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Human Resource Management in National Shipping

Prasadja Ricardianto and Imam Sonny

Abstract

This chapter of this book shows that the mastery of some modern techniques is needed by the ship's crew who work in a management to build a modern ship, in accordance with the theme of this project, namely modern ship engineering, design and operations. The main problem is how the management leaders of this modern ship project can apply transformational leadership style through work-life balance and employee engagement to the ship's crew to make their work effectiveness improved. In carrying out the ship building which takes a quite long time, do the employees can be mutually engaged and can pay equal attention to the work in this project and the work at home? This study uses quantitative method with Structural Equation Modeling. This modern ship building uses some terminologies or variables of human resources such as transformational leadership style, work-life balance, and employee engagement which, based on the research done, directly and positively affect employee's work effectiveness. The key findings of this study indicate that there is a specific model on employee engagement and crew work effectiveness that is very appropriate to be applied to modern ships related to engineering, design and operations.

Keywords: employee engagement, transformational leadership style, ship's crew, work effectiveness, work-life balance, shipbuilding management, modern ships, engineering, design, operations

1. Introduction

According to the data from the Human Resources Division of an Indonesia's national shipping company having some ships berthing in the Port of Tanjung Priok, Jakarta, Indonesia, the employee performance appraisal of the shipping company has a fairly good score in general. There has been an appraisal of one of the ship's officers, who was given a bad score. The employee engagement in general lies on the ship's crew loyalty which is not so strong. In particular, their welfare is not so good as the other similar companies.

The problems of some ships berthing in the Port of Tanjung Priok related to the work effectiveness of ship's crew based on direct interview are such as; (1) Ship installation repair which is not on time, (2) Late and inaccurate reporting on accidents and emergency conditions, (3) The use of personal protective equipment not in accordance with the Standard Operating Procedure, (4) Inaccurate report on shipment, (5) Low understand of International Safety Management Code, and (6) periodic mechanical and electrical maintenance of the ship's hull which is unscheduled.

Transformational leadership style, work-life balance, employee engagement and work effectiveness have been studied in some previous researches. With limited

resources the ship's officers should be able to apply an effective approach in order to improve the work effectiveness of their staff. According to [1], in the human resource management research, three terminologies are used, namely transformational leadership, work-life balance and employee engagement. In fact, the variable of work-life balance has a higher position than other variables.

In addition [2], says that a further research will provide understanding of how engagement will prioritize the employee's interests. Human Resource Management is very necessary in the Shipping Industry [3]. In a modern ship building, the term work-life balance as a whole is rated positively by the respondents [4, 5]. Several things to cope with in the variable of work-life balance, especially with ship's crew, are home sickness, fatigue, family problems, discrimination, bad onboard communication during the voyage and bad work relationship [6, 7]. In addition, work engagement is much needed in the management of human resources in the modern ship industry, especially on cruise ships [8, 9].

In general, ship performance improvement in real time can be done through monitoring, analyzing and displaying the ship's performance during service [10]. The recent design of modern ship can be illustrated as an integrated system of its role, operation, and services and using computer-based appliances and based on the design model integrated with the environment [11]. The integrated use of appliances for a new ship design can lead to the quick implementation of ship virtual prototype that has been planned in the early stage. Currently, there is a need for an integrated ship design, through an innovative approach with a new generation of computers [12]. The management of modern ship should be able to adapt it. According to [13], modern ship building should also see the technology integration in management and ship operation, which especially has a close relationship between the ship and the onshore management unit. The development of information and communication technology on smart cruise ships will add to the cruise experience [14]. Technically a modern ship with improved sensor systems using speed log information, GPS, ocean currents and ship dynamics, after weather matching and filtering processes, can increase the average sailing speed [15].

This study tries to get new findings based on hypothetical test whether there are differences in the use of research method, dimensions and indicators and whether there is a direct or indirect relationship. This study tries to find some novelties by comparing the results of this research to the previous ones. The aim of studying the activities of such a modern ship, in accordance with the main theme of this study, is to provide inputs and considerations to the technically modern ship management to pay more attention to some important terminologies for being able to improve their employees' work effectiveness.

1.1 Literature review and hypothesis

1.1.1 Work effectiveness

Effectiveness and efficiency are of performance measurements that can be used to evaluate the employee performance [16]. The management of a shipping business is expected to be able to make appropriate decisions, as a main power to enhance the safety of their employees. It is necessary to improve the effectiveness of the ship's crew of national shipping companies to be able to compete with the private similar companies. Work effectiveness according to theory [17], has several research aspects; such as quantity, quality, reliability, attendance, and ability to collaborate. The variable of work effectiveness has several research dimensions, namely; 1) Work quality, 2) Work quantity, 3) Punctuality, 4) Work effectiveness, and 5) Independent attitude.

Conceptually, it can be concluded that work effectiveness is the output of employee's work consisting of work quality, work quantity, punctuality and

employee job satisfaction used to achieve the goals. The aspects of work effectiveness are; 1) Punctuality, 2) Work quantity, 3) Work quality, and 4) Work suitability.

1.1.2 Transformational leadership style

According to [18, 19], transformational leadership style is an ability to bring significant changes to the employees in an organization. A leadership style with democratic dimension, according to [20], can give freedom to employees and involve them in the decision making, which is more productive. In addition, the results of the researches done by [12, 13], also indicate the significant influence of transformational leadership on the trust in a leader, and, in turn, it gives a positive impact on the employee engagement. A leader has orientation to his staff and their work. Moreover [21], explains that transformational leadership style can potentially has an influence in improving the performance and quality of ship's crew. Besides that, democratic leadership style is also very effective although further studies show various results. Transformational leadership behavior promotes teamwork, high performance expectations, and individual consideration significantly [22, 23]. Based on the opinion of [24], the characteristics of transformational leadership style, by developing several aspects, are; 1) Ideal influence; 2) Inspirational Motivation; 3) Intellectual Stimulation; and 4) Individual consideration. Ideal influence is the most important aspect of transformational leadership.

Conceptually, based on the theoretical studies and previous relevant researches from some experts who support this study, it can be concluded that transformational leadership style is the way of a leader to design, influence, and ask for the engagement of his subordinates to achieve the organizational goals consisting of several aspects, such as; 1) ideal influence or charisma, 2) inspirational motivation, 3) intellectual stimulation, 4) individual consideration, and 5) democratic style.

1.1.3 Work-life balance

According to some experts like [25, 26], Work-life balance is guided by the working hours and positive results when someone is able to combine work role and family role. In the opinion of [27–29] Work-life balance has become an important variable in coping with one of employee management problems. There is a significant positive relationship between family life and work. Whereas Work-life balance according to [30] closely related to some other aspects like the job characteristics, allowances, support from superiors, employee's working culture, job satisfaction.

According to Frone, Yardley and Markel in [31], Work-life balance has five aspects, namely; (1) Time management; (2) Social life outside the work; (3) Work life balance; (4) Work-family balance; and (5) Ability to keep involved in the non-work interests and activities. Work-life balance is also related to job demand, intention to move and psychological tension, but in positive ways it can involve family and result in job satisfaction [32, 33]. These five aspects are based on the theory and some previous researches that conceptually support this study to become the main aspect in the terminology of Work-life balance.

1.1.4 Employee engagement

An employee who wants to be engaged in the company must have commitment to the job and working motivation to achieve a high performance [19, 34, 35]. In the previous research, employee engagement according to [36–38] is a condition which is expected by the company, having psychological bond, having organizational goals and showing bond, commitment, vigor and focus on work. According to Khan, an employees will be tied to their work and when this happens they will

totally work; physically, cognitively and emotionally [39]. Aon Hewitt, who develops a model of employee engagement (**Figure 1**), explains that the five terminologies of Human Resources Management are established to be a Grand Theory and variable unity in this study.

Employee engagement is something satisfactory related to vigor, dedication, and absorption which is significantly and positively related to the performance of organization [41–44]. Whereas [45], proposes three aspects of employee engagement, namely Say, Stay and Strive. Strong employee engagement will be able to influence a work [46, 47]. In the opinion of [48] the engagement strategy implemented by organizations has reached a satisfactory level. Moreover [49, 50], state that an organization may have a competitive advantage in the form of increasing employee engagement and can affect the welfare. A research carried out by Schaufeli of Utrecht Work Engagement Scale (UWES) uses three dimensions; vigor, dedication and absorptions [51]. The results of correlation and regression from the research of [52], show that team support is the strongest predictor of an engagement.

Conceptually, based on the theory and previous researches from some experts who support this study, it can be concluded that employee engagement is a positive attitude of an employee to the engagement, commitment to working, enthusiasm in working, comfort in working with some aspects, namely: 1) Vigor, 2) Dedication, 3) Absorption, and 4) Stay.

1.1.5 Hypothesis

H1. Transformational Leadership Style has influences on Employee Engagement

H2. Work-Life Balance has influences on Employee Engagement



Figure 1.
Model: Engagement drivers. Sources: [40].

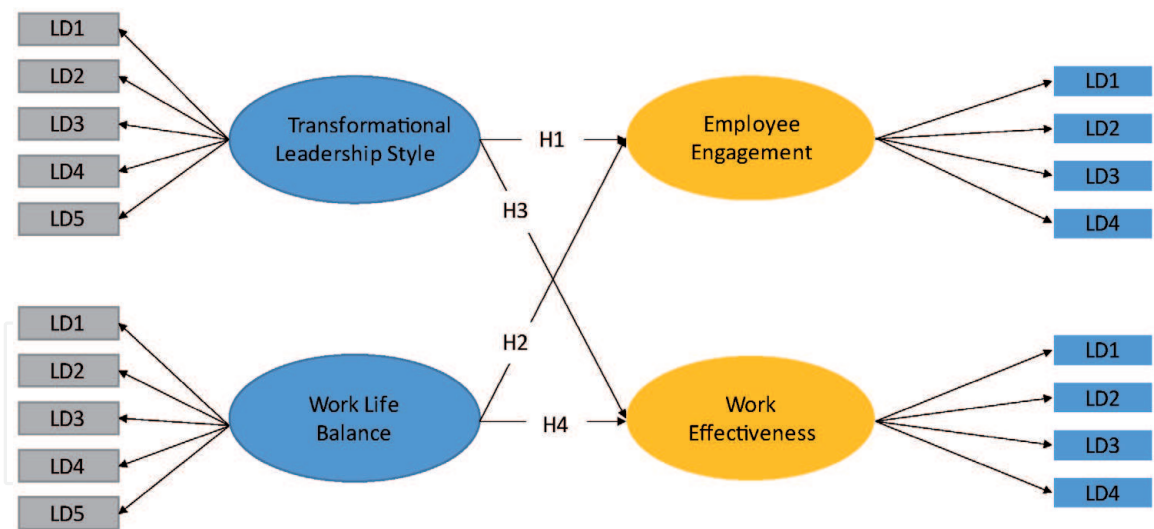


Figure 2.
 Conceptual framework.

- H3. Transformational Leadership Style has influences on Work Effectiveness
- H4. Work-Life Balance has influences on Work Effectiveness
- H5. Employee Engagement has influences on Work Effectiveness

Some terminologies in the Human Resource Management such as; Transformational Leadership Style, Work-Life Balance, dan Employee Engagement are important variables to improve the work effectiveness of ship's crew.

Below is the conceptual framework of this research (**Figure 2**).

2. Research method

This research has four main variables in this case, such as, transformational leadership style, work life balance, employee engagement and work effectiveness. Each variable studied includes several dimensions and indicators. The analytical tool in this quantitative study uses Structural Equation Modeling (SEM) with the help of the Lisrel 8.7.1 program. Hair et al. [53] explained that the use of SEM allows simultaneous analysis of a series of relationships, thus providing statistical efficiency. The use of Structural Equation Modeling is also used to test research hypotheses.

The sampling technique in this study is called Cluster Systematic Sampling. The Slovin formula was used to obtain a sample of 290 crew members from a total population of 1,050 crew members from seven modern passenger ships with a capacity of 2000 passengers on each ship. The results of this research questionnaire are considered reliable and valid in previous trials on 30 respondents from crew members taken from one of the seven modern ships. The validity test on the work effectiveness, transformational leadership style, work-life balance and employee engagement instruments resulted in most of the items being valid statements. The results of the reliability test for all variables show that they are above 0.9 and it means that they have high reliability.

The use of the Lisrel analysis tool from Structural Equation Modeling is currently being carried out by several previous researchers to test the conceptual framework.

Previous research that has a positive effect on work effectiveness using SEM was carried out by [54]. Several studies on transformational leadership styles that have used SEM were also conducted by [48, 49, 55, 56]. The study of work-life balance

also applies a lot of SEM models adapted by [57–59]. Meanwhile, other studies related to employee engagement that use SEM are described by [60, 61]. Several researchers have previously been recorded using the SEM model with the help of the Lisrel program [62–64].

3. Discussion

3.1 Result of model test

Based on the test result of Confirmatory Factor Analysis (CFA) on the construct of transformational leadership style, that all the indicators in the dimension have been valid. Likewise, the value of CR is 0.96 (> 0.70) dan VE is 0.82 (> 0.50). The test result of CFA on the construct of work of balance that all the indicators in the dimension have been valid. Likewise, the value of CR is 0.97 (> 0.70) dan VE is 0.87 (> 0.50). The test result of CFA on the construct of employee engagement that all the indicators in the dimension have been valid. Likewise, the value of CR is 0.98 (> 0.70) dan VE is 0.91 (> 0.50). Whereas, the test result of CFA on the construct of work effectiveness that all the indicators in the dimension have been valid. Likewise, the value of CR is 0.96 (> 0.70) dan VE is 0.87 (> 0.50).

Based on the test result of Confirmatory Factor Analysis (CFA) on the construct of transformational leadership style, work life balance, employee engagement and work effectiveness from all the summarized indices, can be concluded that all the indicators used in this study have good validity and reliability values. Thus, it can be illustrated as the result of the model test (**Figure 3**).

3.1.1 Hypothetical test

Some of the results of hypothesis testing are described in the following tables (**Figure 3**).

Based on **Table 1**, transformational leadership style and work-life balance affect employee engagement, so that both hypotheses 1 and 2 are accepted.

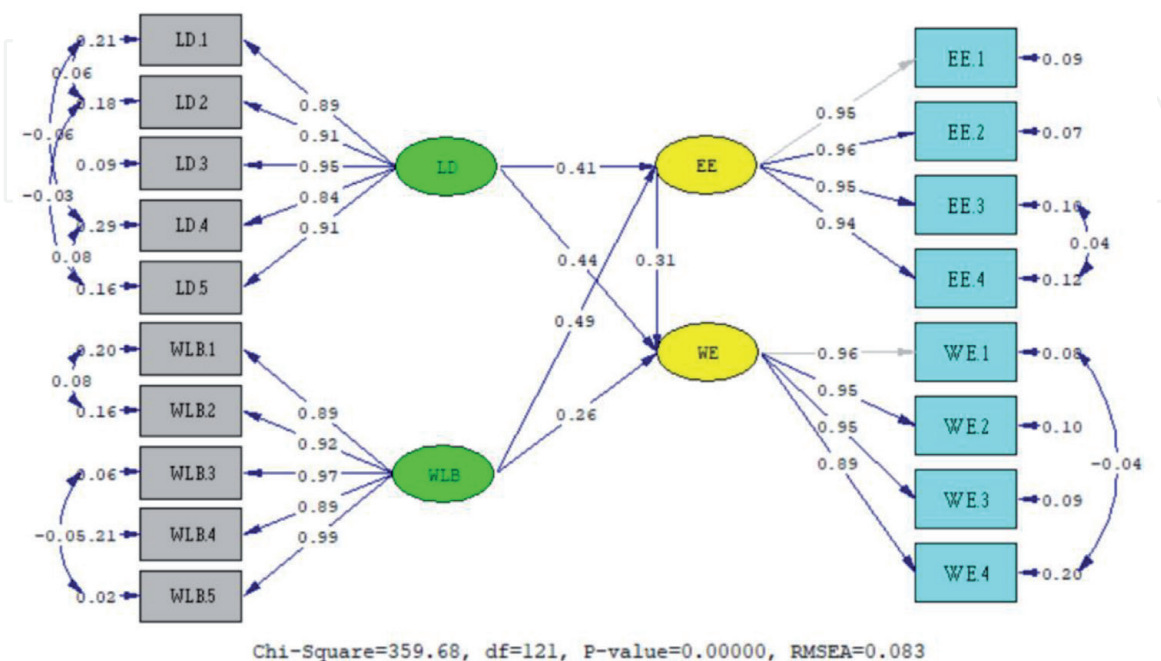


Figure 3.
Research model.

Path	Coefficient	T _{value}	Results
Transformational Leadership Style → Employee Engagement	0.41	7.65	Influential
Work Life Balance → Employee Engagement	0.49	8.90	Influential
Structural Equation $EE = 0.41LD + 0.49WLB + \epsilon$			

Table 1.
The influence of transformational leadership style and work life balance on employee engagement.

H1: The influence of transformational leadership style on employee engagement. Previous relevant study results state that transformational leadership style directly and positively affects employee engagement. The theoretical studies state that leadership style supports employee engagement. For example, the theoretical opinion of [65] states that leadership style supports engagement. Several previous studies by [66, 67], it has been studied that employee engagement can become a mediation for transformational leadership and company branding. Some studies say that transformational leadership style has a positive and direct influence on employee engagement [68, 69].

The result of another research shows that the relationship between the level of employee engagement and the influence of leadership can be measured through the level of management commitment [70]. Another leadership style, i.e. democratic style, shows its quite strong relationship with employee engagement [71]. Another research by [72] states that transformational leadership style affects the employee satisfaction of an Indonesian company through employee engagement. Good transformational leadership will improve employee engagement. However [73], in their study find the indirect relationship between transformational leadership and engagement.

Thus, the results of previous relevant studies support this study. It means leadership style has a direct and positive influence on employee engagement.

H2: The influence of work-life balance on employee engagement.

The previous relevant research by [31] test the hypothesis resulting in that work-life balance is necessary for employee engagement. Employee engagement is increasingly being seen as a win-win strategy for companies, employees, and their communities. Moreover [51], states that work-life balance is getting more important for employee engagement. Another research says that the policy and practice of work-life balance will get benefits from higher employee engagement [52, 53]. In another study through a comparison of indirect effects, the findings of [74] show that employee engagement and work-life balance can act as mediators. Moreover [75], explains that organizations support work-life balance and employee engagement. Another research by [72] explains that work-life balance affects employee satisfaction in an Indonesian company through employee engagement. The result of another research by [76] in Vietnam, shows that work-life balance and work stress positively affects employee engagement.

Thus, the results of this study are in accordance with previous theoretical studies and related research. This means that work-life balance has a positive and positive effect directly on employee engagement.

From **Table 2**, shows that transformational leadership style and work-life balance affect employee engagement, so that both hypotheses 3 and 4 are accepted.

H3: The influence of transformational leadership style on work effectiveness.

Previous relevant study results state that transformational leadership style directly and positively affects work effectiveness. The theoretical studies state that transformational leadership style influence work effectiveness. The findings of

Path	Coefficient	T-value	Results
Transformational Leadership Style → Work Effectiveness	0.44	9.43	Influential
Work-Life Balance → Work Effectiveness	0.26	5.82	Influential
Structural Equation			
$WE = 0.44LD + 0.36WLB + \epsilon$			

Table 2.
The influence of transformational leadership style and work-life balance on work effectiveness.

researches [77], confirm that performance improvement is highly affected by many factors; one of them is leadership. This study is also in line with the opinion [78], stating that the variable of leadership directly affects employee's work effectiveness. Based on the study [79] on the business of shipyard in Indonesia, transformational leadership positively and significantly affects employee performance. The result of another research shows that transformational leadership style directly and positively affects work effectiveness [80]. Moreover [81], states that transformational leadership also develops a research model which is designed to assess the effectiveness and performance of leadership.

In conclusion, the results of this study are in line with previous theoretical studies and related research. Then, transformational leadership style directly and positively affects work effectiveness.

H4: The influence of work-life balance on work effectiveness.

Previous relevant study results state that work-life balance directly and positively affects work effectiveness. The theoretical studies state that work-life balance supports work effectiveness. The researches [80, 82] prove that better work-life balance leads to the improvement of employee performance. The arrangement of work-life balance can be related to the perception of individual performance, that those who have better performance are considered as able to take advantage of work-life balance.

In conclusion, the results of this study are in line with previous theoretical studies and related research. Then, work-life balance directly and positively affects work effectiveness.

From **Table 3** shows that Employee engagement has an effect on work effectiveness, the end result is hypothesis 5 is accepted.

H5: The influence of employee engagement on work effectiveness.

The results of previous relevant researches state that employee engagement directly and positively affects work effectiveness. The theoretical studies state that employee engagement supports work effectiveness. Theoretically [61, 83, 84], state that employee engagement has an impact on the improvement of performance. The result of another research [85], also reveals the positive influence of perceived organizational support on the employee performance mediated by employee engagement. Another researcher shows the way organizations can enhance the engagement among their employees which will improve the effectiveness of organizations [86]. Finally, the need for strong organizational commitment and high work engagement is the determining factor of success to achieve higher performance [37, 87].

Path	Coefficient	T-value	Results
Employee Engagement → Work Effectiveness	0.31	6.45	Influential
Structural Equation			
$WE = 0.31EE + \epsilon$			

Table 3.
The influence of employee engagement on work effectiveness.

In conclusion, the results of this study are in line with previous theoretical studies and related research. Then, employee engagement directly and positively affects work effectiveness.

4. Mediation effect test

This research also conducts a testing related to intervening or mediating variable, so it is necessary will be able to state whether employee engagement is appropriate to produce the intervening variable between transformational leadership style and work-life balance as the independent variables and work effectiveness as the dependent variable.

Employee engagement as an intervening variable between transformational leadership style and work-life balance as well as work effectiveness which explains that initially there is a significant direct relationship. For example, the value of t for the direct influence of transformational leadership style on the work effectiveness is 7.65 and after the inclusion of employee engagement the value of t decreases to 5.09 and still significant with $t_{\text{value}} > 1.96$ (**Table 4**).

The ways to improve the work effectiveness of modern ship's in line with the theme of this project, i.e. Modern Ship Engineering, Design and Operations, are through appropriate analysis, reducing fuel consumption through optimum ship's trim, on time machine setting or propeller cleaning [10]. In terms of engineering and operation, the ship's crew must pay attention to modern ship management such as the data of hindcast wind and the data of wind sensor, speed log sensor, and the filtering process, in order to get an accuracy in the daily report, the number of sensors and the Data Acquisition Systems (DAQs) where each of them can be seen as the node of data collection sources [15, 88].

According to [78, 79], in their researches, transformational leadership style and employee engagement, significantly affect the employee work effectiveness. In the time of Covid-19 pandemic, how the leadership can be responsible for supporting the tourism sector through the management of modern ship in order to be able to manage the crisis [89]. Radic and Radic et al. [9, 90] in their research state that there is an opportunity in a modern ship to enhance the employee engagement by enhancing the factors related to communication and advancement, the capacity to be engaged and the behavior of engagement. Study by [91], asserts the existence of significant and positive engagement related to the degree of retention, and some contributing factors. According to [8], the crew work in a bad condition and it determines their engagement, contributing to the identification of the dimensions of work quality that need to be improved by the Human Resources Manager in modern ships.

Work-life balance in modern ships must pay attention to the significant predictor of welfare such as the employee's multicultural environment [4]. Especially for shipping industry, seafarers who work on modern ships like a cruise ship, Barnett

Influence	Direct		Indirect		Results
	Coef	t _{value}	Coef	t _{value}	
Transformational Leadership Style → Work Effectiveness	0.44		9.43		Influential
Work Life Balance → Work Effectiveness	0.26		5.82		Influential
Structural Equation					
$WE = 0.44LD + 0.36WLB + \epsilon$					

Table 4.
 Single mediation test through employee engagement.

explains the tendency of complaining the work condition which is full of stress and negatively affecting their work-life balance in the long term [3]. Through a quantitative approach [5], explains in his theory that work-life balance is highly necessary for the crew of modern ship.

Some studies are in line with this study that ship management through engineering, Smart Maritime Ecosystem, digital features of modern ship, the utilization of Communication Information Technology, especially in terms of efficiency, sustainability, security, and experience personalization, as well as challenges and limitations related to the improvement of that technology [14]. Improvements in several human resource variables through research on seven modern ships at the Tanjung Priok port, Jakarta, Indonesia that are well integrated will be able to improve engineering, design and operational fields such as the Smart Maritime Ecosystem, digital features of modern ships, utilization of information and communication technology, systems sensors, GPS.

5. Conclusion and recommendation

Then it can be concluded that the effectiveness of work in the national shipping company is directly affected by the transformational leadership style of the ship's officers, work-life balance, and ship's crew engagement. Based on the results of research on modern ship building, the novelty of the research lies in several aspects of human resources. On the effectiveness of the work of the crew at the national shipping company, the novelty in the aspect of work reliability.

The novelty of the transformational leadership style of research lies in the aspect of intellectual stimulation. In the work-life balance variable lies in the work-family balance aspect, while the engagement of the crew is seen as new in the aspect of loyalty. The main novelty in this study is that the employee engagement variable is a mediating variable which is expected to be a key assessment aspect, especially for shipping employees on modern ships.

Overall, on the work effectiveness, It is hoped that the crew can immediately analyze several aspects of non-conformity in work, work safety and hazardous conditions immediately, correctly and accurately. This study is potential to support national shipping companies, particularly modern ship companies to improve the work effectiveness of employees, especially ship's crew.

The key finding of this research which is also a novelty of this research is that through variable of transformational leadership, work-life balance and employee engagement will be able to improve ship crew's work effectiveness. Thus, this modern ship research is integrated in line and supports previous research, especially the relationship between the four variables of human resources with the fields of engineering, design and operational. This research is a model that will improve the quality of modern shipbuilding with large weight and high speed.

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