Transformational Leadership and Safety Performance of Malaysia's Small and Medium Manufacturing Firms

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ABSTRACT :*The increasing accident trend in Malaysia indicates insufficient or ineffective safety performancewithin its industry. Majority of accidents at workplaces were derived from Small Medium-Size Enterprises (SMEs) sector which accounted at 80%. Safety behaviour is also found as the substantial factor towards the scenario. Therefore, the research objective is to investigate the relationship between transformational leadership towards workers' safety participation, safety compliance and safety performance in SMEs manufacturing firms. A total of 157 respondents who are safety officers or human resource personnel from selected manufacturing SMEs had participated in this study. The analysis of data collection has been performed by statistical tool Partial-least-squares structural equation modelling (PLS-SEM) Smart PLS version 3.0. A significant effect has been outlined for transformational leadership towards safety participation, safety compliance and safety performance. This research concluded that an increase in transformational leadership of supervisors will improve the overall safety performance of SME at employee as well as organisational level.*

KEYWORDS -*Leadership, safety compliance, safety participation, safety performance*

I. INTRODUCTION

An accident prompt through unforeseen errors derived from slips, lapses or mistakes [1]. Human is the main contributor to hazardous condition through their unsafe behaviour. Unsafe behaviour can be seen when workers refuse to follow work safety procedure and prefer to not attending or participating safety related activities. Such behaviour might not only the worker's but also other workers by creating a condition that lead to accident and injury. Safety behaviour is the indicator of safety performance of an organization. Safety behaviour have been measured through safety compliance and safety participation [1].

The workplace accident can be prevented through the role of frontline supervisors. The accident happened through unsafe behaviour of the employees can be modify by safety leadership approaches by the frontline supervisors [2]. Safety culture initiate by safety leadership, safety leadership navigate safety culture and safety culture outlining safety behaviour [3]. For safety climate or culture to grow, safety leadership must be included throughout the organization. Safety leadership is a switch of perspective from 'paper' to 'people' targeting message deliver in achieving positive safety behaviour across a whole organization [3].

The rise of national occupational accident rates per 1,000 workers from 2.40 in 2018 to 2.71 in 2019 is alarming [4]. The higher accident rate reflects ineffective safety performance through the level of safety behaviour in an organization. Since 2016, Department of Occupational Safety and Health (DOSH) has established Strategic Plan 2016-2020 for Small and Medium Industry (SMI). The highest accident contribution of SME has trigger DOSH to take action for improvement. The introduction of Occupational Safety and Health (OSH) Coordinator for every SMI in Occupational Safety and Health Master Plan (OSHMP) 2020 has reflected the importance of leadership and management commitment in ensuring OSH practices in SMI [5].

Despite the government effort in implementing this strategic plan, the accident rates consistently increase and not showing significant downturn. Thus, highlight the needs for further research. As the main focus of OSHMP 2020 is leadership and management commitment, the leadership element needed to be reexamined to enhance the safety culture in order to assimilate greater safety behaviour to the extend resulting accident reduction.

II. REVIEW OF LITERATURE

2.1 Transformation Leadership

"Walking the talk" is the concept of transformational leadership approaches whereby the leader displayed the desired behaviour he intends his subordinates to perform in line with the rules and procedures that enhance the safety behaviour. This modelling behaviour provide visual guidance and highlight the importance of the desire behaviour. Bass [6] through Full Range Leadership model categorized transformational leadership into four category consisting inspirational motivation, idealized influence, intellectual stimulation, and individualized.

Based on Bass [7], transformational leadership is responsible to enhance and broaden follower's encouragement or inspiration, perception, maturity and self-value. As the leader set an example of safety compliance towards his subordinate, the subordinate perceived the behaviour is vital as their supervisor exhibit the behaviour for himself. Therefore, to ensure the effectiveness of the OSH management system, the frontline supervisor should not only deliver the desired behaviour from rules and regulations provided but also demonstrated the desired behaviour by themselves to serve as a mode [2].

The transformational leadership approach, idealised influence shows a positive relationship towards safety compliance and safety participation [8]. As the subordinates believed their supervisor with charisma, exhibit good modelling behaviour, they tend to comply safety rules, standards and procedure provided and extend their interest in instilling voluntary safety behaviour. Idealised influence assimilates good safety behavioural through a combination of intellectual enhancement, individual thought and inspiring motivation. Besides, it also physiologically affects the employees thus contribute more to safety participation compared to safety compliance.

Apart from that, transformational leadership was seen to amplify the positive relationship between employer safety obligation and employee's safety compliances, safety participation and safety attitudes [9]. This study expresses the importance of having legislated and responsible employer in which dedicated employer in providing safety resources such as training and ensuring equipment maintenance in order to improve safety behaviour of an organization. In addition, the existence of safety leadership behaviour and leader showing safety promotion image will boost the positive effect of legislated employer safety obligations.

As safety attitude was found to be lessen under lower transformational leadership, it demonstrates the importance of safety leadership in achieving successful program and policies. Employer safety obligation represent the safety prioritization and exhibit employee's health and welfare are matters. Employer also play a vital role in communicating organization commitment in implementing safety throughout the organization. These elements manifest good safety behaviour in employees as they feel confident towards commitment engaged by the leader.

Study by Wu et al. [10] use the concept of idealized influence and role modeling, or charismatic leadership as the safety leadership measurement improvement. It is believed that charismatic leadership create emotional relationship of supervisor with followers. Charismatic leadership motivate their values and goals to the followers to extend the follower's self-interest to broader view of organizational benefits. This leadership affect attitude and awareness thus design their safety behaviour. Apart from that, the safety leadership model for construction projects (SLMCP) showed transformational leadership approach is more significant compare to transactional leadership approach. Besides, safety participation also more significant compared to safety compliance. It was found that safety participation influenced by transformational leadership.

2.2 Safety Behaviour

Safety behaviour consist of two elements, safety compliance and safety participation [11]. These two elements were proposed by Neal et al. [12]. Safety compliance define as any basis and important task that should be perform in order to maintain workplace safety including the requirement to follow working procedure and the needs to wear personal protective equipment. Meanwhile, safety participation refers to any behaviour that aid to improve safety supportive working environment and does not directly affecting an individual's safety. It can be seen through voluntary participation of safety related events, assisting colleague that facing safety related issues and participating safety related meetings [12].

An employee perceived an organization is inspiring to fulfil organization's goal, enhance organizational outcomes and by instilling concept of general wellbeing embedded though out working process, will adhere to a good safety behaviour by a greater extend. The ability of an employee to control their work is crucial to ensure their confidence of their job role contribute to the organization. They be able to display good safety behaviour once they perceive their role is crucial in making any changes towards safety related issues. Once a person feels appreciated by their existence, they tend to be eager in providing the best service towards an organization [13].

2.3 Safety Performance

The safety performance of an organization can be assessed through leading and lagging factors. Leading factor can be assessed through safety behaviour whereas lagging factor derived from injury and death [14]. It showed that using leading factors is more beneficial compared to lagging factors as safety performance is distributing regularly thus facilitate linkage evaluation, well-grounded and more beneficial towards safety assessment and intervention. Safety performance also can be seen through lagging factors consisting accidents frequency, equipment failure frequency, production loss and damage value and personal injuries [15]. Assessing both factors will generate an overall concept of accident reduction.

2.4 Social Exchange Theory

Blau [16] explain the concept of social interaction in which started with our goals or decision. Once we have new goals or decision in a situation, the action will be designed and calculation will be made towards others. The calculation involves delicate balance whether need for overexertion, small effort, slow or rapid action during interaction. The balanced must be maintain to ensure a maximum advantage towards the set goal.

Blau [16] believe for every action, it will create new problem. Thus, urged the importance of interaction calculation (social exchange) to ensure moderate and effective action was taken in order to prevent problems occurrence that retrieved from extreme action.

The flaw of social interaction was found to be focus on human behaviour that shape according to the norms create by the participant. Institution reduces the social exchange calculation by creating the norms through roles of each position, authority power by the management and culture model in an organization to provide a balance system assistance to achieve an organization's goal. This theory is providing the theoretical knowledge to focus on human behaviour in order to achieve organization's goal such as higher productivity. Safety leadership has been used in several research as the norms creating safety behaviour [9, 17].

2.5 Accident Causation Theory

Based on a case study conducted by United Steelworkers of America, Health, Safety & Environment Department [18], Heinrich proposed the idea of unsafe acts by workers is the main reason for an accident to happen. Based on this study, the primary reason of unsafe acts contribution accident accounted 88%. This accident causation foundation was introduced in 1931 as the Heinrich's pyramid or triangle[19]. The Heinrich's pyramid or triangle conclude that an occurrence of major injury accompanies by 29 minor injury and 300 near missed incident. Thus, reflect 42 million additional unreported accidents by including minor injury and near miss [20].

Besides, Heinrich has introduced another concept in 1941 of accident causation through the Domino Theory. The Domino theory was established through the study of accident cost and safety efficiency impact. He discovers management role as an approach for accident prevention. He uses the metaphor of domino blocks to represent the chain of element contributing accident occurrence. The domino blocks starting from social environment and ancestry, faults of a person, unsafe act or condition, accident and injury respectively. These elements are believed to be connected through a cycle. Thus, when once one element is removed from the cycle, the entire process will cease [20]. The central point of the cycle is removal of element 'unsafe act or unsafe condition'. The removal of either element will nullify the accident chain reaction through the Domino model concept [21].

2.6 Framework

The existence of transformational leadership contribution towards safety performance was supported by previous study [8–10, 22]. Nevertheless, the relationship is limited to safety behaviour. There is limited study discover the connection between all three variables; safety compliance, safety participation and safety performance in one facet.

Based on Christian et al. [23], the terms safety performance is questionable as some study refer safety performance as safety consequences such as accidents and injuries [15], meanwhile other study refers safety performance as individual safety related behaviours [8–10, 22]. Safety performance in terms of safety consequences and individual safety related behaviour should be distinguish as different facets contribute different relationship towards the antecedent [23].

According to Blau [16], Social Exchange Theory demonstrate the concept of interaction calculation (social exchange) to ensure moderate and effective action was taken in order achieve goals or decision without any problems. The flaw of social interaction was found to be focus on human behaviour that shape according to the norms create by the participant. Safety leadership has been used in several research as the norms creating safety behaviour [9, 17].

Besides, accident causation theory through Heinrich has stated the accident nature is derived from unsafe act. The cause effect could interfere with production quality, volume and cost. This accident occurrence could be prevented through the elimination of either social environment and ancestry, faults of a person, unsafe act or condition, accident or injury [24].

Based on above conceptual and factual information, the researcher intends to assess transformational leadership relation with safety behaviour and extend the scope towards safety performance (safety consequences in terms of accident and injuries) in order to conclude the effectiveness of transformational leadership as the management approaches in assimilating good norms during social exchange medium in targeting good OSH system.The researcher adopts the research framework from Christian et al. [23] that proved leadership construct as situation factors that contribute towards safety behaviour and safety performance.

Instead of fully adopt the entire framework which shows leadership (situation factors) as an antecedence of safety performance (safety consequences in terms of accident and injuries) moderate by safety behaviour, the research analyses the direct relationship between transformational leadership towards safety behaviour and safety performance. In order to unravel the questionable terms of safety performance, the researcher proposed Figure 1 as the model for this study. The differences between both dependent variables will be compare between their relationship strength to select the best dependent variables to be used in SME firms.

III. OBJECTIVES

This research objective is to investigate the relationship between transformational leadership towards safety participation, safety compliance and safety performance in SMEs manufacturing firms and to compare the strength between safety behaviour and safety performance variables in SMEs manufacturing firms. The framework is as depicted in Fig. 1.

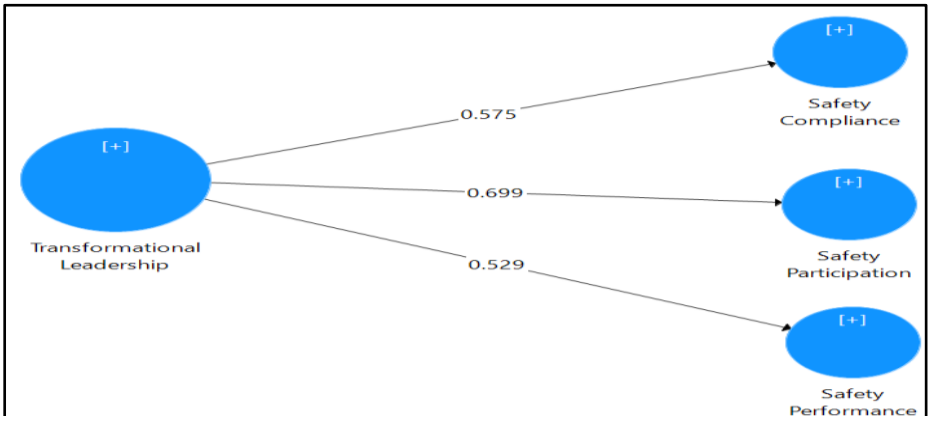

Fig. 1 Proposed Model
Source: Prepared by the authors.
Note: The full colour version of this figure is available online.

3.1 The Rationale of the Study

The researcher performed this study to unveil the link between transformational leadership towards safety behaviour and safety performance. Previous study believed the existence of transformational leadership in organization will cultivate the safety climate and culture, thus will improve the safety behaviour of an organization [3]. This study also broadens the scope covering safety performance as one of the efforts to fill in the empirical gap. As the size of SME is smaller and consisting smaller manpower [25], the leadership is more effective to be distributed to all the employees within the organization. Thus, provide a huge impact towards occupational accident that was dominated by SME firms of overall industries.

IV. METHODOLOGY

4.1 Sample and Data Collection

A total of 165 questionnaires have been distributed through online medium which is Google form as face-to-face meeting is restricted due to Covid-19 pandemic season. A simple random sampling was used. 157 representatives of each SMEs manufacturing sector in Penang and Kedah consisting of Safety & Health Officer, Safety & Health Coordinator, Safety & Health Representative or Human Resource Officer participate in this study. The sample size was determined by G*Power 3.1.9.7 and the minimum total size computed is 107 firms.

4.2 Measurement

A comprehensive conceptual and factual information derived from literature review from previous study has provide the guidance for the researcher to adopt appropriate existing instrument for this study.The item measurements were amended and modified accordingly to fit the respondent's view. The amendment and modification were done by the researcher and was checked by the supervisor to ensure the accuracy and appropriateness. The existing instruments were translated to Malay language to increase the understanding and act as a reference for the respondent. The pilot study has been carried out before the actual data collection to ensure the reliability and validity of the instrument.

4.3 Transformational Leadership

The items used to measure transformational leadership variable are by referring study by Sawhney and Cigularov [22]. This independent variable consisting eight items. Sample items included for transformational leadership were "How often did supervisor provide continuous encouragement to do job safely" and "How often did supervisor spend time showing employees the safest way to do things at work". For all items, this study used 5-point likert scale starting from 1= *not at all* to 5= *frequently or always.*

4.4 Safety Participation

The items used to measure safety participation variable are by referring Neal and Griffin [1]. This dependent variable consisting three items. Sample items included for safety participation were "Employees promote the safety program within the organization" and "Employees voluntarily carry out tasks or activities that help to improve workplace safety". For all items, this study used 5-point likert scale starting from 1= *strongly disagree* to 5= *strongly agree*.

4.5 Safety Compliance

The items used to measure safety compliance variable are by referring Neal and Griffin [1]. This dependent variable consisting three items. Sample items included for safety compliancewere "Employees use all the necessary safety equipment to do their job" and "Employees use the correct safety procedures for carrying out their job". For all items, this study used 5-point likert scale starting from 1= *strongly disagree* to 5= *strongly agree*.

4.6 Safety Performance

The items used to measure safety performance variable are by referring Lu and Shang [15]. This dependent variable consisting four items. Sample items included for safety performancewere "The frequency of accidents is reducing" and "Thevalue of production loss and damage is reducing". For all items, this study used 5-point likert scale starting from 1= *strongly disagree* to 5= *strongly agree*.

V. ANALYSIS

5.1 Measurement Model

The measurement model was analysed through PLS Algorithm factor analysis with 300 maximum

iterations. Its consisting internal consistency reliability, convergent validity and discriminant validity. Internal consistency reliability displayed the Cronbach's alpha and composite reliability (CR), convergent validity shows average variance extracted (AVE) values meanwhile discriminant validity displayed Fornell-Larcker Criterion, Cross Loadings and Heterotrait-Monotrait Ratio (HTMT) values.

Internal consistency reliability can be assessed through two element which are Cronbach's alpha and CR, however Cronbach's alpha is unweighted which resulting unprecise reliability. Based on Table 1, the CR of all constructs are classified as "satisfactory to good" as the results are within 0.70 and 0.95 [26]. The convergent validity through AVE values are accepted asthey are more than 0.5 [27]. It shows that the latent variables display greater than 50% items variance. Then, Table 2 shows the discriminant validity of constructs.

Table 1 Results of Measurement Model

Model Construct	Measurement Item	Loading	AVE	CR
TL	TL1	0.841	0.948	0.697
	TL 2	0.847		
	TL 3	0.813		
	TL 4	0.832		
	TL 5			
	TL 6	0.876		
	TL 7	0.851		
	TL 8	0.843		
		0.770		
SP	SP1	0.887	0.935	0.827
	SP2	0.936		
	SP3	0.904		
SC	SC1	0.906		
	SC2	0.946	0.951	0.867
	SC3	0.940		
	SPM1	0.900		
	SPM2	0.899	0.952	0.831
	SPM3	0.916		
SPM	SPM4	0.932		

Source: Prepared by the authors.
Note: TL =Transformational Leadership; SP = Safety Participation; SC = Safety Compliance; SPM = Safety Performance; AVE = Average Variance Extracted; CR =Composite Reliability.

Table 2 Discriminant Validity of Constructs

	SP	SC	SPM	TL
SC				
SP	0.753			
SPM	0.654	0.581		
TL	0.605	0.756	0.547	

Source: Prepared by the authors.
Note: TL = Transformational Leadership; SP = Safety Participation; SC = Safety Compliance; SPM = Safety Performance.

Fig. 2 expresses the measurement model assessment for present research.

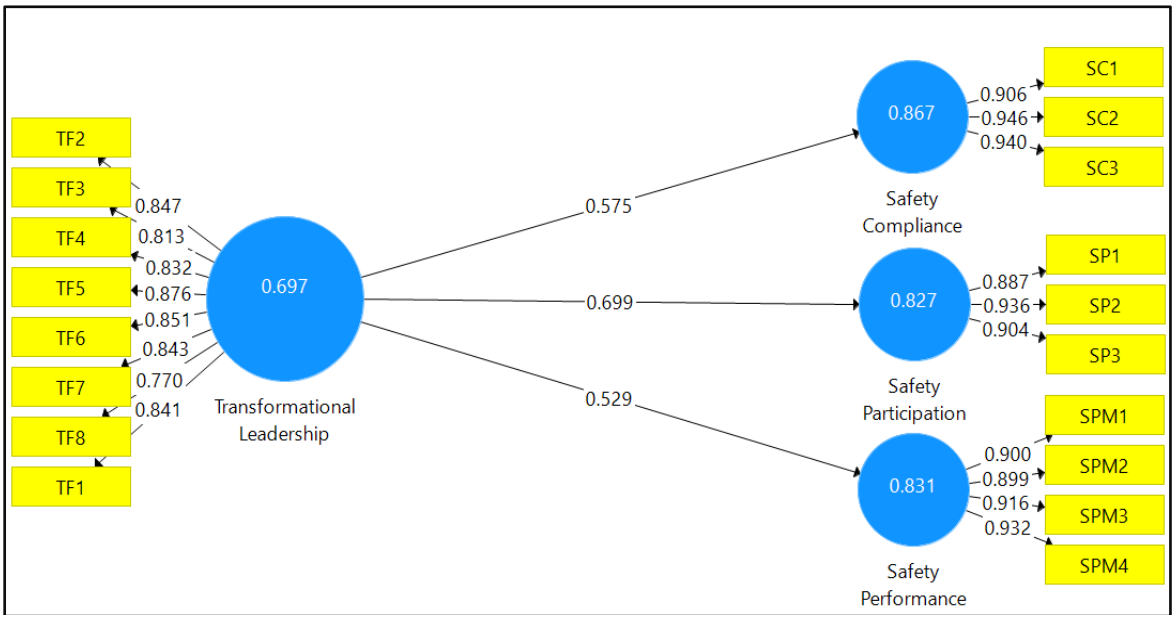

Fig. 2 Measurement Model Assessment
Source: Prepared by the authors
Note: The full colour version of this figure is available online.

5.2 Structural Model

A collinearity analysis must be assessed before proceed with structural model relationship coefficient, to ensure non-bias regression result. The collinearity value is measured based on VIF values. The acceptable VIF values is near 3 and lower [28]. This research computed 1.000 where indicates acceptable collinearity. R^2 value is the next element should be assessed after the collinearity is accepted. The R^2 of each endogenous construct should be range from 0 to 1 and greater value indicating strong explanatory power.

The R^2 values of 0.25, 0.5 and 0.75 indicates weak, moderate and substantial respectively [29]. The R^2 value for safety compliance is 0.331, 0.488 for safety participation and 0.279 for safety performance which indicate weak explanatory power for all dependent variables. However, safety participation demonstrates the greater variance explained compared to safety compliance and safety performance. In addition, the sum of safety participation and safety compliance as safety behaviour construct display a substantial explanatory power compare to safety performance.

Besides, the effect size can be interpret based on f^2 values. The f^2 values of 0.02, 0.15 and 0.35 reflects small, medium and large effect size respectively [30]. The f^2 value of transformational leadership towards safety compliance is 0.495, transformational leadership towards safety participation is 0.954 and transformational leadership towards safety performance is 0.388. All items show a larger effect size. The f^2 value for safety participation is the highest compared to safety compliance and safety performance. Besides, the combination of safety compliance and safety participation as safety behaviour construct also compute the highest effect size compared to safety performance.

Structural model was analysed by bootstrapping path analysis with 300 maximum iterations. Fig. 3 shows the structural model that has been design based on research hypothesis. The blindfolding analysis has been run and the Q^2 value of 0.260 is generated for safety compliance, 0.368 for safety participation and 0.211 for safety performance. As the value is greater than zero, the values are meaningful [28]. The Q^2 values consisting 0, 0.25 and 0.50 represented small, medium and large predictive relevant to the study respectively [28]. The Q^2 for safety compliance and safety participation show a moderate predictive relevant while safety performance shows small predictive relevant.

The significance value for path analysis or research hypothesis is $p < 0.01 (t > 2.58)$ [29]. The transformational leadership show a significant relationship towards safety participation (H_1) as represented by $t = 12.881$, $p = 0.000$. Besides, the transformational leadership relate significantly towards safety compliance (H_2) as represented by $t = 9.043$, $p = 0.000$. Lastly, the transformational leadership is significant towards safety

performance (H_3) as represented by t = 6.627, p = 0.000. The strength of H_1 is the strongest among others as can be seen through the beta value of 0.699. Moreover, relationship between transformational leadership towards the safety behaviour (H_1 and H_2) also show a greater beta value compared to safety performance (H_3).

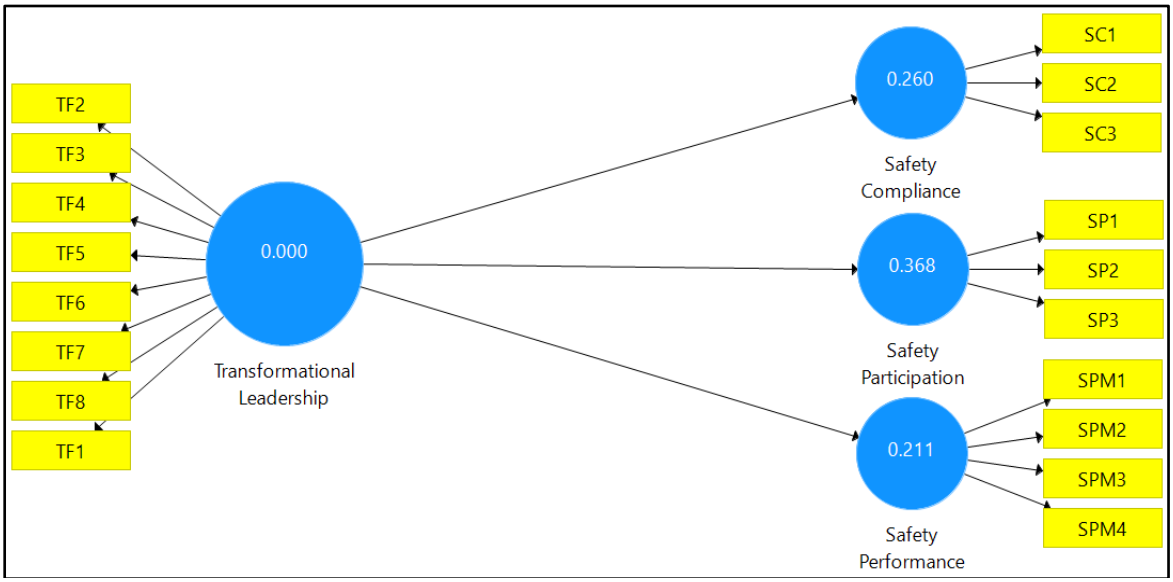

Fig. 3 Structural Model Assessment
Source: Prepared by the authors.
Note: The full colour version of this figure is available online.

Table 3 Summary of Path Analysis/ Research Hypothesis

Path/ ResearchHypothesis	Beta	Standard Error	*T*-Statistic	*p*	Decision
H_1	0.575	0.064	9.043	0.000*	Supported
H_2	0.699	0.054	12.881	0.000*	Supported
H_3	0.529	0.080	6.627	0.000*	Supported

Source: Prepared by the authors.
*p< 0.01(t > 2.58) [29]
Note: H_1 = The relationship of transformational leadership towards safety participation;
H_2 = The relationship of transformational leadership towards safety compliance;
H_3 = The relationship of transformational leadership towards safety performance.

VI. DISCUSSION

This study has acknowledged the research framework proposed by the researcher. Transformational leadership has been proven to have a significant relationship towards safety compliance(H_1), safety participation(H_2) and safety performance(H_3). Implementing transformational leadership would definitely influence safety compliance, safety participation and safety performance of SME firms. Thus, highlighting the importance of introducing transformational leadership as an approach to improve OSH management system in SME firms. These findings are complemented with previous study [8–10, 22].

Baah and Addo [8] believe in the power of supervisor good modelling. Supervisor that acts accordance to good behaviour by complying and following the regulation indirectly motivate the employees. As the employees feel respect and motivated, they would willingly to adhere all the rules and feel delight to involve themselves in safety related events. In addition, this perception was further supported by Mullen et al. [9] as this previous researcher outline legislated employer who fulfill their duty and obligation in terms of organization safety would strengthen the employees' safety behaviour. Obligation performed by the legislated employed such as communicated safety goal of organization or provide safety training would display their effort in ensuring employees' welfare is being heard and protected.

Through Heinrich's pyramid or triangle, the unsafe acts by workers classified as the direct caused of

the accident has causing the extensive study of safety behaviours approach [31]. Besides, based on Domino Theory, unsafe act is the central points of accident occurrence. Thus, by eliminating unsafe acts, safety performance of an organization will be enhanced. As the management role was found to be the preventive element in accident causation model [20], the researcher urged the transformational leadership of supervisor as the appropriate step should be taken by the management to groom in order to eliminate the unsafe behaviour. As frontline supervisor is the most frequent superior the subordinate meets each day [2], the frontline supervisor is found to grant the greatest impact towards unsafe act alteration. Besides, the transformational leadership can be executed as simple as observation through visual guidance [22], compare to other leadership styles, make it the most selective leadership for this study.

Apart from that, above findings have rationalized the concept of transformational leadership into social exchange theory. Lower accident rates [5], and good OSH management system [32], across the organization are the safety goals of an organization. As stated by Blau [16], once a person or organization has goal or decision, the calculation (social exchange) will be made to ensure a sufficient amount of effort was exert to maintain their fame. As every goal have their own problem or flaw [16], the management should address the issues of human unsafe behaviour accordingly. The human unsafe behaviour is highly associated with norms tailored by an organization. Transformational leadership was found to be an effective leadership in tailoring the immediate social environment or norms [2, 8–10, 22]. Thus, the social exchange or calculation should be made through implementation of transformational leadership to confront the unsafe behaviour issues.

As the development of theory by the previous scientist and practitioner purposely to understand the overall system in order to manage and control the arising issues, the researcher gain benefits through this theory and study. The transformational leadership has been proved as an approach in safety behavioural and safety performance improvement in order to control and manage the accident rates[19]. Based on structural model analysis, both R^2 and f^2 values for safety behaviour are outstanding compared to safety performance. In addition, the strength through beta value of their significance relationship has also been proven the vital function of safety behaviour compared to safety performance. Thus, conclude the prominent contribution of safety behaviour enhancement in SME compared to safety performance. A proactive measure through safety behaviour provided a huge impact compare to reactive measure of safety performance. The findings conclude the effectiveness of implementing leading indicators study compared to lagging indicator. As SME is smaller and consisting smaller manpower [25], the safety behaviour enhancement would be effective compared to larger firms.

VII. CONCLUSION

This study was performed to determine the transformational leadership relationship towards employees' safety behaviour and safety performance of SME manufacturing firms and the findings conclude a significant relationship was found. This finding will help the SME manufacturing firm to improve their safety behavior and safety performance through the implementation of transformational leadership. Transformational leadership that underlines the concept of supervisor acts as a model to employees is proven to enhance safety behaviour and safety performance through the feeling of motivated, respected, confident and trust. As an individual whom honour someone, they will consider that person as an example and a mentor worth to be followed. Besides, this study also was conducted to compare the strength between safety behaviour and safety performance indicator. Safety behaviour was found to be more prominent to be implemented in SME firms.

VIII. THEORETICAL IMPLICATION

As limited study discovered the connection between all three variables; safety compliance, safety participation and safety performance in one facet, this study has fill in the empirical gap through the adaptation concept by Christian et al., [23]. Using both Social Exchange Theory [16], and Domino Theory [24], these three elements were compared between their strength. In the context of Social Exchange Theory, transformational leadership act as the norms which shaped the employees' safety behaviour. The interaction calculation was done through transformational leadership in order to achieve firm's goal. Apart from that, Domino Theory indicates unsafe act as the key element of accident occurrence. It also stated that management role as an approach for accident prevention and social environment and ancestry as the first element of Domino blocks. Based on current study, transformational leadership act as an accident prevention and the first element of the Domino blocks. The relationship between transformational leadership towards safety behaviour (safety compliance and safety participation) and safety performance are significant, however safety behaviour specifically safety participation showed the most effective element throughout this link. Transformational leadership was found to give the greatest impact on safety participation in order to achieve a good OSH management system of a firm.

IX. MANAGERIAL IMPLICATIONS

As the first rule to improve safety behaviour of employees and safety performance in SME firms are leadership and management commitment [5, 20], the key solution for these issues is the management itself. The focus of SME firms and DOSH agency should be focus on improvement of safety behaviour as the prominent indicator. The management should commit in implementing transformational leadership throughout the organization for improvement. As the frontline supervisor is the middle man between the management and the employees, the frontline supervisor plays a vital role in achieving good safety behaviour. The frontline supervisor has a direct and high contact with the employees thus increase the enhancement of safety behaviour through the leadership styles [10]. Management should groom their frontline supervisor with transformational leadership as a new intervention of improvement. Besides, DOSH agency also should consider transformational leadership as a new approach to assist OSH coordinator in designing their supervisor. By providing the necessary information and knowledge on transformational leadership towards OSH coordinator, they could shape their supervisor thus strengthening their safety culture. A good supervisor can directly or indirectly affect the safety behaviour.

X. LIMITATIONS

The sample size of this study is limited. Most of the respondent is not intended to participate in this study. As the FMM Directory 51st Edition 2020 listed only the total manufacturing company that subscribe FMM membership in Malaysia, the SME list is limited. The list should be retrieved from SME agency as the agency is most likely to collect all SME information. However, to retrieve the information, it is costly and time consuming. Besides, the Covid-19 pandemic has restricted the researcher to collect the sample appropriately as the communication was limited, thus the explanation and briefing of the study might hinder the participation from the respondent. A face-to-face explanation and briefing might help the researcher to achieve greater respondent for this study.

XI. Acknowledgements

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REFERENCES

[1] A. Neal and M. A. Griffin, A study of the lagged relationships among safety climate, safety motivation, safety behavior, and accidents at the individual and group levels, *Journal of Applied Psychology*, *91(4)*, 2006, 946–953, doi: 10.1037/0021-9010.91.4.946.

[2] S. R. Kessler, L. Lucianetti, S. Pindek, and P. E. Spector, Walking the talk: The role of frontline supervisors in preventing workplace accidents, *European Journal of Work and Organizational Psychology*, *29(3)*, 2020, 450–461, doi: 10.1080/1359432X.2020.1719998.

[3] K. F. Bong, H. van Voorst Vader, and S. Shell Bhd, SPE-185197-MS Stepping Up Safety Leadership in Managing Geophysics and Geomatics Operations, 2017.

[4] "Official Website Department of Occupational Safety and Health - National Occupational Accident & Fatality Rate".

[5] "Strategy 7: Enhancing Occupational Safety and Health for Work Related-Road Safety (WRRS), Informal Sector and Future Jobs."

[6] B. M. Bass, "Leadership and Performance beyond Expectations by," 1987.

[7] B. M. Bass, Does the Transactional-Transformational Leadership Paradigm Transcend Organizational and National Boundaries?, 1997.

[8] K. Dartey-Baah and S. A. Addo, Charismatic and corrective leadership dimensions as antecedents of employee safety behaviours: A structural model,*Leadership and Organization Development Journal*, *39(2)*, 2018, 186–201, doi: 10.1108/LODJ-08-2017-0240.

[9] J. Mullen, E. K. Kelloway, and M. Teed, Employer safety obligations, transformational leadership and their interactive effects on employee safety performance, *Safety Science*, 91, 2017, 405–412, doi: 10.1016/j.ssci.2016.09.007.

[10] C. Wu, N. Li, and D. Fang, Leadership improvement and its impact on workplace safety in construction projects: A conceptual model and action research,*International Journal of Project Management*, *35(8)*, 2017, 1495–1511, doi: 10.1016/j.ijproman.2017.08.013.

[11] Y. Zhu, P. E. Quansah, A. F. Obeng, and E. Cobbinah, Investigating the effects of role demands, psychosocial stress symptoms and safety leadership on mineworkers' safety performance, *Psychology Research and Behavior Management*, *13*, 2020, 419–436, doi: 10.2147/PRBM.S245142.

[12] A. Neal, M. A. Griffin, and P. M. Hart, The impact of organizational climate on safety climate and individual behavior, *Safety science*, *34*(1-3), 2000, 99-109.

[13] B. Fernández-Muñiz, J. M. Montes-Peón, and C. J. Vázquez-Ordás, The role of safety leadership and working conditions in safety performance in process industries,*Journal of Loss Prevention in the Process Industries*, *50*, 2017, 403–415, doi: 10.1016/j.jlp.2017.11.001.

[14] E. N. Adi, A. Eliyana, and Hamidah, An empirical analysis of safety behaviour: A study in MRO business in Indonesia, *Heliyon*, *7(2)*, 2021, doi: 10.1016/j.heliyon.2021.e06122.

[15] C. S. Lu and K. C. Shang, An empirical investigation of safety climate in container terminal operators, *Journal of Safety Research*, *36(3)*,2005, 297–308, doi: 10.1016/j.jsr.2005.05.002.

[16] P. Blau, Exchange and Power in Social Life,*American Sociological Association*, *5(30)*, 1964, 789–790.

[17] K. L. Jungbauer, K. Loewenbrück, H. Reichmann, J. Wendsche, and J. Wegge, How does leadership influence incident reporting intention in healthcare? A dual process model of leader–member exchange,*German Journal of Human Resource Management*, *32(1)*, 2018, 27–51, doi: 10.1177/2397002217745315.

[18] C. Health and S. vs Behavior-Based Safety, "The Steelworker Perspective on Behavioral Safety."

[19] P. J. Blokland and G. L. L. Reniers, An ontological and semantic foundation for safety science, *Safety and Reliability - Safe Societies in a Changing World - Proceedings of the 28th International European Safety and Reliability Conference, ESREL 2018*, 2018, 3157–3166. doi: 10.1201/9781351174664-395.

[20] W. DeCamp and K. Herskovitz, The Theories of Accident Causation, *Security Supervision and Management: Theory and Practice of Asset Protection*, 2015, 71–78. doi: 10.1016/B978-0-12-800113-4.00005-5.

[21] A. S. Sabran, A. R. Abdul Rahim, S. Abdul Aziz, and R. Mohammad, Human Error Knowledge Management Framework in Major Hazard Accident Prevention, *Journal of Advanced Research in Business and Management Studies*, *(1)*, 2021, 1–7.

[22] G. Sawhney and K. P. Cigularov, Examining attitudes, norms, and control toward safety behaviors as mediators in the leadership-safety motivation relationship,*Journal of Business and Psychology*, *34(2)*, 2019, 237–256, doi: 10.1007/s10869-018-9538-9.

[23] M. S. Christian, J. C. Bradley, J. C. Wallace, and M. J. Burke, Workplace safety: A meta-analysis of the roles of person and situation factors, *Journal of Applied Psychology*, *94(5)*, 2009, 1103–1127, doi: 10.1037/a0016172.

[24] H. W. Heinrich, *Industrial accident prevention, a scientific approach* (McGraw-Hill Book Company, Inc. New York and London, 1941).

[25] S. Abdul Hamid, A. M. Leman, N. Goolamally, and N. Afizi Shuaib, Occupational Safety and Health Leadership and Performance in Malaysian Industries, *IOP Conference Series: Materials Science and Engineering*, 864(1), 2020, doi: 10.1088/1757-899X/864/1/012033.

[26] J. Hair, C. L. Hollingsworth, A. B. Randolph, and A. Y. L. Chong, An updated and expanded assessment of PLS-SEM in information systems research,*Industrial Management and Data Systems*, 117(3), 2017, 442–458, doi: 10.1108/IMDS-04-2016-0130.

[27] M. Sarstedt, C. M. Ringle, and J. F. Hair, *Partial Least Squares Structural Equation Modeling* (Handbook of Market Research, Cham: Springer International Publishing, 2017, 1–40). doi: 10.1007/978-3-319-05542-8_15-1.

[28] J. F. Hair, J. J. Risher, M. Sarstedt, and C. M. Ringle, When to use and how to report the results of PLS-SEM, *European Business Review*, 31(1). Emerald Group Publishing Ltd., 2019, 2–24, doi: 10.1108/EBR-11-2018-0203.

[29] J. F. Hair, C. M. Ringle, and M. Sarstedt, PLS-SEM: Indeed a silver bullet, *Journal of Marketing Theory and Practice*, *19(2)*, 2011, 139–152, doi: 10.2753/MTP1069-6679190202.

[30] J. Cohen, Statistical Power Analysis for the Behavioral Sciences, *Lawrence Erlbaum Associates*, 1988.

[31] J. Zhang, C. Xie, J. Wang, A. M. Morrison, and J. A. Coca-Stefaniak, Responding to a major global crisis: The effects of hotel safety leadership on employee safety behavior during COVID-19, *International Journal of Contemporary Hospitality Management*, *32(11)*, 2020, 3365–3389, doi: 10.1108/IJCHM-04-2020-0335.

[32] A. Sklad, Assessing the impact of processes on the occupational safety and health management system's effectiveness using the fuzzy cognitive maps approach, *Safety Science*, *117*, 2019, 71–80, doi: 10.1016/j.ssci.2019.03.021.