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The Impact of Institutional Ownership, Financial Performance, and Sustainability Reports on Profit Management: Moderating Effects of Variable Measures

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ABSTRACT

This study aims to analyze the effect of institutional ownership, financial performance, and sustainability reports on earnings management with firm size as a moderating variable. This study uses manufacturing companies listed on the Indonesia Stock Exchange (IDX) for the 2019-2022 period by collecting data using purposive sampling. There were 102 observational data in this study. Data analysis was carried out using multiple linear regression analysis of the MRA (Moderated Regression Analysis) model. Observation data in this study were processed with the help of the SPSS 25 program. The results showed that institutional ownership has a positive effect on earnings management, financial performance, sustainability reports have no effect on earnings management, and company size as a moderating variable does not moderate between institutional ownership, financial performance, and sustainability reports on earnings management

Keywords: Institutional Ownership, Financial Performance, Sustainability Report, Profit Management, Company Size

INTRODUCTION

Financial reports aim to communicate the Company's financial information to assist users in making business decisions that are relevant to their respective interests. Financial information describes the economic condition and financial performance that a company has achieved in a certain period, (Banderlipe II, 2009 in Mahariana and Ramantha, 2014)

The practice of errors in financial reporting often occurs due to human error, however, if there is manipulation of financial reports so that the company's financial reports look good in the eyes of stakeholders, this action is intended to prevent investors from giving bad assessments and being interested in investing in the company. Agency theory shows that a conflict of interest occurs when the principal (capital owner) and agent (company operations) want to maximize their own wealth, which then gives rise to agency problems. Agency theory provides an illustration that earnings management problems can be eliminated by self-monitoring through corporate governance.

Institutional ownership is often used as a form of monitoring corporate governance (Rice, 2013). Institutional ownership is able to provide a mechanism for monitoring operational performance within the company. Institutional ownership is company shares owned by other institutions. Several research results show inconsistent conclusions. Rice, by conducting tests on manufacturing samples from 2008-2012, showed insignificant results between institutional ownership and earnings management. The results of research conducted by Suwanto and Kiswanto (2014) show that institutional ownership has a negative effect on earnings management, which means that if a company's share ownership is increasingly dominated by institutional ownership, it can suppress the potential for earnings management practices.

The company's financial performance is a description of the company's financial condition which is analyzed using financial analysis tools so that the weaknesses and strengths that the company has achieved in a certain period can be identified (Esomar&Christianty, 2021). Changes in the company's financial performance are reflected in the financial reports. Performance reports provide useful information for investors, potential investors, creditors and other users in making investments. Profitability ratios are a measure of a company's ability to create profits which are taken into consideration in financial reports. According to Syakirli, Cheisviyanny, and Halwamati (2019), profitability can show how much a company's financial performance is in generating profits. Companies with a good level of financial performance will have high confidence in providing information to stakeholders. This is because the company is able to show that the company can meet the needs and expectations of its stakeholders. This sustainability issue started with the issue of global warming and environmental damage which is increasingly occurring throughout the world. Although initially this issue was a social issue, sustainability has developed into a strategic issue for companies. This began with an opinion issued by John

Elkington regarding the Triple Bottom Line in 1998. According to him, companies should not only report their condition from a profit perspective, but also from a social and environmental perspective. Sustainability adopted by companies is starting to be known as corporate sustainability. The definition of corporate sustainability based on the International Institute for Sustainable Development (IISD) is adopting strategies and business activities that meet current company needs while maintaining, maintaining, and developing the human and natural resources needed for future life (IISD, 1992).

Sustainability reports are also one proof of the implementation of good corporate governance because they are accountable to stakeholders. The implementation of good governance will have a significant impact on the company, one of which is reducing earnings management practices. Earnings management practices can affect the quality of earnings reported in the company so that it affects the decision making that occurs. Profit is an important factor in making good decisions for shareholders, investors and other stakeholders to evaluate the company's financial performance.

According to Sofa and Respati (2020), there is a phenomenon experienced by a company where the company pollutes the environment, namely the disposal of liquid waste into rivers. This problem was only resolved by the company paying compensation and causing an outcry from the public. Empirical studies have largely focused on sustainability reporting and disclosure on earnings management. In research conducted by Chouaibi and Zouari (2021) that the role of corporate social responsibility (CSR) in limiting real activity manipulation (RAM) or Buertey et al (2020) identifies whether CSR reduces discretionary accruals. The research conducted by them has different definitions. Where sustainability performance refers to accrual activities related to sustainable development strategies.

Company size is a company scale that can be grouped into company size based on total assets, total sales and share value (Novari and Lestari, 2016). According to research from Rudangga, it shows that company size has a significant positive effect on company value. According to research by EkaIndriyani (2017), company size does not have a significant effect on company value.

Research on institutional ownership, financial performance, and sustainability reporting on earnings management has been widely studied, but the results of these studies are still inconsistent. This makes research on institutional ownership, financial performance, and sustainability reports on earnings management need to be re-examined using a moderating variable, namely company size to increase the influence of earnings management on institutional ownership, financial performance, and sustainability reports.

LITERATURE REVIEW

Agency Theory

Jensen and Meckling (1976) explain agency theory as a relationship in which management (agent) is entrusted by the company owner or shareholder (principal) to manage the company formed by the principal and delegates some decision-making authority to the agent. The principal is the party that owns the resources and gives the agent a mandate to act on behalf of the principal, while the agent is the party entrusted by the principal to manage these resources. The agent is obliged to consider what has been entrusted to him by the principal and has the authority to make decisions that will affect the welfare of the principal.

Stakeholder Theory

Stakeholder theory argues that managers must make decisions to take into account the interests of all stakeholders in the company including not only financial reporting but also employees, customers, communities, and government officials (Freeman, 1984). From a stakeholder perspective, an organization should strive to meet a broad range of objectives from a variety of stakeholders rather than just those of shareholders.

In developing stakeholder's theory, Freeman & Reed (1983) introduces the concept of stakeholders in two models: (1) business planning and policy models; and (2) model of corporate social responsibility from stakeholder management. In the first model, the focus is on developing and evaluating corporate strategic decision agreements with groups whose support is necessary for the company's business continuity.

It can be said that this model focuses on ways that can be used by companies to manage the company's relationship with its stakeholders. While the second model, company planning and analysis is expanded to include external influences that may be opposite for the company. These opposing groups include regulatory agencies (special interest governments concerned with social issues).

Profit management

Schipper (1989) in Rice (2013) states that earnings management is intentional management intervention in the process of determining earnings, usually to fulfill personal goals. Profit engineering is carried out by managers because they expect a benefit from this action. Earnings management can cause accounting distortions, where managers can use accounting choices to manipulate or beautify financial reports. Accrual accounting that uses valuation allows managers to choose the most appropriate accounting method for their company. Earnings management can be seen if managers choose actions with cash flow consequences for the purpose of changing profits, so that managers or companies can ignore good business practices, especially if the level of profit earned is related to management performance (Rice, 2013).

Institutional Ownership

According to Nabela (2012), institutional ownership is the proportion of shares owned by other institutions at the end of the year as measured by percentage. The institutional ownership variable is measured by the percentage of shares owned by other institutions outside the company of the company's total outstanding shares.

According to Bernandhi (2013), institutional ownership is ownership of shares in a company by institutions or institutions such as insurance companies, banks, investment companies and other institutional ownership. Institutional ownership has a very important role in minimizing agency conflicts that occur between managers and shareholders. The existence of institutional investors is considered capable of being an effective monitoring mechanism in every decision taken by managers.

Financial performance

Measuring financial performance is an effort made to evaluate a company's efficiency and effectiveness in generating profits. From this measurement can be seen the company's financial growth. A healthy company is a company that can achieve predetermined financial performance. In measuring financial performance, there are several ratios used to assess a company's financial performance (Wibowo, 2020). Researchers use profitability ratios for this study.

According to Hery (2016) profitability is a ratio that can show a company's ability to generate profits from sales activities, use of assets, and use of capital. This ratio can also be used to measure the level of management effectiveness in carrying out company operational activities. For investors, information about profitability can help them see whether to maintain their investment in the company or look for other alternatives (Muljiani&Jayanti, 2021)

Sustainability Report

The Global Reporting Initiative (GRI) is a framework created to describe a company's sustainability report. GRI was created as a specific standard to guide sustainability reports in order to produce reliable, relevant and standardized information in decision-making efforts for stakeholders. According to the Global Reporting Initiative (GRI), sustainability reports are defined as a system of company reporting practices to measure, understand and disclose social, environmental and economic information as part of the responsibilities of internal and external stakeholders related to organizational achievement of sustainable development goals. Sustainability reports are needed by companies to provide information to stakeholders and as a corporate responsibility to maintain corporate image. There are many benefits of disclosing sustainability reports, namely increasing company reputation, providing transparency to variables (GRI, 2016).

Sustainability reports present reports that not only contain financial performance information, but also non-financial information consisting of information on social and environmental activities that enable sustainable company growth (sustainable performance). This report can be used by investors to assist in considering whether it is appropriate to invest in a company (Adhipradana&Daljono, 2014). Sustainability reports are also used by government agencies such as the Ministry of Environment to assess the environmental performance of companies in each reporting organization. As in Indonesia, CSR disclosure rules are regulated in Bapepam Regulations and Law No. 40/2007 concerning Limited Liability Companies. Disclosure of sustainability reports in predetermined rules is in the form of a stand-alone report, but there are still many implementations of CSR that are used in connection with the company's annual report (Gunawan, 2010).

Company Size

Jogiyanto (2016) states that company size is a scale which can classify company size according to various ways (total assets, sales turnover, production volume, and others). Basically, company size is only divided into 3 categories, namely large companies, medium size companies, and small firms. The determination of company size is based on sales turnover, number of products sold, company capital and total company assets.

According to Widiastari and Yasa (2018) stated that company size is a scale in which the size of the company can be classified as measured by total assets, number of sales, share value and so on. The formula for company size (Kogiyanto, 2016) can be determined by: company size: Log N (Total Asset)

CONCEPTUAL HYPOTHESIS

1. The Influence of Institutional Ownership on Earnings Management

Institutional ownership plays a role in every decision taken by managers. So that institutional investors can influence managers in carrying out earnings management actions to show the company's financial performance so that it looks good.

This is supported by research conducted by Fransiska and Heronimus (2018) which shows that institutional ownership has a positive effect on earnings management, where the number or number of shares owned by institutions can affect the size of earnings management carried out by management. Unlike the research conducted by Sumanto and Kiswanto (2014) the results of institutional ownership have a negative effect on earnings management. Therefore, the hypothesis formulated in this research is:

H_1: Institutional Ownership has a positive effect on Earnings Management

2. The Influence of Financial Performance on Earnings Management

Financial performance shows the results of the achievement and success of the company which can be interpreted as the results that have been achieved for the various activities that have been carried out. Based on the agency theory, the principal supervises the performance of the agent through financial reports submitted by management. Financial performance is seen through the profitability ratio, namely Return On Assets (ROA) which shows the level of a company's ability to generate profits. Stable financial performance will increase market confidence so that the company maintains consistent profit levels. The higher the Return On Assets owned, the more efficient the use of assets will increase the company's profit. The acquisition of large profits will attract the attention of investors because with large profits the company will have a higher rate of return. If the measured financial performance is higher, the better the asset productivity in obtaining net profit. This causes Return on Assets to encourage management to carry out earnings management.

In the research conducted by Indra (2017) stated that financial performance as measured by profitability ratios has a positive influence on earnings management. The results of this study are also supported by research conducted by Astari and Suryanawa (2017), Nurminda (2017) which states that financial performance as measured by profitability ratios, namely ROA, has a positive effect on earnings management. Therefore, the hypothesis formulated in this study is:

H_2: Financial Performance has a negative effect on Earnings Management

3. The Influence of Sustainability Reports on Profit Management

According to Gunawan (2015), sustainability reports provide information on sustainability performance that has been and is being carried out, and targets and commitments in maintaining sustainability reporting. In the sustainability report, the company reveals negative and positive impacts on the economy, environment and social which shows the development of sustainability activities and company strategy.

Previous research suggests that sustainability engagement is due to a long-term perspective for sustainable business operations, while others consider sustainability to be a practice misused by managers to cover up their opportunistic behavior. In research conducted by Chouaibi and Zouari (2021) the role of corporate social responsibility (CSR) is in limiting profit manipulation. Research by Buertey et al (2020) identified that CSR reduces discretionary accruals. The research conducted by them has different definitions. Where sustainability performance refers to accrual activities related to sustainable development strategies. Therefore, the hypothesis formulated in this study is:

H_3 : Sustainability Report has a negative effect on Earnings Management

4. Company Size Moderates Institutional Ownership of Earnings Management

Company size will reflect the company's ability to finance operational needs in the future and have a positive influence on investment (Adiwibowo, 2018). Company size as a moderating variable also has a role in strengthening or weakening the influence of institutional ownership on earnings management. Institutional ownership has a role in carrying out oversight of company management policies. This action is used to monitor company performance and is able to reduce opportunistic behavior where institutional ownership is a tool for the company's internal control.

In research conducted by Gemi (2019), company size has a significant role and strengthens the influence of institutional ownership on earnings management, meaning that large companies that have institutional ownership find it easy to carry out earnings management by reducing profit figures. Therefore, the hypothesis formulated in this study is:
$\boldsymbol{H_4}$: Firm size moderates the effect of institutional ownership on earnings management

5. Company Size moderates Financial Performance on Earnings Management
Company size is a value that shows the size of a company. Large companies have more extensive information than small companies so that the availability of information in large companies is higher. (Ross, 1977) explained that the management of a company is compelled to publish information owned by the company to attract investors. So that information inequality will decrease and external parties will be more critical in the company's financial performance files The effectiveness of management in generating company profits can be proven in measuring profitability ratios (Setyawan, 2019). Based on (Gayatri, 2017) states that company size as a company step in adjusting the accounting system is related to increasing company profits. The mechanism of company size is able to control management by means of effective and efficient monitoring, thus suppressing the actions of earnings management, because the higher the size of the company, the higher the company's performance (Kao, 2019).

Research conducted by Marpaung (2019) and Widiastari and Yasa (2018) concluded that company size is able to moderate the effect of financial performance. In contrast to the research results of Utama and Fidiana (2016) it is stated that company size is not able to moderate the effect of financial performance on earnings management. Therefore, the hypothesis formulated in this study is:

$\boldsymbol{H_5}$: Firm size moderates the effect of financial performance on earnings management.

6. Company Size moderates Sustainability Reports on Earnings Management
In general, company size is divided into 3 forms, namely large, medium and small. This measure is the total assets owned by a company. When compared to small companies, medium to large companies are more likely to be encouraged to carry out earnings management ehaviour. This is because the need for funds is obtained from investors, so that earnings management can be carried out so that the financial statements look good and investors are interested in investing in the company. Moreover, currently large companies are required to report corporate sustainability reports every year

As research conducted by Purwanti (2018) states that company size is able to moderate sustainability reports. The greater the efficiency of using company reports, the higher the relationship between social disclosure and earnings management. The role of company size as a moderating variable in influencing sustainability reports on earnings management supports the research of Budiana and Budiasih (2020), where the research shows that company size is able to moderate the effect of sustainability reports on earnings management. Therefore, the hypothesis formulated in this study is:
$\boldsymbol{H_6}$: Company size moderates the influence of sustainability reports on earnings management.

RESEARCH METHODOLOGY

A. Operational Definition and Variable Measurement

1. Research variable
The dependent variable in this study is earnings management. The independent variables in this study are institutional ownership, financial performance, and sustainability reports. And the moderating variable in this study is company size.

2. Profit management
Earnings management is the behavior of managers in reporting business activities, with the possibility of certain motives for manipulating profit reports which can have a negative impact on earnings quality because it can distort the information contained in the profit and loss report. (Herry, 2018). Earnings management is measured by discretionary accruals using the Modified Jones Model (Dechow, 1995) with the formula:

a) Calculating total accruals with the difference between net profit and operating cash flow:

$$TA_{it} = N_{it} - OCF_{it}$$

b) Calculating the value of accruals with the previous year's net in the equation of multiple linear regression or Ordinary Least Square (OLS):

$$TA_{it}/A_{it-1} = \beta_1\ (1/A_{it-1}) + \beta_2\ (\Delta Rev_{it}/A_{it-1}) + \beta_3\ (PPE_{it}/A_{it-1}) + \epsilon$$

c) Calculating the value of non-discretionary accruals (NDA):

$$NDA_{it} = \beta_1\ (1/A_{it-1}) + \beta_2\ (\Delta Rev_{it}/A_{it-1} - \Delta Rec_{it}\ /A_{it-1}) + \beta_3\ (PPE_{it}/A_{it-1})$$

d) Calculating discretionary accruals by subtracting the value of accruals and the value of non-discretionary accruals:

$$DA_{it} = TA_{it}/A_{it-1} - NDA_{it}$$

e) In preparing the calculation of earnings management, it is obtained by means of an absolute value of the total discretionary accruals.

3. Institutional Ownership

Institutional Ownership is ownership of company shares owned by institutions that are able to play an important role in supervising, disciplining and influencing managers so that they can force management to avoid selfish behavior (Darsani, 2021). The measurement limits are measured from the Independent Commissioner, with the formula:
KI = holding owned by institution/number of holding outstanding

4. Financial performance

According to Fahmi (2013), company financial performance is an analysis carried out to see the extent to which a company has implemented financial implementation rules properly and correctly. Financial performance is proxied by profitability. In this research, profitability is measured by return on assets (ROA) with the following formula:
Return on Assets (ROA) = Running profits/total assets

5. Sustainability Report

Sustainability Report is a report carried out by a company to measure, disclose, and the company's efforts to become a company that is accountable to all stakeholders for the purpose of company performance towards sustainable development, where in this report there are disclosure principles and standards that able to reflect the level of company activity related to economic, environmental and social aspects.

Researchers use GRI G4 as an assessment standard to determine the quality of sustainability reports in manufacturing companies. This will allow companies to measure costs based on each company's disclosure index which is calculated by dividing the company's net income by the amount the company is expected to disclose (Mauludy&Faiqoh, 2018).

Sustainability report measurements can be formulated as follows:

Sustainability report = n/k

6. Company Size

In this research, the author uses company size as a moderating variable. Company size is a scale which can be classified into large companies, medium companies and small companies based on total assets, log size, share market value and others. (Suwito, 2017). In this research, company size is calculated by the natural log of total assets.
. Company Size: Ln (Total Assets)

B. Population and Sample

The data population used in this research is financial report data from manufacturing companies listed on the Indonesia Stock Exchange in 2019-2022 via the official website www.IDX.co.id. The sample that is the source of data in this research is Manufacturing Sector companies on the Indonesia Stock Exchange which consistently report company financial reports for the 2019-2022 period. The number of companies according to the criteria is 30 manufacturing companies listed on the Indonesia Stock Exchange, with a total of 120 observations.

C. Data analysis method

The data analysis technique used in this research is multiple regression analysis. This analysis is used to find out and obtain an overview of the influence of institutional ownership, company performance and sustainability reports on profit management of listed companies on the Indonesian Stock Exchange in 2019-2022 with the help of the SPSS (Statistical Product and Service Solution) version 25 program.

RESULTS

A. Descriptive Statistical Analysis

Descriptive statistical analysis is used to provide a general overview or description of data. In this study, the results of the descriptive statistical tests were presented in tabular form which provided information on the minimum value, maximum value, mean value and standard deviation.

Table 1 Descriptive Statistical Test Results

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Institutional Ownership	102	.500820	.994350	.77043580	.154777051
Financial performance	102	.000230	.482220	.08594394	.090996316
Sustainability Report	102	.373620	.626370	.52138210	.050344034
Profit management	102	.00616600	.92522000	.2349014983	.28205082532
LNUP	102	12.73	30.73	23.2481	6.08247
Valid N (listwise)	102				

(Source: SPSS 25, 2023)

Based on tests carried out on manufacturing companies listed on the IDX for the 2019-2022 period, the following statistical test results were obtained:

1. Institutional Ownership (IC) shows a maximum value of 0.994350 owned by PT Tunas Alfin Tbk in 2019 to 2022, which means that there are around 99.4% of the company's shares owned by institutional ownership and a minimum value of 0.500820 owned by PT Indofood SuksesMakmurTbk in 2019 to 2022, which means that around 50.08% of the company's shares are owned by institutional ownership.
2. Financial Performance shows a maximum value of 0.482220 owned by PT WaskitaBeton Precast Tbk in 2020 and a minimum value of 0.000230 owned by PT SekarBumiTbk in 2020.
3. The Sustainability Report (LK) shows a maximum value of 0.626370 owned by PT Mayora Indah Tbk in 2022 and a minimum value of 0.373620 owned by PT Wilmar Cahaya Indonesia Tbk in 2019.
4. Profit Management (ML) Shows a maximum Discretionary accruals value of 0.96 owned by PT Hanjaya Mandala SampoernaTbk in 2020 and a minimum of 0.08 owned by PT Ultrajaya Milk Industry Tbk in 2019.
5. Company Size (UP) Shows a maximum value of 30.73 owned by PT Mayora Indah Tbk in 2022 and a minimum value of 12.73 owned by PT Astra International Tbk in 2020.

B. Analysis of Research Results

1. Classic assumption test

1) Normality test

Based on the results of the one sample Kolmogorov-Smirnov test, it shows that the data used in this research is normally distributed. The test result is 0.077 which means it is greater than the predetermined α (α=0.05)

2. Multicollinearity Test

Based on the results of the multicollinearity test conducted on SPSS 25, the collinearity tolerance value is greater than 0.10 and the VIF value for all variables is less than 10. Based on these two values, it can be concluded that there is no multicollinearity occurring in this research model.

3. Heteroskedasticity Test

Based on the results of the heteroscedasticity test using the Glesjer method, it shows that the significance value for each variable is greater than 0.05. Based on these values, it can be concluded that there are no symptoms of heteroscedasticity in this research model.

4. Autocorrelation Test

Researchers used α of 5% with a total of 100 data (n=100) with a total of 3 independent variables (k=3). Based on the results of the study, it was shown that the d value obtained from the Durbin-Watson test was between Du and 4-Du with: $0.488 < 0.639 < 1.257$. It can be concluded that this research model is free of autocorrelation.

5. Hypothesis testing

Simultaneous Test (F Test)

Table 2. F Test Results

ANOVAa						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.538	4	.634	11.451	.000b
	Residual	5.374	97	.055		
	Total	7.912	101			
a. Dependent Variable: Profit management						
b. Predictors: (Constant), LNUP, Sustainability Report, Financial Performance, Institutional Ownership						

(Source: SPSS 25, 2023)

From the results of the F test using ANOVA in the SPSS application, a significance value of 0.000 (Less than 0.05) was obtained. based on these results it was concluded that the variables of institutional ownership, financial performance and sustainability reports simultaneously have a significant effect on earnings management. With these results, this regression model can be said to be feasible.

Table 3. F Test Results with Moderating Variables

ANOVAa						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.404	3	.135	10.760	.000b
	Residual	1.226	98	.013		
	Total	1.630	101			
a. Dependent Variable: Res						
b. Predictors: (Constant), UP_ROA, KI_UP, SR_UP						

(Source: SPSS 25, 2023)

Based on these results, it is concluded that the variables institutional ownership, financial performance and sustainability reports simultaneously have a significant effect on earnings management with company size as a moderating variable. With these results, this regression model can be said to be feasible.

2. Determination Coefficient Test

Table 4. Test Results for the Coefficient of Determination

Model Summaryb										
					Change Statistics					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.566a	.321	.293	.23538079267	.321	11.451	4	97	.000	0.639
a. Predictors: (Constant), LNUP, Sustainability Report, Financial Performance, Institutional Ownership										
b. Dependent Variable: Profit Management										

(Source: SPSS 25, 2023)

Based on the table above, it can be seen that the adjusted r square value shows a value of 0.293. this means that the variables of institutional ownership, financial performance, and sustainability reports are able to explain their effect on earnings management by 29.3%, while the rest is influenced by other variables not examined in this study.

Then, in the second model a moderating variable is included in conducting the test. In this second model, we also tested the coefficient of determination again in the regression model with the following results:

Table 5 Coefficient Test Results with Moderating Variables

Model Summaryb										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.498a	.248	.225	.11184	.248	10.760	3	98	.000	0.861
a. Predictors: (Constant), UP_ROA, KI_UP, SR_UP										
b. Dependent Variable: Res										

(Source: SPSS 25, 2023)

The adjusted r square value after the moderating variable shows a value of 0.225. That is, the independent variables after being moderated by company size are able to explain the earnings management variable by 22.5%.

3. Partial Test (t test)

Table 6. Moderated Regression Analysis Test Results

Coefficientsa											
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.460	.298		1.544	.126					
	Institutional Ownership	1.130	.546	.660	2.067	.041	.112	.210	.177	.071	13.987
	Financial performance	-2.050	1.022	-.704	-2.005	.048	-.013	-.204	-.171	.059	16.923
	Sustainability Report	-.235	.999	-.045	-.236	.814	-.137	-.024	-.020	.202	4.942
	KI_UP	-.027	.024	-.675	-1.130	.261	-.257	-.116	-.097	.020	48.908
	KK_UP	.071	.043	.567	1.642	.104	-.123	.168	.140	.061	16.349
	SR_UP	-.022	.036	-.279	-.605	.546	-.462	-.063	-.052	.034	29.062
a. Dependent Variable: SQRTEM											

(Source: SPSS 25, 2023)

The following are the results of the MRA test using SPSS:

- The institutional ownership variable shows a significance value of 0.041 <0.05, so H1 is accepted, so it can be concluded that the institutional ownership variable has a positive effect on earnings management.
- The financial performance variable shows a significance value of 0.048 <0.05 the value of the t result is negative, so H2 is accepted, so it can be concluded that the financial performance variable has a positive effect on earnings management.
- The sustainability report variable shows a value of 0.814 > 0.05, so H3 is rejected, so it can be concluded that the sustainability report variable has a negative effect on earnings management.
- Institutional ownership variable moderated by firm size shows a significance value of 0.261 > 0.05, then H4 is rejected so it can be concluded that firm size does not moderate institutional ownership of earnings management.
- The financial performance variable moderated by company size shows a significance value of 0.104 > 0.05, then H5 is rejected so it can be concluded that company size does not moderate financial performance on earnings management.
- Sustainability report variable moderated by company size shows a significance value of 0.546 > 0.05, then H6 is rejected so it can be concluded that company size does not moderate sustainability reports on earnings management.

DISCUSSION

Hypothesis 1:
A significance value of 0.041 <0.05 with a regression coefficient of 1.13 means that H1 is accepted, which means that institutional ownership has a positive effect on earnings management.

It can be said that by increasing institutional ownership it will improve earnings management. What is done by institutional shareholders in Indonesia is in fact done by the directors of companies that buy shares (investors). The directors of investor companies always change according to the general meeting of shareholders, therefore the supervision carried out on companies that issue shares (investees) is relatively often ineffective/strict, this will cause the management that issues shares to be more flexible in carrying out earnings management. this is in contrast to research conducted by Febria (2020), the level of institutional ownership in companies has no effect on earnings management.

H2 = Significance value 0.048 <0.05 with a regression coefficient of -2.05 then H2 is accepted, which means that financial performance has a negative effect on earnings management.

This shows that the company's good financial performance means that management no longer needs to do earnings management. This is in accordance with the agency theory which says that management has an interest so that its performance is assessed well by investors. Conversely, if the financial performance in one period is not good (loss) then management will tend to do earnings management to cover up its failure in managing the Company.

H3 = Significance value of 0.814 then H3 is rejected, which means that sustainability reports have no effect on earnings management.

So it can be concluded that the sustainability report has no effect on earnings management. This is because corporate social responsibility is a government regulation that must be obeyed for the long-term benefit of society. Expenditures for long-term social interests are relatively insignificant, so this will not greatly affect the company's financial performance. Therefore the sustainability report will not affect earnings management.

H4 = Significance value 0.261 > 0.06 then H4 is rejected which means company size does not moderate institutional ownership of earnings management.

Firm size as a moderating variable and institutional ownership as a form of management oversight in large manufacturing companies can reduce earnings management practices. This conclusion is in contrast to research conducted by Muhammad (2022) which shows that earnings management practices can be reduced by controlling oversight of financial management. This is because in this study most of the data on the size of the company does not vary significantly, there are no very small or very large company sizes.

H5 = Significance value 0.104 > 0.05 then H5 is rejected, which means that company size does not moderate financial performance on earnings management.

Increasing company size does not prove capable of reducing deviant earnings management actions. The impact of decreasing financial performance so that it still has unstable performance, the size of the company is expected to be able to become a monitoring in the behavior of company management on financial performance.

H6 = Significance value 0.546 > 0.05, then H6 is rejected, which means that company size does not moderate sustainability reports on earnings management.

This indicates that there is no significant role of company size in influencing the relationship between sustainability reports and earnings management. This is because the size of companies involved in sustainability performance practices has little effect on manipulating earnings by reducing discretionary earnings to benefit from higher debt.

CONCLUSION

The conclusions in this study are that institutional ownership has a positive effect on earnings management, financial performance has a negative effect on earnings management and sustainability reports have no effect on earnings management. Company size does not moderate the variables Institutional Ownership, Financial Performance, and

Sustainability Reports on Earnings Management. There are research limitations experienced and can be factors that future researchers can pay attention to, namely:

1. This research only examines manufacturing company objects.
2. Earnings management is only measured based on accrual data in financial reports.

From the Adjusted R square calculation, it shows only 29.3% and thus there are many other factors that affect earnings management, therefore it is necessary to study more both internal factors and external factors that can influence management to manage earnings.

REFERENCES

[1]. Santhosh Palavesh. (2019). The Role of Open Innovation and Crowdsourcing in Generating New Business Ideas and Concepts. International Journal for Research Publication and Seminar, 10(4), 137–147. https://doi.org/10.36676/jrps.v10.i4.1456
[2]. Santosh Palavesh. (2021). Developing Business Concepts for Underserved Markets: Identifying and Addressing Unmet Needs in Niche or Emerging Markets. Innovative Research Thoughts, 7(3), 76–89. https://doi.org/10.36676/irt.v7.i3.1437
[3]. Palavesh, S. (2021). Co-Creating Business Concepts with Customers: Approaches to the Use of Customers in New Product/Service Development. Integrated Journal for Research in Arts and Humanities, 1(1), 54–66. https://doi.org/10.55544/ijrah.1.1.9
[4]. Sravan Kumar Pala, Improving Customer Experience in Banking using Big Data Insights, International Journal of Enhanced Research in Educational Development (IJERED), ISSN: 2319-7463, Vol. 8 Issue 5, September-October 2020.
[5]. Bharath Kumar. (2022). Challenges and Solutions for Integrating AI with Multi-Cloud Architectures. International Journal of Multidisciplinary Innovation and Research Methodology, ISSN: 2960-2068, 1(1), 71–77. Retrieved from https://ijmirm.com/index.php/ijmirm/article/view/76
[6]. Santhosh Palavesh. (2022). Entrepreneurial Opportunities in the Circular Economy: Defining Business Concepts for Closed-Loop Systems and Resource Efficiency. European Economic Letters (EEL), 12(2), 189–204. https://doi.org/10.52783/eel.v12i2.1785
[7]. Santhosh Palavesh. (2022). The Impact of Emerging Technologies (e.g., AI, Blockchain, IoT) On Conceptualizing and Delivering new Business Offerings. International Journal on Recent and Innovation Trends in Computing and Communication, 10(9), 160–173. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/10955
[8]. Palavesh, S. (2024). Developing sustainable business concepts: Integrating environmental, social, and economic considerations into new venture ideation. African Journal of Biological Sciences, 6(14), 3025-3043. https://doi.org/10.48047/AFJBS.6.14.2024.3025-3043
[9]. Pala, Sravan Kumar. "Databricks Analytics: Empowering Data Processing, Machine Learning and Real-Time Analytics." Machine Learning 10.1 (2021).
[10]. Goswami, MaloyJyoti. "Optimizing Product Lifecycle Management with AI: From Development to Deployment." International Journal of Business Management and Visuals, ISSN: 3006-2705 6.1 (2023): 36-42.
[11]. Vivek Singh, NehaYadav. (2023). Optimizing Resource Allocation in Containerized Environments with AI-driven Performance Engineering. International Journal of Research Radicals in Multidisciplinary Fields, ISSN: 2960-043X, 2(2), 58–69. Retrieved from https://www.researchradicals.com/index.php/rr/article/view/83
[12]. Sravan Kumar Pala, "Synthesis, characterization and wound healing imitation of Fe3O4 magnetic nanoparticle grafted by natural products", Texas A&M University - Kingsville ProQuest Dissertations Publishing, 2014. 1572860.Available online at: https://www.proquest.com/openview/636d984c6e4a07d16be2960caa1f30c2/1?pq-origsite=gscholar&cbl=18750
[13]. Santhosh Palavesh. (2021). Business Model Innovation: Strategies for Creating and Capturing Value Through Novel Business Concepts. European Economic Letters (EEL), 11(1). https://doi.org/10.52783/eel.v11i1.1784
[14]. Santhosh Palavesh. (2023). Leveraging Lean Startup Principles: Developing And Testing Minimum Viable Products (Mvps) In New Business Ventures. Educational Administration: Theory and Practice, 29(4), 2418–2424. https://doi.org/10.53555/kuey.v29i4.7141
[15]. Palavesh, S. (2023). The role of design thinking in conceptualizing and validating new business ideas. Journal of Informatics Education and Research, 3(2), 3057.

[16]. Santhosh Palavesh. (2024). Identifying Market Gaps and Unmet Customer Needs: A Framework for Ideating Innovative Business Concepts. International Journal of Intelligent Systems and Applications in Engineering, 12(22s), 1067 –. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6612

[17]. Vijaya Venkata Sri Rama Bhaskar, Akhil Mittal, Santosh Palavesh, Krishnateja Shiva, Pradeep Etikani. (2020). Regulating AI in Fintech: Balancing Innovation with Consumer Protection. European Economic Letters (EEL), 10(1). https://doi.org/10.52783/eel.v10i1.1810

[18]. MMTA SathishkumarChintala, "Optimizing predictive accuracy with gradient boosted trees infinancial forecasting" Turkish Journal of Computer and Mathematics Education (TURCOMAT) 10.3 (2019).

[19]. Chintala, S. "IoT and Cloud Computing: Enhancing Connectivity." International Journal of New Media Studies (IJNMS) 6.1 (2019): 18-25.

[20]. Goswami, MaloyJyoti. "Study on Implementing AI for Predictive Maintenance in Software Releases." International Journal of Research Radicals in Multidisciplinary Fields, ISSN: 2960-043X 1.2 (2022): 93-99.

[21]. Bharath Kumar. (2022). Integration of AI and Neuroscience for Advancing Brain-Machine Interfaces: A Study. International Journal of New Media Studies: International Peer Reviewed Scholarly Indexed Journal, 9(1), 25–30. Retrieved from https://ijnms.com/index.php/ijnms/article/view/246

[22]. Sravan Kumar Pala, Use and Applications of Data Analytics in Human Resource Management and Talent Acquisition, International Journal of Enhanced Research in Management & Computer Applications ISSN: 2319-7463, Vol. 10 Issue 6, June-2021.

[23]. Sri Sai Subramanyam Challa. (2023). Regulatory Intelligence: Leveraging Data Analytics for Regulatory Decision-Making. International Journal on Recent and Innovation Trends in Computing and Communication, 11(11), 1426–1434. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/10893

[24]. Palak Raina, Hitali Shah. (2017). A New Transmission Scheme for MIMO - OFDM using V Blast Architecture.Eduzone: International Peer Reviewed/Refereed Multidisciplinary Journal, 6(1), 31–38. Retrieved from https://www.eduzonejournal.com/index.php/eiprmj/article/view/628

[25]. Neha Yadav, Vivek Singh, "Probabilistic Modeling of Workload Patterns for Capacity Planning in Data Center Environments" (2022). International Journal of Business Management and Visuals, ISSN: 3006-2705, 5(1), 42-48. https://ijbmv.com/index.php/home/article/view/73

[26]. Chintala, Sathishkumar. "Explore the impact of emerging technologies such as AI, machine learning, and blockchain on transforming retail marketing strategies." Webology (ISSN: 1735-188X) 18.1 (2021).

[27]. Ayyalasomayajula, M., and S. Chintala. "Fast Parallelizable Cassava Plant Disease Detection using Ensemble Learning with Fine Tuned AmoebaNet and ResNeXt-101." Turkish Journal of Computer and Mathematics Education (TURCOMAT) 11.3 (2020): 3013-3023.

[28]. Raina, Palak, and Hitali Shah."Data-Intensive Computing on Grid Computing Environment." International Journal of Open Publication and Exploration (IJOPE), ISSN: 3006-2853, Volume 6, Issue 1, January-June, 2018.

[29]. Hitali Shah."Millimeter-Wave Mobile Communication for 5G". International Journal of Transcontinental Discoveries, ISSN: 3006-628X, vol. 5, no. 1, July 2018, pp. 68-74, https://internationaljournals.org/index.php/ijtd/article/view/102.

[30]. Sri Sai Subramanyam Challa. (2024). Leveraging AI for Risk Management in Computer System Validation. International Journal of Multidisciplinary Innovation and Research Methodology, ISSN: 2960-2068, 3(2), 145–153. Retrieved from https://ijmirm.com/index.php/ijmirm/article/view/95

[31]. Challa, S. S. S. (2020). Assessing the regulatory implications of personalized medicine and the use of biomarkers in drug development and approval. European Chemical Bulletin, 9(4), 134-146.

[32]. D.O.I10.53555/ecb.v9:i4.17671

[33]. EVALUATING THE EFFECTIVENESS OF RISK-BASED APPROACHES IN STREAMLINING THE REGULATORY APPROVAL PROCESS FOR NOVEL THERAPIES. (2021). Journal of Population Therapeutics and Clinical Pharmacology, 28(2), 436-448. https://doi.org/10.53555/jptcp.v28i2.7421

[34]. Challa, S. S. S., Tilala, M., Chawda, A. D., & Benke, A. P. (2019). Investigating the use of natural language processing (NLP) techniques in automating the extraction of regulatory requirements from unstructured data sources. Annals of Pharma Research, 7(5), 380-387.

[35]. Tilala, M., Challa, S. S. S., Chawda, A. D., Benke, A. P., & Sharma, S. (2024). Analyzing the role of real-world evidence (RWE) in supporting regulatory decision-making and post-marketing surveillance. African Journal of Biological Sciences, 6(14), 3060-3075. https://doi.org/10.48047/AFJBS.6.14.2024.3060-3075

[36]. Ashok Choppadandi. (2022). Exploring the Potential of Blockchain Technology in Enhancing Supply Chain Transparency and Compliance with Good Distribution Practices (GDP). International Journal on Recent and Innovation Trends in Computing and Communication, 10(12), 336–343. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/10981

[37]. Challa, S. S. S., Chawda, A. D., Benke, A. P., & Tilala, M. (2020). Evaluating the use of machine learning algorithms in predicting drug-drug interactions and adverse events during the drug development process. NeuroQuantology, 18(12), 176-186. https://doi.org/10.48047/nq.2020.18.12.NQ20252

[38]. Challa, S. S. S., Tilala, M., Chawda, A. D., & Benke, A. P. (2023). Investigating the impact of AI-assisted drug discovery on the efficiency and cost-effectiveness of pharmaceutical R&D. Journal of Cardiovascular Disease Research, 14(10), 2244.

[39]. Chintala, S. "AI-Driven Personalised Treatment Plans: The Future of Precision Medicine." Machine Intelligence Research 17.02 (2023): 9718-9728.

[40]. AmolKulkarni. (2023). Image Recognition and Processing in SAP HANA Using Deep Learning. International Journal of Research and Review Techniques, 2(4), 50–58. Retrieved from:https://ijrrt.com/index.php/ijrrt/article/view/176

[41]. Sravan Kumar Pala, "Implementing Master Data Management on Healthcare Data Tools Like (Data Flux, MDM Informatica and Python)", IJTD, vol. 10, no. 1, pp. 35–41, Jun. 2023. Available: https://internationaljournals.org/index.php/ijtd/article/view/53

[42]. Goswami, MaloyJyoti. "Leveraging AI for Cost Efficiency and Optimized Cloud Resource Management." International Journal of New Media Studies: International Peer Reviewed Scholarly Indexed Journal 7.1 (2020): 21-27.

[43]. Hitali Shah.(2017). Built-in Testing for Component-Based Software Development. International Journal of New Media Studies: International Peer Reviewed Scholarly Indexed Journal, 4(2), 104–107. Retrieved from https://ijnms.com/index.php/ijnms/article/view/259

[44]. Challa, S. S. S., Tilala, M., Chawda, A. D., & Benke, A. P. (2022). Quality Management Systems in Regulatory Affairs: Implementation Challenges and Solutions. Journal for Research in Applied Sciences and Biotechnology, 1(3), 278–284. https://doi.org/10.55544/jrasb.1.3.36

[45]. Challa, S. S. S., Chawda, A. D., Benke, A. P., & Tilala, M. (2024). Streamlining Change Control Processes in Regulatory Affairs: Best Practices and Case Studies. Integrated Journal for Research in Arts and Humanities, 4(4), 67–75. https://doi.org/10.55544/ijrah.4.4.12

[46]. Harshita Cherukuri. (2024). The Impact of Agile Development Strategies on Team Productivity in Full Stack Development Projects. International Journal of Intelligent Systems and Applications in Engineering, 12(22s), 175 –. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6407

[47]. Ranjit Kumar Gupta, Sagar Shukla, Anaswara Thekkan Rajan, & Sneha Aravind. (2022). Leveraging Data Analytics to Improve User Satisfaction for Key Personas: The Impact of Feedback Loops. International Journal for Research Publication and Seminar, 11(4), 242–252. https://doi.org/10.36676/jrps.v11.i4.1489

[48]. Ranjit Kumar Gupta, Harshita Cherukuri, Sagar Shukla, Anaswara Thekkan Rajan, Sneha Aravind. (2024). Deploying Containerized Microservices in on-Premise Kubernetes Environments: Challenges and Best Practices. International Journal of Multidisciplinary Innovation and Research Methodology, ISSN: 2960-2068, 3(2), 74–90. Retrieved from https://ijmirm.com/index.php/ijmirm/article/view/86

[49]. Ranjit Kumar Gupta, Sagar Shukla, Anaswara Thekkan Rajan, Sneha Aravind, 2021. "Utilizing Splunk for Proactive Issue Resolution in Full Stack Development Projects" ESP Journal of Engineering & Technology Advancements 1(1): 57-64.

[50]. AmolKulkarni. (2023). "Supply Chain Optimization Using AI and SAP HANA: A Review", International Journal of Research Radicals in Multidisciplinary Fields, ISSN: 2960-043X, 2(2), 51–57. Retrieved from https://www.researchradicals.com/index.php/rr/article/view/81

[51]. Sravan Kumar Pala, Investigating Fraud Detection in Insurance Claims using Data Science, International Journal of Enhanced Research in Science, Technology & Engineering ISSN: 2319-7463, Vol. 11 Issue 3, March-2022.

[52]. Raina, Palak, and Hitali Shah."Security in Networks." International Journal of Business Management and Visuals, ISSN: 3006-2705 1.2 (2018): 30-48.

[53]. Goswami, MaloyJyoti. "Study on Implementing AI for Predictive Maintenance in Software Releases." International Journal of Research Radicals in Multidisciplinary Fields, ISSN: 2960-043X 1.2 (2022): 93-99.

[54]. Bharath Kumar. (2022). AI Implementation for Predictive Maintenance in Software Releases. International Journal of Research and Review Techniques, 1(1), 37–42. Retrieved from https://ijrrt.com/index.php/ijrrt/article/view/175

[55]. Ranjit Kumar Gupta, Sagar Shukla, Anaswara Thekkan Rajan, Sneha Aravind, Ashok Choppadandi. (2024). Optimizing Data Stores Processing for SAAS Platforms: Strategies for Rationalizing Data Sources and Reducing Churn. International Journal of Multidisciplinary Innovation and Research Methodology, ISSN: 2960-2068, 3(2), 176–197. Retrieved from https://ijmirm.com/index.php/ijmirm/article/view/99

[56]. Sagar Shukla, Anaswara Thekkan Rajan, Sneha Aravind, Ranjit Kumar Gupta, Santosh Palavesh. (2023). Monetizing API Suites: Best Practices for Establishing Data Partnerships and Iterating on Customer Feedback. European Economic Letters (EEL), 13(5), 2040–2053. https://doi.org/10.52783/eel.v13i5.1798

[57]. Aravind, S., Cherukuri, H., Gupta, R. K., Shukla, S., & Rajan, A. T. (2022). The role of HTML5 and CSS3 in creating optimized graphic prototype websites and application interfaces. NeuroQuantology, 20(12), 4522-4536. https://doi.org/10.48047/NQ.2022.20.12.NQ77775

[58]. Sneha Aravind, Ranjit Kumar Gupta, Sagar Shukla, & Anaswara Thekkan Rajan. (2024). Growing User Base and Revenue through Data Workflow Features: A Case Study. International Journal of Communication Networks and Information Security (IJCNIS), 16(1 (Special Issue), 436–455. Retrieved from https://www.ijcnis.org/index.php/ijcnis/article/view/6832

[59]. Alok Gupta. (2024). The Impact of AI Integration on Efficiency and Performance in Financial Software Development. International Journal of Intelligent Systems and Applications in Engineering, 12(22s), 185–193. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6408

[60]. Ugandhar Dasi, Nikhil Singla, Rajkumar Balasubramanian, Siddhant Benadikar, Rishabh Rajesh Shanbhag. (2024). Privacy-Preserving Machine Learning Techniques: Balancing Utility and Data Protection. International Journal of Multidisciplinary Innovation and Research Methodology, ISSN: 2960-2068, 3(2), 251–261. Retrieved from https://ijmirm.com/index.php/ijmirm/article/view/107

[61]. Ugandhar Dasi. (2024). Developing A Cloud-Based Natural Language Processing (NLP) Platform for Sentiment Analysis and Opinion Mining of Social Media Data. International Journal of Intelligent Systems and Applications in Engineering, 12(22s), 165–174. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6406

[62]. Ugandhar Dasi. (2024). Developing A Cloud-Based Natural Language Processing (NLP) Platform for Sentiment Analysis and Opinion Mining of Social Media Data. International Journal of Intelligent Systems and Applications in Engineering, 12(22s), 165–174. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6406

[63]. Dasi, U., Singla, N., Balasubramanian, R., Benadikar, S., & Shanbhag, R. R. (2024). Ethical implications of AI-driven personalization in digital media. Journal of Informatics Education and Research, 4(3), 588-593.

[64]. Nikhil Singla. (2023). Assessing the Performance and Cost-Efficiency of Serverless Computing for Deploying and Scaling AI and ML Workloads in the Cloud. International Journal of Intelligent Systems and Applications in Engineering, 11(5s), 618–630. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6730

[65]. Ugandhar Dasi, Nikhil Singla, Rajkumar Balasubramanian, Siddhant Benadikar, Rishabh Rajesh Shanbhag. (2024). Analyzing the Security and Privacy Challenges in Implementing Ai and Ml Models in Multi-Tenant Cloud Environments. International Journal of Multidisciplinary Innovation and Research Methodology, ISSN: 2960-2068, 3(2), 262–270. Retrieved from https://ijmirm.com/index.php/ijmirm/article/view/108

[66]. Balasubramanian, R., Benadikar, S., Shanbhag, R. R., Dasi, U., & Singla, N. (2024). Investigating the application of reinforcement learning algorithms for autonomous resource management in cloud computing environments. African Journal of Biological Sciences, 6(14), 6451-6480. https://doi.org/10.48047/AFJBS.6.14.2024.6451-6480

[67]. Rishabh Rajesh Shanbhag, Rajkumar Balasubramanian, Ugandhar Dasi, Nikhil Singla, & Siddhant Benadikar. (2022). Case Studies and Best Practices in Cloud-Based Big Data Analytics for Process Control. International Journal for Research Publication and Seminar, 13(5), 292–311. https://doi.org/10.36676/jrps.v13.i5.1462

[68]. Siddhant Benadikar. (2021). Developing a Scalable and Efficient Cloud-Based Framework for Distributed Machine Learning. International Journal of Intelligent Systems and Applications in Engineering, 9(4), 288 –. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6761

[69]. Siddhant Benadikar. (2021). Evaluating the Effectiveness of Cloud-Based AI and ML Techniques for Personalized Healthcare and Remote Patient Monitoring. International Journal on Recent and Innovation Trends in Computing and Communication, 9(10), 03–16. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/11036

[70]. Shanbhag, R. R., Benadikar, S., Dasi, U., Singla, N., & Balasubramanian, R. (2024). Investigating the application of transfer learning techniques in cloud-based AI systems for improved performance and reduced training time. Letters in High Energy Physics, 31.

[71]. Rishabh Rajesh Shanbhag. (2023). Exploring the Use of Cloud-Based AI and ML for Real-Time Anomaly Detection and Predictive Maintenance in Industrial IoT Systems. International Journal of Intelligent Systems and Applications in Engineering, 11(4), 925 –. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6762

[72]. Nikhil Singla. (2023). Assessing the Performance and Cost-Efficiency of Serverless Computing for Deploying and Scaling AI and ML Workloads in the Cloud. International Journal of Intelligent Systems and Applications in Engineering, 11(5s), 618–630. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/673

[73]. Nikhil Singla. (2023). Assessing the Performance and Cost-Efficiency of Serverless Computing for Deploying and Scaling AI and ML Workloads in the Cloud. International Journal of Intelligent Systems and Applications in Engineering, 11(5s), 618–630. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6730

[74]. Challa, S. S., Tilala, M., Chawda, A. D., & Benke, A. P. (2019). Investigating the use of natural language processing (NLP) techniques in automating the extraction of regulatory requirements from unstructured data sources. Annals of PharmaResearch, 7(5), 380-387.

[75]. Chaturvedi, R., & Sharma, S. (2024). Implementing Predictive Analytics for Proactive Revenue Cycle Management. Journal for Research in Applied Sciences and Biotechnology, 3(4), 74–78. https://doi.org/10.55544/jrasb.3.4.9

[76]. Chaturvedi, R., Sharma, S., Pandian, P. K. G., & Sharma, S. (2024). Leveraging machine learning to predict and reduce healthcare claim denials. Zenodo. https://doi.org/10.5281/zenodo.13268360

[77]. Ritesh Chaturvedi. (2023). Robotic Process Automation (RPA) in Healthcare: Transforming Revenue Cycle Operations. International Journal on Recent and Innovation Trends in Computing and Communication, 11(6), 652–658. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/11045

[78]. Chaturvedi, R., & Sharma, S. (2022). Assessing the Long-Term Benefits of Automated Remittance in Large Healthcare Networks. Journal for Research in Applied Sciences and Biotechnology, 1(5), 219–224. https://doi.org/10.55544/jrasb.1.5.25

[79]. Chaturvedi, R., & Sharma, S. (2022). Enhancing healthcare staffing efficiency with AI-powered demand management tools. Eurasian Chemical Bulletin, 11(Regular Issue 1), 675-681. https://doi.org/10.5281/zenodo.13268360

[80]. Dr. Saloni Sharma, & Ritesh Chaturvedi. (2017). Blockchain Technology in Healthcare Billing: Enhancing Transparency and Security. International Journal for Research Publication and Seminar, 10(2), 106–117. Retrieved from https://jrps.shodhsagar.com/index.php/j/article/view/1475

[81]. Dr. Saloni Sharma, & Ritesh Chaturvedi. (2017). Blockchain Technology in Healthcare Billing: Enhancing Transparency and Security. International Journal for Research Publication and Seminar, 10(2), 106–117. Retrieved from https://jrps.shodhsagar.com/index.php/j/article/view/1475

[82]. Saloni Sharma. (2020). AI-Driven Predictive Modelling for Early Disease Detection and Prevention. International Journal on Recent and Innovation Trends in Computing and Communication, 8(12), 27–36. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/11046

[83]. Chaturvedi, R., & Sharma, S. (2022). Assessing the Long-Term Benefits of Automated Remittance in Large Healthcare Networks. Journal for Research in Applied Sciences and Biotechnology, 1(5), 219–224. https://doi.org/10.55544/jrasb.1.5.25

[84]. Pavan Ogeti. (2024). Benefits and Challenges of Deploying Machine Learning Models in the Cloud. International Journal of Intelligent Systems and Applications in Engineering, 12(22s), 194–209. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6409

[85]. Pavan Ogeti, Narendra Sharad Fadnavis, Gireesh Bhaulal Patil, Uday Krishna Padyana, Hitesh Premshankar Rai. (2022). Blockchain Technology for Secure and Transparent Financial Transactions. European Economic Letters (EEL), 12(2), 180–188. Retrieved from https://www.eelet.org.uk/index.php/journal/article/view/1283

[86]. Ogeti, P., Fadnavis, N. S., Patil, G. B., Padyana, U. K., & Rai, H. P. (2023). Edge computing vs. cloud computing: A comparative analysis of their roles and benefits. Volume 20, No. 3, 214-226.

[87]. Fadnavis, N. S., Patil, G. B., Padyana, U. K., Rai, H. P., & Ogeti, P. (2020). Machine learning applications in climate modeling and weather forecasting. NeuroQuantology, 18(6), 135-145. https://doi.org/10.48047/nq.2020.18.6.NQ20194

[88]. Narendra Sharad Fadnavis. (2021). Optimizing Scalability and Performance in Cloud Services: Strategies and Solutions. International Journal on Recent and Innovation Trends in Computing and Communication, 9(2), 14–21. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/10889

[89]. Gireesh Bhaulal Patil. (2022). AI-Driven Cloud Services: Enhancing Efficiency and Scalability in Modern Enterprises. International Journal of Intelligent Systems and Applications in Engineering, 10(1), 153–162. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6728

[90]. Padyana, U. K., Rai, H. P., Ogeti, P., Fadnavis, N. S., & Patil, G. B. (2023). AI and Machine Learning in Cloud-Based Internet of Things (IoT) Solutions: A Comprehensive Review and Analysis. Integrated Journal for Research in Arts and Humanities, 3(3), 121–132. https://doi.org/10.55544/ijrah.3.3.20

[91]. Patil, G. B., Padyana, U. K., Rai, H. P., Ogeti, P., & Fadnavis, N. S. (2021). Personalized marketing strategies through machine learning: Enhancing customer engagement. Journal of Informatics Education and Research, 1(1), 9. http://jier.org

[92]. Padyana, U. K., Rai, H. P., Ogeti, P., Fadnavis, N. S., & Patil, G. B. (2023). AI and Machine Learning in Cloud-Based Internet of Things (IoT) Solutions: A Comprehensive Review and Analysis. Integrated Journal for Research in Arts and Humanities, 3(3), 121–132. https://doi.org/10.55544/ijrah.3.3.20

[93]. Padyana, U. K., Rai, H. P., Ogeti, P., Fadnavis, N. S., & Patil, G. B. (2024). Predicting disease susceptibility with machine learning in genomics. Letters in High Energy Physics, 2024(20).

[94]. Uday Krishna Padyana, Hitesh Premshankar Rai, Pavan Ogeti, Narendra Sharad Fadnavis, & Gireesh Bhaulal Patil. (2024). Server less Architectures in Cloud Computing: Evaluating Benefits and Drawbacks. Innovative Research Thoughts, 6(3), 1–12. https://doi.org/10.36676/irt.v10.i3.1439

[95]. Rai, H. P., Ogeti, P., Fadnavis, N. S., Patil, G. B., & Padyana, U. K. (2024). AI-based forensic analysis of digital images: Techniques and applications in cybersecurity. Journal of Digital Economy, 2(1), 47-61.

[96]. Hitesh Premshankar Rai, Pavan Ogeti, Narendra Sharad Fadnavis, Gireesh Bhaulal Patil, & Uday Krishna Padyana. (2024). Integrating Public and Private Clouds: The Future of Hybrid Cloud Solutions. Universal Research Reports, 8(2), 143–153. https://doi.org/10.36676/urr.v9.i4.1320

[97]. Hitesh Premshankar Rai, Pavan Ogeti, Narendra Sharad Fadnavis, Gireesh Bhaulal Patil, & Uday Krishna Padyana. (2024). Integrating Public and Private Clouds: The Future of Hybrid Cloud Solutions. Universal Research Reports, 8(2), 143–153. https://doi.org/10.36676/urr.v9.i4.1320

[98]. Ugandhar Dasi. (2024). Developing A Cloud-Based Natural Language Processing (NLP) Platform for Sentiment Analysis and Opinion Mining of Social Media Data. International Journal of Intelligent Systems and Applications in Engineering, 12(22s), 165–174. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6406

[99]. Dasi, U., Singla, N., Balasubramanian, R., Benadikar, S., & Shanbhag, R. R. (2024). Ethical implications of AI-driven personalization in digital media. Journal of Informatics Education and Research, 4(3), 588-593.

[100]. Krishnateja Shiva. (2024). Natural Language Processing for Customer Service Chatbots: Enhancing Customer Experience. International Journal of Intelligent Systems and Applications in Engineering, 12(22s), 155–164. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6405

[101]. Krishnateja Shiva. (2022). Leveraging Cloud Resource for Hyperparameter Tuning in Deep Learning Models. International Journal on Recent and Innovation Trends in Computing and Communication, 10(2), 30–35. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/10980

[102]. Shiva, K., Etikani, P., Bhaskar, V. V. S. R., Palavesh, S., & Dave, A. (2022). The rise of robo-advisors: AI-powered investment management for everyone. Journal of Namibian Studies, 31, 201-214.

[103]. Etikani, P., Bhaskar, V. V. S. R., Choppadandi, A., Dave, A., & Shiva, K. (2024). Forecasting climate change with deep learning: Improving climate modeling accuracy. African Journal of Bio-Sciences, 6(14), 3903-3918. https://doi.org/10.48047/AFJBS.6.14.2024.3903-3918

[104]. Etikani, P., Bhaskar, V. V. S. R., Nuguri, S., Saoji, R., & Shiva, K. (2023). Automating machine learning workflows with cloud-based pipelines. International Journal of Intelligent Systems and Applications in Engineering, 11(1), 375–382. https://doi.org/10.48047/ijisae.2023.11.1.375

[105]. Etikani, P., Bhaskar, V. V. S. R., Palavesh, S., Saoji, R., & Shiva, K. (2023). AI-powered algorithmic trading strategies in the stock market. International Journal of Intelligent Systems and Applications in Engineering, 11(1), 264–277. https://doi.org/10.1234/ijsdip.org_2023-Volume-11-Issue-1_Page_264-277

[106]. Shiva, K., Etikani, P., Bhaskar, V. V. S. R., Mittal, A., Dave, A., Thakkar, D., Kanchetti, D., & Munirathnam, R. (2024). Anomaly detection in sensor data with machine learning: Predictive maintenance for industrial systems. J. Electrical Systems, 20-10s, 454–462.

[107]. Bhaskar, V. V. S. R., Etikani, P., Shiva, K., Choppadandi, A., & Dave, A. (2019). Building explainable AI systems with federated learning on the cloud. Journal of Cloud Computing and Artificial Intelligence, 16(1), 1–14.

[108]. Ogeti, P., Fadnavis, N. S., Patil, G. B., Padyana, U. K., & Rai, H. P. (2022). Blockchain technology for secure and transparent financial transactions. European Economic Letters, 12(2), 180-192. http://eelet.org.uk

[109]. Vijaya Venkata Sri Rama Bhaskar, Akhil Mittal, Santosh Palavesh, Krishnateja Shiva, Pradeep Etikani. (2020). Regulating AI in Fintech: Balancing Innovation with Consumer Protection. European Economic Letters (EEL), 10(1). https://doi.org/10.52783/eel.v10i1.1810

[110]. Krishnateja Shiva, Pradeep Etikani, Vijaya Venkata Sri Rama Bhaskar, Savitha Nuguri, Arth Dave. (2024). Explainable Ai for Personalized Learning: Improving Student Outcomes. International Journal of Multidisciplinary Innovation and Research Methodology, ISSN: 2960-2068, 3(2), 198–207. Retrieved from https://ijmirm.com/index.php/ijmirm/article/view/100

[111]. Dave, A., Shiva, K., Etikani, P., Bhaskar, V. V. S. R., & Choppadandi, A. (2022). Serverless AI: Democratizing machine learning with cloud functions. Journal of Informatics Education and Research, 2(1), 22-35. http://jier.org

[112]. Dave, A., Etikani, P., Bhaskar, V. V. S. R., & Shiva, K. (2020). Biometric authentication for secure mobile payments. Journal of Mobile Technology and Security, 41(3), 245-259.

[113]. Saoji, R., Nuguri, S., Shiva, K., Etikani, P., & Bhaskar, V. V. S. R. (2021). Adaptive AI-based deep learning models for dynamic control in software-defined networks. International Journal of Electrical and Electronics Engineering (IJEEE), 10(1), 89–100. ISSN (P): 2278–9944; ISSN (E): 2278–9952

[114]. Narendra Sharad Fadnavis. (2021). Optimizing Scalability and Performance in Cloud Services: Strategies and Solutions. International Journal on Recent and Innovation Trends in Computing and Communication, 9(2), 14–21. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/10889

[115]. Varun Nakra. (2023). Enhancing Software Project Management and Task Allocation with AI and Machine Learning. International Journal on Recent and Innovation Trends in Computing and Communication, 11(11), 1171–1178. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/10684

[116]. Arth Dave, Lohith Paripati, Venudhar Rao Hajari, Narendra Narukulla, & Akshay Agarwal. (2024). Future Trends: The Impact of AI and ML on Regulatory Compliance Training Programs. Universal Research Reports, 11(2), 93–101. Retrieved from https://urr.shodhsagar.com/index.php/j/article/view/1257

[117]. Joel lopes, Arth Dave, Hemanth Swamy, Varun Nakra, & Akshay Agarwal. (2023). Machine Learning Techniques And Predictive Modeling For Retail Inventory Management Systems. Educational Administration: Theory and Practice, 29(4), 698–706. https://doi.org/10.53555/kuey.v29i4.5645

[118]. Varun Nakra, Arth Dave, Savitha Nuguri, Pradeep Kumar Chenchala, Akshay Agarwal. (2023). Robo-Advisors in Wealth Management: Exploring the Role of AI and ML in Financial Planning. European Economic Letters (EEL), 13(5), 2028–2039. Retrieved from https://www.eelet.org.uk/index.php/journal/article/view/1514

[119]. Akhil Mittal, Pandi Kirupa Gopalakrishna Pandian. (2023). Adversarial Machine Learning for Robust Intrusion Detection Systems. International Journal on Recent and Innovation Trends in Computing and Communication, 11(11), 1459–1466. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/10918

[120]. Akhil Mittal, Pandi Kirupa Gopalakrishna Pandian. (2024). Deep Learning Approaches to Malware Detection and Classification. International Journal of Multidisciplinary Innovation and Research Methodology, ISSN: 2960-2068, 3(1), 70–76. Retrieved from https://ijmirm.com/index.php/ijmirm/article/view/94

[121]. Mittal, A., & Pandian, P. K. G. (2022). Anomaly detection in network traffic using unsupervised learning. International Journal on Recent and Innovation Trends in Computing and Communication, 10(12), 312. https://www.ijritcc.org

[122]. Akhil Mittal. (2024). Machine Learning-Based Phishing Detection: Improving Accuracy and Adaptability. International Journal of Intelligent Systems and Applications in Engineering, 12(22s), 587–595. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6524

[123]. Nitin Prasad. (2024). Integration of Cloud Computing, Artificial Intelligence, and Machine Learning for Enhanced Data Analytics. International Journal of Intelligent Systems and Applications in Engineering, 12(22s), 11–20. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6381

[124]. Nitin Prasad. (2022). Security Challenges and Solutions in Cloud-Based Artificial Intelligence and Machine Learning Systems. International Journal on Recent and Innovation Trends in Computing and Communication, 10(12), 286–292. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/10750

[125]. Prasad, N., Narukulla, N., Hajari, V. R., Paripati, L., & Shah, J. (2020). AI-driven data governance framework for cloud-based data analytics. Volume 17, (2), 1551-1561.

[126]. Jigar Shah , Joel lopes , Nitin Prasad , Narendra Narukulla , Venudhar Rao Hajari , Lohith Paripati. (2023). Optimizing Resource Allocation And Scalability In Cloud-Based Machine Learning Models. Migration Letters, 20(S12), 1823–1832. Retrieved from https://migrationletters.com/index.php/ml/article/view/10652

[127]. Big Data Analytics using Machine Learning Techniques on Cloud Platforms. (2019). International Journal of Business Management and Visuals, ISSN: 3006-2705, 2(2), 54-58. https://ijbmv.com/index.php/home/article/view/76

[128]. Shah, J., Narukulla, N., Hajari, V. R., Paripati, L., & Prasad, N. (2021). Scalable machine learning infrastructure on cloud for large-scale data processing. Tuijin Jishu/Journal of Propulsion Technology, 42(2), 45-53.

[129]. Narukulla, N., Hajari, V. R., Paripati, L., Shah, J., Prasad, N., & Pandian, P. K. G. (2024). Edge computing and its role in enhancing artificial intelligence and machine learning applications in the cloud. J. Electrical Systems, 20(9s), 2958-2969.

[130]. Narukulla, N., Lopes, J., Hajari, V. R., Prasad, N., & Swamy, H. (2021). Real-time data processing and predictive analytics using cloud-based machine learning. Tuijin Jishu/Journal of Propulsion Technology, 42(4), 91-102

[131]. Secure Federated Learning Framework for Distributed Ai Model Training in Cloud Environments. (2019). International Journal of Open Publication and Exploration, ISSN: 3006-2853, 7(1), 31-39. https://ijope.com/index.php/home/article/view/145

[132]. Lohith Paripati. (2024). Edge Computing for AI and ML: Enhancing Performance and Privacy in Data Analysis . International Journal on Recent and Innovation Trends in Computing and Communication, 12(2), 445–454. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/10848

[133]. Paripati, L., Prasad, N., Shah, J., Narukulla, N., & Hajari, V. R. (2021). Blockchain-enabled data analytics for ensuring data integrity and trust in AI systems. International Journal of Computer Science and Engineering (IJCSE), 10(2), 27–38. ISSN (P): 2278–9960; ISSN (E): 2278–9979.

[134]. Arth Dave. (2024). Improving Financial Forecasting Accuracy with AI-Driven Predictive Analytics. International Journal of Intelligent Systems and Applications in Engineering, 12(21s), 3866 –. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6158

[135]. Hajari, V. R., Chaturvedi, R., Sharma, S., Tilala, M., & Chawda, A. D. (2024). Risk-based testing methodologies for FDA compliance in medical devices. African Journal of Biological Sciences, 6(Si4), 3949-3960. https://doi.org/10.48047/AFJBS.6.Si4.2024.3949-3960

[136]. Hajari, V. R., Prasad, N., Narukulla, N., Chaturvedi, R., & Sharma, S. (2023). Validation techniques for AI/ML components in medical diagnostic devices. NeuroQuantology, 21(4), 306-312. https://doi.org/10.48047/NQ.2023.21.4.NQ23029

[137]. Hajari, V. R., Chaturvedi, R., Sharma, S., Tilala, M., Chawda, A. D., & Benke, A. P. (2023). Interoperability testing strategies for medical IoT devices. Tuijin Jishu/Journal of Propulsion Technology, 44(1), 258.

[138]. Kumar, A., Dodda, S., Kamuni, N., & Arora, R. K. (2024). Unveiling the impact of macroeconomic policies: A double machine learning approach to analyzing interest rate effects on financial markets. arXiv. https://arxiv.org/abs/2404.07225

[139]. Suresh Dodda, Anoop Kumar, Navin Kamuni, et al. Exploring Strategies for Privacy-Preserving Machine Learning in Distributed Environments. TechRxiv. April 18, 2024.

[140]. DOI: 10.36227/techrxiv.171340711.17793838/v1

[141]. Kumar, A., Ayyalasomayajula, M. M. T., Panwar, D., & Vasa, Y. (2024). Optimizing photometric light curve analysis: Evaluating Scipy's minimize function for eclipse mapping of cataclysmic variables. arXiv. https://doi.org/10.48550/arXiv.2406.00071

[142]. Kumar, A., Dodda, S., Kamuni, N., & Vuppalapati, V. S. M. (2024). The emotional impact of game duration: A framework for understanding player emotions in extended gameplay sessions. arXiv. https://doi.org/10.48550/arXiv.2404.00526

[143]. Kumar, A. (2019). Implementation core business intelligence system using modern IT development practices (Agile & DevOps). International Journal of Management, IT and Engineering, 8(9), 444-464. https://doi.org/10.5281/zenodo.1234567

[144]. Ashutosh Tripathi, Low-Code/No-Code Development Platforms,

[145]. International Journal of Computer Applications (IJCA), 4(1), 2023, pp. 27–35.

[146]. https://iaeme.com/Home/issue/IJCA?Volume=4&Issue=1

[147]. Ashutosh Tripathi, Optimal Serverless Deployment Methodologies: Ensuring Smooth Transitions and Enhanced Reliability, Face Mask Detection, Journal of Computer Engineering and Technology (JCET) 5(1), 2022, pp. 21-28.

[148]. Tripathi, A. (2020). AWS serverless messaging using SQS. IJIRAE: International Journal of Innovative Research in Advanced Engineering, 7(11), 391-393.

[149]. Tripathi, A. (2019). Serverless architecture patterns: Deep dive into event-driven, microservices, and serverless APIs. International Journal of Creative Research Thoughts (IJCRT), 7(3), 234-239. Retrieved from http://www.ijcrt.org

[150]. Bellapukonda, P., Vijaya, G., Subramaniam, S., & Chidambaranathan, S. (2024). Security and optimization in IoT networks using AI-powered digital twins. In Harnessing AI and Digital Twin Technologies in Businesses (p. 14). https://doi.org/10.4018/979-8-3693-3234-4.ch024

[151]. E. A. Banu, S. Chidambaranathan, N. N. Jose, P. Kadiri, R. E. Abed and A. Al-Hilali, "A System to Track the Behaviour or Pattern of Mobile Robot Through RNN Technique," 2024 4th International Conference on Advance Computing and Innovative Technologies in Engineering (ICACITE), Greater Noida, India, 2024, pp. 2003-2005, doi: 10.1109/ICACITE60783.2024.10617430.

[152]. Patil, Y. M., Abraham, A. R., Chaubey, N. K., Baskar, K., & Chidambaranathan, S. (2024). A comparative analysis of machine learning techniques in creating virtual replicas for healthcare simulations. In Harnessing AI and Digital Twin Technologies in Businesses (p. 12). https://doi.org/10.4018/979-8-3693-3234-4.ch002

[153]. George, B., Oswal, N., Baskar, K., & Chidambaranathan, S. (2024). Innovative approaches to simulating human-machine interactions through virtual counterparts. In Harnessing AI and Digital Twin Technologies in Businesses (p. 11). https://doi.org/10.4018/979-8-3693-3234-4.ch018

[154]. Charaan, R. M. D., Chidambaranathan, S., Jothivel, K. M., Subramaniam, S., & Prabu, M. (2024). Machine learning-driven data fusion in wireless sensor networks with virtual replicas: A comprehensive evaluation. In Harnessing AI and Digital Twin Technologies in Businesses (p. 11). https://doi.org/10.4018/979-8-3693-3234-4.ch020

[155]. Ayyavaraiah, M., Jeyakumar, B., Chidambaranathan, S., Subramaniam, S., Anitha, K., & Sangeetha, A. (2024). Smart transportation systems: Machine learning application in WSN-based digital twins. In Harnessing AI and Digital Twin Technologies in Businesses (p. 11). https://doi.org/10.4018/979-8-3693-3234-4.ch026

[156]. Venkatesan, B., Mannanuddin, K., Chidambaranathan, S., Jeyakumar, B., Rayapati, B. R., & Baskar, K. (2024). Deep learning safeguard: Exploring GANs for robust security in open environments. In Enhancing Security in

Public Spaces Through Generative Adversarial Networks (GANs) (p. 14). https://doi.org/10.4018/979-8-3693-3597-0.ch009

[157]. P. V, V. R and S. Chidambaranathan, "Polyp Segmentation Using UNet and ENet," 2023 6th International Conference on Recent Trends in Advance Computing (ICRTAC), Chennai, India, 2023, pp. 516-522, doi: 10.1109/ICRTAC59277.2023.10480851.

[158]. Athisayaraj, A. A., Sathiyanarayanan, M., Khan, S., Selvi, A. S., Briskilla, M. I., Jemima, P. P., Chidambaranathan, S., Sithik, A. S., Sivasankari, K., & Duraipandian, K. (2023). Smart thermal-cooler umbrella (UK Design No. 6329357).

[159]. Krishnateja Shiva. (2024). Natural Language Processing for Customer Service Chatbots: Enhancing Customer Experience. International Journal of Intelligent Systems and Applications in Engineering, 12(22s), 155–164. Retrieved from https://ijisae.org/index.php/IJISAE/article/view/6405

[160]. Shiva, K., Etikani, P., Bhaskar, V. V. S. R., Mittal, A., Dave, A., Thakkar, D., Kanchetti, D., & Munirathnam, R. (2024). Anomaly detection in sensor data with machine learning: Predictive maintenance for industrial systems. Journal of Electrical Systems, 20(10s), 454-462.

[161]. Kanchetti, D., Munirathnam, R., & Thakkar, D. (2024). Integration of Machine Learning Algorithms with Cloud Computing for Real-Time Data Analysis. Journal for Research in Applied Sciences and Biotechnology, 3(2), 301–306. https://doi.org/10.55544/jrasb.3.2.46

[162]. Challa, S. S. S., Chawda, A. D., Benke, A. P., & Tilala, M. (2023). Regulatory intelligence: Leveraging data analytics for regulatory decision-making. International Journal on Recent and Innovation Trends in Computing and Communication, 11, 10.

[163]. Challa, S. S. S., Chawda, A. D., Benke, A. P., & Tilala, M. (2024). Streamlining change control processes in regulatory affairs: Best practices and case studies. Integrated Journal for Research in Arts and Humanities, 4(4), 4.

[164]. Challa, S. S. S., Tilala, M., Chawda, A. D., & Benke, A. P. (2019). Investigating the use of natural language processing (NLP) techniques in automating the extraction of regulatory requirements from unstructured data sources. Annals of Pharma Research, 7(5),

[165]. Challa, S. S. S., Tilala, M., Chawda, A. D., & Benke, A. P. (2021). Navigating regulatory requirements for complex dosage forms: Insights from topical, parenteral, and ophthalmic products. NeuroQuantology, 19(12), 15.

[166]. Challa, S. S. S., Tilala, M., Chawda, A. D., & Benke, A. P. (2022). Quality management systems in regulatory affairs: Implementation challenges and solutions. Journal for Research in Applied Sciences and Biotechnology, 1(3),

[167]. Gajera, B., Shah, H., Parekh, B., Rathod, V., Tilala, M., & Dave, R. H. (2024). Design of experiments-driven optimization of spray drying for amorphous clotrimazole nanosuspension. AAPS PharmSciTech, 25(6),

[168]. Hajari, V. R., Chaturvedi, R., Sharma, S., Tilala, M., & Chawda, A. D. (2024). Risk-based testing methodologies for FDA compliance in medical devices. African Journal of Biological Sciences, 6(4),

[169]. Tilala, M. (2023). Real-time data processing in healthcare: Architectures and applications for immediate clinical insights. International Journal on Recent and Innovation Trends in Computing and Communication, 11, 20.

[170]. Tilala, M. H., Chenchala, P. K., Choppadandi, A., Kaur, J., Naguri, S., Saoji, R., & ... (2024). Ethical considerations in the use of artificial intelligence and machine learning in health care: A comprehensive review. Cureus, 16(6), 2.

[171]. Tilala, M., & Chawda, A. D. (2020). Evaluation of compliance requirements for annual reports in pharmaceutical industries. NeuroQuantology, 18(11), 27.

[172]. Tilala, M., Challa, S. S. S., Chawda, A. D., Pandurang, A., & Benke, D. S. S. (2024). Analyzing the role of real-world evidence (RWE) in supporting regulatory decision-making and post-marketing surveillance. African Journal of Biological Sciences, 6(14),

[173]. Tilala, M., Chawda, A. D., & Benke, A. P. (2023). Enhancing regulatory compliance through training and development programs: Case studies and recommendations. Journal of Cardiovascular Research, 14(11),

[174]. Ashok Choppadandi, Jagbir Kaur, Pradeep Kumar Chenchala, Akshay Agarwal, Varun Nakra, Pandi Kirupa Gopalakrishna Pandian, 2021. "Anomaly Detection in Cybersecurity: Leveraging Machine Learning Algorithms" ESP Journal of Engineering & Technology Advancements 1(2): 34-41.

[175]. Ashok Choppadandi et al, International Journal of Computer Science and Mobile Computing, Vol.9 Issue.12, December- 2020, pg. 103-112. (Google scholar indexed)

[176]. Choppadandi, A., Kaur, J., Chenchala, P. K., Nakra, V., & Pandian, P. K. K. G. (2020). Automating ERP Applications for Taxation Compliance using Machine Learning at SAP Labs. International Journal of Computer Science and Mobile Computing, 9(12), 103-112. https://doi.org/10.47760/ijcsmc.2020.v09i12.014

[177]. [Chenchala, P. K., Choppadandi, A., Kaur, J., Nakra, V., & Pandian, P. K. G. (2020). Predictive Maintenance and Resource Optimization in Inventory Identification Tool Using ML. International Journal of Open Publication and Exploration, 8(2), 43-50. https://ijope.com/index.php/home/article/view/127]

[178]. AI-Driven Customer Relationship Management in PK Salon Management System. (2019). International Journal of Open Publication and Exploration, ISSN: 3006-2853, 7(2), 28-35. https://ijope.com/index.php/home/article/view/128

[179]. Kaur, J., Choppadandi, A., Chenchala, P. K., Nakra, V., & Pandian, P. K. G. (2019). AI Applications in Smart Cities(Jagbir 2019)"

[180]. Kaur, J., Choppadandi, A., Chenchala, P. K., Nakra, V., & Pandian, P. K. G. (2019). Case Studies on Improving User Interaction and Satisfaction using AI-Enabled Chatbots for Customer Service. International Journal of Transcontinental Discoveries, 6(1), 29-34. https://internationaljournals.org/index.php/ijtd/article/view/98]

[181]. Kaur, J., Choppadandi, A., Chenchala, P. K., Nakra, V., & Pandian, P. K. G. (2019). Case Studies on Improving User Interaction and Satisfaction using AI-Enabled Chatbots for Customer Service. International Journal of Transcontinental Discoveries, 6(1), 29-34. https://internationaljournals.org/index.php/ijtd/article/view/98]

[182]. Tilala, M. H., Chenchala, P. K., Choppadandi, A., Kaur, J., Naguri, S., Saoji, R., & Devaguptapu, B. (2024). Ethical Considerations in the Use of Artificial Intelligence and Machine Learning in Health Care: A Comprehensive Review. Cureus, 16(6), e62443. https://doi.org/10.7759/cureus.62443]

[183]. Predictive Maintenance and Resource Optimization in Inventory Identification Tool Using ML. (2020). International Journal of Open Publication and Exploration, ISSN: 3006-2853, 8(2), 43-50. https://ijope.com/index.php/home/article/view/127

[184]. Chenchala, P. K., Choppadandi, A., Kaur, J., Nakra, V., & Pandian, P. K. G. (2020). Predictive Maintenance and Resource Optimization in Inventory Identification Tool Using ML. International Journal of Open Publication and Exploration, 8(2), 43-50. https://ijope.com/index.php/home/article/view/127

[185]. Pradeep Kumar Chenchala. (2023). Social Media Sentiment Analysis for Enhancing Demand Forecasting Models Using Machine Learning Models. International Journal on Recent and Innovation Trends in Computing and Communication, 11(6), 595–601. Retrieved from https://www.ijritcc.org/index.php/ijritcc/article/view/10762

[186]. 2021

[187]. (Ashok : "Ashok Choppadandi, Jagbir Kaur, Pradeep Kumar Chenchala, Akshay Agarwal, Varun Nakra, Pandi Kirupa Gopalakrishna Pandian, 2021. "Anomaly Detection in Cybersecurity: Leveraging Machine Learning Algorithms" ESP Journal of Engineering & Technology Advancements 1(2): 34-41.") 2020

[188]. Ashok : "Choppadandi, A., Kaur, J., Chenchala, P. K., Nakra, V., & Pandian, P. K. K. G. (2020). Automating ERP Applications for Taxation Compliance using Machine Learning at SAP Labs. International Journal of Computer Science and Mobile Computing, 9(12), 103-112. https://doi.org/10.47760/ijcsmc.2020.v09i12.014"]

[189]. Predictive Maintenance and Resource Optimization in Inventory Identification Tool Using ML. (2020). International Journal of Open Publication and Exploration, ISSN: 3006-2853, 8(2), 43-50. https://ijope.com/index.php/home/article/view/127

[190]. Chenchala, P. K., Choppadandi, A., Kaur, J., Nakra, V., & Pandian, P. K. G. (2020). Predictive Maintenance and Resource Optimization in Inventory Identification Tool Using ML. International Journal of Open Publication and Exploration, 8(2), 43-50. https://ijope.com/index.php/home/article/view/127

[191]. 2019

[192]. Jagbir. : "Kaur, J., Choppadandi, A., Chenchala, P. K., Nakra, V., & Pandian, P. K. G. (2019). AI Applications in Smart Cities(Jagbir 2019)"]

[193]. Kaur, J., Choppadandi, A., Chenchala, P. K., Nakra, V., & Pandian, P. K. G. (2019). Case Studies on Improving User Interaction and Satisfaction using AI-Enabled Chatbots for Customer Service. International Journal of Transcontinental Discoveries, 6(1), 29-34. https://internationaljournals.org/index.php/ijtd/article/view/98]

[194]. Choppadandi, A., Kaur, J., Chenchala, P. K., Kanungo, S., & Pandian, P. K. K. G. (2019). AI-Driven Customer Relationship Management in PK Salon Management System. International Journal of Open Publication and Exploration, 7(2), 28-35. https://ijope.com/index.php/home/article/view/128.]

[195]. Kaur, J., Choppadandi, A., Chenchala, P. K., Nakra, V., & Pandian, P. K. G. (2019). Case Studies on Improving User Interaction and Satisfaction using AI-Enabled Chatbots for Customer Service. International Journal of Transcontinental Discoveries, 6(1), 29-34. https://internationaljournals.org/index.php/ijtd/article/view/98]