Quality Management System in Aviation Industry In The United Arab Emirates: Basis For Compliance Framework

HAROLD BALOYOS
PhD in Business Administration, major in Strategic Management & Leadership
Operation/ Material Planner
Global Aerospace Logistics

RONALDO A. POBLETE, DBA, D.SLCD , D. Hum PD-SML
Pasig Catholic College
BSBA Program Head
Graduate School Professor

MARIA FE B. DE CASTRO, DBA, D. Hum, D.Hrd
Arellano University-Pasig
SBA Research Department Head
School of Business Faculty
Graduate School Professor

Abstract — This study aims to determine whether or not the quality of management system in the aviation industry in United Arab Emirates might be enhanced by the implementation of the ISO 9001-2015 quality management system among the perceptions of the employees. Thus, several steps will be taken to collect the pertinent information for the study. The researcher will utilize a quantitative, descriptive, and correlational research approaches to answer the research questions posed in the study. By doing so, a pilot study among 30 employees in the aviation industry will be conducted to test the validity and reliability of the research instrument. Afterwards, the researcher will facilitate the actual survey among 380 respondents through Google forms, e-mail, and Messenger. The researcher will strictly adhere to the ethical considerations stipulated in the study. Once all responses are retrieved, the data will be forwarded to the statistician to perform the necessary analysis through SPSS.

Keywords — Aviation Industry; ISO 9001: 2015; Quality Management System; United Arab Emirates

I. Introduction

Organizations in the aviation, space, and defense industries place an emphasis on quality. Customer satisfaction is contingent upon the delivery of high-quality products, and if quality is compromised, there may be major safety repercussions. Moreover, Aviation, Space, and Defense companies rely on expansive supplier networks to bring their final goods to market, needing an effective way of vendor communication. Companies in highly regulated industries, such as aerospace and defense (A&D) or the fast-expanding commercial space industry, usually rely on a

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quality management software (QMS) solution with greater functionality than a standard enterprise resource planning (ERP) system. To support quality and compliance best practices, these organizations chose a QMS that can handle rapid innovation and an ever-changing regulatory landscape.

According to TIP technologies (2018), massive expenditures in operations and maintenance are required to keep fleets of aircraft, spacecraft, and jet engines in optimal operational condition. To keep equipment in operating order, complex and usually insufficiently automated procedures exist. Effective software for quality management may automate compliance and traceability processes for all raw materials, components, and finished products. Access to quality and production data in real-time is vital and can have a substantial effect on the final product. A complete solution for quality supports enterprise-wide information exchange and promotes continuous development. Following is a list of quality assurance initiatives that should be a top priority for industry leaders and may necessitate a best-of-breed quality management solution for optimal performance. The Quality Management System of an organization is comprised of resources, organizations, people, and processes that are used to implement the organization's quality policy.

The International Organization for Standardization (ISO) 9001 is the most widely- used quality management system standard in the world and is internationally recognized. Aviation industries may benefit from utilizing it to assist them in achieving their objectives and ensuring that the expectations of their clients are satisfied at all stages of any projects. The safety Management Systems (SMS) and Quality Management Systems (QMS) are deployed in the jet fuel value chain to determine its excellence. The expansion of digital technology results in a change in how the aviation industry thinks about existing manufacturing practices.

The researchers wanted to be able to objectively evaluate the quality of each maintenance plan, so they constructed what they believe to be the ideal maintenance plan for a certain weight (Zhao et al., 2018). They were able to compare and determine the effectiveness of the various maintenance procedures as a result of this. This not only demonstrates that the model is accurate and applicable, but it also gives a wide range of theoretical guidelines that managers who have a variety of perspectives on maintenance are able to implement.

II. Methodology

The purpose of this research is to evaluate the effectiveness of the Quality Management System ISO 9001 among the employees in the aviation industry in United Arab Emirates, based on the findings of the study. It is the purpose of descriptive research to amass material to test hypotheses and also, to provide answers to questions pertaining to the current state of the phenomenon under inquiry. To put it simply, it is a method of conducting preliminary research.

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Comparatively, quantitative research is the act of locating and evaluating a specific situation that may be relevant to a research problem under investigation, as opposed to qualitative research (Leedy & Ormrod 2001; Williams, 2011). According to Aliaga and Gunderson (2002), the methodology's broad scope enables researchers to acquire a full view on data after thoroughly evaluating each component. Finally, Seeram (2019) discussed that a correlational research is a form of research design that examines the relationship of two or more variables in the study. As a result, a review of the literature was conducted initially to have a better understanding of the study's topic and principles.

Descriptions of the Respondent

To determine the effectiveness of Quality Management System ISO 9001-2015 among the employees in aviation companies in the United Arab Emirates, the following criteria in choosing the respondents of the study will be set by the researcher:

a. The respondent must be working in different aviation company in UAE.

b. The respondent must be living in United Arab Emirates.

Respondents who did not meet any of the aforesaid criteria will not be chosen to participate in the study.

Reliability Statistics – Level of Effectiveness of Quality Management System

Construct	Number of Items	Cronbach's Alpha
Quality	10	0.861
Time	10	0.788
Cost	10	0.818
Client Satisfaction	10	0.745
Over All	40	0.955

Table 2 shows the Reliability Statistics Level of Effectiveness of Quality Management System ISO 9001-2015. The result revealed that Quality with n = 13; ($\alpha = 0.861$), Time with n = 10; ($\alpha = 0.788$), Cost with n = 7; ($\alpha = 0.818$), Client Satisfaction with n = 10; ($\alpha = 0.745$) and Over all with n = 40; ($\alpha = 0.955$) were all to be found reliable.

Reliability is the measure of internal consistency of the construct in the study. Construct reliability was assessed using Cronbach Alpha. A general accepted rule is that α of 0.60 -0.70 indicates an acceptable level of reliability, and 0.80 or greater a very good level. (Hulin, Netemeyer, and Cudeck, 2001).

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Data-Gathering Procedure

A number of measures will be done in order to acquire the information required for the study. The researcher will approach the different aviation company and multiple aviation customer to request for a permission to conduct a survey on the efficiency of the Quality Management System ISO 9001-2015 in the aviation industry in the United Arab Emirates. A survey will be distributed to a total of 300 participants upon receipt of the approval from different aviation company and their multiple customer. The questionnaire will be encoded by the researcher through Google Forms. The survey will be divided into two sections: general information about the participants and the perception of the employees on the effectiveness of the QMS ISO 9001 management system.

An email with a link to the instrument will be sent out to each respondents' individual email address. The instruments will be sent with instructions that respondents need to read before answering the questionnaire, as well as a consent letter noting that participation is entirely voluntary and that their comments are greatly appreciated. After which, the findings will be collated and counted in accordance with the frequency with which the respondents reviewed the items in the survey.

Afterwards, the participants will be told of the relevance, purpose, and contribution of the study, which was designed to determine if the Quality Management System ISO 9001 is effective in the aviation industry in UAE. Furthermore, there will be no physical, psychological, economic, or legal hazards that will be involved in the study because the researcher will only carry out the procedures that are necessary to meet the study's goals. Once the link has been clicked, the questionnaire will be made available to the responders.

The researcher will also take full advantage of the subjects' willingness to participate, and they will not be exploited, coerced, or manipulated in any manner during the research process. There will be no personal or financial conflicts of interest in the study that could have jeopardized the study's findings. After completing the survey form, the respondents will not be compensated in anyway by the researcher. Finally, the researcher will ensure that the gathered data and the treatment for analysis are accurate and authentic.

Statistical Treatment of Data

The data that will be obtained from this research will be subject to statistical treatments. The data will be coded, collected, and tabulated for improved presentation and interpretation of the results. The statistical methods to be used are as follows:

1. Weighted mean. This will be used to determine the average responses of the different options provided in the various parts of the survey questionnaire. It will be employed to help solve data for statement of the problem 1 to 2.

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2. Frequency and Percentage. These statistical treatments are used when determining the percentage of a general data of a profile such as age, time, gender, etc.

3. Rank. This refers to a person's or objects' relative position, value, worth, complexity, power, importance, and authority, or level within a ranking. The rank in this study refers to the level of the weighted mean of the respondents' reactions.

4. T-test. When used on the null hypothesis, the t-test is any statistical hypothesis test in which the test statistic follows the t-distribution of the researcher.

Pearson Correlation Coefficient - This will be used to determine the statistical relationship between two continuous variables. Since it is based on the method of covariance, it is considered as the most effective way of calculating the relationship between variables The data from the instrument will be analyzed using SPSS (Statistical Package for the Social Sciences) Version 17 software to find correlations between variables and to answer questions about those associations. To support the complete analytical process, SPSS provides a broad variety of capabilities. As a result, all the information from the questionnaire will be entered into the software to derive the mean and mode of variable.

III. Results and Discussion

Profile of the Respondents

A limited number of clients, consultants, and contractors from aviation companies with ISO 9001-2015 accreditation who worked on the aviation projects are eligible to receive the certificate. Neither a different geographic location nor other aviation companies could benefit from the findings of the study, which was limited in scope.

In light of UAE's current condition, only a few aviation developments will be able to collect sufficient information from their respondents, resulting in a dearth of data.

Since aviation companies in the United Arab Emirates have more than 32,200 employees and multiple customer, the researcher will focus on 380 respondents who are all employed several aviation companies at the time of the study. Purposive sampling will be employed by the researcher in his investigation. Purposive sampling, according to Alchemer (2021), is a non-random sampling technique that involves the use of specialized criteria to select a small number of respondents for a study. Furthermore, while investigating with a small sample size, purposive sampling was the most effective sampling strategy available. As a result, there were no calculations performed, and the researchers relied on their own judgment when selecting the participants for the study.

In terms of demographic profile, most of the respondents are male with a total of 323 or 85% of the respondents that means that male are more tasks oriented and with a good interpersonal style. They belong to the age bracket of 30 – 39 with total respondents of 152 or 40% of the

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respondents had no impact on surface acting, they differed significantly in deep acting. In terms of years of experience, Majority of the respondents are in the organization from 11 years of more, viewed that employee experience doesn't need to replace engagement. For the respondents level of knowledge, majority of the respondents have a high level of knowledge with 266 or 70% of the respondents knowledge in QMS ISO 9001 that a umber of quality system features underlie the effectiveness of the QMS ISO 9001. Lastly, In terms of training, 371 or 98% of the respondents do attend training. It shows that quality management system are necessary for a project's success As to the level of Quality Management System ISO 9001 in terms of Quality with an overall weighted mean of 3.57 and the standard deviation of 0.29, this implied that the International Organizations for Standardization (ISO) has an standard for global standard for quality management systems specifically it ensures accurate recording, reporting, elucidation and resolution of quality assurance issues. For Quality Management System ISO 9001 in terms of Time with an overall weighted mean of 3.51 and the standard deviation of 0.49, this means that if quality management system are not effectively established and maintained, they can soon take on a bureaucratic appearance and become ineffective specifically QMS ISO 9001 provides more reliable aviation projects scheduling and delivery. Quality Management System ISO 9001 in terms of Cost with an overall weighted mean of 3.49 and the standard deviation of 0.48, this implied that quality management system that certification by the International Organization for Standardization (ISO) signifies that a corporation conforms to high standards of quality, safety and efficiency in the delivery of services to it customers most especially in the implementation of QMS ISO 9001 helps the aviation reach its objectives and stay in compliance, while ensuring that aviation projects are carried out successfully and within the allotted budget and time frame.. Lastly, For Quality Management System ISO 9001 in terms of Client Satisfaction with an overall weighted mean of 3.52 and the standard deviation of 0.24, this means there are certain businesses that follow the QMS (Quality Management System) principles, although not all of them are ISO-certified. There are various processes that need to be completed in order to acquire certification specifically in the application of QMS ISO 9001-2015 in the aviation companies helps the business processes to track and resolve issues quickly and effectively among the clients For Perceived Effectiveness of Quality Management System ISO 9001 with Sex, The ANOVA was not significant in all the four factors of Perceived Level of Effectiveness of QMS ISO 9001. Thus there is a significant evidence to accept the null hypothesis and conclude that there is no significant difference between the Perceived Level Effectiveness of QMS ISO 9001 and their Sex. For Perceived Effectiveness of Quality Management System ISO 9001 with Age, The ANOVA was significant in all the four factors of Perceived Level of Effectiveness of QMS ISO 9001. Thus there is a significant evidence to reject the null hypothesis and conclude that there is a significant difference between the Perceived Level Effectiveness of QMS ISO 9001 and their Age. For Perceived Effectiveness of Quality Management System ISO 9001 with Length of Experience, The ANOVA was significant in all the four factors of Perceived Level of Effectiveness of QMS ISO 9001. Thus there is a significant evidence to reject the null hypothesis and conclude that there is a significant difference between the Perceived Level Effectiveness of QMS ISO 9001 and the length of experience. For

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Perceived Effectiveness of Quality Management System ISO 9001 with Length of Knowledge, The ANOVA explained that Perceived level effectiveness in terms of Quality F(2,377) = 3.880, p=0.021 is significantly different while the Time F(2,377) = 1.772, p=0.171; Cost F(2,377) =0.248 p= 0.781 and Client Satisfaction F(2,377) = 0.807, p=0.447 has no significant difference between Perceived Level of Effectiveness of QMS ISO 9001and the length of experience. For Perceived Effectiveness of Quality Management System ISO 9001 with Training, The ANOVA was not significant in all the four factors of Perceived Level of Effectiveness of QMS ISO 9001. Thus there is a significant evidence to accept the null hypothesis and conclude that there is no significant difference between the Perceived Level Effectiveness of QMS ISO 9001 and the Training.

IV. Conclusion

Based on the hypothesis of the study, it is concluded that there is no significant difference in the Perceived Effectiveness of Quality Management System ISO 9001 – 2015 when grouped according to ISO Individual Training profile of the respondents. For the aviation industry, null hypothesis is accepted which means that there is no significant difference between perceived effectiveness of Quality Management System ISO 9001 and the length of knowledge among employees of the organization.

V. Recommendations

In view of the findings and conclusions, the following are recommended.

1. The management must adapt specific methodology in dealing with the accomplishment of a company's objectives based on the given time frame and company's resources.
2. With the effective implementation to the company's QMS it will lead into the reduction of delay as a result of error and rework.
3. The management must look into lowering production costs due to fewer nonconforming products, less rework, lowered rejection rates, streamlined processes and fewer mistakes due to the implementation and effectiveness of QMS 9001.
4. The management may help the aviation company in the identification of the early defects and with an immediate correction at a lower cost.
5. The management may help improve the assessment of process performance and ability to achieve client's satisfaction as their primary objectives in the business
6. The management may implement standards, aviation companies may actively evaluate client satisfaction religiously, build a system for effectively resolving their concerns, and increase the likelihood of keeping their present customers as a proof of Having loyal client.

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Proposed Compliance Framework.

a. Identify and Integrate Requirements – The organization must implement control mechanism specifically in implementing new programs in the organization. All activities must be align with the plan.

b. Assess and Remediate Gaps – Once the gap are determine based on the actual and the target. The business may implement new administrative and technical control to address the gap.

c. Test Effectiveness and Assess Risk – The effectiveness of controls must be measured and properly reported. There must be a consistent and regular assessment of the possible risk that the business might encounter. Compliance with internal security standards and requirements must be considered always.

d. Attain Certification and Attestations – The business must be affiliated with any accrediting body in order to comply with certain level of standards that reflect quality for the service offered by the business.

e. Improve and Optimize – With the continues upgrading of the employees competency, rest assure that the business in general may improve its presence in the business and maximize every single resources that the business utilizes.

REFERENCES

[1] Adekitan, A. I. (2020). Safety integrated with quality management as operational excellence tool in the aviation fuel industry. Engineering Review: Međunarodni časopis namijenjen publiciranju originalnih istraživanja s aspekta analize konstrukcija, materijala i novih tehnologija u području strojarstva, brodogradnje, temeljnih tehničkih znanosti, elektrotehnike, računarstva i građevinarstva, 40(3), 13-20.
[2] Alchemer. (2021, May 21). Purposive sampling 101. https://www.alchemer.com/resources/blog/purposive-sampling-101
[3] Alchemy. (2021). Purposive Sampling 101. https://www.alchemer.com/resources/blog/purposive-sampling-101/
[4] Aleksandrova, S. V., Vasiliev, V. A., & Alexandrov, M. N. (2019, September). Integration of quality management and digital technologies. In 2019 International Conference" Quality Management, Transport and Information Security, Information Technologies"(IT&QM&IS) (pp. 20-22). IEEE.
[5] Ali, A and Rahmat, H. (2010). The performance measurement of aviation projects managed by ISO-certifiedcontractors in Malaysia. Journal of Retail & Leisure Property, 2010, 9(1), pp. 25–35.
[6] Aliaga, M. and Gunderson, B. (2002) Interactive Statistics. [Thousand Oaks]: Sage Publications

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[7] Al-Nakeeb, A.A.R., Williams, T., Hibberd, P. and Gronow, S. (1998), "Measuring the effectiveness of quality assurance systems in the aviation industry", Property Management, Vol. 16 No. 4, pp. 222-228.
[8] Alshamsi, S. S., & Ahmad, K. Z. B. (2018). THE IMPACT OF PROACTIVE-PERSONALITY ON INNOVATIVE WORK BEHAVIOR AND WORK ENGAGEMENT IN THE UAE AVIATION INDUSTRY. In International Conference on Advances in Business and Law (ICABL) (Vol. 2, No. 1, pp. 108-112).
[9] AlShamsi, A. T. J. A., Akmal, S., Kamalrudin, M., Yahaya, S. H., & Yuhazri, M. Y. (2022). Determination of Key Factors for Total Quality Management Implementation for Airport using AHP. Mathematical Statistician and Engineering Applications, 71(3), 67-83.
[10] Alwerfalli A. & Karatas, A (2016). Application of Quality Management Systems (QMS) in Aviation Industry, Proceedings of the 2016 International Conference on Industrial Engineering and Operations Management Detroit, Michigan, USA, September 23-25.
[11] Alzoubi, H. M., In'airat, M., & Ahmed, G. (2022). Investigating the impact of total quality management practices and Six Sigma processes to enhance the quality and reduce the cost of quality: the case of Dubai. International Journal of Business Excellence, 27(1), 94-109.
[12] Arditi, D. & Gunaydin, H.M. (1997). Total Quality Management in the Aviation Process. Institute of Technology, Department of Civil and Architectural Engineering, USA.
[13] Awad, M., Alzaatreh, A., AlMutawa, A., Al Ghumlasi, H., & Almarzooqi, M. (2019). Travelers' perception of service quality at Dubai International Airport. International Journal of Quality & Reliability Management.
[14] Bailey, C., Holyoak, A., & Snider, J. (2019). An Analysis of the Effects of the Aviation Industry in the United Arab Emirates.
[15] Barbosa, L. C. F. M., de Oliveira, O. J., Machado, M. C., Morais, A. C. T., Bozola, P. M., & Santos, M. G. F. (2021). Lessons learned from quality management system ISO 9001: 2015 certification: practices and barrier identification from Brazilian industrial companies. Benchmarking: An International Journal.
[16] Bakır, M., & Atalık, Ö. (2021). Application of fuzzy AHP and fuzzy MARCOS approach for the evaluation of e-service quality in the airline industry. Decision Making: Applications in Management and Engineering, 4(1), 127-152.
[17] Biswas, P. (20212019, March 31). Seven principles of quality management. ISO Consultant in Kuwait. https://isoconsultantkuwait.com/2019/05/08/1572/
[18] Boiyon, E. K. (2022). Relationship between ISOI 9001 certification and customer satisfaction in public universities in Kenya (Doctoral dissertation, university of kabianga).
[19] Brand, S. (n.d.). 5 benefits of being ISO 9001 certified. California Manufacturing Technology Consulting | CMTC. https://www.cmtc.com/blog/5-benefits-of-being-iso-9001-certified
[20] Business Development Bank of Canada. (2020). 4 essential steps to ISO certification. https://www.bdc.ca/en/articles-tools/operations/iso-other-certifications/iso-certificate-process
[21] Chaves, F. (2020). Airline safety management system issues: A practitioner's perspective. Aircraft Engineering and Aerospace Technology, 92(2), 117-127.
[22] Compliance Quest (2021). Four ways to prevent or minimize non-conformance in a quality first organization. https://www.compliancequest.com/blog/four-ways-to-prevent-or-minimize-non-conformance-in-a-quality-first-organization/
[23] de Sant, D. A. L. M., & de Hilal, A. V. G. (2021). The impact of human factors on pilots' safety behavior in offshore aviation companies: A brazilian case. Safety science, 140, 105272.

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[24] Ellrich, F., Bauer, M., Schreiner, N., Keil, A., Pfeiffer, T., Klier, J., ... & Molter, D. (2020). Terahertz quality inspection for automotive and aviation industries. Journal of Infrared, Millimeter, and Terahertz Waves, 41, 470-489.
[25] ETQ (2016). 5 Ways the Quality Management System Reduces the Cost of Quality. https://www.etq.com/blog/5-ways-the-quality-management-system-reduces-the-cost-of-quality/
[26] Freeman, R. (2019, January 7). ISO 9000 conference chair, TAG 176 member falsely claims AS9100 "Accreditation". Oxebridge Quality Resources. https://www.oxebridge.com/emma/iso-9000-conference-chair-tag-176-member-falsely-claims-as9100-accreditation/
[27] Gisario, A., Kazarian, M., Martina, F., & Mehrpouya, M. (2019). Metal additive manufacturing in the commercial aviation industry: A review. Journal of Manufacturing Systems, 53, 124-149.
[28] Harjanti, W., Wahjoedi, T., Sari, A. K., & Setiadi, P. B. (2021). Work Experience, Interpersonal Communication on Performance and Use of Information Technology, Aircraft Maintenance Companies. Ekuitas: Jurnal Ekonomi dan Keuangan, 5(4), 1-20.
[29] Hassan, A., & Rahman, N. A. A. (Eds.). (2022). Digital Transformation in Aviation, Tourism and Hospitality in Southeast Asia. Taylor & Francis.
[30] HMC (2019). What is ISO and difference between ISO 9000 and IS/ISO 9001 standards? Retrieved from isocertificateonline.in/iso-difference-iso-9000-isiso-9001-standards/
[31] Ismyrlis, V. (2017). The contribution of quality tools and integration of quality management systems to the organization. The TQM Journal.
[32] ISO 9001:2015 - What is the 9001:2015 standard? | ASQ. (n.d.). Excellence Through Quality | ASQ. https://asq.org/quality-resources/iso-9001
[33] John, H. (2021, February 5). ISO 9001 certification for 20 years | blog | John Horsfall. John Horsfall. https://www.johnhorsfall.com/iso-certification-2020/
[34] Juaneza, B. & Neyestani, B. (2017). Impact of ISO 9001 Standard on the Quality Cost of Aviation Projects in the Philippines. Retrieved from

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