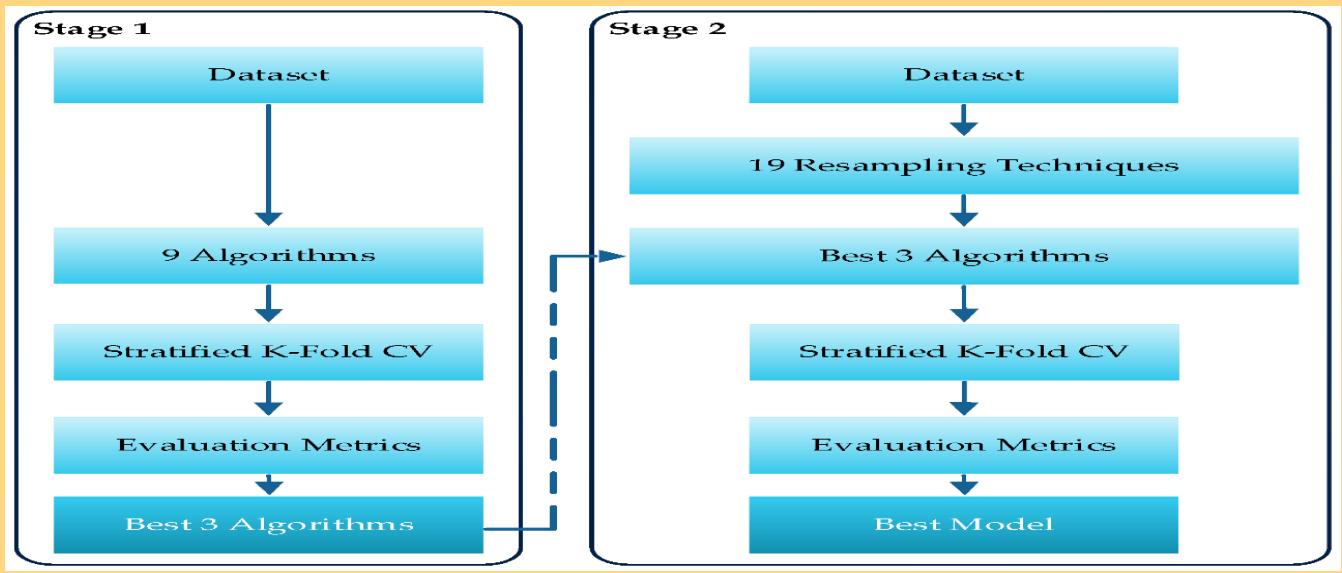


Enhancing data breach detection and ensuring customer data privacy in the banking sector using Isolation forest compared with one-class support vector machine

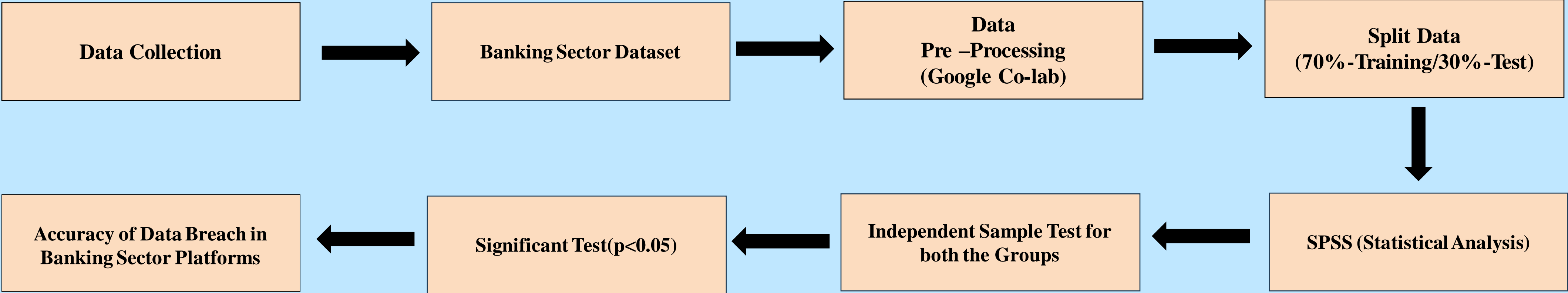
INTRODUCTION

- In the constantly evolving landscape of cybersecurity in the banking sector, the detection of data breaches and ensuring customer data privacy stands as a paramount challenge.
- This paper introduces a novel approach that integrates the Isolation Forest algorithm and compares its performance with the One-Class Support Vector Machine (SVM) for heightened effectiveness in data breach detection and privacy assurance.
- The focus is on evaluating the superiority of Isolation Forest over One-Class SVM, particularly in terms of accuracy and overall performance, underscoring the significance of cybersecurity and data breach detection in the banking sector.
- The foundation of this research is rooted in an extensive exploration of scholarly papers addressing the nuances of cybersecurity in the banking sector. Drawing insights from 1,500 comprehensive studies sourced from platforms review uncovers traditional and state-of-the-art approaches to data breach detection and privacy in the banking sector.
- The overarching goal of this study is to enhance data breach detection and ensure customer data privacy in the banking sector through the incorporation of the Isolation Forest algorithm.



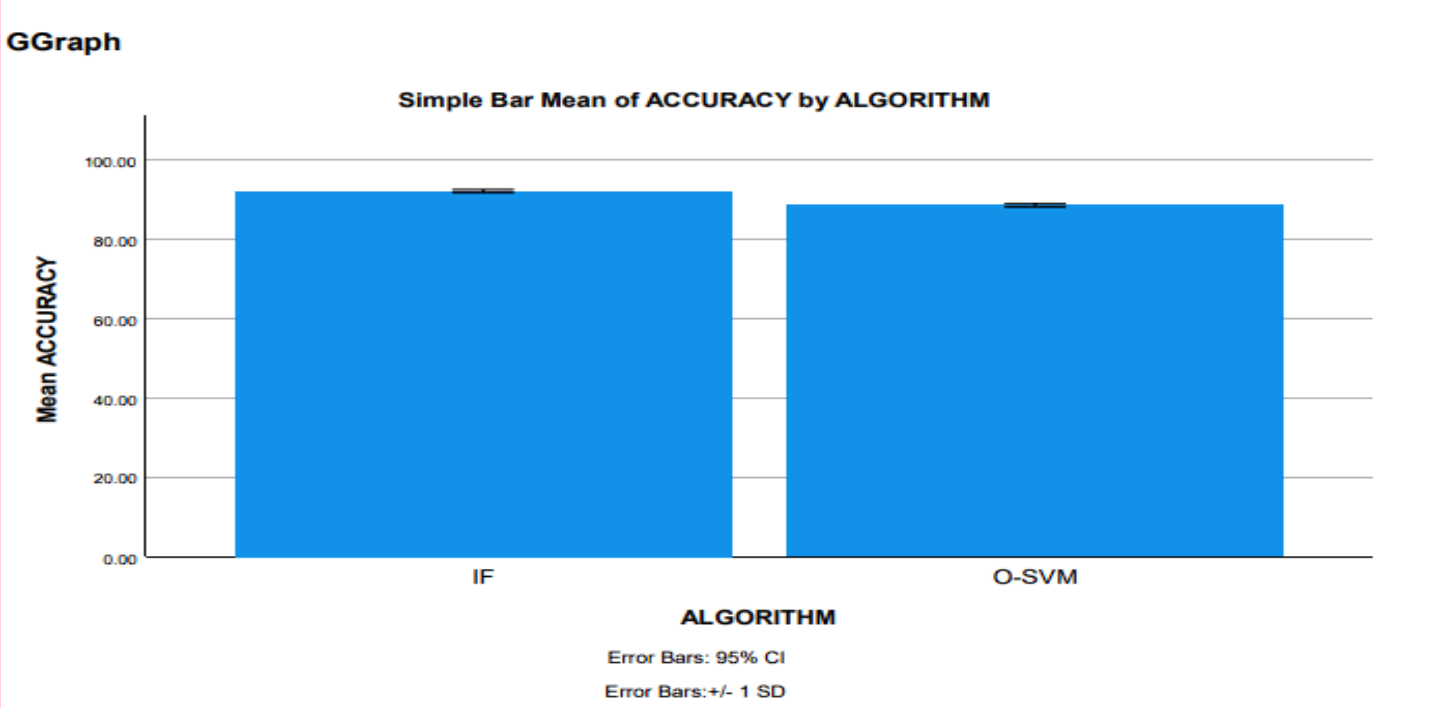
Data Breach Information

MATERIALS AND METHODS



Improving Product Information Accuracy in E-commerce Platforms

RESULTS



IF and O-SVM

- When comparing IF and O-SVM models in terms of mean accuracy, it is observed that IF expose more accuracy compared to O-SVM.

	Algorithms	N	MEAN	Std. Deviation	Std. Error Mean
Accuracy	IF	20	92.067	0.79920	.17871
	O-SVM	20	88.50	0.90851	.20315

		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Accuracy	Equal variances assumed	.030	.864	13.185	38	.000	3.56	.27057	3.019	4.115
	Equal variances not assumed			13.185	37.392	.000	3.56	.27057	3.019	4.115

Significant Threshold value of a Accuracy rate Comparison of IF and O-SVM algorithm.

DISCUSSION AND CONCLUSION

- This research study unmistakably demonstrates the superior performance of Isolation Forest over One-Class SVM concerning accuracy and overall performance in data breach detection and customer data privacy assurance in the banking sector.
- Isolation Forest achieves an outstanding accuracy rate, with a mean accuracy of 92.06%, surpassing One-Class SVM, which yields an accuracy of 88.50%. The application of an independent sample T-test confirms the statistical (Misman and Bhatti 2020; Siano et al. 2020) significance of these differences, highlighting the paramount importance of cybersecurity and customer data privacy.
- This research emphatically underscores the superior performance of Isolation Forest over One-Class SVM in the realm of data breach detection and customer data privacy assurance, emphasizing the pivotal aspects of cybersecurity in the banking sector.
- Isolation Forest achieves an impressive accuracy of 92.06%,surpassing the One-Class SVM's accuracy of 88.50%.
- Overall, the results suggest that Isolation Forest stands out as a promising and influential tool in revolutionizing the landscape of data breach detection and customer data privacy assurance, contributing significantly to improved cybersecurity and enhanced customer data protection in the banking sector.
- Isolation Forest's exceptional potential to significantly enhance accuracy and transform the landscape of this domain, emphasizing the crucial considerations of cybersecurity and customer data privacy.(Mageto 2021; Sun et al. 2020)

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Enhancing data breach detection and ensuring customer data privacy in the banking sector using Isolation forest compared with Gradient Boosting Algorithm

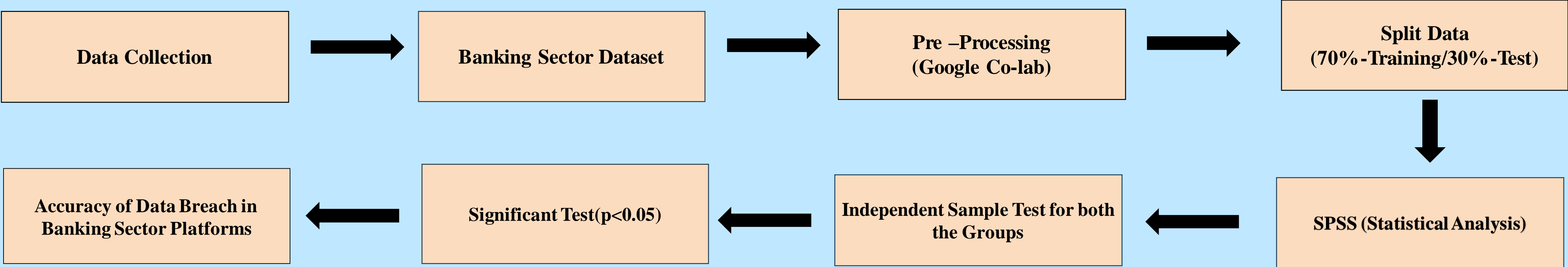
INTRODUCTION

- In the constantly evolving landscape of cybersecurity in the banking sector, the detection of data breaches and ensuring customer data privacy stands as a paramount challenge.
- This paper introduces a novel approach that integrates the Isolation Forest algorithm and compares its performance with the Gradient Boosting Algorithm (XGBOOST) for heightened effectiveness in data breach detection and privacy assurance.
- The focus is on evaluating the superiority of Isolation Forest over Gradient Boosting(XGBOOST), particularly in terms of accuracy and overall performance, underscoring the significance of cybersecurity and data breach detection in the banking sector.
- The foundation of this research is rooted in an extensive exploration of scholarly papers addressing the nuances of cybersecurity in the banking sector. Drawing insights from 1,500 comprehensive studies sourced from platforms review uncovers traditional and state-of-the-art approaches to data breach detection and privacy in the banking sector.
- The overarching goal of this study is to enhance data breach detection and ensure customer data privacy in the banking sector through the incorporation of the Isolation Forest algorithm.



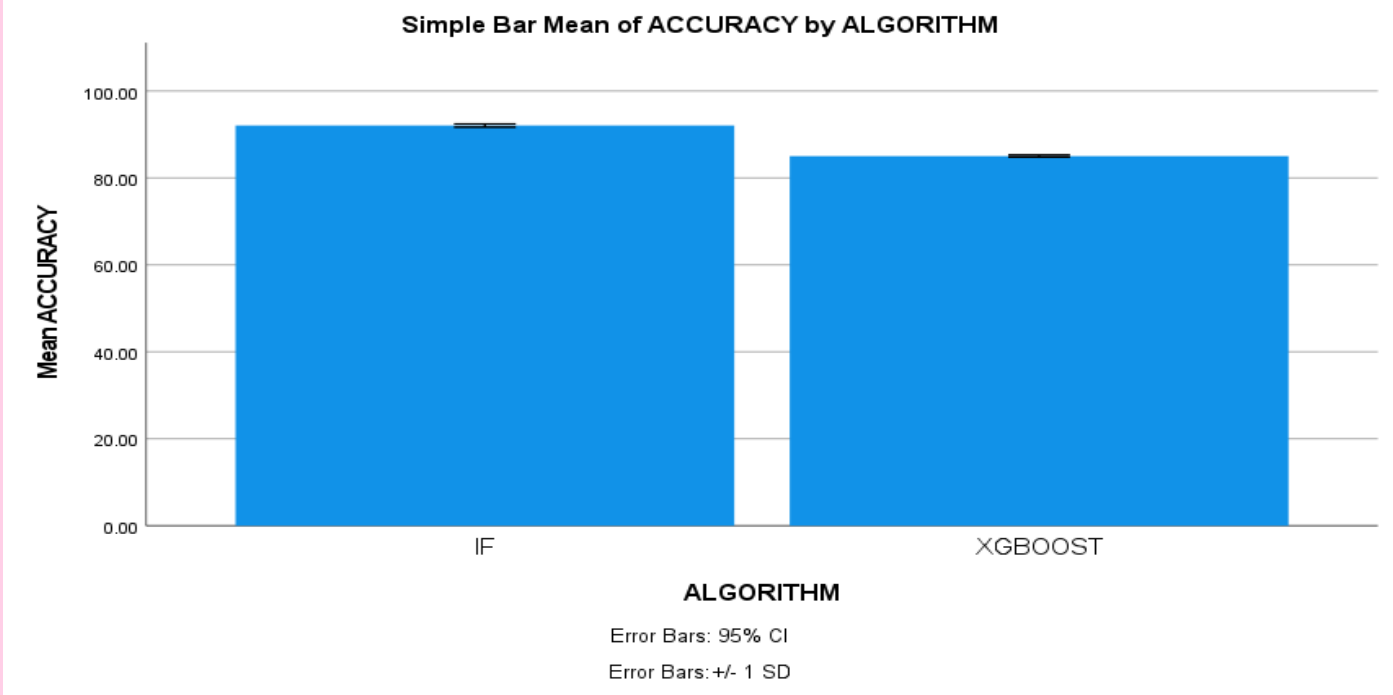
Data Breach Information

MATERIALS AND METHODS



Improving Data Accuracy in Banking Sector

RESULTS



IF and XGBOOST

- When comparing IF and XGBOOST models in terms of mean accuracy, it is observed that IF expose more accuracy compared to XGBOOST.

	Algorithms	N	MEAN	Std. Deviation	Std. Error Mean
Accuracy	IF	20	92.06	0.79920	.17871
	XGBOOST	20	85.04	0.52424	.11722

		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
Accuracy	Equal variances assumed	8.631	.006	32.861	38	.000	7.02315	.21372	6.59049	7.45581
	Equal variances not assumed			32.861	32.796	.000	7.02315	.21372	6.58822	7.45807

Significant Threshold value of a Accuracy rate Comparison of IF and XGBOOST algorithm.

DISCUSSION AND CONCLUSION

- This research study unmistakably demonstrates the superior performance of Isolation Forest over XGBOOST concerning accuracy and overall performance in data breach detection and customer data privacy assurance in the banking sector.
- Isolation Forest achieves an outstanding accuracy rate, with a mean accuracy of 92.06%, surpassing XGBOOST, which yields an accuracy of 88.50%. The application of an independent sample T-test confirms the statistical (Misman and Bhatti 2020; Siano et al. 2020) significance of these differences, highlighting the paramount importance of cybersecurity and customer data privacy.
- This research emphatically underscores the superior performance of Isolation Forest over XGBOOST in the realm of data breach detection and customer data privacy assurance, emphasizing the pivotal aspects of cybersecurity in the banking sector.
- Isolation Forest achieves an impressive accuracy of 92.06%,surpassing the XGBOOST accuracy of 88.50%.
- Overall, the results suggest that Isolation Forest stands out as a promising and influential tool in revolutionizing the landscape of data breach detection and customer data privacy assurance, contributing significantly to improved cybersecurity and enhanced customer data protection in the banking sector.
- Isolation Forest's exceptional potential to significantly enhance accuracy and transform the landscape of this domain, emphasizing the crucial considerations of cybersecurity and customer data privacy.(Mageto 2021; Sun et al. 2020)

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Enhancing data breach detection and ensuring customer data privacy in the banking sector using Isolation forest compared with K-Means Clustering

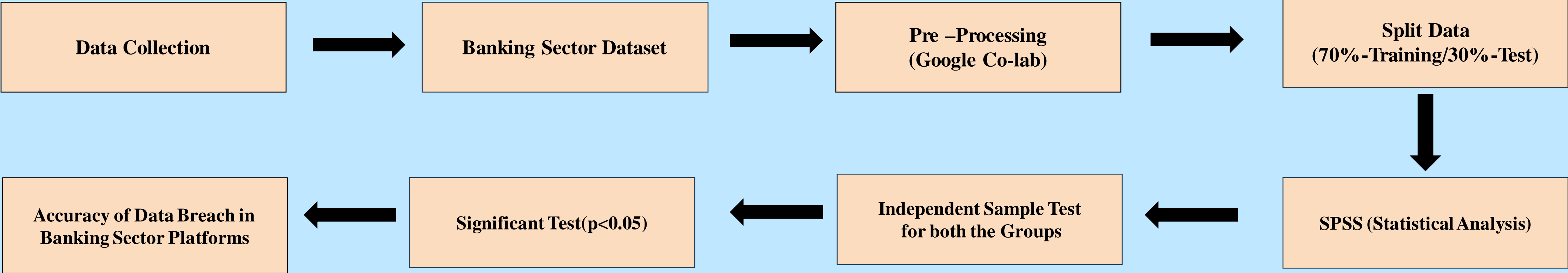
INTRODUCTION

- In the constantly evolving landscape of cybersecurity in the banking sector, the detection of data breaches and ensuring customer data privacy stands as a paramount challenge.
- This paper introduces a novel approach that integrates the Isolation Forest algorithm and compares its performance with the Gradient Boosting Algorithm (K-M) for heightened effectiveness in data breach detection and privacy assurance.
- The focus is on evaluating the superiority of Isolation Forest over K-means(K-M), particularly in terms of accuracy and overall performance, underscoring the significance of cybersecurity and data breach detection in the banking sector.
- The foundation of this research is rooted in an extensive exploration of scholarly papers addressing the nuances of cybersecurity in the banking sector. Drawing insights from 1,500 comprehensive studies sourced from platforms review uncovers traditional and state-of-the-art approaches to data breach detection and privacy in the banking sector.
- The overarching goal of this study is to enhance data breach detection and ensure customer data privacy in the banking sector through the incorporation of the Isolation Forest algorithm.
- The Isolation Forest algorithm stands as a powerful tool in the domain of machine learning, particularly well-suited for enhancing data breach detection and ensuring customer data privacy in the banking sector.



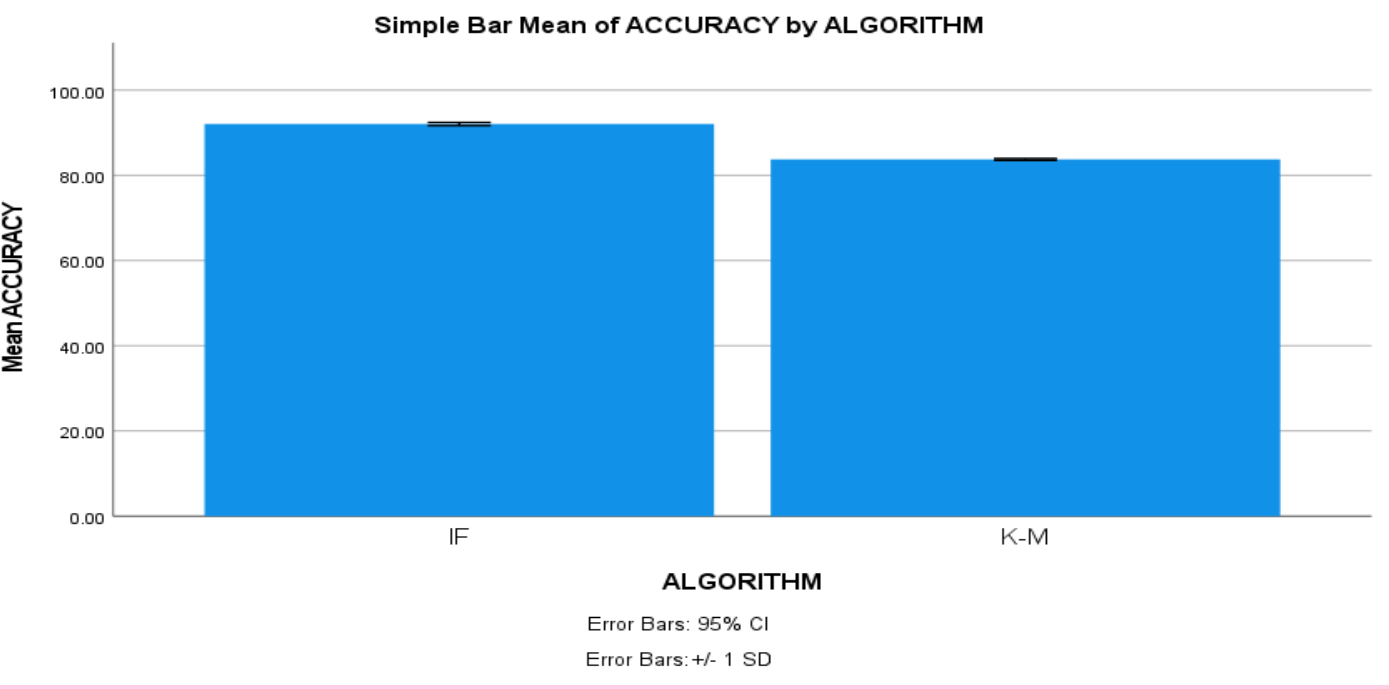
Data Breach Information

MATERIALS AND METHODS



Improving Data Accuracy in Banking Sector

RESULTS



IF and K-M

- When comparing IF and K-M models in terms of mean accuracy, it is observed that IF expose more accuracy compared to K-M.

	Algorithms	N	MEAN	Std. Deviation	Std. Error Mean
Accuracy	IF	20	92.06	0.79920	.17871
	K-M	20	83.74	0.48290	.10798

		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
Accuracy	Equal variances assumed	9.945	.003	39.885	38	.000	8.32791	.20880	7.90523	8.75060
	Equal variances not assumed			39.885	31.242	.000	8.32791	.20880	7.90220	8.75362

Significant Threshold value of a Accuracy rate Comparison of IF and K-M algorithm.

DISCUSSION AND CONCLUSION

- This research study unmistakably demonstrates the superior performance of Isolation Forest over K-M concerning accuracy and overall performance in data breach detection and customer data privacy assurance in the banking sector.
- Isolation Forest achieves an outstanding accuracy rate, with a mean accuracy of 92.06%, surpassing K-M, which yields an accuracy of 88.50%. The application of an independent sample T-test confirms the statistical (Misman and Bhatti 2020; Siano et al. 2020) significance of these differences, highlighting the paramount importance of cybersecurity and customer data privacy.
- This research emphatically underscores the superior performance of Isolation Forest over K-M in the realm of data breach detection and customer data privacy assurance, emphasizing the pivotal aspects of cybersecurity in the banking sector.
- Isolation Forest achieves an impressive accuracy of 92.06%,surpassing the K-M accuracy of 88.50%.
- Overall, the results suggest that Isolation Forest stands out as a promising and influential tool in revolutionizing the landscape of data breach detection and customer data privacy assurance, contributing significantly to improved cybersecurity and enhanced customer data protection in the banking sector.
- Isolation Forest's exceptional potential to significantly enhance accuracy and transform the landscape of this domain, emphasizing the crucial considerations of cybersecurity and customer data privacy.(Mageto 2021; Sun et al. 2020)

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Enhancing data breach detection and ensuring customer data privacy in the banking sector using Isolation forest compared with Naïve Bayes Classification

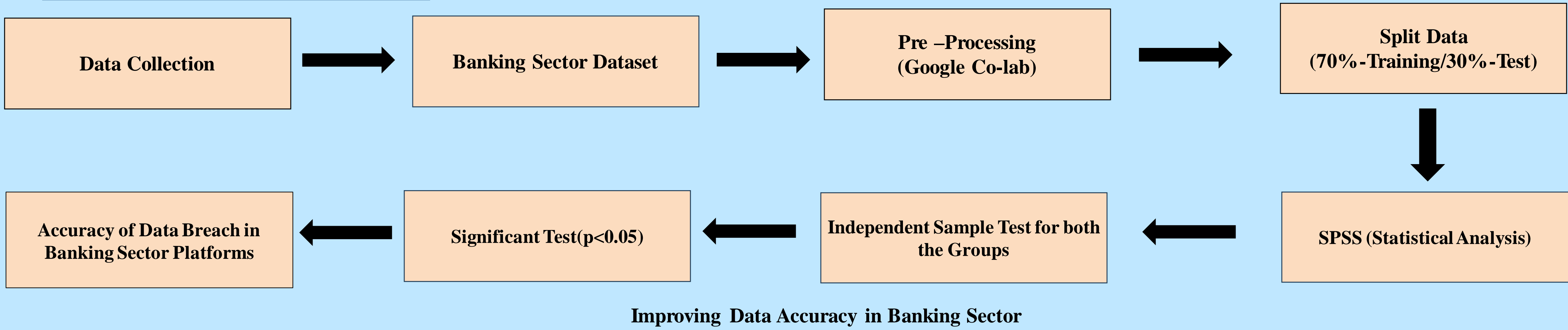
INTRODUCTION

- In the constantly evolving landscape of cybersecurity in the banking sector, the detection of data breaches and ensuring customer data privacy stands as a paramount challenge.
- This paper introduces a novel approach that integrates the Isolation Forest algorithm and compares its performance with the Naïve Bayes (NB) for heightened effectiveness in data breach detection and privacy assurance.
- The focus is on evaluating the superiority of Isolation Forest over Naïve Bayes(NB), particularly in terms of accuracy and overall performance, underscoring the significance of cybersecurity and data breach detection in the banking sector.
- The foundation of this research is rooted in an extensive exploration of scholarly papers addressing the nuances of cybersecurity in the banking sector. Drawing insights from 1,500 comprehensive studies sourced from platforms review uncovers traditional and state-of-the-art approaches to data breach detection and privacy in the banking sector.
- The overarching goal of this study is to enhance data breach detection and ensure customer data privacy in the banking sector through the incorporation of the Isolation Forest algorithm.

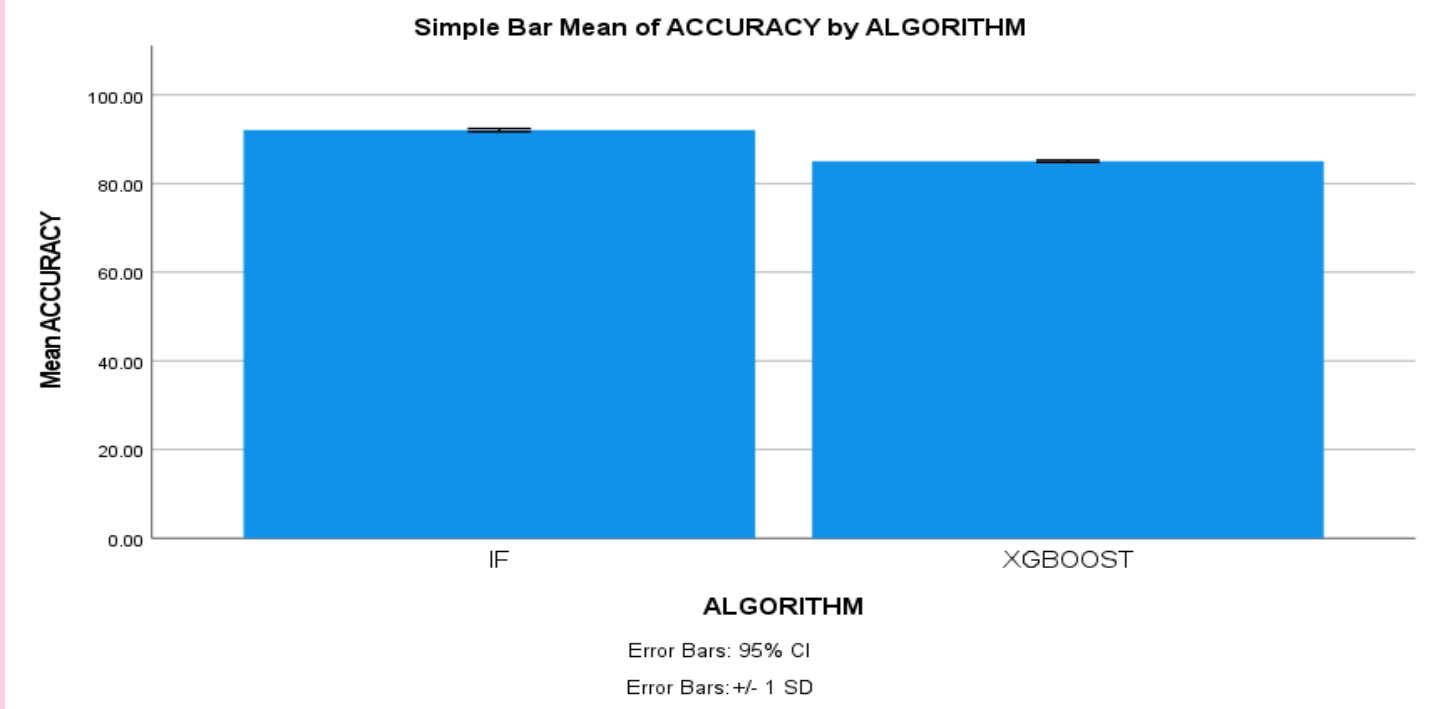


Data Breach Information

MATERIALS AND METHODS



RESULTS



IF and NB

- When comparing IF and NB models in terms of mean accuracy, it is observed that IF expose more accuracy compared to NB.

	Algorithms	N	MEAN	Std. Deviation	Std. Error Mean
Accuracy	IF	20	92.06	0.79920	.17871
	NB	20	83.38	0.43528	.09733

		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
Accuracy	Equal variances assumed	13.766	.001	42.669	38	.000	8.68290	.20349	8.27095	9.09485
	Equal variances not assumed			42.669	29.360	.000	8.68290	.20349	8.26693	9.09887

Significant Threshold value of a Accuracy rate Comparison of IF and NB algorithm.

DISCUSSION AND CONCLUSION

- This research study unmistakably demonstrates the superior performance of Isolation Forest over NB concerning accuracy and overall performance in data breach detection and customer data privacy assurance in the banking sector.
- Isolation Forest achieves an outstanding accuracy rate, with a mean accuracy of 92.06%, surpassing NB, which yields an accuracy of 88.50%. The application of an independent sample T-test confirms the statistical (Misman and Bhatti 2020; Siano et al. 2020) significance of these differences, highlighting the paramount importance of cybersecurity and customer data privacy.
- This research emphatically underscores the superior performance of Isolation Forest over NB in the realm of data breach detection and customer data privacy assurance, emphasizing the pivotal aspects of cybersecurity in the banking sector.
- Isolation Forest achieves an impressive accuracy of 92.06%,surpassing the NB accuracy of 88.50%.
- Overall, the results suggest that Isolation Forest stands out as a promising and influential tool in revolutionizing the landscape of data breach detection and customer data privacy assurance, contributing significantly to improved cybersecurity and enhanced customer data protection in the banking sector.
- Isolation Forest's exceptional potential to significantly enhance accuracy and transform the landscape of this domain, emphasizing the crucial considerations of cybersecurity and customer data privacy.(Mageto 2021; Sun et al. 2020)

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