




PREDICTING JOB SATISFACTION OF MALAYSIAN MECHANICAL VENTILATION AND AIR CONDITIONING MAINTENANCE PERSONNEL IN THE OIL AND GAS SECTOR


 **Mohd Syafiq Syazwan Mustafa**¹

 **Anies Fазiehan Zakaria**²⁺

 **Siti Shaidatul Zarifah Che'Om**³

 **Fatimah Mohamed Yusop**⁴

 **Faizal Amin Nur Yunus**⁵

 **Mohammad Ashraf Abdul Rahman**⁶

^{1,3,6}Faculty of Engineering Technology, Universiti Tun Hussein Onn Malaysia, Pagoh Campus, Malaysia.

¹Email: mohdsyafiq@uthm.edu.my Tel: +606-9722001

²Email: cn170050@siswa.uthm.edu.my Tel: +606 9722001

³Email: fatimahy@uthm.edu.my Tel: +606-9722001

⁴Email: ashrafr@uthm.edu.my Tel: +606-9722001

²Faculty of Engineering and Built Environment, Universiti Kebangsaan Malaysia, Malaysia.

²Email: aniesfaziehan@ukm.edu.my Tel: + 603- 89217184

⁴Faculty of Technical and Vocational Education, Universiti Tun Hussein Onn Malaysia, Malaysia.

⁵Email: faizaly@uthm.edu.my Tel: +074537000



(+ Corresponding author)

ABSTRACT

Article History

Received: 31 March 2022

Revised: 16 May 2022

Accepted: 2 June 2022

Published: 29 June 2022

Keywords

Demographics
Extrinsic
Intrinsic
Job satisfaction
MVAC.

Oil and gas industry pose a higher risk of operational hazards for the maintenance personnel who are least exposed to job satisfaction measures especially in the field of mechanical ventilation and air conditioning (MVAC). This study discussed current trends in the demographics of maintenance personnel in Malaysia's oil and gas maintenance sector. 50 MVAC employees (n=50) from a Malaysian oil and gas company completed a questionnaire survey as a part of this study. The set of questions was related to intrinsic and extrinsic motivation that can help achieve employees' job satisfaction. The results indicated that the general element in M = 4.26 is at the highest level with M = 4.15, and the extrinsic element is at M = 4.15. The reliability of Cronbach Alpha of each component was 0.937, 0.902, and 0.899. The warrior experience and the significant values of 0.027, 0.049, and 0.019 were essential predictors of overall job satisfaction. The findings from this study offer an up-to-date overview of employees' inner and outer motivation to continue improving work performance.

Contribution/Originality: This is one of the first studies to examine the mechanical ventilation and air conditioning maintenance personnel in the Malaysian oil and gas sector, studying their job satisfaction level based on their background and demographics. It explores how gender and demographics moderate the impact of job satisfaction on the personnel.

1. INTRODUCTION

The outreach of oil and gas industry is vast and global. The Malaysian oil and gas industry has provided significant economic benefit for the country for decades. Malaysia is the second-largest oil and natural gas producer in Southeast Asia and is the fifth largest exporter of liquefied natural gas (LNG) in the world, as of 2019. It is

strategically located on important routes for seaborne energy trade. The industry contributes to Malaysia's overall socio-economic well-being through the creation of jobs, supporting the domestic economy as well as boosting government revenue through the payment of taxes and royalties. Petroleum-related revenue is forecast to decline by 40.3% to RM50 billion in 2020 (2019: RM83.8 billion), due to exclusion of special dividend for tax refund as well as reduction in PITA and royalty amounting to RM8.5 billion and RM4.2 billion, respectively, based on lower global crude oil prices. An average global discovery maintenance failure often happens but when a company continuously faces failures, this situation possibility needs downsizing. Besides, the oil and gas industry outlook in 2021 is expected to remain challenging due to the unprecedented demand destruction from the COVID-19 pandemic which has made a profound impact on both the domestic and global markets.

Human resource management plays an important role to ensure the demand of the pro technical or the maintenance professional. The Malaysia oil and gas industry is currently facing recruitment and retention difficulties due to the shortage of skilled workers. One of the means to retain existing employees is to improve workers' job satisfaction. The oil and gas sector is different from other high-risk industries as it is complex, though advanced in technology, but highly hazardous. Several studies have concluded that human factors contribute significantly to accidents in high-risk industries, especially in maintenance work (Antonovsky, Pollock, & Straker, 2014; Moura, Beer, Patelli, Lewis, & Knoll, 2017; Strauch, 2017). According to Othman, Majid, Mohamad, Shafiq, and Napih (2018), work exertion and incompetency are among the main factors in work-related hazards.

Due to the complex and challenging working environment, one of the important human resource issues highlighted is job satisfaction. Job satisfaction studies have attracted the wide discussion of researchers in various discipline (i.e. education, engineering, banking, entrepreneurs, medical and nursing) and it is trans-disciplinary study which concerns human resources management, employee and organizational behaviors. A vast volume of research exists related to various factors and mediator impacts concerning job satisfaction. Job satisfaction is commonly defined as the pleasurable or positive experiences that encourage better job performance. Job satisfaction is an attitude that emphasizes on the human behaviors by the extent to what employee(s) achieve personal and organizational goals. This makes them satisfied on their job. Job satisfaction can be categorized into two: intrinsic and extrinsic (Bektas, 2017). Factors like self-responsibility, discipline, and skill development are intrinsic values while extrinsic factors include working condition, salary, and relationships among co-workers and employers.

Many studies have suggested that job satisfaction factors should be considered more to understand the complexity and inter-relation of work attitudes and fulfil the desired work condition among workers (Ahad, Khan, & Rahman, 2020; Hope, Holding, Verner-Filion, Sheldon, & Koestner, 2019; UTOMO, UDIN, & HARYONO, 2022). The general aspects of job satisfaction are employment, salary, promotion, award, advantages, work conditions, supervision, colleagues, company, and management (Hope et al., 2019; Lee, Yang, & Li, 2017). The compatibility of personal values with other individuals may cause conflict as differences in attitudes, wishes, and targets may affect the work performance (Shaju & Subhashini, 2017). Besides, job satisfaction studies are also concerned with the demographic profile such as gender, age, educational qualification, experience, marital status, and income significantly influence the job satisfaction among the employees. A study reported that demographic variables such as age, job title and marital status have significant effect the individual job satisfaction.

In addition, the expression "maintaining the happy ship" is a common term among maritime workers, which means that job satisfaction in the organization is considered an essential element of work culture. Job satisfaction combines psychological, physiological, and environmental conditions that enable a person to feel good during/at work (Al-Ali, Ameen, Isaac, Khalifa, & Shibami, 2019). On the other hand, negative work behavior will lead the employee to absenteeism, misjudgment, violation of safety procedures, under-reporting accidents, and decreasing work commitment (Mohd Suki, Rony, & Mohd Suki, 2020). However, as stated by Antonovsky et al. (2014), a petroleum processing plant is suitable for studying the effect of human factors on maintenance work as it is least studied. This study highlights the job satisfaction level of the mechanical ventilation and air conditioning (MVAC)

maintenance personnel in the oil and gas sector. Therefore, this study mainly focused on determining the applicable personnel that were sampled for this case study. First, academic background was the main guideline to ensure the personnel were acceptable for this job. The academic background provided additional information for future graduates and community. It was also a basic requirement in joining oil and gas industry, particularly in MVAC maintenance. The MVAC maintenance job has a challenging job scope and task in the oil and gas industry. Hence, its demographics trends would help to understand the real situation on what the actual job scope is and how it influences the job satisfaction levels. MVAC systems need skillful petro technicians who are able to work efficiently and can ensure safety during the maintenance and operational process. Therefore, the current study investigated job satisfaction, particularly in mechanical ventilation and air conditioning (MVAC) areas. This study therefore focused chiefly on gender demographics, academic qualifications, and work experience as demographics of the personnel to study their employee satisfaction factors in this sector

2. LITERATURE REVIEW

2.1. Mechanical, Ventilation and Air Conditioning System

Due to the capital-intensive nature of the oil and gas sector, offshore and onshore plants must operate with high reliability and availability, as system failure downtime has a significant impact on a production activity and safety. Various types of equipment, including hydraulic, mechanical, ventilation, and air conditioning systems are frequently employed to ensure the success of operations in oil and gas sectors. The main purpose of the MVAC is to ensure the comfort condition of the air-conditioned space subject to the outdoor temperature and climate. Comfort condition commonly refers to the specific range of temperature, humidity, fresh and clean air to a desired level. For the Malaysian shore, the outdoor ambient temperature is normally higher as compared to the conditioned space. Therefore, there are specific tools and techniques required to adjust the relative humidity that meets the standard and are environmental friendly. Most of the available MVAC systems are designed based on the client need's and project constraints, which includes effective maintenance to ensure continued functioning and meeting production targets (Ikwunze & Nwosu, 2016; Mehdi, Yao, Cook, & Clements-Croome, 2018). In the MVAC system, one of the most essential functions is to assist in maintaining acceptable indoor air quality through appropriate ventilation with filtration while also providing thermal comfort. MVAC systems are among the most energy-intensive equipment in oil and gas facilities. Other high-performance objectives such as water consumption (water-cooled air conditioning equipment) and acoustics, can be influenced by the selection and design of the MVAC system.

The oil and gas platforms are very complex and require a specific operation procedure in executing the MVAC maintenance. This is challenging in term of theoretical system implementation (i.e. MVAC configuration and ventilation process) as compared to onshore MVAC system and building MVAC. For the MVAC configuration in oil and gas platform, this system is normally installed outside of building, near the helicopter platform. There are three main general units of MVAC system, which include Pressure Unit (PU) Air Cooled Condensing Unit (ACCU) and Air Handling Unit (AHU). The pressure unit consists of one set of adjustable speed fan that controls the uncertain and different frequency. It is critical to have a thorough maintenance program in place to guarantee that the MVAC system operates as efficiently as possible. Cleansing and examining various components, verifying pressure relationships, modifying and replacing the necessary equipment are a part of the process.

The maintenance service staff should adhere to the maintenance handbook and manufacturer's recommendations as well as and make suitable adjustments to meet the necessary maintenance requirements and frequency schedules. Apart from the MVAC function, the maintenance of MVAC is one of the challenging processes and requires highly skilled personnel (Syafiq et al., 2021). The MVAC maintenance staff should therefore possess both technical and non-technical skills and competencies. Qualified personnel are necessary to avoid human error and reduce the safety risk. Human errors are the most common cause of accidents, accounting for 90% of all incidents specifically in oil and gas sector (Chizaram, Nwankwo, Arewa, Theophilus, & Victor, 2021). This is to

fulfil the ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) standards, where platform engineers and designers should fully follow the guidelines and regulations.

2.2. Job Satisfaction

Job satisfaction is generally defined as a type of emotional response given to a specific work condition. As a result, it cannot be seen but can only be experienced. The level of job satisfaction is commonly referred to as the degree to which outputs satisfy expectations. Moreover, job satisfaction is much dependent on the work environment. In other words, persons who cannot locate what they are looking for will not be showing positive outputs. Job satisfaction studies conducted over the last few years can be categorized into organizational (Tran, 2020; Wang, Chou, & Lai, 2019), manufacturing (Chin, 2018; Minh, Zailani, Iranmanesh, & Heidari, 2019), educational (Torlak & Kuzey, 2019), and industrial settings.

In the context of job satisfaction in manufacturing sectors, studies have mainly focused on workplace turnover attention, machine and tool operations (i.e. job scheduling, resource allocation, workplace design (Hambali, Mohamad, & Ito, 2021) collaborative work between robot and human, modelling and optimization. For example, Başar and Engin (2021) have studied an employment scheduling environment that focused on manufacturing capacity constraints, and the firm was unable to complete all jobs on schedule. The study focused on a no-wait flow shop scheduling problem with setup times in a fuzzy environment. Besides, Chin (2018) studied the influence of job satisfaction on employee turnover intention in the manufacturing industry of Malaysia and found no negative relationship between career development, supervision and employee turnover meaning.

On the other hand, there are studies on job satisfaction elements in oil and gas sectors such as skill, practice and competency among workers; turnover intention, organization management, culture and values (Al-Ali et al., 2019; Alias, Nokman, Ismail, Koe, & Othman, 2018; Mohd Suki et al., 2020; Williams, 2019). Most studies have described how job satisfaction is influenced by several factors such as communication, culture, leadership, career development, opportunities, and employee personalities. These factors can impact (i) employee performance such as competency levels and (ii) organization benefits i.e. production, lower turnover and profit. For example, Al-Mannaee and Ryan (2018) studied elements that contributed to the efficiency of competency models from a trainee's perspective in an oil business in the United Arab Emirates. The study highlighted the model goals, the connection of the content and material to the trainees' jobs, the assessment of the trainees' competencies, and the trainees receiving little or no coaching contributed to the perceived efficacy of the competency-based model of training.

3. METHODS

3.1. Participants and Procedure

Figure 1 presents an overview of the methodology that includes the design and development of questionnaire, data collection methods (survey, online and face to face), and data analysis. The questionnaire emphasized on job satisfaction based on several variables such as the demographic profile of respondents and job satisfaction level. The Minnesota Satisfaction Questionnaire (MSQ), consisting of 21 items, was designed and modified for this study. The MSQ measured both intrinsic (i.e., how individual felt about their work duties) and extrinsic (i.e., how individuals felt about the aspects of their working conditions external to the work itself) job satisfaction levels. Beforehand, the questionnaire underwent a preliminary assessment and pilot study to ensure the reliability index, which was acceptable. Some amendments were also made in terms of language, interface, and word selection. The reliability of the questionnaire was conducted to ensure there was no bias, and was suitable in the Malaysian employee's usage context. The questionnaire was distributed to maintenance personnel (oil and gas contractors) using the face to face approach. A total of 100 questionnaires were distributed, however, only 50 were completed and no missing values were detected. Random sampling method was used to select the sample.

The data pre-processing step involved sorting and extraction of data and data analysis. In this step, the collected data was cleaned to ensure there are no missing values. Once completed, statistical data analysis was conducted. The analysis aimed to determine the degree of job satisfaction in terms of general perspective of job satisfaction, intrinsic and extrinsic. Besides, regression analysis method was conducted to examine the relationship between variables (demographic profile and job satisfaction levels). The regression results showed which demographic variable had impacted most the job satisfaction level of the employees. Prior to conducting regression analysis, such dependent and independent variables were defined and hypothesized to examine how they could impact each variable. Figure 1 sums up the research methodology adopted in this study.

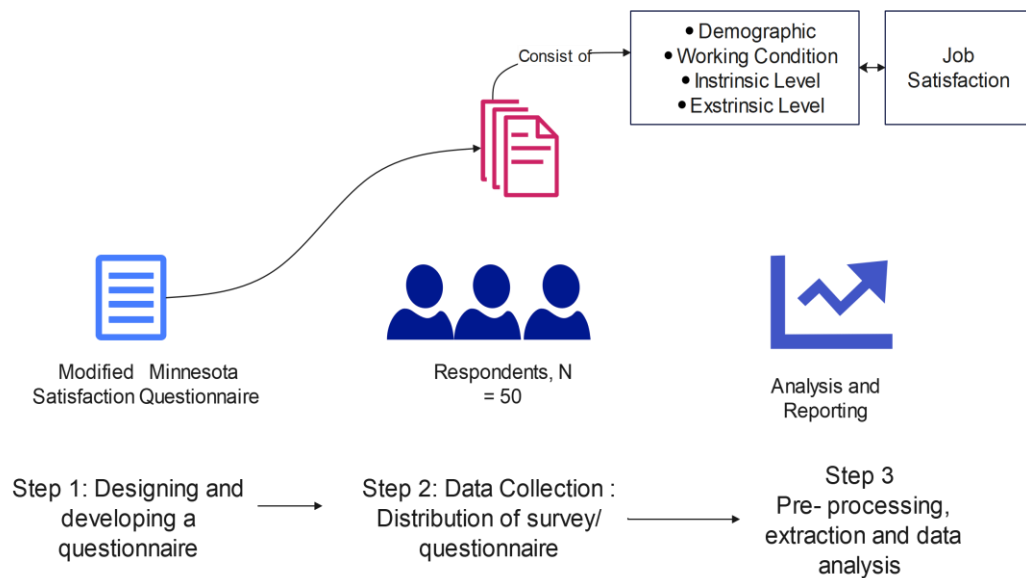


Figure 1. Overview of methodology.

3.2. Score Mean, Interpretation and Cronbach's Alpha

The researcher administered a standardized questionnaire on individual participants to fill the items manually with their characteristics: age, gender, qualification, work experience, and job position to check the level of significance of each variable with job satisfaction. A set of questionnaires was provided to each respondent containing two main sections, as shown in Table 1. Section A contained demographic items while Section B measured intrinsic and extrinsic job satisfaction levels.

Table 1. Score mean, interpretation and Cronbach's Alpha.

Section	Elements	Score of Mean	Interpretation of Mean Score	Cronbach's Alpha
A	Demographic profile	-	-	-
B	General	4.29	Very High	0.937
	Intrinsic Job satisfaction level	4.15	High	0.902
	Extrinsic Job satisfaction level	4.15	High	0.899

Data was analyzed through the Social Science Statistical Package (SPSS) application using descriptive statistical analysis to summarize data using reference numbers. Sections A and B were the main sections of information collection through the Likert-scale response options. Scale "1" meant very unsatisfactory while "5" meant very satisfactory. Furthermore, the analysis of variance ANOVA was used to examine demographic

differences in job satisfaction, and a linear regression test was used to identify the predictors of job satisfaction. The statistically significant result was restricted to p-value < 0.05.

3.3. Reliability

The reliability test refers to a degree to which a test assesses accurately and consistently. It has a strong relationship with the validity of the test. It is a degree of precision to which measurement occurs without error. The Cronbach's Alpha was conducted to determine the reliability of the respondents' job satisfaction and the acceptable reliability values were more significant than 0.7. The results of the analysis of the reliability statistics showed that the values of Cronbach Alpha were highly accepted and understood by the participants in each of the study elements for this study, such as general elements (0.937), intrinsic elements (0.902) and extrinsic elements (0.899). Therefore, the reliability value was accepted in this study as it exceeded 0.7.

4. RESULT AND DISCUSSION

Table 2 shows the interpretation of the mean score adopted to analyze data. The score was distributed in five ranges from 'Very Low' to 'Very high' and the measurement depended on the average scores as reliable value to reflect each data set.

Table 2. Interpretation of mean score.

Min Score	Interpretation of Min Score
1.00-1.80	Very Low
1.81-2.60	Low
2.61-3.20	Medium
3.21-4.20	High
4.21-5.00	Very High

Table 3. Demographic profile.

Demographic Elements	No. of Respondents	Percentage %
Gender	Male	50
	Female	0
Age	20 – 29 years	12
	30 – 39 years	34
	≥ 40 years	4
Nationality	Malaysian	50
	Non - Malaysian	0
Education Level	High School Level	2
	Diploma	25
	Degree	15
	Others	8
Position	Technician	23
	Supervisor	20
	Engineer	5
	Others	2
Professional Experience	0 – 2 years	0
	3 – 6 years	36
	7 – 9 years	3
	≥ 10 years	11
Monthly salary (MYR)	1000 – 2000	15
	2001 – 3000	10
	3001 – 4000	18
	≥ 40001	7
Location of work	Offshore	12
	Onshore	20
	Both onshore and offshore	18

Table 3 provides the demographic profile of the respondents (i.e. MVAC maintenance respondents serving in the oil and gas sector). A total number of 50 respondents participated in this study who were analyzed for variables like gender, age, nationality, education level, working experience, income per month, and location of work. This section presents the frequency value for each variable. The highest frequency number of each demographic profile was highlighted. All the respondents were male which was due to domination of male workers in the oil and gas industry. Williams (2019) observed that job insecurity contributed to gender inequality in the oil and gas industry. Besides, all respondents were Malaysians due to the sampling technique used, as it purposely focused the Malaysian perspectives.

Table 3 presents that 50% of the respondents had obtained a diploma certificate and were primarily technicians. Generally, the essential requirement for a technician position in any industrial field in Malaysia requires at least a diploma (Hadi, Hassan, Razzaq, & Mustafa, 2015). Furthermore, Malaysia has a government-mandated minimum wage, and no worker in Malaysia can be paid less than the government-mandated minimum wage rate of compensation. Thus, this study found that the minimum wage earned was within 1000-2000 (MYR), and a few respondents earned (3001-4000, MYR) income per month.

Table 4 presents the descriptive analysis for three main sections of questionnaires. The first section is general acquisition referring to the working conditions, and 4.29 average mean was obtained. A majority of respondents showed a high level of job satisfaction. This finding indicated that a majority of respondents were happy working in the oil and gas sector, or in their current job in general. A satisfied working experience is important in job satisfaction studies for making intrinsic and extrinsic assessment. This is in line with Al-Ali et al. (2019) who found that job happiness (i.e. in a working environment) was an essential mediator between job satisfaction and employee performance and the likelihood of leaving the company. This study also emphasized on benchmarking the execution of policies by human resources or other organizations management teams in the UAE Oil and Gas sector. Alias et al. (2018) also determined that job satisfaction among employees at an oil and gas company is positively correlated between payment, recognition, empowerment, and work-life balance.

Table 4. Descriptive analysis of questionnaire.

Section	Code	Item	Mean	Overall Mean	SD
A (General)	G1	The working conditions	4.24	4.29	0.744
	G2	The way my co-workers get along with each other	4.34		0.745
B (Intrinsic)	IN1	Being able to keep busy all the time	4.08	4.15	0.9
	IN2	The chance to work alone on the job	4.24		0.96
	IN3	The chance to do different things from time to time	4.36		0.693
	IN4	The chance to be somebody in the community	4.12		1.003
	IN5	Being able to do things that do not go against my conscience	3.84		0.955
	IN6	The way my job provides for steady employment	3.8		0.948
	IN7	The chance to do things for other people	4.26		1.046
	IN8	The chance to tell people what I do	4.08		0.853
	IN9	The chance to do things that makes use of my abilities	4.32		0.794
	IN10	The freedom to use my judgement	4.22		0.859
	IN11	The chance to try my odds of doing the job	4.18		1.101
	IN12	The feeling of accomplishment I get from the job	4.14		0.99
C (Extrinsic)	E1	The way my boss handles his challenges	4.06	4.00	1.096
	E2	The competency of my supervisor in making a decision	3.92		0.966
	E3	The way company policies are put into practice	3.94		0.978
	E4	My pay and the amount of work I do	3.84		1.315
	E5	The chance for advancement on this job	4.14		0.833
	E6	The praise I get for doing a good job	4.08		1.066

Note: G=General; IN= Intrinsic; E=Extrinsic.

The second section comprised intrinsic motivation questions that highlighted the aspects and components such as a sense of accomplishment at work, relationships with co-workers, job stability, customer service, and endeavors to discover one's abilities. This section found a high level of agreement of intrinsic component with an overall mean of 4.15 obtained. The highest mean obtained was for the item (IN3) "the chance to do different things time to time", mean = 4.36 SD= 0.693. This indicated that respondents were ready to learn new things and acknowledged the necessity of reskilling or upskilling their skills job (Sivalingam & Mansori, 2020). Upskilling is the process of discovering whole new skill sets that will lead to new career opportunities. In contrast, reskilling is the process of learning new abilities that will help the improvement of one's present. Besides, the lowest mean for this section was (IN6), "The way my job provides for steady employment", mean = 3.8, SD = 0.948.

The next section was the study of extrinsic factors. Seven of the 12 questions were measured average high, and the remainder very high. Item (E5), "The chance for advancement on this job" with the mean = 4.14, SD = 0.833 obtained the highest mean score. While item (E4), "My pay and the amount of work I do" with the mean = 3.84, SD = 1.315 was the lowest mean for this section. Job satisfaction is the perspective of a person on his job. This suggests that satisfaction with employment depends on the intrinsic and extrinsic behavior of employees (Simanjuntak, Nadapdap, & Winarto, 2017).

Table 5 is the overall mean value of demographics factors and presents the results of an MCAV maintenance staff population study in the petroleum and gas industry. The results show that the mean value for age over 40 is M = 4.71 years; for 20 to 29 years is M = 4.53; and for 30 to 39 years of M = 4.02. For the education level for SPM and diploma graduates, the same performance was obtained, which was very high e.g., M = 4.53 and M = 4.23. The difference in graduate students was high M = 4.15. The work experience for the staff was very high too, M = 4.27 between 3 to 6 years, and the lowest average was 7 to 9 years M = 3.66. For this study, the mean was very high M = 4.55 positions for technicians. The monthly salary of M = 4.40 staff was very high, with RM1000 to RM2000 payment received. Selection of workplaces had an equal interpretation of M = 4.41, M = 4.24 and a high level of M = 3.75 in both locations.

Table 5. Prediction of demographic variance analysis.

Elements		Min	Standard Deviation	F	Sig.
Age	20 - 29 years	4.53	0.51	1.149	0.366
	30 - 39 years	4.02	0.64		
	≥ 40 years	4.71	0.25		
Education Level	SPM	4.53	0.48	1.139	0.374
	Diploma	4.23	0.71		
	Degree	4.15	0.59		
	Others	4.16	0.34		
Work Experience	0 - 2 years	-	-	1.833	0.07
	3 - 6 years	4.27	0.63		
	7 - 9 years	3.66	0.35		
	≥ 10 years	4.03	0.66		
Position	Technician	4.55	0.75	2.031	0.042
	Supervisor	4.15	0.68		
	Engineer	4.30	0.51		
	Others	3.89	0.41		
Monthly Salary	RM 1000 - RM2000	4.40	0.57	1.1764	0.083
	RM2001 - RM3000	3.85	0.85		
	RM3001 - RM4000	4.33	0.52		
	≥RM4001	3.90	0.52		
Location of Work	Onshore	4.41	0.63	2.201	0.028
	Offshore	4.24	0.58		
	Both	3.75	0.61		

The study data analysis showed that oil and gas maintenance personnel had the same mean $M = 4.15$ motivation and had a strong relationship with their work performance. The management of the organization must instead use the motivation of the employees to maintain the work performance of its employees. All these motivations boosted the morale of the staff and influenced their performance. Organizations should deal with intrinsic and extrinsic motivation separately. They should give priority to increasing employee motivation.

4.1. Performance of The Regression of Demographic Trends

The results of age, status, education level and salary were not significant in the overall satisfaction of the job using linear regression methods as shown in Table 6 ($p < 0.05$). Workplace factors ($P = 0.019$), work experience ($P = 0.27$) and position held ($P = 0.049$) are important predictors of overall job fulfilment. This measurement explains that staff finds a workplace satisfactory if it enhances the quality of their work life. The workplace is thus a factor that affects the satisfaction of employment, followed by work experience and positions. According to Cropley, Dijk, and Stanley (2006) some jobs have different workloads and factors that negatively impact individual job satisfaction. The results of the analysis show demographic factors significantly positive for all study elements. This is supported by a study by Caprara, Barbaranelli, Borgogni, and Steca (2003), which viewed that high self-confidence gave high level of job satisfaction. Based on this observation, every phase of work satisfaction level and employee efficiency should have a responsible party to ensure that the welfare needs are monitored from the start of employment. Compliance with standards provides the organization with the best impact on staff to guarantee good work quality and sustainable work. In addition, the interviewees took the views and satisfaction of labor between the organization and staff and between staff.

Table 6. Regression analysis on the overall satisfaction of the job satisfaction prediction.

Elements	Standard Error	Linear Coefficient, β	t	Sig.
Age	0.179	0.041	0.269	0.789
Education Level	0.117	-0.076	-0.518	0.607
Position	0.196	0.501	2.027	0.049
Work Experience	0.144	-0.433	-2.299	0.027
Monthly Salary	0.156	-0.189	-0.731	0.469
Work of Location	0.141	-0.403	-2.431	0.019

Note: Dependent variable, overall job satisfaction. $R = 0.208$, $R^2 = 0.043$, adjusted $R^2 = 0.019$. Bold indicates significant result.

5. DISCUSSION

The oil and gas industry has been traditionally male-dominated, and this study found that the majority of respondents in MVAC maintenance are male workers. The main reason of this domination is because of education stereotypes in the community, in which technical degree is designed for men, and more men are interested in pursuing study in technical degrees. Nevertheless, Board of Engineering has been continuously empowered by Malaysia government's 12th Malaysian Plan, 2021-2025, where there is an emphasis on the increasing number of women employment in oil and gas industry, including MVAC maintenance. However, there is still a gap needed to be taken into account, particularly in long term employment strategies of employment and/or women employment. Therefore, a study related to job satisfaction level and associated with the demographics profile (i.e. gender) was worth to discover.

The job satisfaction also relies on income or salary, which some studies found positively collated with job satisfaction. In the context of income, oil and gas sector is commonly classified as the highest paid job compared to regular maintenance companies in MVAC maintenance and building sectors. The reasons why oil and gas industry offer higher salary because a limited number of employees are interested to join petro - platform for many reasons (e.g., far from home, work condition not pleasant, high safety risk, etc.). However, this is a misconception of higher salaries in oil and gas sectors since this study found the salary range as low as RM 1000- RM2000. The salary

ranges however differed depending on the job position. Some studies though found that salary was significantly correlated with job satisfaction level; however, this study shows that job satisfaction level is not significantly influenced by good wages.

Besides, this study revealed that job requirement and scope might lead to job satisfaction and earning enough to support the employee's style; however, the real "happiness" to pursue career as technician in MVAC maintenance was not influenced solely by income, there were other factors involved. Furthermore, this study found that job satisfaction level showed an increasing trend in early stage and decreasing in the middle of service and further increased after working more than 10 years. Specifically, the difference between the older workers and the younger ones' satisfaction level increased with age; however, in the middle of working duration showed a decreasing trend. This was because employees might be looking for a more stable job and often felt it difficult continuously doing the same job for a long time. Moreover, as the job tenure increased, the employees felt that there were limited opportunities for them or a few got bored with the monotony. However, the findings also suggested that as people completed work tenure of more than 10 years, job satisfaction increased as the more experienced work gained them better pay and benefits.

6. CONCLUSION

There is no dearth of studies on Job satisfaction as this subject has often attracted reviewers in the past. There were two main reasons for choosing job satisfaction for this study. The first factor was that job satisfaction is an integral part of any work culture and should be considered a human right. Every working human being is entitled to a reward in the form of job satisfaction. The second factor was the role of job satisfaction as the cause of formulation of other work behaviors such as work ethics, work identification and work performance. Moreover, improved job satisfaction also ensures security and safety of the work place. Many positive effects can be obtained if employees are wise to achieve job satisfaction. Job satisfaction is able to create a sense of integrity as every task that needs to be done is considered a trust and trust by the organization. Thus, the productivity of the work will be maintained at a high level and thus contributes to the development of the organization in particular and the development of the country in general. When we are satisfied with work, we try to avoid the stress element, not to mention having to think about family affairs and personal matters other than work.

This study revealed that job satisfaction emanates more from easy and comfortable job requirements and scope, along with a good income to support the employee's life. However, in the case of MVAC maintenance employees, there were factors other than income which were found affecting the job satisfaction. This study also suggested that the cyclic pattern of employee experienced a motivation in job satisfaction, when in the early stage it was "easy period" and they felt happy joining oil and gas companies

The following recommendations are proposed in this study for the maintenance of MVAC in the oil and gas sector in the light of the rapid technological transition:

- Personnel must be educated and trained in the field of career selection. The addition of this training would provide the best understanding and exposure to state-of-the-art technology.
- Industry professionals should understand the problems of the staff working in an organization, such as the provision of the appropriate monthly salaries and welfare facilities.
- The organization must ensure that the range of work provided did not affect the quality emotions of staff.

Each personnel should also cooperate where it is necessary to ensure the spirit of the work so that the quality of the work does not change.

Funding: This research is supported by Universiti Tun Hussein Onn (Grant number: Tier 1 (vot H790)).

Competing Interests: The authors declare that they have no competing interests.

Authors' Contributions: All authors contributed equally to the conception and design of the study.

REFERENCES

- Ahad, A. A., Khan, M. R., & Rahman, M. S. (2020). HR retention strategies for enhanced job satisfaction in a highly competitive job market: A study with private banking sector in Bangladesh. *International Journal of Social Sciences Perspectives*, 6(1), 53–58. Available at: <https://doi.org/10.33094/7.2017.2020.61.53.58>.
- Al-Ali, W., Ameen, A., Isaac, O., Khalifa, G. S., & Shibami, A. H. (2019). The mediating effect of job happiness on the relationship between job satisfaction and employee performance and turnover intentions: A case study on the oil and gas industry in the United Arab Emirates. *Journal of Business and Retail Management Research*, 13(4), 1-14. Available at: <https://doi.org/10.24052/jbrmr/v13is04/art-09>.
- Al-Mannaee, N. S., & Ryan, J. C. (2018). Examining a competency model of workplace learning: An assessment of participants' reactions. *International Journal of Work Organisation and Emotion*, 9(1), 107-124. Available at: <https://doi.org/10.1504/ijwoe.2018.10012448>.
- Alias, N. E., Nokman, F. N., Ismail, S., Koe, W.-L., & Othman, R. (2018). The effect of payment, recognition, empowerment and work-life balance on job satisfaction in the Malaysia's oil and gas industry. *International Journal of Academic Research in Business and Social Sciences*, 8(9), 639-656. Available at: <https://doi.org/10.6007/ijarbss/v8-i9/4645>.
- Antonovsky, A., Pollock, C., & Straker, L. (2014). Identification of the human factors contributing to maintenance failures in a petroleum operation. *Human factors*, 56(2), 306-321. Available at: <https://doi.org/10.1177/0018720813491424>.
- Başar, R., & Engin, O. (2021). *A no-wait flow shop scheduling problem with setup time in fuzzy environment*. Paper presented at the International Conference on Intelligent and Fuzzy Systems (pp. 607-614). Springer, Cham.
- Bektas, C. (2017). Explanation of intrinsic and extrinsic job satisfaction via mirror model. *Business & Management Studies: An International Journal*, 5(3), 627-639. Available at: <https://doi.org/10.15295/bmij.v5i3.118>.
- Caprara, G. V., Barbaranelli, C., Borgogni, L., & Steca, P. (2003). Efficacy beliefs as determinants of teachers' job satisfaction. *Journal of Educational Psychology*, 95(4), 821-832.
- Chin, C. L. (2018). The influence of job satisfaction on employee turnover intention in the manufacturing industry of Malaysia. *Journal of Arts & Social Sciences*, 1(2), 53-63.
- Chizaram, D., Nwankwo, A. O., Arewa, S. C., Theophilus, & Victor, E. N. (2021). Analysis of accidents caused by human factors in the oil and gas industry using the HFACS-OGI framework. *International Journal of Occupational Safety and Ergonomics*, 1-13. Available at: <https://doi.org/10.1080/10803548.2021.1916238>.
- Cropley, M., Dijk, D. J., & Stanley, N. (2006). Job strain, work rumination, and sleep in school teachers. *European Journal of Work and Organizational Psychology*, 15(2), 181-196.
- Hadi, M. Y. A., Hassan, R., Razzaq, A. R. A., & Mustafa, M. Z. (2015). Application of thinking skills in career: A survey on technical and vocational education training (TVET) qualification semi-professional job duties. *Procedia-Social and Behavioral Sciences*, 211, 1163-1170.
- Hambali, R. H., Mohamad, E., & Ito, T. (2021). *Ergonomic design for assembly manufacturing workstation based on universal design principles*. In *International Conference on Applied Human Factors and Ergonomics*. Paper presented at the In International Conference on Applied Human Factors and Ergonomics (pp. 870-877). Springer, Cham.
- Hope, N. H., Holding, A. C., Verner-Filion, J., Sheldon, K. M., & Koestner, R. (2019). The path from intrinsic aspirations to subjective well-being is mediated by changes in basic psychological need satisfaction and autonomous motivation: A large prospective test. *Motivation and Emotion*, 43(2), 232-241. Available at: <https://doi.org/10.1007/s11031-018-9733-z>.
- Ikwunze, K. C., & Nwosu, H. U. (2016). Developing maintenance model for effective oil and gas equipment management: A case study. *International Journal of Advanced Academic Research | Sciences, Technology & Engineering*, 2(5), 1-13.
- Lee, X., Yang, B., & Li, W. (2017). The influence factors of job satisfaction and its relationship with turnover intention: Taking early-career employees as an example. *Annals of Psychology*, 33(3), 697-707. Available at: <https://doi.org/10.6018/analesps.33.3.238551>.

- Mehdi, S., Yao, R., Cook, G. K., & Clements-Croome, D. (2018). Decision-making on HVAC&R systems selection: A critical review. *Intelligent Buildings International*, 10(3), 133-153. Available at: <https://doi.org/10.1080/17508975.2017.1333948>.
- Minh, K. S., Zailani, S., Iranmanesh, M., & Heidari, S. (2019). Do lean manufacturing practices have negative impact on job satisfaction? *International Journal of Lean Six Sigma*, 10(1), 257-274. Available at: <https://doi.org/10.1108/ijlss-11-2016-0072>.
- Mohd Suki, N., Rony, N. I., & Mohd Suki, N. (2020). Do gender and income really moderate on employees' job satisfaction? Insights from Malaysia's oil and gas industry. *International Journal of Management Science and Engineering Management*, 15(1), 47-58. Available at: <https://doi.org/10.1080/17509653.2019.1597657>.
- Moura, R., Beer, M., Patelli, E., Lewis, J., & Knoll, F. (2017). Learning from accidents: Interactions between human factors, technology and organisations as a central element to validate risk studies. *Safety Science*, 99, 196-214. Available at: <https://doi.org/10.1016/j.ssci.2017.05.001>.
- Othman, I., Majid, R., Mohamad, H., Shafiq, N., & Napiah, M. (2018). *Variety of accident causes in construction industry*. Paper presented at the The MATEC Web of Conferences.
- Shaju, M., & Subhashini, D. (2017). A study on the impact of job satisfaction on job performance of employees working in automobile industry. *Journal of Management Research*, 17(2), 74-83.
- Simanjuntak, D. S., Nadapdap, K. M. N., & Winarto, W. (2017). The effect of perceived performance appraisal on employee job satisfaction. *Journal of Management*, 3(2), 6-13.
- Sivalingam, A. D., & Mansori, S. (2020). How organizations should view reskilling and upskilling the workforce. Retrieved from: <http://www.sastraeducation.com/how-organizations-should-view-reskilling-and-upskilling-the-workforce.html>.
- Strauch, B. (2017). *Investigating human error: Incidents, accidents, and complex systems* (2nd ed.). London: CRC Press.
- Syafiq, M. S., Yusop, F., Rahim, M. B., Sari, K. A. M., Saji, N., & Sunar, N. M. (2021). *Needs assessment for the development of competency heating ventilation and air conditioning (HVAC) supervisor and technician in oil and gas industry Malaysia*. Paper presented at the In AIP Conference Proceedings. AIP Publishing LLC.
- Torlak, N. G., & Kuzey, C. (2019). Leadership, job satisfaction and performance links in private education institutes of Pakistan. *International Journal of Productivity and Performance Management*, 68(2), 276-295. Available at: <https://doi.org/10.1108/ijppm-05-2018-0182>.
- Tran, Q. H. (2020). Organisational culture, leadership behaviour and job satisfaction in the Vietnam context. *International Journal of Organizational Analysis*, 29(1), 136-154.
- UTOMO, W. A., UDIN, U., & HARYONO, S. (2022). Visionary leadership and employee quality in the public service sector. *International Journal of Applied Economics, Finance and Accounting*, 12(2), 31-37. Available at: <https://doi.org/10.33094/ijaefa.v12i2.542>.
- Wang, K. Y., Chou, C. C., & Lai, J. C. Y. (2019). A structural model of total quality management, work values, job satisfaction and patient-safety-culture attitude among nurses. *Journal of Nursing Management*, 27(2), 225-232. Available at: <https://doi.org/10.1111/jonm.12669>.
- Williams, C. L. (2019). The deserving professional: Job insecurity and gender inequality in the oil and gas industry. *Labour & Industry: A Journal of the Social and Economic Relations of Work*, 29(2), 199-212. Available at: <https://doi.org/10.1080/10301763.2019.1600856>.

Views and opinions expressed in this article are the views and opinions of the author(s), Humanities and Social Sciences Letters shall not be responsible or answerable for any loss, damage or liability etc. caused in relation to/arising out of the use of the content.