human resource management → Process management	0.71	7.98
4	Process management → Human resource management	-0.36	-6.55
5	Process management → HSE Performance	0.35	5.28
6	Human resource management → HSE Performance	0.51	5.75
7	HSE Performance → Competitive advantage	1.00	19.83
8	HSE Performance → Financial performance	0.10	5.10
9	Competitive advantage → Financial Performance	0.52	11.07

Management commitment to Process and Human Resource Management

Hypothesis 1 and 2 are accepted in which Management commitment (MC) has significant and strong positive effect to Human resource management (loading factor at 1), whilst it has significant but relatively low positive effect to Process management (loading factor at 0.21). This suggests that top management has given their commitment both to process and human factors, but he or she gives higher portion of his or her commitment to human resources rather than to process management.

It is clear that operation of the processes in the HSE management cannot be initiated or sustained without factual commitment from top management. For instance, when there is not a budget provided to install a Continuous Emission Monitoring (CEM) commonly required in continuous chemical industries, top management may decide to do the sampling process of air stack emission manually. In other words, the top management has decided to improve personnel skills (indicator Y20) in doing or supervising manual sampling (indicator Y17) instead of investing a new expensive processing device. This reveals that top management chooses a strategy to strengthen competency and skills of human resource rather than putting investment on new infrastructure.

In meeting OHS regulation in Indonesia, there are certified trainings mandated for which the top management inevitably has to upgrade his or her employees to follow the trainings such as General safety specialist, Chemical safety specialist and Electrical safety specialist (indicator Y19). These are particularly seen during the initial phase of HSE management development. However, to some extent top management has to establish HSE procedures (indicator Y6) in order to meet requirements of HSE auditor or government inspector. For instance, HSE risk assessment, identification and evaluation to regulation compliance, risk control, and emergency preparedness and response.

Relationship between Process management and Human resource management

The study result reveals that Human resource management affects significantly and positively to Process Management (loading factor 0.71) and at the same time, Process Management affects significantly and negatively to Human resource management is at loading factor of -0,36. These support hypothesis 3 and reject hypothesis 4 of the study.

Acceptance to hypothesis 3 confirms that execution HSE procedures (indicator Y6) and operating any unit operations (indicator Y5) require workers, the more competent operators will provide better results (indicator Y1). Clear understanding of employees to HSE responsibilities and authorities has ensured operation of machinery within control preventing from HSE incidents. For instance, an authority to stop any hazardous activity given to all personnel regardless of their position has prevented many accidents. A contractor operator without safety harness, who is working at height shall be immediately warned by company member without awaiting approval from his or her supervisor. Delaying warning will increase the probability of the operator fall down that cause fatality.

The negative effect of process to human factors (rejection of hypothesis 4) suggests that providing a process has not necessarily improved employees' performance. For example, the application of risk assessment (Indicator Y1), which is more complex than traditional Job Safety Analysis (JSA) is reluctantly adopted by site personnel. These *field* type personnel are already burdened to meet several production deadlines, additional duties to do risk assessment or JSA has only given new problems. Another illustration is that the requirement to undertake process of determining HSE objective (Indicator Y2) and associated actions plan to achieve them has forced them to allocate additional time to do administrate. These groups prefer general objective laid onto top management domain (indicator X1) such as zero accident and zero pollution and hope the objectives are nothing to do with them.

Effects to HSE Performance

The study reveals that hypothesis 5 and 6 is accepted in which Process management and Human resource management has significant and positive effect to HSE performance at loading factors of 0.35 and 0.51 respectively. Referring to the previous discussion on Management commitment, it is comprehended that the loading factor of Human resource management is higher than Process management loading factor because top management has given more commitment to human resource factors.

As an illustration, good risk assessment is essential to prioritize control over high risks, which eventually increase HSE performance. It is impossible to get adequate HSE risk register when a procedure and associated forms (indicator Y1) nor a training (Y20) are not provided for employees to complete the risk analysis. Everybody has his/ her perception to risk and limited knowledge on HSE terminology by which they cannot identify their own HSE risks. An exhaust unit installed to reduce contact between chemicals fume and production operator is an risk-control equipment (indicator Y5) that directly increase HSE performance by reducing concentration of emitted contaminating gases in indoor area. Yet, it does not give its function, when operators are unaware to operate adequately (indicator Y21).

In short, the strategy of companies in pursuing high HSE performance is prioritized to human factors whilst it is still maintaining the applicability of the HSE processes.

Effects to Competitive advantage

The research obtains that HSE performance gives significant and high positive effect to Competitive advantage (customer satisfaction, customer complaint, reputation, award, legitimacy and external relation) as postulated in Hypothesis 7. The loading factor is at 1.

One mining company in Indonesia has suffered severely from bad reputation (indicator Y31) as an environmental polluting and damaging operation facility (indicator Y25, Y27 and Y28). Prolonged publication on the damaged river and disturbed ecosystem has even raised issues on the banning of the operation or taking over the operation by government. The issue has shifted to political one. Consequently, the company has to experience tight and continuous inspections from various government institutions for many reasons. This problem in legitimacy to operate (indicator Y33, Y34), of course, reduces its competitiveness of the company since it has triggered its creditor, bankers, insurers raise their risk factor leading to an increase of cost of debt. Furthermore, the company is forced to speed up its environmental investment to recover river, establish of reclamation areas sooner than the original plan.

On the other way around, meeting customer HSE requirements has prevented customer complaints and led to customer satisfaction. The CSMS (Contractor Safety Management System) in oil and gas industry is designed to give score to contractors on the basis of long list of HSE internal processes (availability of HSE team, procedures, inspection, etc) and final performances (zero accident/Y26, reduced incident/Y26, zero pollution/Y25 and regulation compliance/Y27). Success to have high score will put the contractor in the vendor list to maintain the buying level and in some case to have higher volume in comparison to previous year. Companies that received PROPER green (indicator Y28) has an advantage to get trust from public and government (indicator Y32) as responsible business organizations. However, other operations grouped into PROPER Black or Red have to suffer bad image from the stakeholders (indicator 31). In practical terms, Indonesian regulation forbids banks to give credit to these companies (indicator Y37) until the result of the following year of PROPER evaluation release them from the bad category.

Effects to Financial Performance

Hypothesis 7 and 8 stipulating that financial performance is positively affected by competitive advantage and HSE performance are accepted. The loading factors are at 0.52 and 0.1 respectively.

As mentioned before that good reputation from PROPER Green has given direct positive effect to financial performance in a way that capital can be gained. In safety perspective, insurance company undertake annual audit to facilities to determine premium price (indicator Y36) and enforce application of insurance contract details. The insurance audit focuses on the adequacy and effectiveness of emergency facilities (indicator Y15) such as hydrant box and pump, alarm and heat sensor functionality, safety procedures as well as personnel capabilities (indicator Y19). These details checked by insurance auditors are in fact requirements of the safety regulations which directly relevant to the compliance performance of the operation.

The effect of HSE performance to financial benefits supports some previous research, although the correlation level is low. At least, this gives opposite facts, when it is compared to common belief that implementing HSE management generates only costs by which deteriorate financial strength. There might be changing in Indonesian context in which the purchase process from customer has considered HSE parameters as explained above. The low

value relates to the fact that the samples taken for this research are comprised from various industrial sectors which a wide range of correlation level. As an average, the effects are becoming small. As an example, manufacturing sectors (textile, pharmaceutical, shipping, etc) have not intensively asked for HSE parameters during product or service supply.

Analysis of Overall Model

Overall model fitness analysis namely Goodness of Fit (GOF) is meant to see how good the matchness between data and model. Tabel 3 shows the result of model fitness tests based on (a) absolute, (b) incremental and (c) parsimonious. The absolute fit model matchness, named as RMSEA and GFI, aims to determine prediction level of overall model (structural and measurement model) to correlation and covarian matrix. RMSEA is to measure deviation of parameter value of the model to population covarian matrix (Hair et al, 2004). It can be said that RMSEA is the most informative model fitness measurement. The study result has RMSEA at 0,065 and GFI at 0,97, which reveals that overall model meets with test criteria of the absolute fit model. The test performance is defined as Good fit.

Incremental fit model measurement is to compare proposed model with a basic model, which is often known as null model or independent model. This consists of several testing tools alike: (a) CFI (Comparative Fit Index), (b) NFI (Normed Fit Index), (c) NNFI (Non-Normed Fit Index), (d) IFI (Incremental Fit Index), (e) RFI (Relative Fit Index). Research result show that value of CFI = 1.000; NFI = 1.000, NNFI = 1.066, IFI = 1.061 and RFI = 1.000, which meet all relevant standards. The incremental fit model gives the same results in which the model is defined as Good Fit.

Tabel 3 Reliability Test Result

Variable	Sign	Indicator	SLF	Error	CR > 0,70
Commitment	X1	Enthusiastic	0.86	0.27	0.87
	X2	Example	0.75	0.42	
	X3	Budget	0.73	0.47	
	X4	Meeting	0.73	0.47	
	X5	Decision	0.71	0.49	
Process Management	Y1	Risk assessment	0.55	0.56	0.92
	Y2	Objective	0.71	0.50	
	Y3	Compliance	0.71	0.50	
	Y4	PPE	0.53	0.72	
	Y5	Operational Control	0.62	0.62	
	Y6	Procedure	0.70	0.61	
	Y7	HSE permit	0.78	0.51	
	Y8	Engineering	0.54	0.39	
	Y9	3R	0.77	0.59	
	Y10	Integration	0.62	0.41	
	Y11	Substitution	0.55	0.62	
	Y12	Elimination	0.52	0.70	
	Y13	Monitoring	0.55	0.57	
	Y14	Audit	0.52	0.73	
	Y15	Emergency	0.70	0.50	

		response			
	Y16	Contractor	0.74	0.45	
Human Resource Management	Y17	Repsonsibility & Authority	0.66	0.58	0.90
	Y18	Structure	0.69	0.52	
	Y19	Competency	0.76	0.43	
	Y20	Training	0.82	0.34	
	Y21	Awareness	0.83	0.32	
	Y22	Meeting	0.79	0.38	
	Y23	Participation	0.70	0.52	
	Y24	External Communication	0.68	0.54	
HSE Performance	Y25	Environmental pollution	0.08	0.99	0.17
	Y26	OHS accident	0.04	1.00	
	Y27	Compliance Status	0.38	0.85	
	Y28	Overall performance	0.31	0.90	
Competitive Advantage	Y29	Kepuasan pelanggan	0.66	0.57	
	Y30	Customer satisfaction	0.43	0.82	0.79
	Y31	Reputation	0.65	0.58	
	Y32	Award	0.61	0.63	
	Y33	Legitimacy	0.79	0.38	
	Y34	External cooperation	0.76	0.43	
Financial performance	Y35	Total sales	0.85	0.27	0.73
	Y36	Net profit	0.91	0.18	
	Y37	ROA	0.91	0.18	

Parsimonius fitness model measurement is to compare between proposed model with basic model in which all variable within the model are free from one to another. This consists of the following fitness tests: (a) AGFI (Adjusted Goodness Fit Index) and (b) PGFI (Parsimony Goodness Fit Index). The result of AGFI is at 0.98 and PGFI at 0.81, which suggests that the model is as Good Fit.

In conclusion, the overall model tests results is categorized as Good Fit.

Reliability Test

Construct Reliability (CR) is a measurement showing consistency level or indicators stability in representing latent variable. Reliability testing is useful to test confidence limit and consistency of measuring device through applicable questionnaire. Kaplan and Saccuzzo (1989) propose that theoretically alpha coefficient value which is above 0.70 defined as

reliable. Furthermore, CR value ≥ 0.5 is considered as sufficiently reliable whilst CR \leq is not reliable.

Tabel 4 Result of Model Fitness Analysis

	Calculation result	Standard
<i>Absolute fit model</i>		
RMSEA	0,065	RMSEA < 0,08
GFI	0,970	GFI > 0,90
<i>Incremental Fit Model</i>		
NFI	1,000	NFI > 0,90
NNFI	1,066	NNFI > 0. 90
CFI	1,000	CFI > 0,90
IFI	1,061	IFI > 0,90
RFI	1,000	RFI > 0,90
<i>Parsimanius Fit Model</i>		
AGFI	0,966	AGFI > 0,90
PGFI	0,864	PGFI > 0,50

Reliability value provided in CR (Construct reliability) show value > 0.70 to all paths except for HSE performance. These are Commitment management (0.87), Process management (0.92), Human resource management (0.90), Competitive Advantage (0.79) and Financial Performance (0.73). Whilst HSE performance at 0.17. The result of CR and VE suggest that the model in principle is reliable and valid.

Managerial Implication

Research has shown that Indonesian companies have adopted proactive strategy in pursuing high HSE performance whilst securing reactive approach as the base line of its HSE management. Achieving HSE performance to exactly in compliance to regulations is not enough for today's context since business competition and external pressures keep increasing. Management can initiate, in a short term, a target on the regulations compliance as this is immediate and real pressure to be faced by companies. Yet, relying on this exactly compliance level in long term cannot ensure organizations' sustainability. Issuance of new and tighter HSE regulations cannot be stopped and keep happening by which organization shall be able to response to this continuing changing and it is wisely to anticipate for the potential changing. The requirement of environmental regulation never become lighter such as Threshold Limit Value (TLV) of effluent wastewater has been reduced continuously as seen that Ministry of Environment has revised in year 1990, 1998 and recently the TLV applied to wider range of industrial sectors. Handling these responsibilities by relying on End of Pipe Treatment will not be sufficient. Companies shall define its HSE target to go beyond government's TLV in response to high potency that the requirement is tightened in the future.

Similarly, anticipation to international requirements shall be done that might be relevant in Indonesian context. For instance, Minamata Protocol intends to totally ban the use of mercury in material, process and product shall give beneficial input for companies to anticipate. Organization shall seek for advice from government in any issues of which good cooperation between private business and government has succeeded Indonesia in meeting international interests on Montreal Protocol apply to ozon depleting substances impacts.

Today, top management can include OHS and environmental performance as part of company's strategic business performance. With this, HSE is treated as part of core processes such as marketing, production, maintenance, purchasing and so forth. General HSE objective alike 'No fatality accident' or 'Reduction of HSE incident to 30% from previous year' is cascaded to division, department or section level as accordance to level areas of responsibility and it is not exclusive to HSE function. HSE incident reduction in production department means that operation specifications have to be met more consistently by production staff or in maintenance department means that preventive maintenance shall be totally and consistently implemented.

Conclusion and Remarks

This study aims to provide a strategic model to enhance organization's competitive advantages based on implementation of HSE management. Results reveal that enhancement to the competitive advantage can be facilitated by high HSE performance as structured by three constructs that are Management commitment, Process management and Human resource management. The high performance of HSE increases customer satisfaction including complaints reduction, gains high reputation and award as well as improve operation legitimacy. All of these subsequently affect positively to companies' financial performance. The research shows that HSE performance gives weak direct positive impact to financial performance. Yet, it indirectly improves financial performance strongly through organization competitive advantage.

The findings also show that management commitment is the main driving force to the achievement of HSE performance. The commitment works through human resource forces rather than process ones because top management relies on the human factor rather in the mechanism to run process.

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