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Sustainable and Green Information Systems (GIS) – Leveraging MIS for Organizational

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Abstract: *This research investigates the role of Green Information Systems (GIS) in enhancing organisational performance and environmental responsibility in Saudi organisations in which the variables that potentially affect the outputs are organisational culture and managerial support. The research is carried out on the background of the Resource-Based View (RBV) and the Stakeholder Theory to comprehend how a competitive advantage and environmental accountability can be developed using the sustainability-oriented information system in line with the objectives of the Saudi Vision 2030. Data was collected through the survey and analysis was carried out with the help of reliability tests, correlation analysis and hierarchical regression analysis of 100 respondents represented in different sectors. The findings have shown that Organisational Performance and Environmental responsibility are strong predictors of the GIS adoption with the latter being the most significant. Conversely, the predictive power of the managerial support and organisational culture had a positive relationship though the predictors were not significant in the regression model. This underscores the fact that outside forces and performance pressures are more likely driving forces behind the adoption of green IS than the internal cultural or management factors. The research has theoretical value since it builds on RBV and Stakeholder Theory when considering the process of GIS adoption, as well as provides practical advice that organisations and policymakers should consider when introducing environmental sustainability into strategy, improving managerial commitment, and enabling collaboration between the public and the private sector.*

Keywords: *Green Information Systems, organisational performance, environmental responsibility, managerial support, organisational culture, Saudi Arabia.*

I. INTRODUCTION

A. Background of the Study

According to Guthrie (2024), Green Information Technology (GIT), also known as sustainable information technology, is defined as environmentally sound IT. This research is based on comprehensive definition of green IT by indicating that it deals with the effective and efficient designing, manufacturing, usage, and disposal of servers, computers, and associated subsystems such as devices, printers, monitors, and communication systems. Technology has been developed to limit the impact of business procedures on the environment. GIT is associated with the development of a sustainable environment through applications, simulation tools, and decision-support systems. Karim et al. (2024) proposed that green organisational practices have become popular due to the increasing interest of the environmentally-conscious customers in the issues of environmental protection, social responsibility, and sustainability practices. Thus, GIT implementation has received significant importance over the past few years. Moreover, the research has also emphasised that green technology is applied by manufacturers to minimise pollution, preserve resources, as well as limit the emission of greenhouse gases. This means the current problems of the environment, such as a lack of resources and climate change, can be overcome through the creation of a green and sustainable economy.

Many scholars and practitioners have discussed organisational sustainability. Almuqrin et al. (2023) stated that various have employed the Triple Bottom Line (TBL) model to emphasise its application in maintaining economic, social, and environmental resources at the organisational level. For example, as Dzhenigiz (2020) stated that under the set of Sustainable Development Goals (SDG) lies environmental sustainability as a concept that implies conserving natural resources and biodiversity to minimise waste and emissions and increase regeneration capacity. Researchers have related organisational sustainability, business performance and environmental responsibility and found that increased organisational sustainability could have positive impacts on market performance, financial stability, and customer satisfaction. However, most of these resources are outdated and published before 2020. Further, there is limited research in context of Green Information System (GIS) and sustainability with Saudi firms' performance and environmental responsibility.

B. Problem Statement and Research Gap

Customer expectations and the changing technological landscape place considerable pressure on Saudi organisations to balance environmental responsibility with economic growth. Management information systems (MIS) provide remarkable support in maintaining financial performance and improving business operations, whereas their role in supporting business sustainability remains underexplored. Recent studies show that variables related to information system success account for only a small proportion of variance in sustainability outcomes (Almuqrin et al., 2023). The results show that the implementation of information technology in Saudi organisations has a weak to moderate association with organisational sustainability, showing an evidence gap about the benefits of MIS to improve environmental performance. Besides this, Madkhali and Sithole (2023) reported that the adoption of innovative ideas in Saudi companies may help address sustainability concerns, however, the measurable impacts were not clearly established. This further signified the need to develop a clear and accurate relationship between MIS, organisational sustainability, and environmental responsibility.

C. Research Objectives and Questions

This research aims to determine the role of GIS in promoting environmental responsibility and organisational performance in Saudi organisations. The following are the objectives of this study:

- ✓ To explore the current trends and usage patterns of GIS in Saudi organisations.
- ✓ To explore the role of GIS in promoting the Green IT initiative and sustainable business practices.
- ✓ To determine the association between the implementation of GIS and achieving environmental responsibility.

This research addresses the following research question:

What is the impact of a GIS on the environmental responsibility and overall performance of Saudi organisations?

D. Contribution of the Study

This research has significant contributions in terms of theory and practice. Theoretically, this will add meaningful and updated insights on the association between green information systems and environmental and organisational performance. It addresses the knowledge gap existing in the literature by linking the relationship to the Saudi business environment. In practice, the findings will be useful to both the CEOs of Saudi organisations and policymakers, who will be in a position to establish how well the green information systems are effective in ensuring that organisations become environmentally responsible. The findings present the potential of implementing MIS to achieve environmental responsibility and enhance the performance of organisations. This stimulates the optimisation of MIS adoption in Saudi organisations, whereas the data about the existing trends and usage patterns allow the policy makers to find supportive policies that may promote MIS adoption in Saudi organisations..

II. LITERATURE REVIEW

A. Overview of Prior Studies

1) Definition of Management Information System (MIS)

According to Magableh et al. (2024), MIS is a tool for effective decision-making and data control. It collects, processes, and presents information from multiple sources to support business planning, analysis, and governance. The study further explains that MIS can improve time management and gather the most relevant information in an organised manner for critical business decisions. Further, Esmailian et al. (2020) stated that the use of MIS can contribute positively to sustainability. It highlights that MIS can be used in smart logistics, IoT-enabled energy management systems, and smart business management systems. Sustainability can be reflected in multiple forms, including management system efficiency, product lifecycle visibility, and sustainability monitoring across organisational supply chain networks. Thus, managers and executives should encourage employees to adopt GIT and align their business practices accordingly.

2) Driving Forces to Green IS Adoption

According to Radu and Popescul (2024), the driving forces behind adopting GIS can be explained through defensive and proactive approaches to technology adoption. Considering the proactive approach companies often adopt green IS to respond to market threats and changes, while the defensive approach begins with external motivational factors. The study highlighted several external motivations for adopting GIS, including government regulations on business operations, competitive actions by rivals, and limited access to scarce resources. On the other hand, Reznik et al. (2024) stated that protecting the environment is an ecological responsibility of organisations and helps them attract new customers.

This implies that companies adopting green technology can increase their revenue and market competitiveness, which becomes an internal motivation to adopt GIS. However, management involvement in adopting GIS performs a crucial role, as it can positively influence organisational beliefs and values regarding green technology and environmental responsibility, thereby leading to sustainable business practices. Besides this, managers showcase multiple benefits of Green IS to encourage employees towards its implementation.

3) *Benefits of GIS for Saudi Companies*

According to Madkhali and Sithole (2023), information technology can improve sustainability efforts in Saudi Arabia which ensures the transition towards green initiatives by the adoption of blockchain, IoT, and AI. Information systems have a profound positive impact on reducing waste generation, improving energy efficiency, strengthening environmental sustainability, and improving economic growth. Besides this, information systems have a profound positive impact on reducing waste generation, while there can be challenges during the adoption and implementation of green technology, such as a lack of technical expertise and required investment. GIS reduce business costs, enhance brand image, and build ecosystem-level competencies.

A recent study indicates that GIS enhance green creativity, thus providing a competitive advantage and improving its organisational performance (Setyaningrum, Kholid, & Susilo, 2023). This implies that Saudi organisations can consider Green IS as a source of competitive advantage, particularly in highly competitive industries. However, this study does not integrate the challenges faced by small companies when integrating technology. Since small companies have limited budgets, this technology integration could outweigh the potential benefits of technology. Furthermore, the successful implementation of technology depends on policy interventions and public-private partnerships in achieving economic growth and environmental sustainability.

Similar to Setyaningrum, Kholid, and Susilo (2023), Adiguzel and Sonmez Cakir (2025) highlighted that GIS along with Big Data Analytics (BDA) infrastructure flexibility, can have a significant positive impact on economic, social, and environmental performance. Furthermore, BDA can have a positive impact on the performance of green information systems. Overall, there is a critical role of GIS and BDA in managing technology to achieve future sustainable goals, particularly in the energy sector. These findings play a vital role in supporting the effectiveness of GIS in the energy sector, however, there is a need to specifically link these findings with Saudi organisations.

The study by Brendel et al. (2022) gathered multiple perspectives on the effectiveness of Green IS in terms of implementation which primarily focused on support in decision-making and improvements in existing business practices. However, sustainability challenges can be addressed through GIS implementation. GIS implementation is carried out through cooperation and close coordination with policymakers and practitioners to gain insights into real-world impacts. This collaboration ensures that future research is grounded in practical and real-life examples that are necessary to inform managers and policymakers about sustainable business practices.

B. *Theoretical Background*

1) *Resource-Based View (RBV)*

Barney proposed the Resource-Based View theory in 1991 (Barney et al., 2021). This theory views the organisation as a functional unit with a convergence of resources that could be greatly used to ensure that it holds a competitive position in the market and also to improve the overall performance of the business. The theory can be applied to determine resources that can give a company a sustained competitive advantage. The theory is applied in this research to recognise the effectiveness of GIS on the enhancement of performance within an organisation. In addition, it is also applied in evaluating the control, access, and management of information technology in Saudi organisations to enhance organisational performance and foster environmental responsibility. It makes MIS capabilities sustainable in Saudi organisations, guaranteeing better performance and green sustainability.

2) *Stakeholder Theory*

The Stakeholder Theory finds wide application in the literature of business management and organisational ethics. According to the theory, organisations must aim at making profits and generate value to the stakeholders (Freudenreich et al., 2020). The key and secondary stakeholders of Saudi organisations are employees, regulators, investors, and customers. The companies must address the needs and preferences of stakeholders as they make decisions concerning the business operations. The theory aids in the analysis of the contribution of various stakeholders in encouraging organisations towards being environmentally responsible by adopting GIS. Moreover, it indicates that MIS may serve as a reporting and accountability tool for dealing with the issues of various stakeholders who are environmentally aware of the effects of business operations.

C. Identification of Research Gaps

This research provides a general overview of management information systems and the impacts of GIS on business performance. However, there is a lack of empirical evidence on how GIS can influence environmental responsibility and the overall organisational performance in Saudi Arabia. Previous research has conducted both qualitative and quantitative analyses to determine the effectiveness of GIS, however, there is limited quantitative analysis that can demonstrate the relationship between GIS, environmental responsibility, and business performance. It is important to note that the influence of IS on performance and environmental responsibilities can be influenced by multiple factors such as organisational culture, government policies and support, and the current technological landscape prevalent in the region. This highlights the need to establish the significance of this relationship, particularly within the context of Saudi organisations.

D. Conceptual Framework and Hypotheses Development

1) Green Information Systems (GIS)

GIS refers to a customised information system that is used to monitor business practices related to environmental activities and their consequences.

2) Organisational Performance

Organisational performance is defined as the ability to meet organisational goals and objectives with the help of resource optimisation, capital allocation, and tracking the progress towards success. Previous research identifies a positive association between green information systems and organisational performance, which can be mediated by managerial support and involvement. Managers are responsible for providing the required resources and support for technology implementation. Further, they are responsible for creating a culture of technology transformation and environmental responsibility that is necessary to motivate employees towards green transformations. This leads to the following hypothesis.

H1: *Organisational performance can have a significant positive impact on adoption of a green information system.*

3) Environmental Responsibility

Environmental responsibility refers to the duty of the community, individuals, and companies to protect the environment from harmful waste and emissions. The literature and recent studies show a link between environmental responsibility and Green IS adoption with organisational culture as a mediating variable. Organisational culture is a combination of norms, values, and attitudes. For an organisation in which environmental responsibility comes under the core values of the company, it will be easier for employees to adopt a green information system as part of their environmental responsibility. This leads to the following hypothesis:

H2: *Environmental responsibility has a significant positive association with Green IS adoption.*

The figure below shows the possible relationship between the dependent variable (GIS) and independent variables (organisational performance and environmental responsibility) by considering mediating variables that are managerial support and organisational culture.

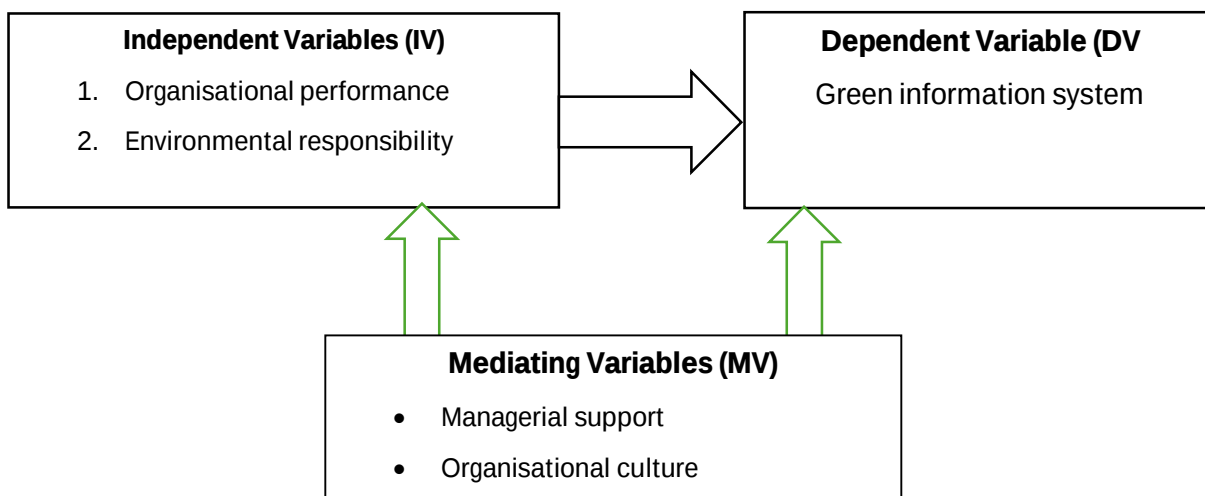


Figure 1 Conceptual Framework

III. METHODOLOGY

A. Introduction

The methodology followed in this section describes how the two variables, organisational performance and environmental responsibility, mediate the uptake of GIS by the managers and organisational culture. The study needs a well defined methodological framework to make it come up with reliable and valid results. The chapter reports about the research design, population and sampling strategy, data collection methods, measurement of variables, and methods of data analysis. It also deals with issues of reliability, validity and ethical issues. This section presents the procedures in detail and thus forms the basis of testing the research hypotheses in a systematic way.

B. Research Design

This research has adopted a quantitative and cross-sectional survey research design as a way to investigate empirically the relationship between organisational performance, environmental responsibility, and adoption of GIS considering the mediator roles of managerial support and organisational culture. Quantitative research was used to test hypotheses and quantify the relationship between the specified constructs with the help of the structured information. The cross-sectional type of design enables the collection of data at one instance in time, thus efficient and workable when the study of organisations may not be possible due to longitudinal data (Bryman, 2016). Mediation analysis could also be performed using statistical modelling (e.g. regression or structural equation modelling), which are suitable to estimate both direct and indirect impacts in sustainability and information systems research (Hair et al., 2019).

C. Population and Sampling

The sample of this research were the employees of organisations that have either implemented or are intending to implement sustainable and GIS. The purposive sampling was used to make the sample relevant to the study by focusing on respondents who have the knowledge of MIS and organisational sustainability efforts. At least 100 valid responses were gathered to obtain sufficient regression and mediation statistical power. Furthermore, this sample is also consistent with the methodology recommendations, which indicate that a minimum of 100 respondents is necessary to obtain sufficient power and reliability in social science research (Kline, 2023). The rule of thumb to use a minimum of 10 times of the indicators per construct justifies this sample size as a quantitative study (Hair et al., 2019). The choice of respondents with different designations gave heterogeneity of views. Such research approach enhanced representativeness and allows managerial and non-managerial information to be both included in the data (Saunders et al., 2019).

D. Data Collection Method

The online questionnaire was used to gather the data which was divided into two sections demographics and measurement items according to the study variables. The measurement of responses were based on a five-point Likert scale, i.e., 1 = *strongly disagree*, 2 = *strongly disagree*, 3 = *strongly disagree*, 4 = *strongly disagree*, 5 = *strongly agree* (Bhattacharjee, 2012). The questionnaire was circulated via electronic networks, LinkedIn, and emails of organisations in order to enhance delivery and response. Online distribution is cost effective, efficient and has a wide geographic coverage, especially in working professionals (Creswell & Creswell, 2018). To address the ethical requirements of the academic research, the participants were guaranteed anonymity, confidentiality, and voluntary participation.

E. Measurement of Variables

The study method ensured that the measurement scales are reliable and construct valid will be the application of validated measurement scales that have been adjusted to accommodate the current study. The variables were measured using five-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). GIS was used as a dependent variable, and it measured using three items that covered the adoption and utilisation of sustainable IT practises. The independent variables were Organisational Performance and Environmental Responsibility, whose measures need three items that are grounded on published organisational and sustainability publications (Elkington, 1998; Venkatraman & Ramanujam, 1986). The mediating variables, Managerial Support and Organisational Culture focused on the leadership involvement and common values on sustainability (Schein, 2010). The demographic data such as age, gender, and designation were used to contextualise the responses. Pre-validated and adapted scales promoted the comparability and content validity of the results in studies.

F. Data Analysis Techniques

Hierarchical regression analysis to be performed in SPSS were used to test the hypothesised relationships between the variables used in the study. Hierarchical regression were suitable to investigate the mediation effects by sequentially adding predictor variables to the model to see the change in explained variance (R^2) on adding mediate variables to the model (Cohen et al., 2013). Specifically, hierarchical regression was selected as it provided the researcher the opportunity to study the incremental contribution of each combination of predictors to the variance of the dependent variable. This gradual addition of variables, in specific, is useful in testing the mediation because it allowed to determine the amount of variance that is explained prior to the introduction of mediators and after it (Aiken & West, 1991; Cohen et al., 2013). Hierarchical regression was better suited to this research than standard regression as it gives more insight into what effects of individual and combined predictors are more unique and clear.

This study did not use Structural Equation Modeling (SEM) due to the large size needed, usually over 200 respondents, to stabilize the model and estimate the parameters correctly (Kline, 2023). Since there were 100 respondents in the present sample, hierarchical regression emerged as the more suitable option, since it can be effectively used to examine mediation and incremental variance without having such a complicated model fit requirement. In addition, hierarchical regression gives a better understanding of the contribution made by each variable to the dependent construct in a stepwise manner (Cohen et al., 2013). In the former step, the independent variables were organisational performance and environmental responsibility regressed on to the dependent variable, which is GIS. The second step will involve introducing the mediating factors which will be managerial support and organisational culture to the model. The incremental variance explained (ΔR^2), the alterations in the beta coefficients will reveal the mediating effect of these variables (Baron & Kenny, 1986). Diagnostic tests like multicollinearity (VIF), normality and linearity were conducted before hypothesis testing to ensure strength. This is a step-by-step method that gives information on the mediated effects and the direct effects.

G. Reliability and Validity

To the credibility of this study, it was essential to ensure that there is reliability and validity. Reliability is the measurement consistency and will be assessed by evaluating Cronbach alpha which is 0.70 and above is acceptable (Nunnally & Bernstein, 1994). Further, the internal consistency of constructs were verified by the use of composite reliability and item-total correlation. Validity will be evaluated in a variety of ways in terms of content validity where by adoption of pre-validated scales in previous studies will be used (Bhattacharjee, 2012); construct validity through factor analysis to ascertain dimensionality; convergent and discriminant through Average Variance Extracted (AVE) and inter-construct validity (Fornell & Larcker, 1981). A small number of respondents were piloted to narrow down the items further to make them clear and precise. The procedures made measurement instruments to measure the intended constructs in a reliable and unbiased way, which increased the strength of the statistical results and the overall generalisability of findings in the study (Hair et al., 2019).

3.8 Ethical Considerations

This research study was conducted in accordance with the set code of ethics to guarantee credibility and prevent the violation of the rights of the participants. The purpose of the research was communicated to the respondents and the informed consent will be taken before engaging the respondents in the research. The participation was done a voluntary basis and at any point, the right to opt out without any reprisal. The data was stored in a secure location and aggregated results were reported instead of ensuring confidentiality and anonymity. No sensitive information was given and no personal bias and objective was imposed in the research study. The institutions of approval about the ethical approvals was obtained by the respective institutional review board, which will be in line with the norms of Belmont Report (National Commission for the Protection of Human Subjects of Biomedical, & Behavioral Research, 1979).

H. Limitations

Although this study was carefully designed, there were a few limitations that required to be recognised. To begin with, the study applied purposive sampling methodology, which, guaranteed the relevance of the sampled participants in terms of the knowledge they have about MIS and sustainability. This might constrained the extrapolation of the results to the overall Saudi Arabian organisations population. Non-probability sampling limited the possibility of making inferences about the entire population and had the risk of sampling bias. Second, the research is based on self-reported information gathered with the help of questionnaires that may be biased by social desirability or false recollection presented by respondents. This influenced the objectivity of responses particularly on sensitive matters like organisational sustainability practices.

Furthermore, since the sample was restricted to employees of organisations planning to or already using green MIS, there was a contextual restriction to the scope that the results can be generalised to organisations at an earlier phase of digital or sustainability change. Third, the research is cross-sectional, it did not allow for the assumption of relationship between green MIS adoption, environmental responsibility, and organisational performance. These relationship between these variables might be more effectively studied using longitudinal studies to determine their changes over time.

IV. ANALYSIS AND DISCUSSION

A. Introduction

This section is based on the analysis of data gathered from survey questionnaire using different statistical techniques. Therefore, the descriptive statistics have been included to provide the statistical properties of the variables. In addition, the demographic analysis was also included along the reliability and correlation analysis. Furthermore, the effect was determined with the help of hierarchical regression. Lastly, the discussion was carried out at the end of this chapter.

B. Descriptive Statistics

Table 1 presents the descriptive statistics for the study variables: Green Information Systems (GIS), Organisational Performance (OP), Environmental Responsibility (ER), Managerial Support (MS), and Organisational Culture (OC). Each variable was measured on a five-point Likert scale with responses from 100 participants. The mean values for all constructs are relatively high, ranging between 3.98 and 4.18, suggesting that respondents generally agree with the presence of sustainable practices, organisational performance, and managerial and cultural support for green initiatives. Specifically, Environmental Responsibility ($M = 4.18$, $SD = 0.56$) has the highest mean, indicating that organisations are strongly perceived as environmentally responsible. This is closely followed by Managerial Support ($M = 4.15$, $SD = 0.59$) and Organisational Culture ($M = 4.13$, $SD = 0.63$), highlighting that leadership and cultural values are seen as important enablers of sustainability. Green Information Systems ($M = 4.01$, $SD = 0.67$) also shows positive perceptions, though slightly more varied, suggesting differences in adoption levels across organisations. Standard deviations for all variables are below 0.70, reflecting relatively low variability and consistent responses among participants.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Green Information Systems (GIS)	100	3.000	5.000	4.01333	0.674899
Organisational Performance (OP)	100	2.667	5.000	3.98667	0.589698
Environmental Responsibility (ER)	100	3.000	5.000	4.17667	0.557482
Managerial Support (MS)	100	3.000	5.000	4.14667	0.590459
Organisational Culture (OC)	100	3.000	5.000	4.13000	0.626563
Valid N (listwise)	100				

Table 1 Descriptive Statistics

C. Demographic Analysis

The gender distribution of the respondents is provided in Table 2. There are 63% males and 37% females among 100 participants. This implies that most of the surveyed employees are males implying that there is a possibility of gender imbalance in organisational functions with regard to sustainability and information systems. The cumulative percentage shows that male respondents dominate the sample, but female representation remains significant, accounting for more than one-third of the participants. This distribution may reflect the broader workforce demographics in technology- and management-related positions, which often see higher male participation. However, the presence of 37% females ensures that both gender perspectives are represented in the study. The relevance of gender diversity to sustainability practises can be explained by the fact that men and women might have different perceptions of the environmental responsibility and organisational culture priorities. Indicatively, past researches have noted that women tend to bring a different approach to corporate social responsibility and eco-sustainability programmes, which may reflect on decision-making.

In general, the male majority might give a slight bias to the perceptions of the traditionally predominant views, but the fact that a considerable number of female respondents is involved adds credibility to the data and makes it more inclusive. Such a gender balance helps create a more detailed analysis of factors determining the adoption of green information systems.

		Gender		Valid Percent	Cumulative Percent
		Frequency	Percent		
Valid	Male	63	63.0	63.0	63.0
	Female	37	37.0	37.0	100.0
	Total	100	100.0	100.0	

Table 2 Gender

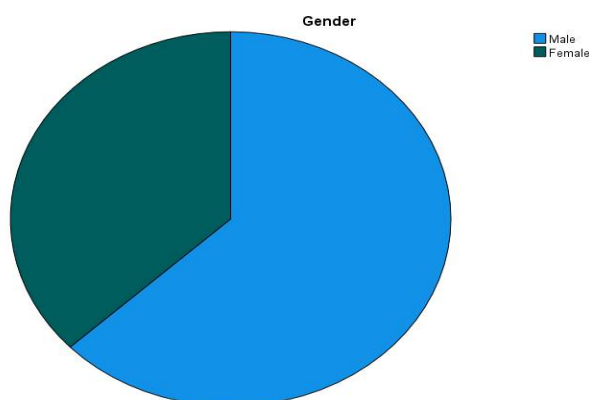


Figure 2 Gender

Table 3 summarises the age distribution of respondents. The largest group falls within the 26–35 years category (35%), followed by 36–45 years (28%), and 18–25 years (24%). Smaller proportions include 46–55 years (7%) and those above 55 years (6%). This suggests that the majority of participants are young to mid-career professionals, with relatively fewer older employees represented. The age profile highlights that younger and mid-level employees are more actively engaged with organisational sustainability and information system initiatives. This may be due to their greater familiarity with digital technologies and growing awareness of environmental responsibility compared to older generations. The 26–45 age range, which collectively accounts for 63% of respondents, typically represents individuals in decision-making or influential roles, such as middle and senior managers. Their strong presence in the sample ensures reliable insights into organisational performance and culture regarding sustainability. The relatively smaller representation of older employees (above 46 years) may suggest limited involvement of top-tier professionals or experienced executives in responding to surveys, possibly due to time constraints. Nonetheless, the broad age coverage ensures diversity in perspectives, enabling the study to capture generational differences in views toward green information systems adoption and organisational support.

		Age		Valid Percent	Cumulative Percent
		Frequency	Percent		
Valid	18–25 years	24	24.0	24.0	24.0
	26–35 years	35	35.0	35.0	59.0
	36–45 years	28	28.0	28.0	87.0
	46–55 years	7	7.0	7.0	94.0
	Above 55 years	6	6.0	6.0	100.0
	Total	100	100.0	100.0	

Table 3 Age

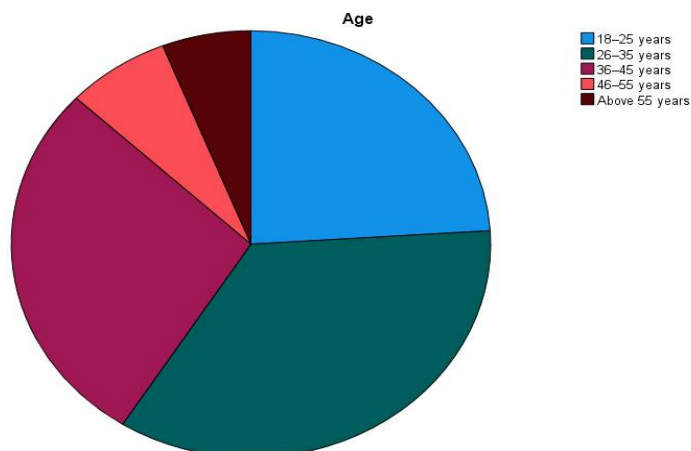


Figure 3 Age

Table 4 displays respondents' designation levels. The majority belong to middle management (48%), followed by senior management (40%), while executive/top management accounts for 10%. Only 2% are entry-level employees. This distribution highlights that the dataset is dominated by managerial respondents, which is highly relevant to the study's focus on managerial support, organisational culture, and performance. The strong representation of middle management indicates that this group plays a critical role in implementing sustainability initiatives and green information systems. As middle managers often act as the link between strategic directives and operational practices, their perspectives provide valuable insights into how organisational policies are translated into action. Similarly, the substantial presence of senior management suggests that decision-makers responsible for resource allocation and sustainability strategies are well-represented. The small number of entry-level employees (2%) reflects that sustainability and MIS adoption are often shaped by managerial and executive levels rather than frontline staff. However, the inclusion of executives (10%) ensures that strategic viewpoints are also considered. Overall, the designation distribution strengthens the study by capturing insights across multiple management tiers, thereby providing a holistic understanding of organisational dynamics supporting green information systems adoption.

Designation				
Valid		Frequency	Percent	Valid Percent
				Cumulative Percent
	Entry-level Employee	2	2.0	2.0
	Middle Management	48	48.0	50.0
	Senior Management	40	40.0	90.0
	Executive/Top Management	10	10.0	100.0
	Total	100	100.0	100.0

Table 4 Designation

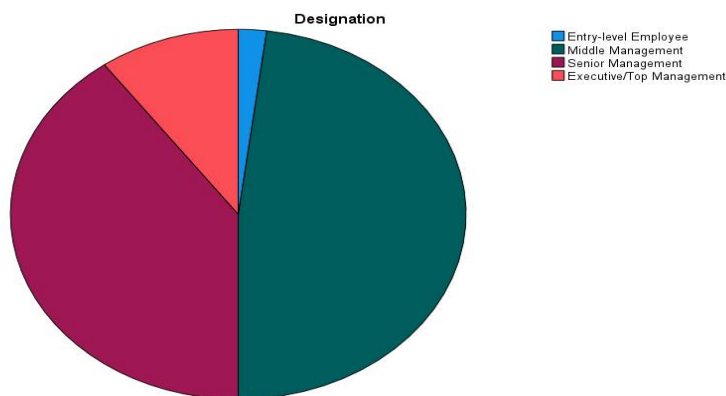


Figure 4 Designation

D. Reliability Analysis

Table 5 presents the results of the reliability analysis using Cronbach's Alpha for all study variables. Cronbach's Alpha measures internal consistency, indicating how well the items within each construct are correlated. A threshold of 0.70 or higher is generally considered acceptable for social science research (Nunnally & Bernstein, 1994). The results demonstrate strong reliability across all constructs. Green Information Systems ($\alpha = 0.888$) shows excellent reliability, suggesting that the items consistently measure perceptions of sustainable information system practices. Organisational Performance ($\alpha = 0.783$) and Managerial Support ($\alpha = 0.814$) both exceed the acceptable threshold, indicating good internal consistency. Organisational Culture ($\alpha = 0.810$) also reflects high reliability, confirming that responses to cultural values and practices are consistent. Environmental Responsibility ($\alpha = 0.722$), while the lowest among the variables, still meets the minimum threshold, suggesting satisfactory reliability. Overall, the analysis confirms that the measurement scales used for this study are reliable and suitable for further statistical testing, including regression and mediation analyses. The consistently high reliability values strengthen the credibility of the findings, ensuring that the constructs accurately capture the underlying dimensions of green information systems adoption and organisational sustainability.

Variables	Cronbach's Alpha
Green Information Systems (GIS)	0.888
Organisational Performance (OP)	0.783
Environmental Responsibility (ER)	0.722
Managerial Support (MS)	0.814
Organisational Culture (OC)	0.81

Table 5 Reliability Analysis

E. Correlation Analysis

Table 6 presents the Pearson correlation coefficients among the study variables: Green Information Systems (GIS), Organisational Performance (OP), Environmental Responsibility (ER), Managerial Support (MS), and Organisational Culture (OC). All correlations are statistically significant at the 0.01 level (2-tailed), indicating strong associations across variables.

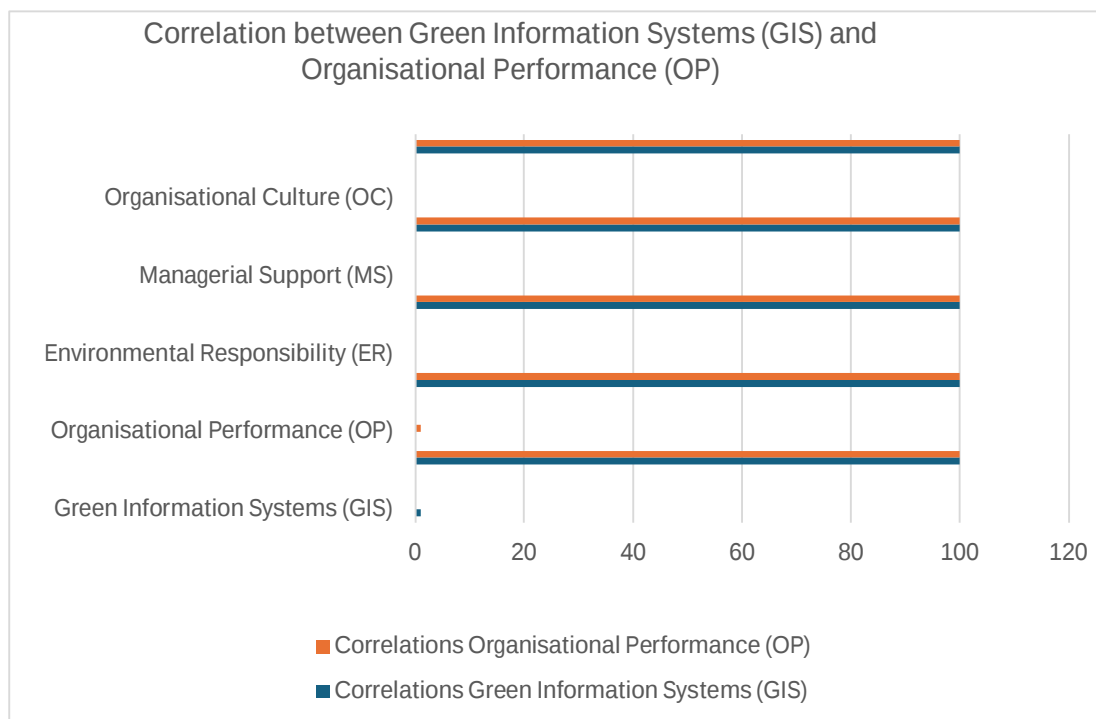


Figure 5 Correlation between Green Information Systems (GIS) and Organisational Performance (OP)

The dependent variable, Green Information Systems (GIS), shows significant positive correlations with all independent and mediating variables (Fig. 5). Specifically, GIS has a strong correlation with Environmental Responsibility ($r = 0.692$, $p < 0.01$), suggesting that organisations committed to environmental responsibility are more likely to adopt green information systems (Fig. 6). Similarly, GIS correlates highly with Organisational Performance ($r = 0.646$, $p < 0.01$), indicating that enhanced performance is associated with greater use of sustainable MIS practices. Moderate correlations with Organisational Culture ($r = 0.566$, $p < 0.01$) and Managerial Support ($r = 0.488$, $p < 0.01$) highlight the importance of leadership and cultural values in facilitating green IS adoption, though these are slightly weaker than performance and responsibility factors.

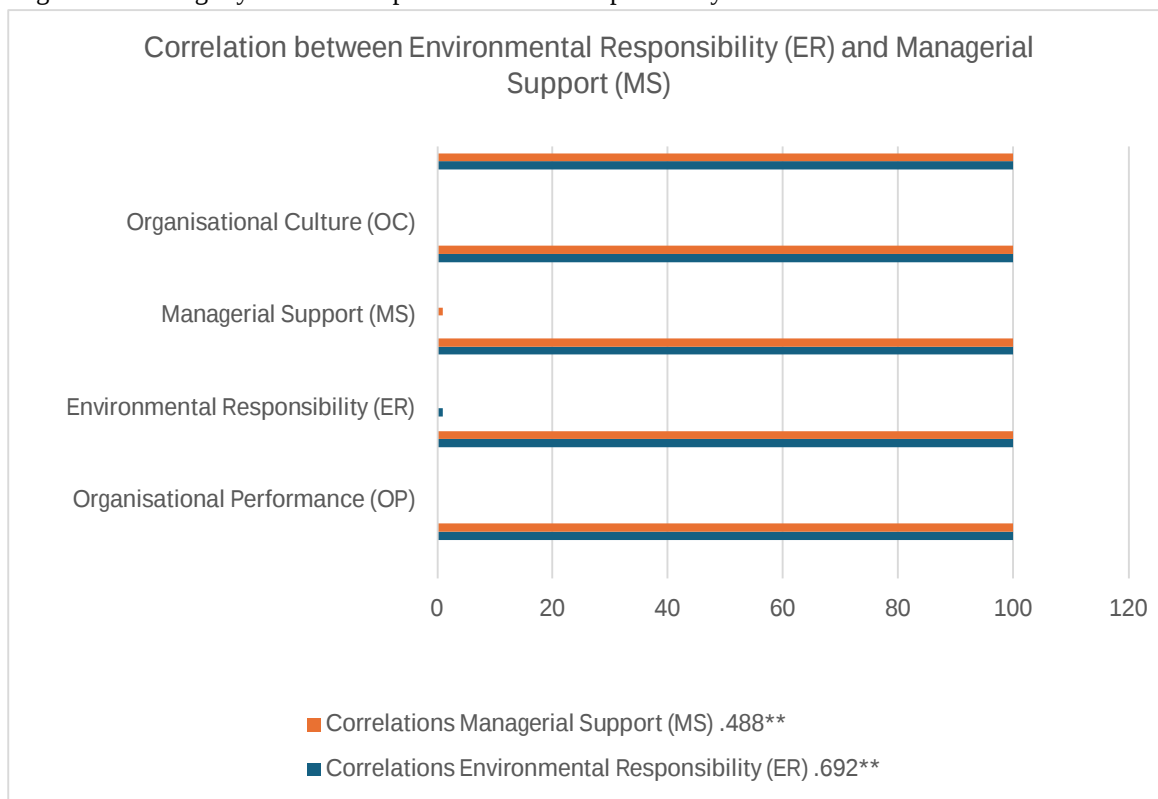


Figure 6 Correlation between Environmental Responsibility (ER) and Managerial Support (MS)

The independent variables also display strong interrelationships. Organisational Performance and Environmental Responsibility ($r = 0.762$, $p < 0.01$) demonstrate the highest correlation in the table, reflecting that organisations performing well tend to simultaneously exhibit greater environmental accountability. This aligns with the triple bottom line perspective, where economic and environmental outcomes reinforce one another (Elkington, 1998). Performance is also strongly correlated with Managerial Support ($r = 0.676$, $p < 0.01$), suggesting that effective leadership plays a pivotal role in achieving both performance and sustainability goals. Environmental Responsibility shows the strongest correlations across variables, with Managerial Support ($r = 0.787$, $p < 0.01$) and Organisational Culture ($r = 0.718$, $p < 0.01$) emerging as highly influential. These findings suggest that responsible environmental position cannot exist in isolation but is entrenched in favourable leadership and mutual cultural principles. This can be aligned with the previous literature that supports the idea that sustainability efforts must be supported by both technological investment and managerial dedication and cultural congruence (Melville, 2010; Schein, 2010).

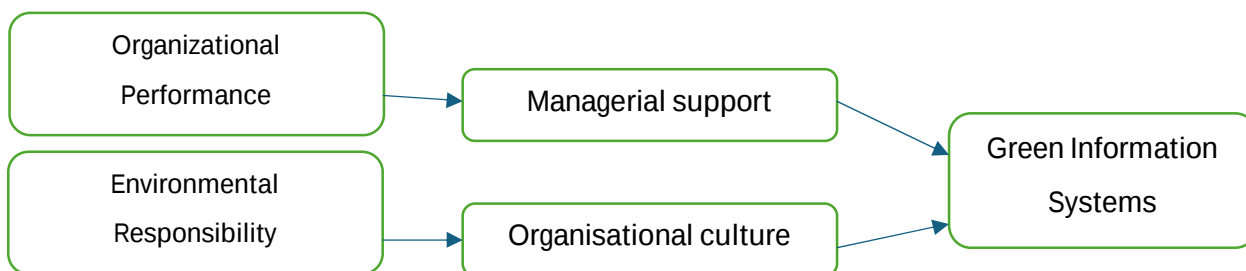
More, the relationship between Managerial Support and Organisational Culture ($r = 0.555$, $p < 0.01$) supports the fact that supportive leadership is usually accompanied by the culture of sustainability and innovation. Such a relationship is critical in that it is a combination of the intangible organisational factors that translate into the adoption of green IS. The reason why the correlations between most of the variables are relatively high is that multicollinearity in regression analysis becomes significant to evaluate. Nevertheless, none of the correlations are above 0.90, so it is not likely that the threat of multicollinearity will be problematic (Hair et al., 2019). To sum up, the correlation analysis indicates that all the study constructs are significantly and positively connected. The most closely related factor throughout the framework is the environmental responsibility, which strengthens its position in the middle of the first motivation of both the performance of the organisation and the adoption of green IS.

There is also significant evidence of managerial support and organisational culture, which comprises the mediating potential in the relationship between independent and dependent variables. These findings form a strong basis on which additional testing can be done using hierarchical regression in order to establish the mediation effects and the strength of predictors, in relation.

Correlations					
	Green Information Systems (GIS)	Organisational Performance (OP)	Environmental Responsibility (ER)	Managerial Support (MS)	Organisational Culture (OC)
Green Information Systems (GIS)	1	.646**	.692**	.488**	.566**
		0.000	0.000	0.000	0.000
	100	100	100	100	100
Organisational Performance (OP)	.646**	1	.762**	.676**	.585**
	0.000		0.000	0.000	0.000
	100	100	100	100	100
Environmental Responsibility (ER)	.692**	.762**	1	.787**	.718**
	0.000	0.000		0.000	0.000
	100	100	100	100	100
Managerial Support (MS)	.488**	.676**	.787**	1	.555**
	0.000	0.000	0.000		0.000
	100	100	100	100	100
Organisational Culture (OC)	.566**	.585**	.718**	.555**	1
	0.000	0.000	0.000	0.000	
	100	100	100	100	100

**, Correlation is significant at the 0.01 level (2-tailed).

Table 6 Correlation Analysis



F. Hierarchical Regression Analysis

The Model Summary outlines the predictive strength of hierarchical regression models in explaining the variance in Green Information Systems (GIS). In Model 1, which included Organisational Performance (OP) and Environmental Responsibility (ER), the R-value of 0.716 indicates a strong correlation between predictors and GIS. The R^2 value of 0.512 shows that 51.2% of the variance in GIS is explained by OP and ER, with an adjusted R^2 of 0.502, confirming robustness when adjusted for sample size. The R^2 change of 0.512 and the significant F-change ($p < 0.001$) highlight that the predictors substantially contribute to the model. In Model 2, the inclusion of Managerial Support (MS) and Organisational Culture (OC) raised R^2 to 0.535, with an adjusted R^2 of 0.516. Although there was an improvement, the R^2 change of 0.023 was not statistically significant ($p = 0.101$). This indicates that adding MS and OC did not significantly enhance the model beyond the variance already explained by OP and ER. Thus, the summary demonstrates that ER and OP are primary predictors of GIS, while MS and OC contribute marginally, but not significantly, to explaining additional variance.

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.716 ^a	0.512	0.502	0.476114	0.512	50.963	2	97	0.000
2	.732 ^b	0.535	0.516	0.469604	0.023	2.354	2	95	0.101

a. Predictors: (Constant), Environmental Responsibility (ER), Organisational Performance (OP)

b. Predictors: (Constant), Environmental Responsibility (ER), Organisational Performance (OP), Organisational Culture (OC), Managerial Support (MS)

Table 7 Model Summary

The ANOVA table assesses the overall fit and statistical significance of the hierarchical regression models. In Model 1, the regression sum of squares (23.105) compared to the residual sum of squares (21.988) indicates that the predictors—Organisational Performance (OP) and Environmental Responsibility (ER)—account for more variance in GIS than unexplained variance. The F-statistic of 50.963 with a significance level of $p < 0.001$ demonstrates that Model 1 is highly significant, confirming the predictive validity of OP and ER in determining GIS adoption. In Model 2, after adding Managerial Support (MS) and Organisational Culture (OC), the regression sum of squares increased slightly to 24.143, with a reduced residual (20.950). The F-statistic of 27.370 ($p < 0.001$) confirms that the model as a whole remains statistically significant. However, compared to Model 1, the increase in explained variance is minimal, and the drop in the mean square value indicates that the additional predictors did not dramatically strengthen the model. Overall, the ANOVA results confirm that OP and ER are strong, statistically significant predictors of GIS, while MS and OC offer limited incremental predictive power.

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.105	2	11.552	50.963	.000 ^b
	Residual	21.988	97	0.227		
	Total	45.093	99			
2	Regression	24.143	4	6.036	27.370	.000 ^c
	Residual	20.950	95	0.221		
	Total	45.093	99			

a. Dependent Variable: Green Information Systems (GIS)

b. Predictors: (Constant), Environmental Responsibility (ER), Organisational Performance (OP)

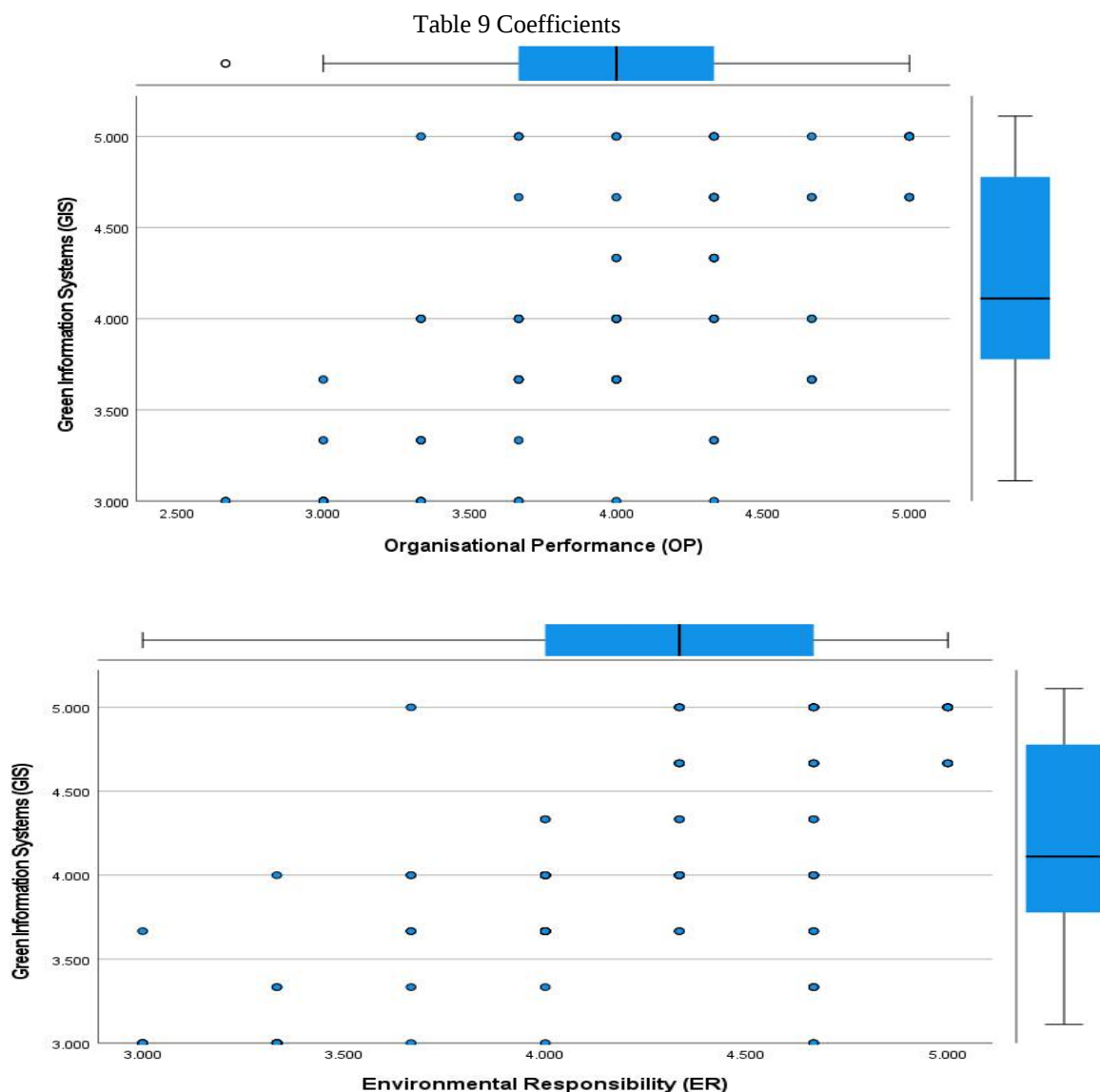
c. Predictors: (Constant), Environmental Responsibility (ER), Organisational Performance (OP), Organisational Culture (OC), Managerial Support (MS)

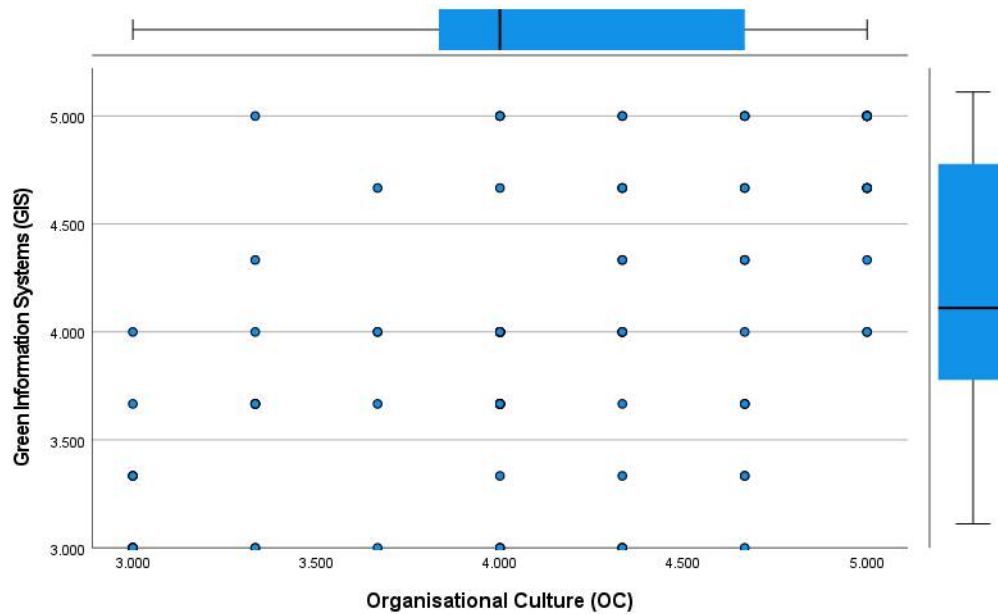
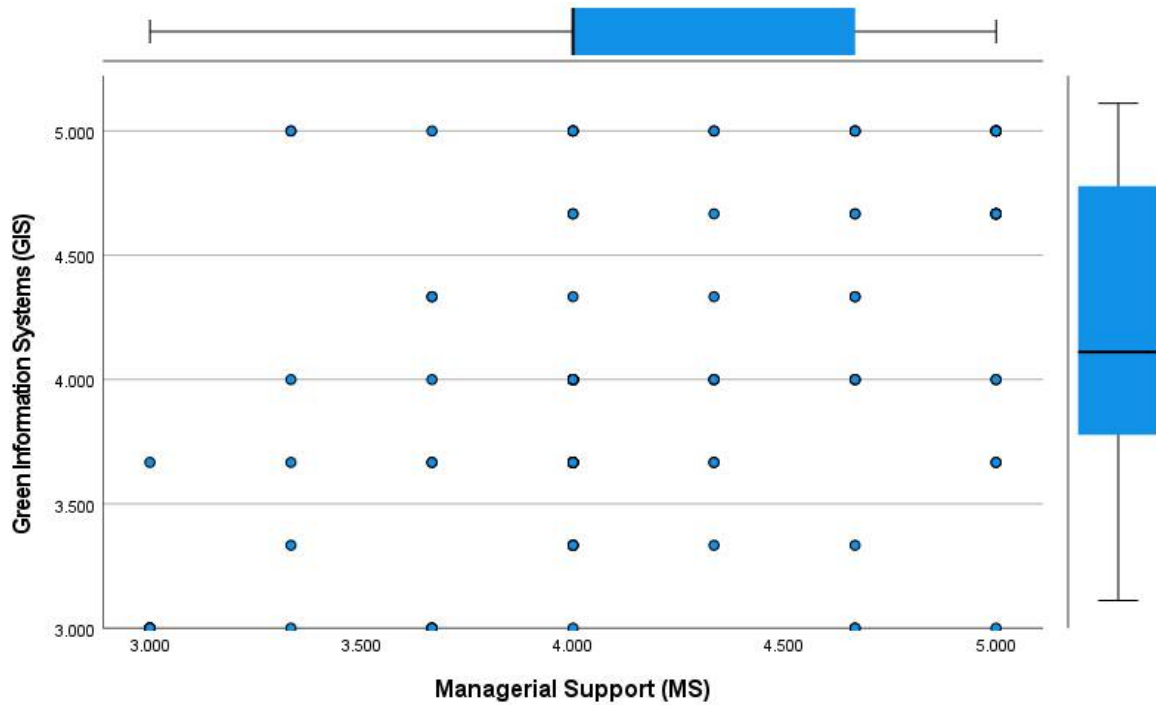
Table 8 ANOVA

The coefficients table provides insights into the unique contribution of each predictor variable toward explaining Green Information Systems (GIS). In Model 1, both predictors were significant. Organisational Performance (OP) had a positive unstandardized coefficient ($B = 0.325$, $p = 0.011$), suggesting that a one-unit increase in OP leads to a 0.325 increase in GIS, holding other factors constant. Environmental Responsibility (ER) showed a stronger effect ($B = 0.575$, $p < 0.001$), with the highest standardized beta ($\beta = 0.475$), indicating it is the most influential predictor in the model. In Model 2, after including Managerial Support (MS) and Organisational Culture (OC), ER remained the strongest predictor ($B = 0.647$, $\beta = 0.534$, $p < 0.001$). OP also maintained significance ($B = 0.357$, $p = 0.006$). Interestingly, MS showed a negative coefficient ($B = -0.237$, $\beta = -0.207$), but this was only marginally significant ($p = 0.076$), suggesting its influence may not be reliably predictive. OC ($B = 0.125$, $p = 0.254$) was not statistically significant. These results confirm that ER and OP consistently predict GIS adoption, while MS and OC do not contribute significantly when included. Thus, promoting environmental responsibility and organisational performance is crucial for driving GIS implementation.

Coefficients ^a					
		Unstandardized Coefficients		Standardized Coefficients	
Model		B	Std. Error	Beta	T
1	(Constant)	0.314	0.370		0.848
	Organisational Performance (OP)	0.325	0.125	0.284	2.598
	Environmental Responsibility (ER)	0.575	0.132	0.475	4.342
2	(Constant)	0.357	0.380		0.939
	Organisational Performance (OP)	0.357	0.126	0.312	2.823
	Environmental Responsibility (ER)	0.647	0.179	0.534	3.609
	Managerial Support (MS)	-0.237	0.132	-0.207	-1.794
	Organisational Culture (OC)	0.125	0.109	0.116	1.148

a. Dependent Variable: Green Information Systems (GIS)





This research importantly reflects Saudi Vision 2030, which focuses on the digital transformation of the economy to enhance sustainable economic diversification and environmental stewardship. The study will help achieve the aim of Vision 2030 of promoting a more environmentally friendly industry and intelligent governance by showing that Green Information Systems help organisations to increase their performance and level of eco-awareness. The findings also place emphasis on how the national transition to a knowledge-based, green economy can be enhanced through reinforced support and a culture of sustainability.

G. Discussion

This was aimed at investigating how Green Information Systems (GIS) can be used to boost organisational performance (OP) and environmental responsibility (ER) in Saudi organisations with managerial support (MS) and organisational culture (OC) being used as mediating variables. The results validate the fact that the implementation of GIS is closely related to the enhancement of organisational performance and sustainability. This discussion explains these findings regarding available literature, theoretical view, and Saudi Arabian business environment.

1) GIS Adoption and Organisational Performance

The findings showed that a high positive relationship exists between GIS adoption and organisational performance (OP), demonstrating that GIS is a key driver of performance improvements in Saudi organisations. Regression revealed that OP made a significant contribution towards the prediction of GIS, and the correlation coefficient indicated that the constructs are highly related. These findings are in line with Magableh et al. (2024), who found that MIS enhances decision making, operational efficiency, and governance, which directly relates to the objective of Saudi Vision 2030 to encourage economic diversification and efficiency. GIS help companies to align their resources, reduce process inefficiencies, and encourage performance enhancement, which aligns with Vision 2030 that focuses on sustainability and economic growth. The adoption of GIS in the Saudi context is useful in terms of competitiveness because it helps to improve cost-efficiency, waste reduction, and the use of resources, particularly in the rapidly evolving sectors such as energy and technology, which are the focus of Vision 2030 (Qwaider et al., 2023). The findings of the present research also confirm Setyaningrum et al. (2023), who have highlighted that GIS fosters green creativity and competitive advantage. The regression model validated that OP was not insignificant despite the inclusion of mediators (MS and OC) and indicated performance to be a precursor of GIS adoption among Saudi organisations. This is consistent with the Resource-Based View (RBV) (Barney et al., 2021), which suggested that firm-specific resources, such as GIS, can provide a sustained competitive advantage. In this instance, for Saudi firms, adopting GIS as a green capability aligns with Vision 2030's strategy to leverage advanced technologies for national competitiveness.

2) GIS and Environmental Responsibility

The second significant observation was that the most important predictor of GIS adoption is the environmental responsibility (ER). Both the correlation and regression analyses showed that ER was the most effective factor, which suppresses OP in the predictive effect, aligning with the Stakeholder Theory (Freudenreich et al., 2020), which emphasised responding to stakeholder concerns, such as regulators, communities, and customers, through environmentally responsible practices. This aligns with Saudi Vision 2030, which prioritises sustainability and eco-friendly policies. Reznik et al. (2024) claimed that ecological responsibility is not merely a moral duty, but also a competitive strategy in the market, reinforcing the pressure on Saudi companies to integrate sustainability in line with Vision 2030. In line with Radu and Popescul (2024), the implementation of Green IS is indicative of both defensive measures (meeting the regulations) and offensive ones (developing a competitive advantage by displaying sustainability). GIS adoption enables Saudi organisations to meet regulatory and customer expectations by tracking environmental impacts like emissions and resource usage, thus supporting Vision 2030's sustainability goals. This not only ensures compliance but also provides a competitive market edge through demonstrated environmental commitment.

3) Role of Managerial Support and Organisational Culture

Managerial support and organisational culture are positively related to GIS did not have significant effects in the hierarchical regression model. The relationship between MS and OC was not significant, and they were moderately negative. This implies that managers and culture are important in helping to form attitudes in organisations, but they may not have a direct significant impact on the uptake of GIS when OP and ER are put into consideration. This observation is different from that of Radu and Popescul (2024) and Reznik et al. (2024), who highlighted the role of managers in formulating organisational values and influencing employees to adopt GIS. However, the current findings reflected a difference in Saudi Arabia, where policy-driven, compliance-based motives and top-down interventions still dominate, in line with Saudi Vision 2030's regulatory focus. Although culture and attitudes of the managers are applicable, they might not be fully integrated as standalone forces of GIS adoption as compared to performance imperatives and environmental obligation. It is also aligned with Brendel et al. (2022), who contended that the studies on GIS tend to fail to look at the entire picture of sustainability issues. Saudi companies may be at the transitional phase, and the managers and cultural values have not yet become decisive in defining GIS practices. This indicates that future interventions, especially under Saudi Vision 2030, will focus on strengthening organisational culture and leadership to drive sustainability practices and empower managers to take proactive steps toward achieving long-term environmental goals.

4) *Comparison with Prior Studies*

The research study is consistent with the international and regional tendencies of GIS adoption and provides increased information about the obstacles encountered by Saudi organizations. The use of GIS in the world is one of the important tools towards sustainability, particularly in areas such as energy, urban planning, and resource management. ESRI (2024) highlights the importance of GIS in the MENA, such as Egypt, the UAE, and Morocco, and how GIS manages to strike a balance between modernisation and the traditional approach, especially in areas such as agriculture and health. Similarly, Singh et al. (2022) emphasised the importance of GIS integration in organisational systems to enhance sustainability in the U.S., particularly in the area of resource management.

The developed nations have well-developed infrastructures and regulatory systems that favor GIS implementation. Lei (2024) discussed that the strategic alignment of IT and business initiatives in China can promote environmental performance, which makes GIS very important in business and environmental integration. The countries enjoy enhanced technological preparedness and governmental encouragement. Developing countries, particularly in the Gulf, such as Saudi Arabia, experience increased barriers, such as a lack of funds, a shortage of skilled workers, and a lack of managerial assistance. According to Setyaningrum et al. (2023) and Madkhali and Sithole (2023), GCC countries, and particularly Saudi Arabia, have a resource shortage that impedes the successful implementation of GIS in smaller companies.

Saudi Arabia experiences challenges, unlike the other countries of the GCC. Alzighaibi et al. (2016) emphasized the barriers to GIS adoption in the Saudi Arabian public sector, such as outdated IT infrastructures and the unsupportive attitude of the managers. These are the issues that are consistent with the present study, which has highlighted the significance of leadership commitment and organisational culture in addressing the barriers to GIS adoption. By comparison, Bahrain has had greater success applying GIS using GIS to simplify zoning and urban planning in its Information Systems Directorate. Equally, the UAE has achieved significant degrees of advancement in adopting GIS to smart city projects and incorporating it in urban planning and sustainability plans, particularly in Dubai.

Although developed nations like the U.S. are interested in external forces, such as ecological beliefs and government policies to promote GIS use, Saudi Arabia and other GCC nations are limited to internal forces that do not encourage the adoption of GIS. According to Ajina et al. (2024), the GIS adoption in Saudi Arabia is complicated by the absence of coherent internal policies, fiscal constraints, and management. Externality and regulatory pressure tend to dominate the necessity of an internal culture of sustainability and technological adoption in these countries. This implies that developed nations such as the U.S. are enjoying the advantages of having external forces behind the use of GIS, whilst Saudi Arabia and other GCC nations are struggling with individual internal constraints because of financial and management constraints. Therefore, this study shows the necessity of a cultural change and administrative assistance to promote a successful GIS implementation in such areas.

V. CONCLUSION AND RECOMMENDATIONS

A. *Introduction*

This section of the research provides the conclusion and the recommendations of the study based on the results and discussion of the previous section. It examined the relationship between GIS and the performance and the environmental responsibility of Saudi organisations through managerial support and organisational culture as mediation variables. A conclusion is given on the research findings, recommendations made and future research directions.

B. *Summarised Findings*

The research has established the fact that organisational performance (OP) and environmental responsibility (ER) have a significant impact on the use of GIS in the Saudi organisations. The regression analysis showed that ER was the most predictive of them, indicating the role of ecological accountability in the establishment of corporate technology strategies. The role of OP is also significant, and it contributes to the idea that the companies find GIS to be an opportunity to improve their efficiency, optimisation of resources and competitiveness. On the other hand, the positive correlation between managerial support (MS) and organisational culture and GIS did not have any significance as predictors in the hierarchical regression. It is to say that sustainability can be achieved through the promotion of managers and cultural values, but not to the same extent that ER and OP do so, when being controlled separately. This observation is typical of the Saudi business environment where the business regulatory pressures, expectations of external stakeholders, and performance pressures have a greater impact than the internal cultural changes. The results conform to the RBV since GIS can be used to generate competitive advantage as a strategic resource. Similarly, they support Stakeholder Theory, which illustrates that environmental responsibility, pursued by regulators, communities and customers, is a

major pivot behind the green technology adoption. Overall, this paper suggests that the MIS role is changing to support the objectives of Saudi Vision 2030 that involve economic diversification and sustainability.

C. Future Implications

The results have several implications to theory, practice and policy.

1) Theoretical implications

The research develops RBV and Stakeholder Theory by using it in the GIS adoption context in Saudi Arabia. It shows that although external forces and performance conditions are the driving force to adoption, cultural and managerial factors are not yet sufficiently developed, which indicates the gaps in the alignment of theory and practice.

2) Practical implications

The findings of this study have significant implications for SMEs in Saudi Arabia, particularly in the context of GIS adoption. The results indicate that GIS can not only drive sustainability initiatives but also enhance overall organisational performance. To implement GIS effectively, SMEs should approach it as a strategic asset rather than a compliance cost. The following are several actionable recommendations for SMEs to successfully adopt and leverage GIS:

a) Reposition GIS as a Long-Term Value Asset

GIS should be considered a strategic investment by SMEs, creating value. By using GIS as a tool for saving funds, efficiency, and image improvement, companies can change their focus to not only the short-term compliance but also future financial success (Douglas, 2008). Managers are advised to highlight that GIS can help to maximise the use of resources and minimise waste, as this is consistent with the goals of Saudi Vision 2030 in terms of sustainability.

b) Implement Gradual Integration Approaches

To reduce the financial risks and make the adoption process less challenging, SMEs are recommended to start with small-scale GIS solutions, including IoT-based energy monitoring systems or digital waste trackers. These cost-effective and scalable solutions will enable the organisations to test and prove the effectiveness of the technology before they invest in enterprise-wide solutions. With time, as trust in the technology increases, the SMEs may ensure greater GIS implementations.

c) Leverage Public-Private Partnerships and Government Incentives

SMEs must leverage the public-private partnership and government incentives provided under Saudi Vision 2030 in order to overcome financial and technical challenges. There are also government initiatives like digital transformation funds and sustainability funds, which can aid SMEs in implementing GIS (Hao et al., 2024). Moreover, it is possible to work with the technology providers or industry associations to find cost-effective solutions and best practices.

d) Invest in Capacity-Building and Training

To ensure that GIS is effectively employed, SMEs should prioritize building capacity, particularly in digital literacy and sustainability measures. The workshop-based training of staff and the communication of the leadership will empower employees to embrace the technology and align their operations with the sustainability objectives (Arulsamy et al., 2023). The buy-in of employees is essential and may be promoted by rewarding environmentally friendly practices.

e) Adopt Cloud GIS Solutions for Cost-Efficiency

SMEs can recognise an opportunity to use cloud-based GIS solutions to reduce initial infrastructure expenses. The services in the form of subscriptions allow the SMEs to have access to sophisticated sustainability analytics without committing to any major capital investment (OECD, 2025). This approach will ensure that the SMEs can expand their GIS capacities according to their needs as they grow, and at lower start-up costs.

3) Policy Implications and Future Research

Saudi Arabian regulators and policymakers can largely influence organisational practices. Government assistance schemes, training and supportive frameworks may assist companies especially SMEs to overcome GIS barriers. Enhancing partnerships between the government and the private companies is necessary to expand sustainability efforts.

Although the current study adds value to the knowledge of the use of Green Information Systems (GIS) in improving the performance and environmental responsibility of organisations, future studies could broaden the scope in a number of ways. First, there is a need to conduct sector-specific research in order to analyse the differences in the adoption of GIS in various industries, including energy, healthcare, manufacturing, and retail.

The sustainability challenges and technology capability of each sector are unique and, therefore, targeted analysis is more applicable to specific strategies. Second, future studies ought to use bigger and more varied samples in order to enhance the generalisation of results. This is especially critical considering the fact that SMEs and large enterprises might have varying degrees of financial and technical and managerial capabilities when applying GIS. Third, comparative researches across countries may be of great help in the way national policies, cultural contexts, and regulation influence the implementation and performance of GIS. One such example would be the contextual enabling factors and hindrances between Saudi Arabia and other Gulf nations or developed nations. Also, longitudinal research to describe the long-term impacts of GIS on performance and sustainability outcomes would give better evidence of causality.

Lastly, a combination of quantitative and qualitative results with a qualitative method (case study or interviews with decision-makers) would help to reveal a more profound organisational insight into GIS implementation.

D. Recommendations

1) Environmental Responsible Initiatives

Based on the findings, the following specific recommendations are proposed for managers, policymakers, and SMEs. Organisational managers are required to integrate environmental responsibility into the company's mission statement and corporate policies. Assign measurable environmental KPIs, such as reducing energy consumption by 10% over the next year or reducing waste by 15%, and ensure these targets are tied to departmental performance reviews. For example, a department that meets its energy reduction target can be rewarded with a sustainability bonus. Policy makers are required to promote national guidelines to standardise environmental KPIs across industries, creating a framework that companies can follow. Incentivise organisations that meet these standards with tax benefits or certifications.

2) Use of GIS for Driving Operational and Strategic Performance

Managers need to implement GIS-enabled dashboards that provide real-time data on resource usage, carbon footprints, and operational efficiency. These dashboards can help identify cost-saving opportunities and improve logistics. For example, a waste reduction dashboard can be linked to logistics optimisation, showing managers areas where they can reduce both costs and environmental impact. Policymakers should create incentives for businesses that integrate GIS analytics in compliance with Saudi Vision 2030 goals. Offer financial support or subsidies for companies that adopt GIS-based systems to enhance sustainability reporting.

3) Improving Managerial Support and Organisational Culture

Managers must initiate the structured leadership development initiatives that emphasise on sustainable innovation. Institute internal sustainability committees, which would monitor the progress of GIS implementation and report directly to the top management. Implement green innovation awards, recognition schemes and bonuses based on sustainability to motivate the employees to participate in GIS and sustainability activities.

As an example, a monthly award of a Sustainable Leader could be given, and a team reward given to departments with the most improvement in sustainability. The policy makers must build public-private partnerships where cross sectoral collaboration on sustainability can be achieved.

4) Cross-Sectoral Collaboration

Co-finance opportunities of GIS Pilot project in main sectors of manufacturing, logistics and services should be established by policymakers. Subsidies of GIS software, training, and technical support should be used to encourage such projects. Another option that policymakers can make is to establish a national green IT forum where the leaders in the industry and business executives can engage in co-developing green IT standards and also share best practices in the sector. The managers are supposed to attend such green IT forums in order to be ahead of the national standards and to come into contact with the best practices that could be applied in their respective organisations.

5) Creating Tailored Strategies for SMEs Support

Smaller-scale GIS software like IoT-based energy sensors or digital waste trackers should be the starting point of SMEs. The tools are cost-effective and can be incorporated over time, which gives quantifiable environmental information. Cloud GIS solutions should be the primary source of attention by SMEs to reduce initial investments and have access to the latest sustainability analytics. An example is an SME that may begin with monitoring the use of energy with the help of cloud-based systems and expand to larger systems with the expansion of resources. Financial incentives should be provided by policymakers to decrease the initial cost of GIS adoption by SMEs; this can be achieved through tax breaks or subsidised GIS software. Another thing is to establish grant programs and offer technical support by partnering with local universities or technology incubators to assist SMEs in acquiring skills and facilities needed to implement GIS. The affordability consultancy services should also be involved in the activity of SME managers to enable them to make GIS adoption financially viable.

E. Conclusion

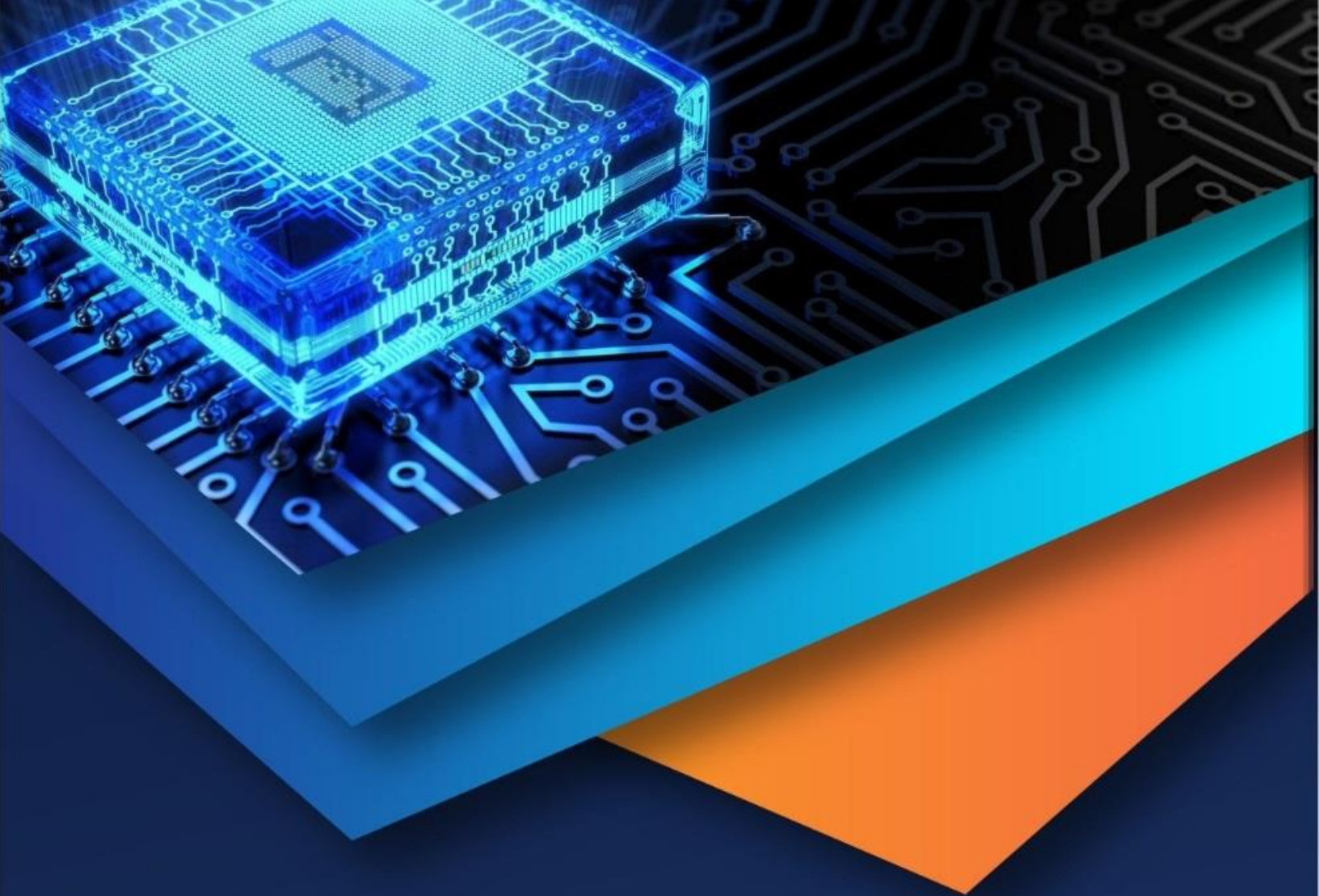
This research paper examined the contributions of Green Information Systems towards organisational performance and environmental responsibility of Saudi organisations. The findings have affirmed that performance deliverables and ecological responsibility are the major driving factors of GIS adoption, and managerial support and organisational culture are the second most potent factors. The findings provide an insight into the opportunities and challenges: although Saudi organisations are adapting to the global sustainability trends and the vision 2030 goals, the integration of the cultural and managerial aspects is low. The study makes a contribution to the academic and practical discussion as it puts GIS in the context of RBV and Stakeholder Theory and provides us with the idea of interaction between the technology and sustainability and the organisational results. Future research should further increase the sample size, and carry out sector analysis and use more sophisticated methods of modelling like Hierarchical Regression to improve the definition of mediating relationships. Finally, GIS is not just a technology but it is also a strategic facilitator of sustainability and competitiveness. With the inclusion of environmental responsibility as part of strategy, increased commitment by the managers, and favourable policies, Saudi organisations will be able to use GIS as a tool to attain sustainable growth and long-term stability.

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