

Improvement Strategies for Women Representation in Malaysian Maritime Transportation Industry to Support 3D Jobs; Dirty, Dangerous and Demeaning

Nuraqilah Abd Rahman^{1*}, Nurul Haqimin Mohd Salleh²
^{1,2}Universiti Malaysia Terengganu

*Corresponding Author: nuraqilah.rahman@yahoo.com

Abstract

Maritime transportation industry can be classified as 3D jobs; dirty, dangerous and demeaning with historically been male dominated industry. This give challenges for women to be a part of maritime sector. The imbalance gender in maritime transportation industry are still been debated over the year. Until 2016, only 1 to 2% over 1.25 million seafarers are women. Malaysia as one of the maritime nation has facing the same problem regarding the issue of imbalance gender especially in seafaring career. Concerning about this issue, this paper analyses and recommends improvement strategies of women representation in Malaysian maritime transportation industry. As a result, the primary of this paper listing the potential strategies that can be used to improve women participation in maritime career. This research also highlights the perspective and idea of solution that comes from organisation that lean to the maritime including Malaysian government, maritime institution, industry and NGOs. Firstly, the status of women seafarer in Malaysia maritime industry will be analysed. Secondly, the improvement strategies of women representation in Malaysia maritime transportation industry will be evaluated. Finally, the most effective strategies will be recommended. In order to achieve these objectives, two mathematical methods will be employed which are Analytical Hierarchy Process (AHP) and Evidential Reasoning (ER). This research is expected to contribute to the maritime industry in the interest of attracting women participation in maritime sector.

Keywords: Women Seafarers, 3D Jobs; Dirty, Dangerous and Demeaning, Gender Imbalance, Analytical Hierarchical Process (AHP), Evidential Reasoning (ER)

Introduction

Today, women have shown a very good performance as a maritime employee in most country (Jones, 2008). The participation of women in maritime industry are no longer seems weird. As a broad industry, women might working in many divided maritime sector. Besides at sea, women are capable to work as manager at port, logistic and distributive, inland maritime operation and others maritime profession sector. Women was attracted to be a part of maritime industry due to

the opportunity of travel, good pay, experience and making a difference in the worldwide national and regional economies (Brickman, 2012). Usually in maritime organisation, women are frequently attributed as a part of decision maker as reason they are likely placed in top management level (Rahman *et al.*, 2013). However, the tough maritime profession that implicate dirty, dangerous and demeaning (3D) atmosphere was forming an idea, that maritime career was only for man. This issue was arousing a challenge on the imbalance gender in maritime transportation industry. Until 2016, only 2% over 1.25 million seafarers are women. Malaysia as one of the maritime nation has facing the same problem regarding the issue of imbalance gender especially in seafaring career.

Generally, the gender imbalance occurs in many type of occupations as well. The society believes that women are not supposed to work and yet they are not even belong to the dirty and dangerous sector. The Materialist Theory (2017) mentioned that women's role as mother and wife in order to maintain the harmonisation of life for the society. While man need to go outside and work in market place (Eitzen *et al.*, 2003). It seems like the society stereotype are triggering mind set to people, that women should not involve in dirty and dangerous sector including seafarers career (Dragomir *et al.*, 2013).

Table 1 shows the number of total application for seafarer's career in Malaysia. From 2012 until 2016, male seafarer was registered more than thousand every year while registered female seafarer not even more than 5%. Only in 2013, there is a small improvement of women application. However, it was dramatically decrease in 2014 until 2016.

Table 1: Total local seafarer Application in Malaysia from 2012 - 2016

Year	Total Male	Total Female	Total Application
2012	13085	263	13348
2013	12155	329	12484
2014	14182	256	14438
2015	12302	284	12586
2016	10099	252	10351

Source: Malaysia Marine Department 2017

Therefore, this paper analyses and recommends improvement strategies for women representation (ISWR) in Malaysian maritime transportation industry. First, the improvement strategies of women representation in Malaysia maritime transportation industry are identified. Then, the identified strategies are prioritized before selecting the most recommended to be used in the decision-making part.

Literature Review

Women are attract to work as seafarer for many reason including the opportunity for travel, economic reason, and experience they use in on shore based for future (Jo, 2010). However, according to Kitada (2010) women is intent to work at sea because of political movement on promoting women in top level position and their strategic promotion as workers on board. Dragomir and Surugiu (2013) state the main motivation of women to work at sea due to the good offshore wages and family encouragement to continue the tradition as sea employee. Meanwhile, some women try hard to be a part of seafarer workers to prove to the society that the capabilities of women and man are in the same level (Guo & Liang, 2012)

The invention of many maritime institutions due to skill labour needs at sea. Most of the time, maritime institution engender towards encourage more women to work as seafarers. Even though the actual representations of women are still lack, yet the number of their participation is remain constant over the year. In Malaysia, the numbers of local female application seafarer from 2012 to 2016 are constantly below 300 people per year. But the numbers are still available since there is registration every year (Malaysia Marine Department, 2017). However, it is undeniable after women seafarers get married they were likely end up their job on the reason to focus more on the family and some like to serve in the onshore maritime sector. This is probably the reason why women usually not stayed longer as seafarer at sea.

In maritime, the issue regarding gender imbalance was not seems intentionally scepticism anymore. From the view of maritime university, there is place for women in a men's world now (Popescu & Varsami, 2010). In fact,

International labour Organisation (ILO) and IMO, has devised various strategies starting from the education level for eliminate perceptions that bring to gender imbalances in the maritime industry. Based on the literature, several researches on women representation in maritime industry have been widely conducted. In year 2000, study about history of women in maritime industry and difficulty that face by women seafarers has been constructed by Aggrey that suggest to the United Nation, about free compulsory basic schooling for developing countries to break their traditional and cultural barrier. The journal also suggests the scholarship for every potential female in order to encourage them to be present in seafaring profession.

In 2013, Rahman has been written about the contribution and participation of women in maritime industry by focusing in northern region of Malaysia. Rahman have mention a few suggestion to improve women in maritime industry, including to set up a new ground rules when women working on board. He also stated, women now should and be always treated equal to the men. In the latest study regarding issue from china about Chinese women seafarers: A case study of the women cadets in Shanghai related the Gender Empowerment and Multi-cultural Crew (GEM) Project, an international study aiming to examine seafarers' welfare, focusing on gender issues arising from a multi-cultural crew environment. Despite of the issue of imbalance gender in maritime transportation industry, there are strategies need to be implemented in order to improve women participation in maritime transportation industry.

The developments of maritime industry manage to attract more women to get in the sector. Since 1989, IMO has built a strategy to enhance the involvement of women in maritime. Through the policy and strategy developed with the cooperation of United Nation (UN), they are committed to promote gender equality and empower women (Fernandez *et al.*, 2014). In Malaysia, women in maritime industry may begin from the institution approach. The participation of institution as the employee resources for industry will always encourage women to join maritime industry. For instant the Malaysian Maritime Academy (ALAM)

was success presence the first batch of 13 women over 302 maritime graduated candidates during 2016. They highly expected to fulfill the needs of maritime industry (Bernama, 2017). Besides ALAM, there is other institution providing women maritime graduates, such Universiti Malaysia Terengganu and RANACO Institute. In its entirety, women in maritime has been appeared for so long. Even though their growth in maritime industry are still being debated but it seems like their emersion are still remain constant over the year.

The improvement strategies have been identified by four main criteria, which are government strategies, academic strategies, industry strategies and NGOs strategies. Government is the first criteria, where as a base for other main criteria to productively work by playing the role. The government strives to improve the maritime industry and the maritime support services activities (Khalid, 2008). Followed by academic, where each educational institution is instrumental in producing a workforce equipped with relevant technical and management skills (Abas *et al.*, 2013). Academic will supply human capital to the industry. Generally, industry played major role in enhance economy. Industries have a bigger role in providing the job opportunity to community (Anner *et al.*, 2006). With the development of the industry, larger job opportunities will be opened for the community. This will able to improve the standard of living of the community. As well as, maritime industry played major role for the economy. The fourth criterion is Non-government organisation (NGOs), where this criteria work as supportive organisation to ensure the maritime employment work normally (Reimann, 2006). NGOs play a big role especially in sectors that cannot be fulfilled with government services (Nithyanandhan & Mansor, 2017). Maritime NGOs is also has an interest in drafting a maritime future plan in order to improve women representation Malaysian maritime industry.

To analyse the strategies and the effective strategies for improving women in Malaysian maritime industry, two methods are used including Analytical Hierarchy Process (AHP) and Evidential Reasoning (ER). The AHP an effective method to deal with critical decision making, AHP help the decision maker to set

priorities and make the best decision by prioritising the strategies using the pair wise comparison (Saaty, 1980). However, Evidential Reasoning is to formalising the human reasoning that handles conflict in multi-criteria decision-making (Wang *et al.*, 2006). The advantages of ER method are the ability to handle the incomplete, uncertain and unclear data as a complete data. The ER gives flexibility to the respondent to express their judgement by using subjectively or qualitatively (Sonmez *et al.*, 2002).

Method

In order to identify the improvement strategies of women representation (ISWR) in Malaysia maritime industry, the process was begin by assign four major contributor in improving women participation. This process required meticulous understanding of ISWR and the specific through of main criteria. Literature reviews have been used as the main technique to identify the sub criteria. However in order to get more accurate data, the expert consultation has been conducted together with literature review. In the beginning, the general strategies was identifies and it is been assess in order to deduct the repetition of strategies factor until the final assessment criteria are selected. To develop the calculation process in the ISWR, a flow chart of proposed methodology in sequential order is illustrated in Figure 1.

Improvement strategies identification

The identification of improvement strategies is based on literature review and expertise consultation. All of the experts have been chosen under four main criteria which are in government sector, academic sector, industry and NGOs sector. As a result, all the strategies have been listed in generic model Figure 2.

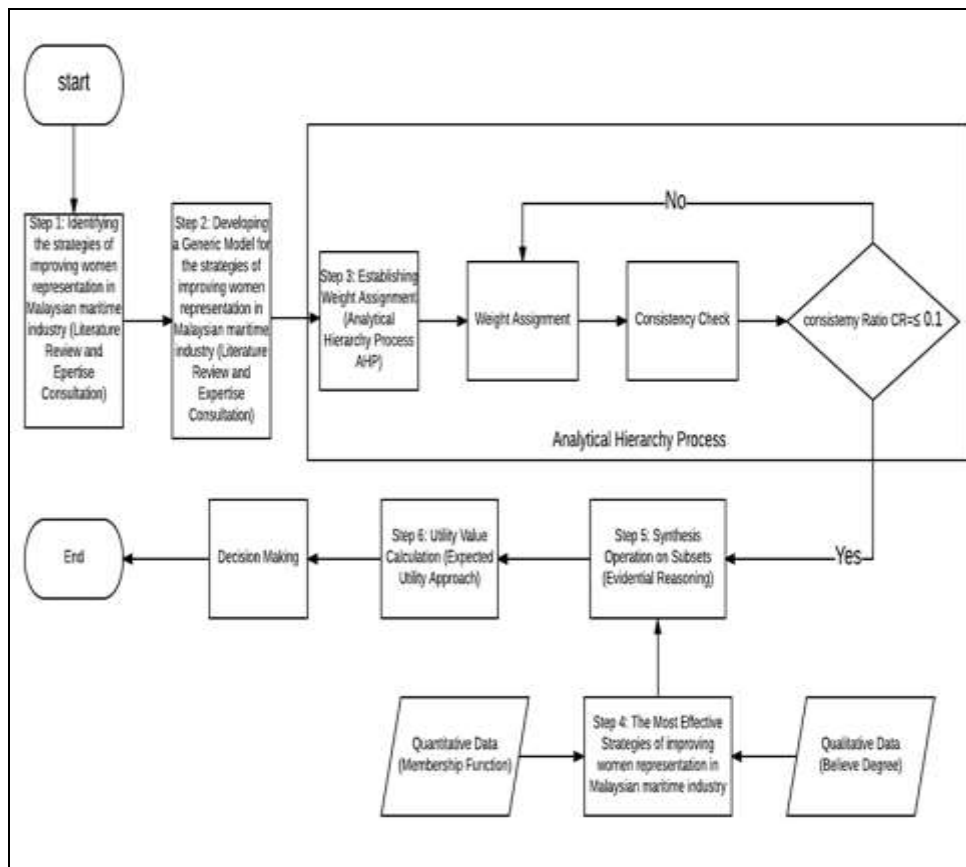


Figure 1: The Procedures in ISWR

AHP Weight Assessment

The weight criteria will be measure by using comparison scale of AHP. To compare the sub-criteria in field of pair-wise comparison mode, a fundamental scale of number is used. Table 6 shows a preferable scale from 1 to 9. The comparison scale described scale by using linguistic meaning where scale 1 as the equivalent between strategies, scale 3 refers as weekly important. 5 is strongly important, 7 very strongly important and extremely important for 9. However, 2, 4, 6, 8 are intermediate values between two adjacent judgments.

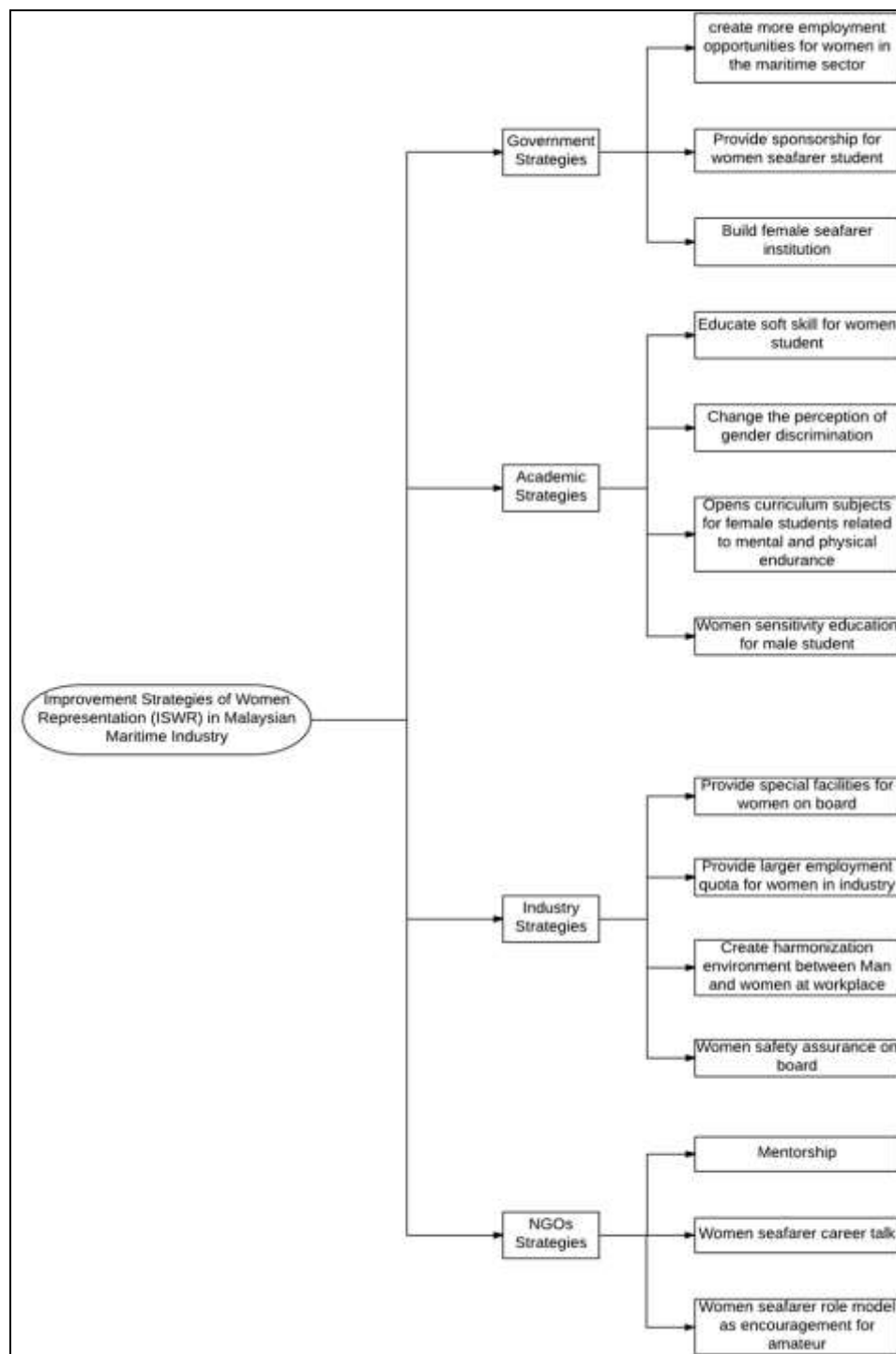


Figure 2: ISWR Generic Model

Table 2: Comparison Scale

Numerical Assessment (Scale)	Linguistic Meaning
1	Equally Important (EQ)
3	Weakly Important (WE)
5	Strongly Important (ST)
7	Very Strongly Important (VS)
9	Extremely Important (EX)
2, 4, 6, 8	Intermediate values between the two adjacent judgments.

To quantify judgments of pairs of criterion A_i and A_j are presented by $n \times n$ matrix D. The a_{ij} entries are defined by entry rules as follows:

- Rule 1: if $a_{ij} = \alpha, 1/\alpha, \alpha \neq 0$
- Rule 2: if A_i is judge to be of equal number of equal relative number as A_j , then $a_{ij} = a_{ji} = 1$.

According to above rules of matrix D is shown as follows:

$$D = a_{ij} = \begin{bmatrix} 1 & a_n & \cdots & a_{1n} \\ 1/a_n & 1 & \cdots & a_{2n} \\ 1/a_{1n} & 1/a_{2n} & \cdots & 1 \end{bmatrix} \quad (1)$$

where $i, j = 1, 2, \dots, n$ and each a_{ij} is the relative importance of criterion A_i to criterion A_j .

The quantified judgment of comparison of pair (A_i, A_j) is noted as a_{ij} in the matrix D; a further step is to allocate the weight vector for each criterion or alternative, as it show the prioritization of the criterion or alternatives (Riahi *et al.*, 2012) a weight value w_k can be calculated as follow :

$$w_k = \frac{1}{n} \sum_{j=1}^n \left(\frac{a_{kj}}{\sum_{j=1}^n a_{ij}} \right) \quad k = 1, 2, 3, \dots, n \quad (2)$$

where a_{ij} stands for the entry row i and column j in a comparison matrix of order n .

By using Consistency Ratio (CR), inconsistency of pair wise comparison can be measured. If CR value is 0.10 or less, the consistency of the pair wise comparison is considered reasonable and can be accepted, the AHP continue with calculation of weight vector (Salleh *et al.*, 2015). However if CR is greater than 0.10 it will led to an inconsistency of pair wise judgments. Thus, decision maker shall review the pair wise judgment before proceed. To check the consistency of judgments, a CR is computed by using Equation below.

$$CR = \frac{CI}{RI} \quad (3)$$

$$CI = \frac{\lambda_{max} - n}{n - 1} \quad (4)$$

$$\lambda_{max} = \frac{\sum_{j=1}^n \left(\frac{\sum_{k=1}^n w_k a_{jk}}{w_j} \right)}{n} \quad (5)$$

where CI is the inconsistency index, RI is the average random index (Table 5), n is the number of items being compared, and λ_{max} is the minimum weight value of the $n \times n$ comparison matrix D (Salleh *et al.*, 2015)

Table 3: Value of Average Random Index

n	1	2	3	4	5	6	7	8	9	10
RI	0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.49

Evidential Reasoning (Step 5)

Linguistic variables representing the qualitative criteria (Salleh *et al.*, 2015);(Xu & Yang, 2002) as follows:

$$\tilde{E} = \{(0, \text{Very Low}), (0, \text{Low}), (0, \text{Medium}), (0.6, \text{High}), (0.4, \text{Very High})\}$$

$$\tilde{E} = \{(0, \text{Very Low}), (0, \text{Low}), (0.2, \text{Medium}), (0.5, \text{High}), (0.3, \text{Very High})\}$$

These assessment grades will be synthesized after gathering the assessment from experts. This synthesis will be conducted using ER Algorithm. The basis of a multi-attribute evaluation framework and the evidence combination of the D-S theory has led to the development of ER Algorithm (Salleh *et al.*, 2015);(Xu & Yang, 2002). ER Algorithm is where an upper level is assessed through lower level attributes to assess the high level attribute

Table 4: The Effective Strategies Scale for Main Criteria

Main Criteria	Not Effective	Low Effective	Fairly Effective	Very Effective	Absolutely Effective
Government Strategies	0	25	50	75	100
Academic Strategies	0	25	50	75	100
Industry Strategies	0	25	50	75	100
NGOs Strategies	0	25	50	75	100

Synthesis Operation on Subsets (ER Algorithm)

The basis of a multi-attribute evaluation framework and the evidence combination of the D-S theory has led to the development of ER Algorithm (Xu & Yang, 2002). ER Algorithm is where an upper level is assessed through lower level attributes to assess the high level attribute. The equation below will be used to conduct this synthesis:

$$\tilde{E} = \tilde{E}_1 \oplus \tilde{E}_2$$

To show this formula, $\tilde{E}$ will represent the whole set of expression, and it will be assessed by aggregating two subsets $\tilde{E}_1$ and $\tilde{E}_2$ as follows:

$$\tilde{E} = \{(\beta^1, \text{Very Low}), (\beta^2, \text{Low}), (\beta^3, \text{Medium}), (\beta^4, \text{High}), (\beta^5, \text{Very High})\}$$

$$\tilde{E}_1 = \{(\beta_1^1, \text{Very Low}), (\beta_1^2, \text{Low}), (\beta_1^3, \text{Medium}), (\beta_1^4, \text{High}), (\beta_1^5, \text{Very High})\}$$

$$\tilde{E}_2 = \{(\beta_2^1, \text{Very Low}), (\beta_2^2, \text{Low}), (\beta_2^3, \text{Medium}), (\beta_2^4, \text{High}), (\beta_2^5, \text{Very High})\}$$

In this paper, the expressions in subsets are ‘not effective’, ‘low effective’, and ‘fairly effective’, ‘very effective’ and ‘absolutely effective’. This parameter will be connected with their corresponding belief degrees. When $m = 1, 2, 3, 4, 5$ M_1^m and M_2^m are the individual degrees to where the subsets $\tilde{E}_1$ and $\tilde{E}_2$ support the hypothesis that the assessment is confirmed to the five expressions.

Case Study

In order to test the effectiveness ISWR, 20 experts have been chosen by considering the respondents experience, education, and managerial level. The experts have been selected under the conformity towards maritime organisation. It is including, government agencies, NGOs, academic and industry. The information provided in the questionnaires is assisting the experts during the interview session. In order to overcome the difficulty in allocating weights and to prevent prejudgment, equal weight has been assigned in the questionnaire. Based on step 3, the identified the prioritisation of all strategies by establishing the weight assignment using pair wise comparison and AHP algorithm.

Table 5: Result of weight value and consistency ratios

Main-Criteria		Weight	Sub-Criteria		Local weight	Global Weight
Industry		0.5014	Safety assurance		0.3450	0.1730
			Special facilities		0.2567	0.1287
			Employment quota		0.2078	0.1042
			Harmonisation environment		0.1905	0.0955
				CR=	0.002	
Government		0.2808	Female seafarer institution		0.4120	0.1157
			Sponsorship		0.3551	0.0997
			Employment opportunities		0.2329	0.0654
				CR=	0.002	
Academic		0.1335	New curriculum subjects		0.3584	0.0478

			Education Soft skill		0.2267	0.0303
			Women sensitivity education		0.2199	0.0260
			Change discrimination perception		0.1949	0.0260
				CR=	0.001	
NGOs		0.0843	Mentorship		0.3720	0.0314
	CR=	0.02	Seafarer role model		0.3341	0.0282
			Seafarer career talk		0.2939	0.0248
				CR=	0.001	

Table 5 shows the weight of each strategy, where the most effective strategies is women safety assurance on board with the weight of 0.1730, followed by provide special facilities for women on board (0.1730) and build female seafarer institution (0.1157). However, the lowest rank of strategy is women seafarer career talk from NGOs strategies with the weight 0.0248. In step 5, all strategies have been assessed quantitatively and qualitatively by expert and the implementation of Intelligent Decision System (IDS) for the purpose of multiple criteria assessment. As a result, the aggregation of main criteria and sub criteria shows in table 6 and 7.

Table 6: Aggregation for Sub-Criteria of ISWR

Sub-Criteria	Not Effective	Low Effective	Fairly Effective	Very Effective	Absolutely Effective	Utility value
Employment opportunities	0	0.0801	0.4701	0.2358	0.2140	0.6459
Sponsorship	0	0.0522	0.4421	0.3193	0.1865	0.6600
Seafarer institution	0.0224	0.2452	0.174	0.2501	0.3083	0.6442
Aggregation	0.0090	0.1339	0.3388	0.2742	0.2441	0.6527
Soft skill education	0	0.2523	0.3834	0.1981	0.1662	0.5696
Changing perception	0	0.0042	0.4214	0.1840	0.3904	0.7402
New curriculum subjects	0	0.0210	0.3720	0.4984	0.1086	0.6737
Sensitivity education	0	0.0085	0.4313	0.2327	0.3275	0.7198
Aggregation	0	0.0569	0.4164	0.3188	0.2079	0.6694
Special facilities	0	0.0212	0.4995	0.2961	0.1832	0.6603

Employment quota	0	0.0475	0.3063	0.4601	0.1861	0.6962
Harmonisation environment	0	0.0214	0.4260	0.3408	0.2118	0.6857
Safety assurance	0	0	0.1833	0.4083	0.4084	0.8063
Aggregation	0	0.0157	0.3307	0.3890	0.2646	0.7256
Mentorship	0	0.1488	0.6273	0.1829	0.0410	0.5290
Career talk	0.0439	0.0485	0.4046	0.3130	0.1900	0.6392
Role model	0.0428	0.0043	0.2767	0.4911	0.1851	0.6928
Aggregation	0.0230	0.0644	0.04723	0.3213	0.1190	0.6123

Table 7: Aggregation of Main-Criteria of ISWR

Main-Criteria	Not Effective	Low Effective	Fairly Effective	Very Effective	Absolutely Effective	Utility Value
Government	0.009	0.1339	0.3388	0.2742	0.2441	0.6527
Academic	0	0.0569	0.4164	0.3188	0.2079	0.6694
Industry	0	0.0157	0.3307	0.3890	0.2646	0.7256
NGOs	0.0230	0.0644	0.4723	0.3213	0.1190	0.6123
Aggregation	0.0030	0.0450	0.3601	0.3537	0.2382	0.6947

Result and Discussion

Based on AHP calculation, the weight of industry strategies is 0.5014, followed by government strategies is 0.2808, academic strategies is 0.1335 and NGOs strategies is 0.0843. Most of the experts believe that industry played the best rule to improve women participation in maritime since they are the larger contributor to the economy. As overalls, the highest three effective strategies are belong to women safety assurance on board (0.1730), followed by provide special facilities for women on board (0.1287) and build female seafarer institution (0.1157). Safety assurance is all planned and systematic action required earning enough trust that the products, services, organizations or systems work to achieve acceptable or acceptable security (EU Commission, 2011). Safety assurance for women on board shall be established by company in order to protect women from physical and social danger. Safety assurance can be established in terms of policy enforce by industry for example women working hours on board (France, 2014). Through safety assurance designated by industry, women will feel safer to work on board.

The maritime industry is gearing up as a job on board is a big issue to

women (ITF Seafarer, 2017). Women as minority on board are facing difficulty to share some facilities with the opposite gender, especially facilities involving sensitivity such as bedroom, toilets and etc. (Aggrey, 2000). On that particular thing, through this strategy, industry shall provide special facilities reserved for women. Based on the previous study, the industry has begun to realize the importance of isolating women and men facilities on board (Yosoff *et al.*, 2015). However, this strategy has not yet been widely adopted. For this reason, this strategy can be applied to create women's comfort on board while at the same time enhancing women's confidence to participate in the maritime industry, especially in seafaring career.

Women Maritime Association (MMA) seen as one of the platforms for the government to provide space for women in the maritime industry (IMO, 2017). The statistic of women seafarer workers is achieving only 1-2% until year 2016 (Govender, 2016). Reliable, the tiny statistic happened due to lack of women representation in any maritime institution. Suppose that, by build women seafarer institution in future, women who are interested in this profession will feel more comfortable to join the maritime sector. Therefore through this strategy, through government strategy the number of women participation as seafarer may rise in this world.

Based on Table 6, among the lowest level strategies, safety assurance (80.63%) is the most effective strategies for the improvement of women participation, followed by changing the perception of women discrimination (74.02%) and women sensitivity education for male student (71.98%). However, mentorship (52.90%) is the lowest effectiveness strategies for improvement of women participation in Malaysia maritime transportation industry. Based on Table 7, in overall, with 72.56% effectiveness, industry strategy can be considered as closed to very effective, followed by academic strategy (66.94%), government strategy (65.27%) and NGOs (61.23%). It defined that the industry are able to increase the involvement of women in maritime. With the role played by the

industry, larger working opportunity can be opened for the community especially by focusing on women.

Conclusion

The participation of women in maritime industry is still can be considered low compared to the man especially in seafaring career. As female in male domination world, there are lot of things that women need to faces in order to stay in their working position. From the strategies that has been analysed by using literature review and expertise consultation, there are fourteen potential strategies has been proposed in the generic model. Through the comparison that has been made for the all of potential strategies, it can be seen that industry's strategy is the most important strategy that can contribute to improvement of women participation in Malaysian maritime transportation followed by government strategy, academic strategy and NGOs strategy. All the interest parties shall be work together in order to improve women participation in maritime transportation industry. With the policy enforce by government and responsibility played by industry, academic and NGOs, it is reliable to mention that all of the potential strategies in sub-criteria are effective to be implemented at their own level. On that thing, this research is expected to assist the parties in the interest of attracting women participation in maritime transportation. Hopefully from the result obtain and from the action taken, the participation of women in maritime would be increased in the future. Nevertheless, the research regarding this issue shall be conducted by time to time in order to gain a better result appropriate with the current situation.

References

- Ab Rahman, F., Ismail, S. B., Ishak, I. C., & Halim, M. M. A. (2013). Statistical Analysis of Women Participation and Contribution in Maritime Industry at Northern Region Of Malaysia.
- Abas-Mastura, M., Imam, O. A., & Osman, S. (2013). Employability skills and task performance of employees in government sector. International Journal

of Humanities and Social Science, 3(4), 150-162.

- Aggrey, H. A. (2000). Women in the maritime industry: a review of female participation and their role in Maritime Education and Training in the 21st century.
- Anner, M., Greer, I., Hauptmeier, M., Lillie, N., & Winchester, N. (2006). The industrial determinants of transnational solidarity: Global interunion politics in three sectors. *European Journal of Industrial Relations*, 12(1), 7-27.
- Brickman, J. P. (2012). Recruitment and Retention of Women in the Maritime Industry. Ph.D. dissertation. U.S. Merchant Marine Academy.
- Dragomir, C., & Surugiu, Felicia (2013). Seafarer Women Perception of the Seafaring Career. In Conference proceedings paper. *Advances in Fiscal, Political and Law Science*.
- Eitzen, D. S., & Zinn, M. B. (2003). *Social Problems: With Research Navigator*. Allyn & Bacon.
- EU Commission. (2011). Commission Regulation (EU) No 1129/2011 of 11 November 2011 amending Annex II to Regulation (EC) No 1333/2008 of the European Parliament and of the Council by establishing a Union list of food additives. *Official Journal of the European Union L*, 295(4), 1211.
- Fernandez- Feijoo, B., Romero, S., & Ruiz- Blanco, S. (2014). Women on boards: they affect sustainability reporting?. *Corporate Social Responsibility and Environmental Management*, 21(6), 351-364.
- France, G. D. R. (2014). International Labour Organization (ILO). *The Statesman's Yearbook 2015: The Politics, Cultures and Economies of the World*, 16.
- Govender, (2016). Women in Shipping and Maritime Industry | Shipping & Logistics. Retrieve December 2, 2017, from <https://www.bowmanslaw.com/insights/porttransportlogistics/woman-seafarers-turning-against-the-tide/>
- Guo, J. L., & Liang, G. S. (2012). Sailing into rough seas: Taiwan's women seafarers' career development struggle. In *Women's Studies International Forum* (Vol. 35, No. 4, pp. 194-202).
- High Seas' Challenge Awaits ALAM's Women Grads. (2017). Retrieved October 22, 2017, from

<http://maritime.bernama.com/news.php?id=459030&lang=en&cat=ex>

- International Maritime Organization (2017). Retrieved September 20, 2017, from <http://www.imo.org/en/Pages/Default.aspx>
- ITF Seafarer (2017). Women Seafarers. Retrieved December 16, 2017, from <http://www.itfseafarers.org/ITI-women-seafarers.cfm>
- Jo, S. H. (2010). Why not women seafarers?: towards a development strategy for the recruitment and retention of women seafarers in cargo ships with particular reference to the Republic of Korea.
- Jones, R. G. (2008). Empowering professional women in the Maritime World: the WMU contribution. *WMU Journal of Maritime Affairs*, 7(2), 505-508.
- Khalid, N. (2008). Enhancing Maritime Support Services in Malaysia: A Strategic Approach.
- Kitada, M. (2010). Women seafarers and their identities. Cardiff University (United Kingdom).
- Malaysian Marine Department (2017). Total Seafarer Application in Malaysian Marine Department 2012-2016 Retrieved August 28, 2017.
- Nithyanandhan, S. H., & Mansor, N. (2017). Self Help Groups and Women's Empowerment. *Institutions and Economies*, 143-164.
- Popescu, C., & Varsami, A. E. (2010). The place of women in a men's world from a maritime university perspective. In *Proceedings of the 7th WSEAS International Conference on Engineering Education: Latest Trends on Engineering Education*, World Scientific and Engineering Academy and Society (WSEAS), Corfu Island, Greece, 22-24 July (pp. 182-186).
- Reimann, K. D. (2006). A view from the top: International politics, norms and the worldwide growth of NGOs. *International Studies Quarterly*, 50(1), 45-67.
- Riahi, R., Bonsall, S., Jenkinson, I., & Wang, J. (2012). A seafarer's reliability assessment incorporating subjective judgements. *Proceedings of the Institution of Mechanical Engineers, Part M: Journal of Engineering for the Maritime Environment*, 226(4), 313-334.
- Saaty, T. L. (1980). A scaling method for prioritise in hierarchical structures, *Journal of Mathematical Psychology*. 15(3): 234-281.

- Salleh, N.H.M. Riahi, R, Yang, Z., and Wang, J. (2015), Business environmental based risk model for the Container liner shipping industry, *European Journal of Business and Management* 7(27): 15-27.
- Sonmez, M., Yang, J. B., Graham, G., & Holt, G. D. (2002). An evidential reasoning based decision making process for pre-qualifying construction contractors. *Journal of decision systems*, 11(3-4), 355-381.
- The Materialist Theory (2017). Chapter 9 Gender Inequality. Retrieved from <http://dmc122011.delmar.edu/socsci/rlong/problems/chap-09.htm>
- Wang, Y. M., Yang, J. B., & Xu, D. L. (2006). Environmental impact assessment using the evidential reasoning approach. *European Journal of Operational Research*, 174(3), 1885-1913.
- Xu, L., & Yang, J. B. (2002). Introduction to multi-criteria decision making and the evidential reasoning approach. *Manchester School of Management*.
- Yusoff, F. A. M., Yusof, R. N. R., & Hussin, S. R. (2015). Halal Food Supply Chain Knowledge and Purchase Intention. *International Journal of Economics*.