The importance of mitigating the risk associated with online purchases for retail businesses cannot be overstated, phishing websites are a significant threat to these businesses as they deceive web users and steal their sensitive information. In this paper, we proposed a stack ensemble model consisting of three different classification algorithms RandomForest, GradientBoosting(Xgboost), and Adaptive Boosting (Ada Boost), with logistic regression as an aggregator, to detect phishing websites. The proposed model was evaluated and compared with each individual algorithm in the stack, as well as with existing studies. Our analysis showed that the proposed stack ensemble model performed better than each algorithms and existing studies in terms of accuracy, recall, specificity, precision, and F1 score. Specifically, our proposed model obtained an accuracy of 98.72%, recall of 98.84%, specificity of 98.60%, precision of 98.60%, and F1 score of 98.72%, with a low error rate of 1.28%. Overall, the results of our study demonstrate the effectiveness of the proposed stack ensemble model in detecting phishing websites for retail businesses. This model can play a crucial role in enhancing cybersecurity measures and mitigating the risks associated with online purchases. The findings of this study could be beneficial to security experts and policymakers working to improve cybersecurity in the retail industry.