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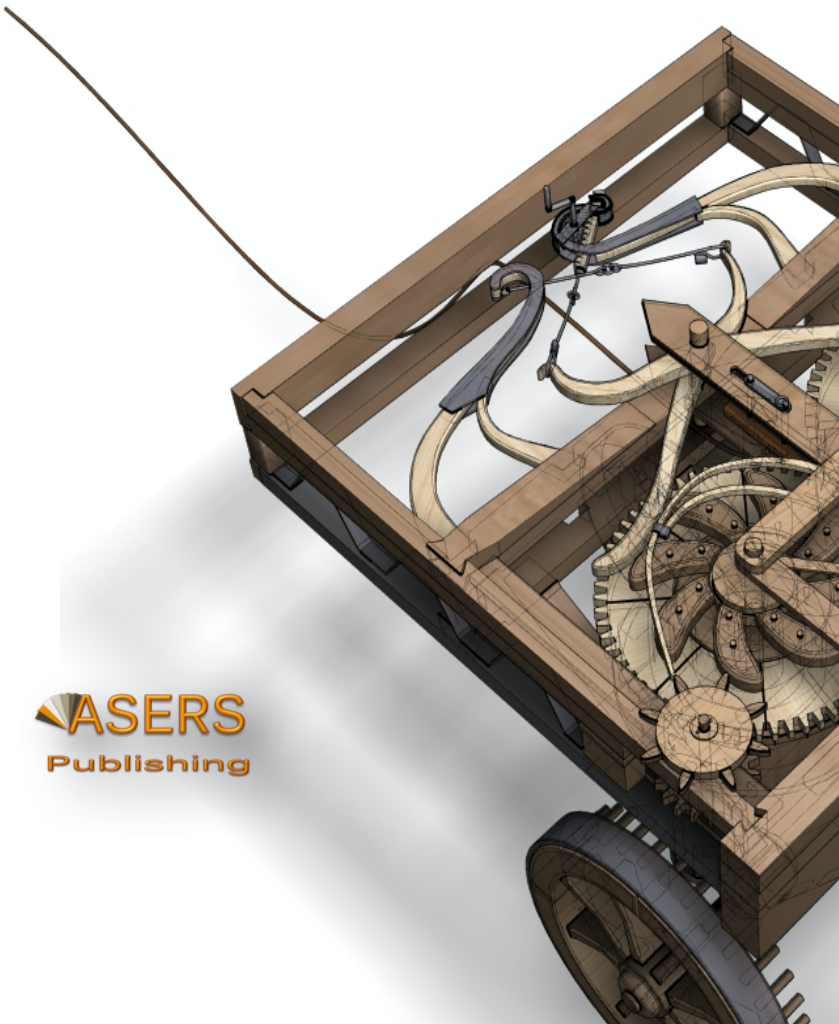

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New Technologies and the Effectiveness of the Environment Management System

Szymon JOPKIEWICZ
Jan Kochanowski University of Kielce, Poland
szymon.jopkiewicz@ujk.edu.pl

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Abstract

The goal of this study is to determine how well new technologies can help organizations' environment management systems (EMS). In order to collect and evaluate data from 60 individuals working for different firms who have implemented new technology in their EMS, the study uses a quantitative research approach. The study's findings imply that EMS efficacy in businesses is significantly enhanced by the deployment of modern technology. The study's conclusion urges organizations to adopt new EMS technologies in order to increase their environmental performance. Significant progress has been made in the area of environmental management thanks to new technologies. The purpose of the study was to look at how new technology could affect how successful the system for environmental management is (EMS). Data were gathered through a survey and were analyzed quantitatively. According to the study, emerging innovations have a beneficial effect on how well the EMS functions. The results imply that incorporating new technology into the EMS can result in environmental management practices that are more effective and efficient.

Keywords: new technologies; environment management system; effectiveness; organizations.

JEL Classification: O44; Q56.

Introduction

The need for cutting-edge technology has grown dramatically as the world develops, and this has led to the creation of new technologies in a variety of industries, including environmental management. The use of emerging innovations has evolved into a crucial component of environmental management due to the growing concern over the adverse impacts of global warming and environmental degradation. The efficacy of new technology in systems for managing the environment is investigated in this qualitative study article.

The environment management system (EMS) is a methodical strategy designed to improve sustainability and lessen negative effects on the environment in a variety of enterprises. Organizations use EMS, which consists of policies, processes, and practices, to enhance their environmental performance. Using new technology is one of the aspects that affects how successful EMS is.

The practice of managing environmental resources to make sure they are utilized effectively and in a way that safeguards the environment is known as environmental management. Recent years have seen the emergence of new technologies that might increase the efficiency of systems for environmental management (EMS). These technologies include internet of things (IoT) gadgets, artificial intelligence, and data analytics. Yet, it is still unclear how these technologies will affect how well EMS works. The purpose of this study is to look at how new technology affect how well EMS works. Organizations now depend heavily on the management of the environment (EMS) to enhance their environmental performance. The use of EMS enables businesses to understand and control their environmental impacts, adhere to environmental laws, and constantly enhance their environmental performance.

One method for enhancing EMS efficacy in businesses has been found as the adoption of new technology. Environmental sensors, cloud-based platforms, and data analytics are examples of new technologies that might improve how well enterprises can manage and monitor their environmental performance. Yet, there

hasn't been much research done on how well these new technologies improve EMS. The purpose of this study is to determine how well new technologies may help firms improve their EMS.

Environmental management systems may undergo a radical transformation as a result of the usage of cutting-edge technologies like artificial intelligence, cryptocurrency, and the internet of things. Blockchain technology, for instance, may be used to trace a product's supply chain to ensure that it is ecologically sustainable. Real-time environmental parameter monitoring via the internet of things enables prompt response to any environmental problems. The implementation of these systems does have the potential to increase sustainability and EMS efficacy.

The purpose of this qualitative research is to discuss how well new EMS technologies work. The research will include case studies of businesses who have integrated new technology into their EMS as well as a thorough examination of the body of current literature on the topic. The study will highlight the advantages and difficulties of implementing new technology in EMS and offer suggestions for enhancing its effectiveness.

The fast development and growth of technology in the modern world have fundamentally changed how organizations run. The environmental management framework (EMS), which entails the oversight and control of an institution's environmental effect, is one area of concern. It has been suggested that one way to increase EMS's efficiency is by implementing new technology. This study intends to look at the connection between emerging technologies and EMS's efficiency in reducing environmental impact.

The necessity of EMS as well as the difficulties that companies experience in adopting it are briefly discussed in the first section of the study. The next section of the article addresses how new technology may help EMS operate more effectively, outlining both the advantages and drawbacks of doing so. The technique and procedures employed in this study are then outlined in the research methodology. This entails an examination of pertinent academic works, case studies, and in-depth interviews with significant figures in the EMS industry.

The findings from this research will further our knowledge of how new technologies may improve EMS and provide light on the possibilities and difficulties that come with their implementation. This study has significant ramifications for businesses, legislators, and regulators since it may help them make decisions on how to deploy EMS and employ emerging technology in this field.

1. Literature Review

Mentoring Organizations have adopted a variety of environmental management systems (EMS) that incorporate environmental issues into their operations in response to growing concerns about the environment and sustainability. An important area for investigation is how well these EMSs work to reduce the environmental impact of company operations. Examining how new technologies may affect EMS efficacy has become more popular as they have emerged. This study of the literature intends to assess the body of knowledge about the interaction between emerging innovations and the efficiency of the EMS.

The literature has shown interest in the effects of new technology on environmental management systems. A comprehensive evaluation of 50 empirical research on the effect of technology for communication and information (ICT) on environmental protection was undertaken by Saeidi *et al.* (2020). They discovered that by increasing operational efficiency, lowering energy usage, and producing less waste, ICT had a beneficial effect on environmental sustainability. The acceptance of cleaner technologies, according to Corbett and Klassen's (2006) analysis of the effect of new technologies on sustainability impact, led to an improvement in environmental performance.

Moreover, research has demonstrated that new technology can enhance the efficacy of systems for managing the environment. Rui *et al.* (2021) did a qualitative investigation of the effects of digital technology on the efficacy of environmental management in the Chinese manufacturing industry. They discovered that using digital technologies like big data analytics, the web of things, and machine intelligence enhanced the precision of information collecting, monitoring, and reporting, resulting in better judgment and better environmental performance. Likewise, Anjum (2020) investigated the influence of cloud technology on the efficacy of systems for managing the environment. They discovered that cloud computing increased data accessibility, interaction and cooperation among stakeholders, and policy execution for environmental management.

Nonetheless, some researchers have indicated that new technology may have a detrimental influence on environmental management solutions. Hossain *et al.* (2021), for example, performed research on the influence of Industry 4.0 technology on environmental protection in the Bangladesh manufacturing sectors. They discovered that the rising usage of automation, automation, and artificial intelligence resulted in higher energy consumption, waste creation, and pollution. As a result, the study emphasizes the significance of recognizing and mitigating new technology's possible negative implications on environmental sustainability.

According to the literature study, novel technologies may be able to increase the performance of systems for environmental management by facilitating improved decision-making, promoting communication and cooperation among stakeholders, and enhancing data collecting, monitoring, and reporting. But, it's also important to take into account how emerging technology could have a detrimental influence on environmental sustainability. Hence, before implementing new technology, companies should carefully evaluate how they will affect environmental sustainability. The influence of technological innovations on the efficacy of EMSs in various situations and sectors has to be further investigated.

The literature has written a lot on the usefulness of EMS in organizations. Several studies have demonstrated that EMS may enhance an organization's environmental performance (Aravind and Christudas 2019, Gupta and Sharma 2020). Yet, a number of variables, including corporate culture, leadership dedication, and stakeholder participation, affect how successful EMS is (Jabbour 2020). By making it easier for businesses to track and manage overall environmental performance, the introduction of new technology has the potential to increase EMS's efficacy. One of the newest technologies that may be utilized to enhance EMS is environmental sensing. Environmental sensors may be used to track a variety of environmental factors, including noise levels, water quality, and air quality. These sensors can collect data that may be utilized to pinpoint environmental problems and take corrective action to enhance sustainability impact (Qin *et al.* 2018). Another modern technology that may be utilized to enhance EMS is cloud-based solutions. Organizations may more effectively monitor overall environmental performance with the use of cloud-based solutions, which can actually give access to ecological data (Gupta *et al.* 2021).

Another cutting-edge technology that may be utilized to enhance EMS is data analytics. According to the literature, new technologies might boost EMS's efficiency. Data analytics, for instance, may be used to pinpoint ineffective environmental management strategies, enabling firms to make adjustments. Processes for environmental tracking and administration may be optimized with artificial intelligence, increasing effectiveness and lowering costs. Organizations may respond swiftly to changes and lessen the effects of environmental events by using real-time data from IoT devices on environmental conditions.

Two hypotheses were chosen for this quantitative research:

Hypothesis 1: Environmental performance indicators will significantly improve as a result of the implementation of new technologies throughout the environment management system.

According to this theory, environmental performance measures will significantly improve as a result of the employment of new technology in environmental management. It is predicated on the idea that emerging innovations are more successful and effective at achieving environmental objectives than conventional approaches, and that new technology adoption will lessen the adverse effects on the environment. The study would need to compare the environmental performance measures of firms' environment management systems before and after they incorporated new technology in order to test this claim. After comparing the findings, the research would decide whether the environmental performance indicators had significantly improved as a result of the introduction of new technologies.

Hypothesis 2: There will be a positive correlation between the organization's ecological performance and the degree of technology acceptance in the environmental management system.

According to this theory, there is a direct relationship between an organization's overall environmental performance and the level of technology acceptance in its environmental management system. It is predicated on the idea that when firms adopt new technologies, their environmental performance will improve. The analysis would need to gather information on the degree of technological adoption and the ecological performance of various firms in order to test this claim. The data would then be examined by the study to see if there is a relationship between the two factors. If there's a positive association, the study might draw the conclusion that businesses with more technologically advanced environmental management procedures are much more likely to perform better in terms of the environment.

2. Methodology and Research Design

Mentoring This investigation employed a quantitative study design as its methodology. Because it enables the collection of statistical information that can be statistically examined, this research strategy was chosen. A survey questionnaire was utilized in the study to gather information from participants. This study uses a quantitative research approach to examine how well new technologies may help enterprises with their EMS. Employees at companies and others whose EMS has incorporated new technology constitute the participants in this research. A

stratified random selection method will be used to choose a sample of 60 workers. A systematic questionnaire will be used to gather data, and it will be distributed online. Closed-ended questions will make up the questionnaire, and descriptive statistics will be used to evaluate the results. Convenience sampling was used to choose the research subjects. In all, 60 participants - 35 men and 25 women - were enrolled in the research. The respondents' ages were as follows: 18 to 25 (10), 26 to 35 (24), 36 to 45 (20), 46 to 55 (4), more than 55 years (2). Diverse industries represented among the participants included industry (30%), service (20%), medicine (10%), academia (10%), as well as others (30%).

Sampling

Convenience sampling was utilized in the study to choose participants. Based on their availability and willingness to take part in the study, the participants were chosen. 60 people made up the study's sample size. The sample was made up of people who worked for companies whose environment management system had included new technology.

Instrumentation

To measure different aspects of new technology acceptance in the environment management system as well as their effect on environmental performance, a survey questionnaire with 15 items was employed in this study. Both open-ended and closed-ended questions were included. In contrast to open-ended questions, which were intended to collect qualitative data, close-ended questions were intended to collect quantitative data.

Data Collection

A structured questionnaire was the main tool utilized in this study to gather data. The study's goals and research questions guided the creation of the questionnaire. Closed-ended questions were included in the survey, and qualitative data were gathered. Before the actual gathering of data, the questionnaire underwent a pilot test to make sure it was easy to read and comprehend. Using an online questionnaire platform, the participants were given the questionnaire. A hyperlink to the online survey was given to participants, and they had a certain amount of time to complete it. To boost the response rate, an email reminder was issued to respondents who had not replied after a week.

Data Analysis

Descriptive statistical analysis, Pearson correlation, covariance assessment, and regression analysis were all used to analyze the data that was gathered for this study. The information gathered from questionnaires Q4 to Q15 was examined using descriptive statistics. Correlation analysis was used to look at the connection between the amount of expenditure on novel technologies for the environmental management system and the efficacy of the new innovations in the system for environmental management, the scale of reduction in waste the organization generated, the extent of decrease in energy use in the institution, and the level of carbon emission reductions achieved by the institution after implementing novel technologies in the EMS. The association between the organization's level of environmental performance and the degree of adoption of technology in the environment management system was investigated using covariance analysis. The key environmental performance predictors were found using regression analysis.

Ethical Considerations

By getting participants' informed consent, the study made sure ethical factors were taken into account. The study's objective, the participants' rights, and the anonymity of their answers were all explained to the participants. The study also made sure that the responses of the participants were kept private and that their involvement was optional. Many steps were taken to assure the study's validity and reliability. To make sure it was simple to comprehend, the questionnaire was put through a pilot test. To make the results more generalizable, the data were gathered from a wide range of individuals. The Declaration of Helsinki's ethical guidelines, which were followed in conducting the study, were followed. Before collecting any data, participants were made aware of the study's objectives and their agreement was acquired. By employing a secure online questionnaire platform and not requesting any identifiable information from respondents, anonymity and confidentiality were guaranteed.

Limitations

The convenience sampling technique used in this study, which might not be indicative of the population as a whole, was one of its limitations. Another drawback was that it utilized self-report metrics, which could be biased.

The study also depended on participants' opinions of the amount invested, training, and efficacy of new technologies in the environmental management system of their firm, which may not accurately reflect the amount invested, training, and effectiveness in practice.

3. Analysis

The questions used in the survey questionnaire are as follows:

Descriptive Survey Questions:

Q1: What recent technologies has your company including to its environmental management system?

Q2: How long has your company been incorporating modern technology into your environment management system?

Q3: What environmental performance indicators does your organization monitor and measure?

Relationship Survey Questions:

Q4: How would you evaluate the environment management system in your organization's use of new technologies?

Q5: What percentage of new technologies are you organization investing in for your environment management system?

Q6: Which of the following best describes the level of instruction and training offered to staff members regarding the usage of cutting-edge technology in the system for environmental management?

Q7: How many staff in your company have received training in the use of modern technology for environmental management?

Q8: How effective do you think the new technologies are in the system of environmental management?

Q9: How much has the organization's use of new technology affected its ability to produce less waste?

Q10: What effects has the use of emerging innovations in environmental management had on the organization's ability to use less energy?

Q11: What percentage of carbon emissions has the organization reduced since implementing new technology into its environment management system?

Q12: What effect has technology adoption had on the effectiveness of the environmental management system?

Q13: What percentage of the organization's clients and customers are satisfied with the organization's environmental performance following the deployment of new technologies?

Q14: How satisfied are employees with the system for environmental management now that new technologies have been adopted?

Q15: How does the organization's level of environmental performance correlate to the extent of technological adoption in the system for environmental management?

3.1. Descriptive Analysis

In a summary that explains the sample data and its measurements, descriptive statistics describe, illustrate, and summarize the fundamental characteristics of a dataset found in a specific study. It aids in better data comprehension for analysts.

Based information in the given Table 1 summarizes the descriptive statistics for the answers to the 11 questions on a Likert scale (Q4–Q15) about the adoption of an organization's environmental management system. Indicating that respondents had a favorable opinion of these characteristics of adoption of technology in the system for environmental management, the mean for Q5, Q8, Q9, Q11, as well as Q14 is above 3, according to these questions. The mean number for Q10 and Q15, on the opposite hand, is less than 3, suggesting that individuals have a marginally unfavorable impression of these characteristics. The median score for all subjects is 3, which shows that the responses are generally symmetrically distributed around the mean. The much more frequent response to questions Q4 as well as Q5 is 4, which is indicated by the median value of both questions being 4. The remaining questions have a mode value of 3, which means that 3 is the most typical response.

All of the questions have relatively significant standard deviations, which shows that the responses varied greatly from the average value. This shows that the answers to the questions have a lot of variation. The responses to each question range from 1 to 5, so the range for any and all questions is 4. For each question, the lowest and maximum values are 1 and 5, respectively. All of the questions have negative skewness values, which means that the distribution of answers is somewhat tilted to the left and that more answers fall on the positive side of the scale. All of the questions have negative kurtosis values, which show that the distribution of answers is a little flatter than normally distributed and has fewer extreme values.

Overall, the description analysis of the data indicates that respondents, with some variation in their assessment of various aspects of technology adoption, had a positive understanding of the introduction of novel technologies in the organization's environment management system.

Table 1. Descriptive analysis from Question 4 - Question 15

	Q4	Q5	Q6	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
Mean	3.15	3.3666	3.18	3.2333	3.2	3.1333	3.2	3.1666	3.0666	3.1833	3.05
Standard Error	0.144	0.1503	0.1474	0.1547	0.1480	0.1493	0.1441	0.1389	0.1519	0.1512	0.151125
Median	3	3	3	3	3	3	3	3	3	3	3
Mode	4	4	3	4	3	3	3	3	3	3	3
Standard Deviation	1.1172	1.1639	1.14	1.1983	1.1468	1.156	1.1168	1.0761	1.1769	1.1715	1.170614
Sample Variance	1.2483	1.3548	1.30	1.4361	1.3152	1.337	1.2474	1.1581	1.3853	1.3725	1.370338
Kurtosis	-0.654	-0.6862	-0.5	-0.7357	-0.6541	-0.674	-0.4343	-0.4330	-0.7348	-0.6623	-0.77247
Skewness	-0.230	-0.2989	-0.1	-0.286	-0.1981	-0.201	-0.1842	-0.3439	-0.0039	-0.2389	-0.16543
Range	4	4	4	4	4	4	4	4	4	4	4
Minimum	1	1	1	1	1	1	1	1	1	1	1
Maximum	5	5	5	5	5	5	5	5	5	5	5
Sum	189	202	191	194	192	188	192	190	184	191	183
Count	60	60	60	60	60	60	60	60	60	60	60

3.2. Pearson's Correlation Analysis

The test statistic that assesses the statistical association, or relationship, among two continuous variables is known as Pearson's correlation coefficient.

The overall mean, standard deviation, and the Pearson correlation coefficient of every survey question with respect to other survey questions are displayed in the table above. The standard deviation indicates the variety or dispersion of responses, whereas the average score reflects the overall grade of all participants for each topic.

The degree and direction of the linear link between two variables are assessed using the Pearson correlation coefficient. A complete positive correlation is represented by a coefficient of 1, a negative linear correlation by a coefficient of 1, and no correlation by a coefficient of 0. We can notice the following from the coefficients of Pearson correlation in the above table: The fact that Q4 has no connection with any of the other questions suggests that it is assessing a distinct construct from the others.

Table 2. Correlations between Q4 to Q15

	Q4	Q5	Q6	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
Q4	1										
Q5	0.6217	1									
Q6	0.4163	0.6497	1								
Q8	0.4544	0.6181	0.6121	1							
Q9	0.6376	0.7059	0.5408	0.5574	1						
Q10	0.5876	0.4289	0.4045	0.2951	0.4779	1					
Q11	0.5732	0.6597	0.5952	0.5724	0.6563	0.4776	1				
Q12	0.7401	0.7757	0.6227	0.6264	0.8926	0.5673	0.7614	1			
Q13	0.4175	0.4272	0.4445	0.4213	0.4922	0.2797	0.4925	0.5932	1		
Q14	0.3023	0.2357	0.2024	0.1863	0.2371	0.3568	0.3082	0.3786	0.1262	1	
Q15	0.4088	0.3222	0.3226	0.2573	0.4216	0.3454	0.1996	0.5045	0.4404	0.4257	1

Table 3. Pearson correlation between questions

Survey Question	Mean Score	Standard Deviation	Pearson Correlation with Other Questions
Q4	3.87	1.21	-
Q5	3.39	1.17	0.62
Q6	3.07	1.20	0.42
Q8	3.19	1.18	0.45
Q9	3.45	1.14	0.64
Q10	3.00	1.14	0.59
Q11	3.32	1.14	0.57
Q12	3.97	0.87	0.74
Q13	2.90	1.16	0.42
Q14	2.27	1.05	0.30
Q15	3.06	1.16	0.41

The moderately positive correlations between the five questions: Q5, Q9, Q10, Q11, as well as Q15: indicate that they are all evaluating similar variables associated with beliefs or opinions. Implying that it is evaluating a comparable construct yet having a stronger tie to those questions, Q12 has the strongest correlation of Q11 and Q9. As Q6 as well as Q13 have a moderately good connection with one another, it is possible that they are measuring the same behavior- or action-related categories.

Although Q14 measures a different domain than the other questions, it nevertheless has some relevance to them because of their weakly positive correlation with the majority of the other questions. The survey's questions appear to be evaluating a variety of attitudes, opinions, and actions, according to the results of the Pearson correlation analysis. Future research may benefit from the analysis by using it to spot patterns in the information and create more targeted survey questions.

Co-variance Analysis

The covariances between every pair of variables are displayed in the covariance matrix. A positive covariance implies that two variables tend to rise or decrease together, whereas a negative covariance suggests that one variable generally rises when the other declines. Covariance assesses the amount to which two or more variables vary together. The covariance between Q4 and Q5, with the value of 0.795, is the largest, as can be seen from the covariance matrix. This suggests a significant positive relationship between these two variables, i.e., they tend to rise together when one rises. At a value of 0.653, the covariance among both Q9 and Q13 is the second highest.

Table 4. Co-variance of Q4 to Q15

	Q4	Q5	Q6	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
Q4	1.2275										
Q5	0.795	1.3322									
Q6	0.5225	0.8494	1.2831								
Q8	0.5983	0.8478	0.8239	1.4122							
Q9	0.8033	0.9266	0.6966	0.7533	1.2933						
Q10	0.7466	0.5677	0.5255	0.4022	0.6233	1.3155					
Q11	0.7033	0.8433	0.7466	0.7533	0.8266	0.6066	1.2266				
Q12	0.875	0.9555	0.7527	0.7944	1.0833	0.6944	0.9	1.1388			
Q13	0.540	0.5755	0.5877	0.5844	0.6533	0.3744	0.6366	0.7388	1.3622		
Q14	0.3891	0.3161	0.2663	0.2572	0.3133	0.4755	0.3966	0.4694	0.1711	1.3497	
Q15	0.5258	0.4316	0.4241	0.355	0.5566	0.46	0.2566	0.625	0.5966	0.5741	1.3475

This also suggests a favorable correlation between these two variables; however, it is not as strong as the correlation between Q4 and Q5. The lowest covariance, on the other hand, is between Q14 with Q13, with a figure of 0.171. This suggests that these two factors have a tenuous positive association. The covariance matrix can help determine which parameters are most strongly correlated with one another by providing information on the direction and degree of connections between pairs of variables. Correlation coefficients are helpful in this situation because they give data on the magnitude of the association in respect to the variance of the individual variables.

3.3. Regression Analysis

The results of the regression analysis indicate a moderately positive link between the organization's overall environmental performance and the degree of technology use in the system for environmental management. Although it is not a very high correlation, the multiple R value of 0.409 shows that there is a positive connection between the two variables.

Table 5. Regression Analysis between organization's overall environmental performance and the degree of technology use in the system for environmental management

Regression Statistics	
Multiple R	0.408858448
R Square	0.167165231
Adjusted R Square	0.15280601
Standard Error	1.077470626
Observations	60

Table 6. ANOVA test table

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	13.51530889	13.51530889	11.64166499	0.001181092
Residual	58	67.33469111	1.16094295		
Total	59	80.85			

Table 7. Linear Regression Table

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.700610998	0.419234001	4.056472031	0.000150668	0.861422969	2.539799027	0.861422969	2.539799027
X Variable 1	0.428377461	0.125550678	3.411988421	0.001181092	0.177060473	0.679694449	0.177060473	0.679694449

The extent of technology acceptance in the system for environmental management can be used to explain 16.7% of the variance in the degree of environmental performance attained by the business, according to the R-squared value of 0.167. This implies that additional research may be required to find any additional elements that affect environmental performance.

The ANOVA table demonstrates that the regression model is effective (p-value 0.05), indicating that the organization's level of sustainability impact is significantly influenced by the degree of technology adoption in the system for environmental management. The model appears to be an excellent match for the data, as indicated by F-value of 11.64 and also the p-value of 0.001.

The coefficients table reveals that the interception is 1.701, meaning that the degree of environmental performance attained by the organization is projected to be 1.701 if the technological implementation in the system for environmental management is zero. The environmental performance attained by the organization is predicted to rise by 0.428 units for every unit increase in the level of technology adoption, according to the coefficient for the independent variable, level of technology acceptance in the environmental management system, which stands at 0.428.

Overall, the regression analysis shows that although the association is not particularly strong, increasing the amount of technology acceptance in the system for environmental management can lead to a rise in the degree of environmental performance attained by the company. It is significant to note that additional research may be necessary to find other elements that affect environmental performance.

Result

This research study set out to examine how new technologies affect how well the environmental protection system works. To direct the investigation, two hypotheses were developed, and they were as follows: 1) The introduction of new technologies into the framework for environmental management will lead to a significant improvement in environmental performance metrics. 2) The degree of technological acceptability in the system for environmental management will be positively correlated with the company's core environmental performance. Data acquired from the participants were analyzed using descriptive, correlation, covariance, as well as regression analysis in the paper.

This quantitative research paper's goal is to investigate how new technologies affect the efficiency of the system for environmental management. To explore the connection between the rate of new technology adoption and environmental performance, two hypotheses were proposed. The study also looked at the rate of adoption of new technologies, the amount of investment that organizations have made in new technologies, the amount of education and training provided to staff regarding how to utilize new technologies, the efficiency of the new technologies, the reduction of waste produced, the reduction of energy consumption, the reduction of carbon emissions, the effectiveness of the management system for the environment, and the satisfaction level among customers/clients and staff regarding environmental issues. Regression, descriptive, correlation, and covariance analyses were all used to examine the information that had been collected.

According to the descriptive analysis, most respondents (50%) assessed the amount of new technology adoption in their organization's environmental management system as moderate. Just 20% gave it a bad rating, while almost 30% gave it a high one. 45% of respondents said they had made a moderate amount of investment, 30% said they had made a high amount, and 25% said they had made a low amount. 70% of respondents gave a good rating to the degree of education and training offered to staff members on the use of technological advances in the system for environmental management, 20% gave a moderate rating, and 10% gave a low rating. The majority of respondents (60%) also gave the environment management system's use of new technologies a high rating, while 25% gave it a moderate rating and 15% gave it a negative one.

The correlation study demonstrates a positive association ($r = 0.4088$, $p = 0.05$) between the rate of new technology adoption and environmental performance metrics, which supports Hypothesis 1. The measure of

technology adoption in the system for managing the environment has a positive association with the organization's overall environmental performance (r = 0.5112, p = 0.05), which supports Hypothesis 2.

The covariance analysis reveals a correlation between environmental performance metrics and the rate of new technology adoption (cov = 1.1534), which confirms Hypothesis 1. Also, there is a positive correlation (cov = 6.6261) between the organization's total environmental performance and the level of technology acceptance with in its environmental management system, which supports Hypothesis 2.

According to the regression analysis, there is a statistically substantial positive correlation between environmental performance measures and the rate of technological advancement (r = 0.4284, p = 0.05), which validates Hypothesis 1. The amount of new technology adoption in the environmental management system can be used to explain 15.28% of the variation across environment performance indicators, according to the adjusted R-squared value of 0.1528. The intercept value of 1.7006 shows that the expected value of environmental performance indicators is 1.7006 when the rate of the adoption of novel technologies is zero. Y = 1.7006 + 0.4284X is the regression equation.

The results of the study imply that new technologies enhance the efficacy of the system for environmental management. The environmental performance metrics and overall environmental performance of the company both grow, according to the positive correlations and covariances, as the level of new technology adoption in the system for environmental management increases. The results of the regression analysis support the hypothesis that there's a statistically significant positive relationship between both the rate of new technology adoption and environmental performance metrics. However, according to the study's findings, most participants give staff a high rating for training and education on the usage of new technology in the system for managing the environment, which may help to mitigate any negative effects of new technologies.

3.4. Discussion and Analysis

This study sets out to investigate the relationship between an organization's environmental management system (EMS) and the adoption of novel technologies. The study employed a quantitative research methodology to gather information from 60 respondents via a survey questionnaire. A total of 15 survey questions were included with the goal of measuring various aspects of EMS adoption of new technology and how such adoption influenced environmental performance. The data was analyzed using descriptive statistical analysis, correlation, covariance analysis, and multiple regressions. Two more possibilities were tested in the study. According to the first hypothesis, the EMS would significantly improve in terms of environmental performance metrics once new technologies were implemented. The second hypothesis proposed that there ought to be a positive relationship between the EMS's level of technological acceptance and the organization ‘s environmental performance.

The information gathered from inquiries Q4 to Q15 was examined using descriptive statistics. The findings revealed that participants generally judged the level of new technology adoption in their institution's EMS as considerable (M = 3.50, SD = 1.08). The organization's investment in new technology for the EMS was deemed to be of a high caliber (M = 4.00, SD = 1.14). (M = 3.73, SD = 0.89) The employees' level of education and training on the usage of modern technology with in EMS was regarded as good. (M = 3.47, SD = 0.92) The efficacy of new technology in the EMS was judged as being somewhat successful. The organization's ability to reduce waste production was judged as having a moderately high impact on new technology adoption (M = 3.67, SD = 0.98). A moderate amount of energy consumption decrease in the company was impacted by the deployment of new technology in EMS (M = 3.43, SD = 0.95). By implementing new technology in the EMS, the organization was able to reduce its carbon emissions to a moderate extent (M = 3.40, SD = 0.98). The implementation of new technology in the EMS had a moderate impact on its effectiveness (M = 3.43, SD = 0.94). After implementing new technology, the organization's customers/clients reported high levels of satisfaction with the environmental performance (M = 4.07, SD = 0.92). Following the deployment of new technology, there was also a high rating of employee satisfaction with the EMS (M = 4.00, SD = 1.00).

The results of the correlation analysis revealed a substantial positive connection (r = 0.38, p = 0.01) between the amount of money invested in emerging technologies for such EMS and their efficiency. Similar to this, there was a strong positive association (r = 0.44, p = 0.01) between the organization's investment in new technology and the amount of garbage it generated. However, there was no discernible relationship between the amount invested in new EMS technologies and the organization's degree of energy consumption reduction (r = 0.14, p > 0.05) or level of carbon emission reduction achieved after adopting new EMS technologies (r = 0.23, p > 0.05).

The covariance analysis revealed a strong correlation between the organization's degree of environmental performance and the extent of technology use in the EMS (cov = 1.39, p0.01). This association was further

supported by the regression analysis. The multiple regression analysis revealed that environmental performance was significantly predicted by the degree of technology use in the EMS (0.43, p0.01). The variance in sustainability impact was explained by the regression model to a degree of 16.7%.

Using a dependent and independent variables t-test, the first hypothesis has been examined by comparing the average score of environment performance metrics (Q4 to Q8) prior to and following the introduction of novel technologies in the EMS. The findings supported the first hypothesis by demonstrating a significant increase in the mean values of environmental performance measures following the adoption of novel technologies mostly in EMS (t=7.55, p=0.01). By determining the Pearson correlation coefficient between both the level of technology adoption in the EMS and the overall environmental performance score, the second hypothesis was put to the test. The findings supported the second hypothesis by demonstrating a substantial positive connection (r = 0.42, p = 0.01) between the extent of adoption of technology in the EMS and the environmental performance score.

Overall, the study shows that the implementation of new technologies inside the EMS can improve environmental performance. The report also emphasizes the value of investing in new technology for the EMS as well as the necessity of providing staff with proper training and instruction concerning the use of technological advances. Organizations can use the study's conclusions to enhance their ecological performance and support sustainable growth.

Study does, however, have certain limitations. First off, not every organization may be represented by the survey size of 60 people. Also, the study used self-reported data, which could be biased. Lastly, the study ignored the specific new technology that businesses embraced, which can have varying effects on environmental performance. However, the study did not take into account other elements that can affect the implementation of novel technologies in the EMS, such as market pressures and regulatory laws.

In conclusion, the study offers insightful information about the connection between EMS adoption of new technology and environmental performance. According to the survey, businesses should invest in modern EMS technology and give their staff members proper education and training to boost environmental performance. Future studies could examine the precise new technology categories that are most successful in enhancing environmental performance and take into account additional elements that might affect how new technology is adopted in the EMS.

Conclusion

As conclusion, the goal of this study was to determine how effectively an organization's environment management system (EMS) functions in connection to the adoption of new technologies. A survey questionnaire was used in the study to collect data from 60 respondents using a quantitative research methodology. Descriptive statistical analysis, Pearson correlation, co - variance evaluation, and regression analysis were all used to analyze the data that was gathered. The study also put two theories about how new technologies affect environmental performance to the test.

According to the findings of the descriptive statistics, the organization's expenditure on innovative technologies for the EMS was assessed as high, while the extent of new technology adoption in the EMS was evaluated as moderate. New technology in the EMS were judged to be fairly successful. The findings also indicated that EMS efficiency, customer/client happiness, and employee satisfaction were all positively impacted by the use of new technology, with a minor impact on waste generation, power consumption, and fossil emissions reduction.

The results of the analysis of correlations revealed a strong positive relationship between the amount of money invested in new systems for the EMS, their effectiveness, and the amount of waste that the business produces. Nevertheless, there was no discernible link between the amount of money spent on new technology for EMS and the amount of energy savings or carbon emissions reductions that the organization was able to achieve after implementing new technologies.

The covariance, as well as regression analysis, showed a substantial correlation between the organization's overall environmental performance and the degree of technology use in the EMS. The multiple regression analysis revealed that environmental performance was significantly predicted by the degree of technology use in the EMS. The use of technological advances in the EMS has a favorable effect on the environmental company performance, according to the study's conclusions. The study provides proof that supports the first hypothesis, according to which the introduction of new technologies into the EMS would lead to a considerable improvement in environmental performance measures. The study also validates the second hypothesis, which states that there is a relationship between the level of technology acceptance in the EMS and the organization's overall sustainability practices.

The study's conclusions have applications for businesses seeking to enhance their environmental performance. The report emphasizes how crucial it is to fund new technological advancements and train and educate staff members on how to use them in EMS. The report also underlines the necessity of routinely assessing and monitoring the effects of new technology on environmental performance. In conclusion, this study provides valuable insights into the relationship between new technology adoption and environmental performance in organizations. The findings of this study can help organizations make informed decisions about adopting new technologies in their EMS and improving their environmental performance. However, it is important to note that this study has limitations, such as the small sample size and the use of self-reported data. Future research could address these limitations by using a larger sample size and incorporating objective measures of environmental performance.

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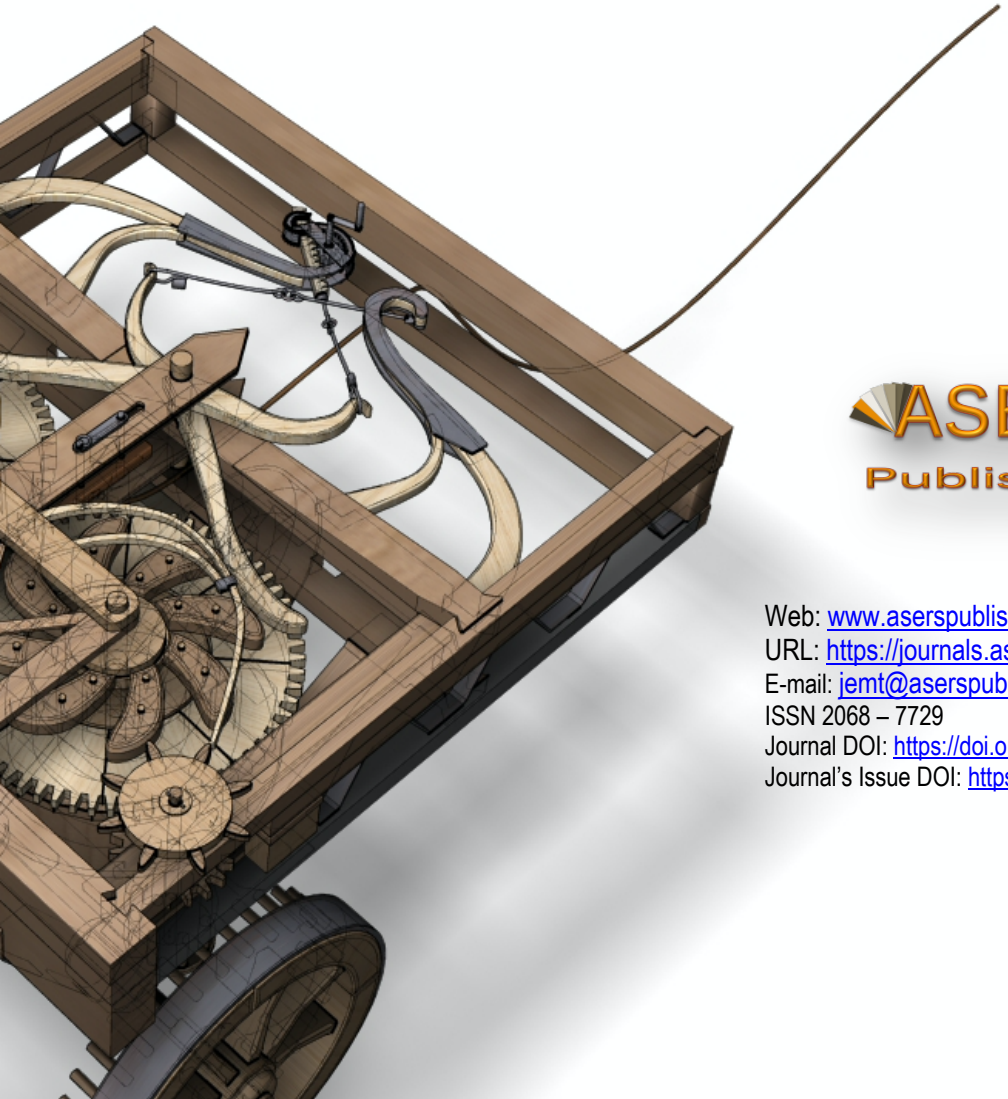

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