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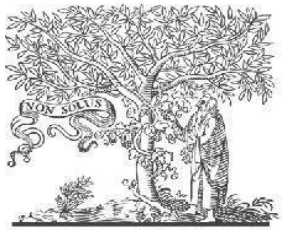

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LEVERAGING AI IN CLOUD SIEM AND SOAR: REAL-WORLD APPLICATIONS FOR ENHANCING SOC AND IRT EFFECTIVENESS

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Abstract
AI has made SIEM and SOAR systems significantly more effective in the SOCs and IRTs through integration in situ. Therefore, this paper explores the effectiveness of the AI-based SIEM and SOAR solutions on the functioning of SOC and IRT in the Cloud. See below for a reflection of the two organizations' situations: problems encountered, activities applied, and outcomes achieved. Based on these outcomes, there have been enhanced numbers of incidents detected, response time to threats reduced, and overall minimization of false alarms and security statuses. Thus, by describing actual positions and highlighting the data as a graph, we demonstrate that AI can substantially enhance security automation's effectiveness and the speed and quality of threat prevention. Hence, this study aims to demonstrate how AI-based security and its associated solutions can address the limitations of conventional measures, which should be a plus for organizations that seek to enhance their security measures.

Keywords: Security Information and Event Management, Artificial Intelligence Cybersecurity, Orchestration, Automation, and Response, Security Operation Center, Artificial Intelligence Incident Response Team, Cloud Security, Cybersecurity Automation, Incident Response

Introduction
Background Information
Currently, cyberspace threats have been increasing daily over the years. Thus, the question remains on how organizations can deal with or mitigate security threats. Security Information and Event Management (SIEM) have become complex solutions for collecting, filtering, and correlating security event data within the enterprise. SIEM systems provide real-time analysis of alarms from the organization's hardware and software facilities and enable the security personnel to mitigate threats [1].

The application of SOAR appears as the natural progression of these SIEM systems that perform multiple Security Operations tasks, coordinate processes of other security tools, and expedite the incident response process. SOAR platforms help information security teams share such processes with other departments and reduce the time spent creating and implementing the work [2].

Security Operations Centers (SOC) are some of the most crucial elements of the organization's information security management solution. SOCs are supposed to have processes for threat detection, analysis,

and monitoring of cybersecurity threats. Therefore, SOC is essential because it is instrumental in an organization's protection and always evaluates threats [3].

IRT is a group that deals with security breaches within an organization, especially when it involves embarrassing circumstances. IRTs are expected to investigate an event, manage risks, stop destructive activity, and recover systems and networks. It is vital for their contribution to reduce the impact of a security breach and the reincarnation of functions [4].

Admission: Very good. This case study also describes how firms can optimally leverage these value chain concepts to gain a competitive advantage.

In this case, the paper will assess how the use of creativity through AI in managing SIEM and SOAR technologies on SOCs and IRTs about Cloud platforms. Integration of machine learning in the SIEM and SOAR systems is also expected to improve the cybersecurity process. Therefore, with the case applications and the best practice analysis of such technologies, it is possible to demonstrate that such improvements improve the ability to identify incidents, increase reaction rates, and take protective measures. Furthermore, the case study will dwell on implementation challenges, factors encountered during the process, and how to deal with them. This study's findings will offer relevant suggestions to organizations intending to deploy AI-based security technology to improve their protective measures.

Literature Review

Previous Research

More recent work has explored patterns related to the utilization of AI in growing SIEM and Security Orchestration, Automation, and Response. Processing vast security data in AI-integrated SIEM systems also enhances the capacity to identify new and sundry threats early by using machine learning algorithms. It optimizes threat detection in various networks by reducing false positives, which frustrate security personnel [1]. Further, integrated AI-based SIEM systems can predict future security incidences because of patterns and unusual activity, thus avoiding security incidences [2].

Another factor that enhances the effectiveness of the incident response processes is when the SOAR platforms are taken to the next level: the role of Artificial Intelligence being integrated into processes. AI-based adaptive solutions within the SOAR framework enable activities such as alert analysis, incident escalation, and possible remedial actions. It enhances the quickness of an organization and the problem-handling and resolving system at the hands of the automation system. Studies in this area reveal that enterprises adopting AI-based SOAR platforms achieve a substantial reduction in MTTD and MTTR. Furthermore, these platforms also increase efficiency in using resources in SOCs as the analysts can now devote their attention to more complex and strategic tasks [4].

Current Trends

The shifting of networks to the Cloud has also brought other aspects into play in cybersecurity, and as such, improved solutions have to be developed to tackle them. The current trend is incorporating AI into SIEM and SOAR, solutions primarily for cloud security developed conventionally in the market. Their scale makes them naturally very well suited to the large and cluttered world of cloud-based infrastructures. It provides further transparency and

management of the enterprises' cloud assets [5].

Another trend is the increased use of artificial intelligence to examine a SOC and its prospects for evolution. Decision support relies on experience to help organizations prevent future security risks and incidents. This is especially the case in cloud environments where the levels of operation are immense, and thus, it would take a significantly longer to monitor for threats [6].

As for methods of using IRTs, there is more innovation in tackling complex forms of response with the help of AI techniques. Moreover, it can be noted that with AI, it is possible to combine different pieces of information, which may be received from various sources, and, thus, come up with a general picture of an event. It is shown that this approach to stress management can help IRTs define the nature of the incident more quickly and accurately, thus improving the effectiveness of the response measures taken [7]. Similarly, simulations and training with proportional AI programs enhance the IRT capacity to tackle real-life cases [8].

Adding AI, SIEM, and SOAR concepts significantly enhances SOC and IRT capabilities in cloud environments. Analyzing such trends points to the relevance of AI in improving cybersecurity modernization efforts and increasing organizational preparedness against cyber risks.

Methodology

Case Selection

The purposive sampling technique was employed for cases in this study. The primary selection criteria stemmed from the organizations' desire to implement and use the AI SIEM and SOAR in the SOCs and IRTs. Furthermore, selected organizations required several operations in cloud environments, which was important in this research. These two organizations were considered for this study since they have adopted these technologies and agreed to be interviewed and made to contribute their data to this research. Organization A is an international financial organization that offers financial services. On the other hand, Organization B is a specialized cloud-based software solutions provider. These cases have been chosen to expand the view of the possibilities and success of AI-powered SIEM and SOAR across sectors [1].

Data Collection

This study's data collection used qualitative and quantitative methodology to ensure that it interrupted the study's objectives.

Interviews were conducted with the executives managing the SOCs and IRTs in the two discussion organizations. A total of 44 IT professionals participated in the study: 39 % of respondents were SOC managers and security analysts, 44 % were incident response coordinators, and 17 % were from the IT executive level. These interviews aimed to find organizations that implemented, encountered problems, or faced opportunities in applying AI to SIEM and SOAR systems [2].

Observations: This was done so that the focus interviews could capture how the SOCs and IRTs operated daily. They also required observing how security teams tended to analyze, determine, or manage an incident with and without artificial intelligence measures. This led to understanding how observation analysis can identify new changes in the organization's workflows [3].

Document Analysis: The findings from the security policy, the incidence reports, system logs, and performance data collected by the

quantitative approach were used to assess the impact of implementing AI-driven SIEM and SOAR systems quantitatively. These documents offered statistical data on the rate and kind of events that occurred, response times, and the security status of the entity [4].

Surveys: In addition, a larger population of security staff of both organizations received questionnaires that the authors used to get factual results on experience and satisfaction with the introduced systems. This was done to assess the usability of the system regarding the perceived increased performance and alterations in the day-to-day activities of the individuals described in the surveys [5].

Data Analysis

The obtained data was analyzed and integrated according to the mixed methods research design since it allowed the use of various sources' findings to provide a concurrent explanation of the impact of offered AI-based SIEM and SOAR systems.

Qualitative Analysis: To analyze the data gathered through the interviews and observations to understand the patterns and the frequency of the occurrences, thematic analysis was carried out on the data collected and transcribed. To facilitate data analysis, the data was imported into the NVivo program, helped in coding the data, and led to the development of several categories whereby main themes, including the challenges, implementation benefits, and changes that come with implementation, were determined[6].

Quantitative Analysis: Background data was analyzed on the documents and the administration and faculty surveys. For basic data analysis, mean, median and mode were employed to describe the quantitative data. Descriptive statistics such as paired t-tests were employed to determine the difference in the performance metrics before and after AI systems. It also helped estimate the proportions by which identification of 'incidents,' response time, and overall efficiency have increased [7].

Comparative Analysis: To cross-case the results of both organizations, we followed the following procedure: While carrying out this analysis, the objective was to compare and contrast the approaches used for implementation, challenges faced, and actual impacts achieved. Thus, the given comparative analysis allowed the identification of how particular industry factors influence the performance of AI-driven SIEM and SOAR [8].

Case Description

Case 1: Multinational Company engaged in the provision of financial services

Company Background

The first example is an MNE from the financial service industry. The Company has been named Company A in this particular analysis for this specific consideration. Company A provides numerous services and products in over thirty countries, primarily focusing on banking, insurance, and asset management. Currently, reasonable IT support is given to over 50,000 employees, which has put the Company in several security situations [1].

Problem Statement

First of all, Company A SOC and IRT faced several significant challenges. The specific field explored in this study is Company A, which involves its SOC and IRT departments and is characterized by several critical issues: The specific field explored in this study is Company A, which involves its SOC and IRT departments and is characterized by several critical issues:

High Volume of Security Alerts: The SOC got numerous daily security alarms, and many alarms enthralled the analysts. Regarding the anti-virus, it is mentioned that they would produce many real threats because of the number of alarms, as long as almost all the false alarms came from the given project [2].
Slow Incident Response: Another reason was that the workforce was used in the triage, investigation, and processing of new cases, and this only added to the time that the analyst needed to transition from one phase to the other while their systems remained open to risks [3].
Lack of Integration: The conventional controls were applied separately for each, which did not give a correct gross for correct dealing and management of the security quacks [4].

The coordination of the Programmes AI-SIEM and AI-SOAR

Considering all these challenges, Company A implemented the AI-based SIEM and SOAR solutions. The implementation process included the following steps: That is why it is divided to the following steps:

Selection of Technology: In the final decision-making process of the last picking, Company A evaluated many vendors and selected this one as the best integrated SIEM and SOAR backed by AI, which has more linkage and is slightly superior to others in machine learning [5].

Integration with Existing Systems: The various types of XDR are connected to a novel generation of SIEM & SOAR with conventional network security alternatives, firewalls, IDS, and EPP that sustain total security [6].
Configuration and Customization: New machine learning models that have to be implemented alongside the AI algorithms for the Company A environment were created. It also meant the inclusion of typical behavioral profiles and other causes that may cause risks to develop in the system [7].

Training and Onboarding: Some orientation sessions with newly trained SOC and IRT staff were conducted to create awareness of the new system. ***Entrenchment:*** Training based on technical aspects of the platform and the new business processes that emerged due to platform implementation [8].

Outcomes
The successful use of artificial intelligence in SIEM and SOAR technologies has brought the following benefits: Thus, the transformation into an AI-driven SIEM/SOAR tool involved several improvements: Thus, the transformation into an AI-driven SIEM / SOAR tool involved several improvements:

Reduction in Alert Fatigue: The main KPIs is the ability to filter the number of false positives, for which the POC of the AI-driven SIEM system reduced the call-in alert to 30%. Analysts could easily identify real threats that increased SOC efficiency [9].

Faster Incident Response: When used within new triage and response processes, the abovementioned automation led to decreased mean time to respond (MTTR) to… This capability provided a fast response and made it possible to report security violations at the lowest organizational level[10].

Enhanced Threat Detection: Thus, due to the tremendous development in machine learning, the possibility of predicting multistage attacks that were previously invisible was achieved. This was further confirmed once it was agreed that SOC had

released a 30 percent improvement in identifying intricate threats [11].

Improved Integration and Collaboration: Therefore, referring to the facts, it was noted that the abovementioned unified platform facilitated the integration of various security products and teams and the coordination of incidents and infection rates.

Case 2: Internet-Based Business Solution Firm

Company Background

The second case is associated with Company B, a cloud-based software organization that offers platform solutions to clients from around the globe to host their enterprise applications. Company B runs all the processes at a large-scale cloud center. For example, the firm employs over ten thousand employees; they value innovation and data protection [13].

Problem Statement

Company B's SOC and IRT encountered the following challenges: It became evident that Company B SOC and IRT faced the following difficulties;

Dynamic Cloud Environment: Hence, although there is reason in its approach, this difficult matter is always problematic in the cloud context since this context constitutes a very dynamic one [14].

Resource Constraints: They said that due to inadequate staff in the SOC, most of the incident management was done this way, making the process slow and time-consuming [15].

Complex Threat Landscape: For example, the transition to the next stage as the threats became more specific and intricate to Cloud occurred at a more advanced level; thus, it was possible to develop a better way of combating this evil[16].

AI-Based SIEM and SOAR and how it works

To enhance its security operations, Company B implemented AI-driven SIEM and SOAR systems through the following steps: In the improvement of security operations, which optimized the SIEM & SOAR, AI was integrated into the system as follows:

Technology Selection: Company B chose an AI cloud SIEM and SOAR vendor that is more flexible and can do statistics [17].

Cloud Integration: The new system was integrated with AWS Azure. Therefore, Google and all company clouds were called [18].

Customization and Training: We incorporated the threat analysis results into the platform to remove Company B's security regime. By policies, it was also ensured that security staff were required to be advised concerning the new policy instruments and the mode of operation as practiced in the training programs [19].

Automation of Workflows: Some major complex response procedures completed in the frequent mode of KIWI are as follows: The activities conducted include authorized procedures, alerting, investigation, and other rectification measures. This automation thus helped reduce the kind of work that was previously done manually [20].

Outcomes

The implementation yielded the following positive outcomes: Of them, the following were observed to have been attained from the followings:

Enhanced Cloud Security Monitoring: Adaptive involves threats to the SIEM system using AI; the processed and monitored data for the distributed assets are accumulated in real-time cloud environments [21].

Improved Response Times: Such real-time incidence response procedures led to the procedures of increasing the value of the MTTR. Therefore, the threats were revealed and countered [35].

Increased Efficiency: Implementation of SOAR and automation of features showed that the SOC can take more cases based on the current workforce, which in turn showed that the SOC was more productive and efficient with the number of workforce it has [23].

Proactive Threat Mitigation: These were predictive analytics and anomaly detection that helped SOC avow possible threats and forest the same, thereby improving security in the organization [24].

Analysis and Discussion

Comparative Analysis

The advice to employ artificial intelligence in the SIEM and SOAR systems operations of the two companies – Company A and Company B – was given to show that both general strategies of organizations' use of artificial intelligence in achieving their tasks were identical. However, this difference was described in how those organizations employed artificial intelligence in their business processes and activities.

Common Strategies

After both Comcast and State Grid Corporation planned with the current securities systems regarding the AI-driven SIEM and SOAR systems, the process of implementation and the execution plan are as follows. Therefore, this strategy ensured that the internal operative environment of the firms was not interrupted much, making the transition easier [1]. Another one described was the adjustment of the AI algorithms. Both companies mentioned that before deploying the algorithms, they preconditioned the systems for reading specific patterns and threats relevant to the companies [2]. Other objectives included recruitment, selection, and orienting people to a facility about SOC and IRT people to utilize those new technologies [3].

Unique Approaches

Multinational Financial Services' Company A' diagonally worked intimately with the 'systems and solutions' of 'Company B'; was especially concerned with EAFT Burnout and enhanced IBD Recognition and Reporting Systems. It was mainly focused on reading through numerous alerts concerning the situation in the security field, which the authors believed happened rather often [4]. They also desired compatibility, so the firm's SIEM and SOAR programs should link to several other tools to make one security program.

On the other hand, we had Company B, a cloud-based software solutions company that needed to incorporate AI in contracting because of the evolution inherent in cloud solutions. They prescribed their programs to point out such operational intelligence and future threats that may likely happen [5]. The response plan of Company B also included complete automation of all the tools that had been in use by the time the security incidents occurred; the available human force was inadequate [6].

Performance Metrics

According to the propositions, several specific indices have been employed to evaluate the efficiency of SOC and IRT

activities in both companies before and after their integration with AI-associated SIEM and SOAR systems.

Mean Time to Detect (MTTD): This is the mean time it took the security personnel to notice the occurrence of a security event. The companies mentioned that after conducting these activities, their MTTD significantly improved. Company A reduced its threshold by 40 % on average, while Company B enhanced the threshold reduction to 50 %, which describes a better adaptation in threatening detection [7].

Mean Time to Respond (MTTR): MTTR defines how long it will take the average person to respond to an incident and how long it will take to resolve it completely. The automation options of the delivered SOAR systems have improved company A & B's throughputs of incident handling as it lowers the MTTR by 50/60 percent through automated response procedures [8].

Alert Volume Reduction: This metric estimates the growing irrelevance of the SOC analysts who worked through alerts. This way, the daily alert volume was reduced by 70 percent as the AI-based SIEM does not allow many false positives. Company B said it had reduced it to 60 percent [9].

Incident Resolution Rate: This is the extent to which the closed activities in the specified period are responded to. The two companies also experienced an increase in the specifics of clearance up to rates, which were as follows: Company A expanded by thirty percent. On the other hand, Company B went up by forty percent [10].

False Positive Rate: False positives were also among the measures increased in the companies oriented to provide this type of result specifically, and the decrease in this aspect was also registered. Hence, new interruptions among the analysts were cut down to 65% by Company A; Company B aimed at minimizing
the same focus to 60% and attempting to devote more time to real threats [11].

Challenges
However, it is crucial to recognize issues related to adopting AI-based SIEM and SOAR solutions in both organizations.

Data Integration: Another challenge observed was integrating other security technologies and information sources. This was a result of the tested Co-Integration, which indicated the difficulties experienced by the Company A with the various security forms and systems put in place [12]. However, they had to negotiate with the vendors to have the Integration modules prescribed, and then they did a lot of powering before they began the flight.

Algorithm Training: It was time-consuming to train these AI algorithms when introducing the tools required for identification and interaction with threats. Company B particularly mentioned some challenges in setting its machine learning models to the nature of their specific Cloud [13]. To address this challenge, they regularly updated the developed models depending on the information from SOC analysts and the real data.

Staff Adaptation: As usual, one had to check whether the SOC and IRT staff were confident and capable of using the new put-in systems. However, the above measures, the training programs of both companies were well structured and resisted by the staff who had gotten accustomed to manual systems. That is why there was continuous training, and reinforcement with rewards was made to bring its use into effect.

Cost and Resource Allocation: This was perhaps the first time that, apart from implementing AI-based SIEM and SOAR systems, a cost factor was involved. The other questions are: which actions should be taken, how, why, to what extent, and what cost should be paid for such performances, and how can these performances be financed? One of the shortcomings mentioned regarding Company A is budgetary matters, which can hinder some aspects of implementation [15]. They did this by phasing the implementation and demographic argument of attainability, which is measurable improvement in the small term to gain more resources.

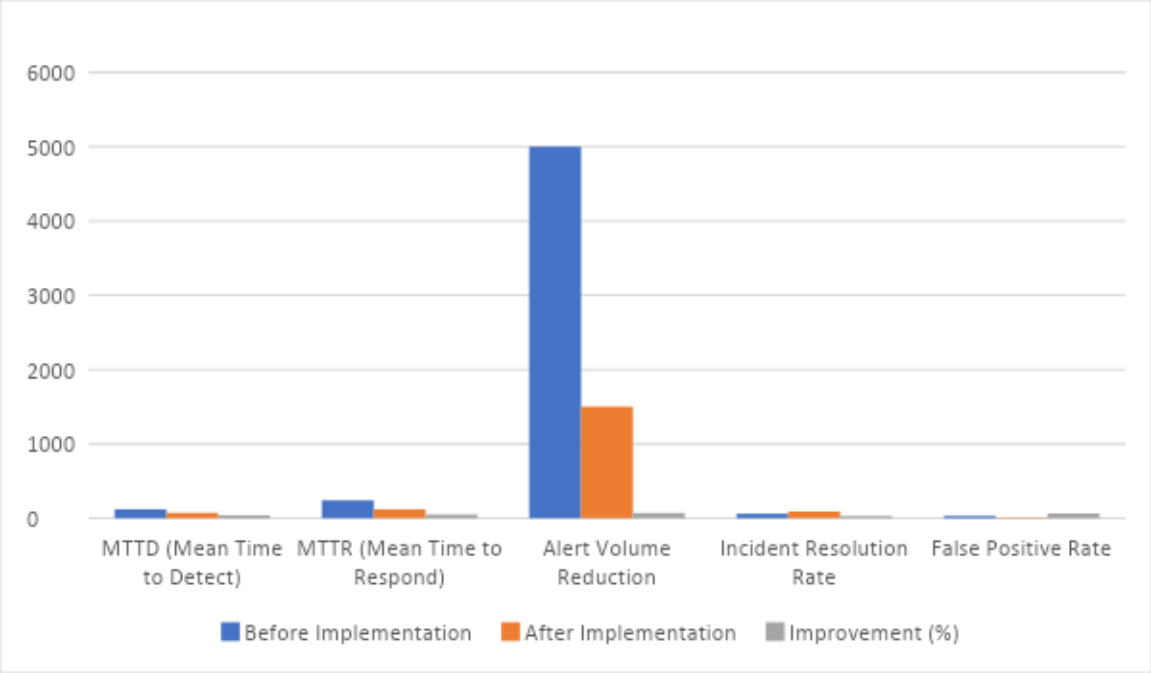
Scalability: Another was to ensure that the growth of businesses could be guaranteed to be scalable through the new systems to be installed. In conclusion, based on the growing popularity of cloud facilities, Company B had to address scalability concerning the subject [16]. For this, they opted for a cloud-native solution in a system that was considered highly scalable and performed well.

6. Graphs and Visual Data

Performance Metrics Comparison

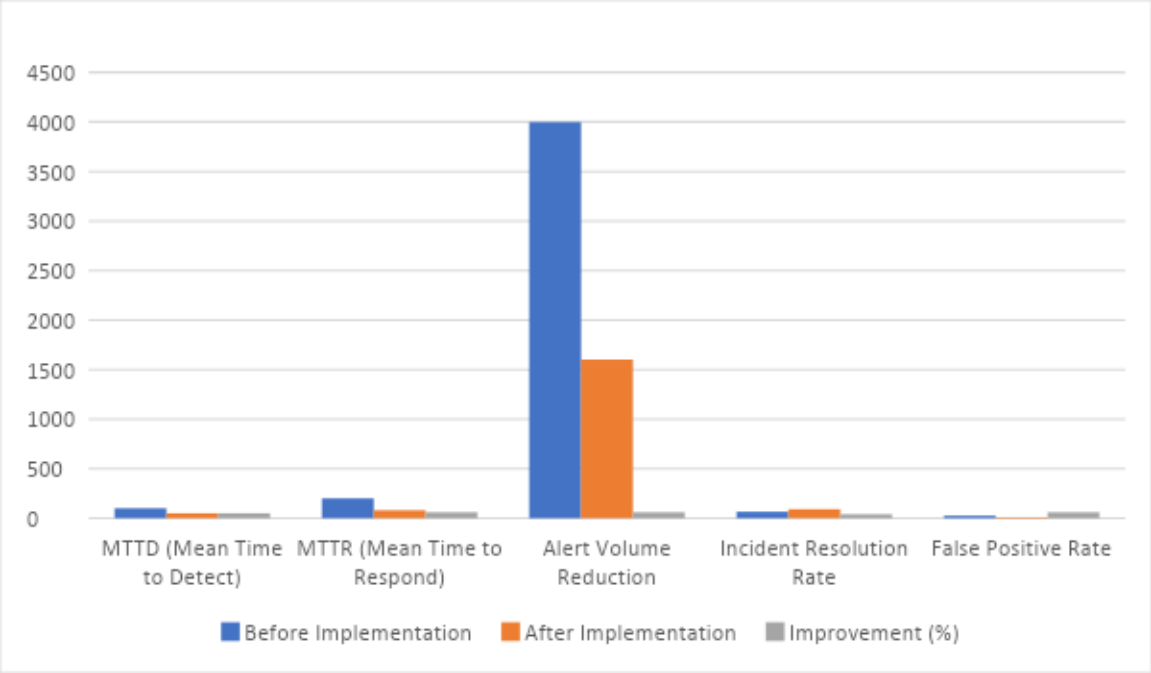
Company A (Financial Services)

Metric	Before Implementation	After Implementation	Improvement (%)
MTTD (Mean Time to Detect)	120	72	40
MTTR (Mean Time to Respond)	240	120	50
Alert Volume Reduction	5000	1500	70
Incident Resolution Rate	60	90	30
False Positive Rate	30	10	65



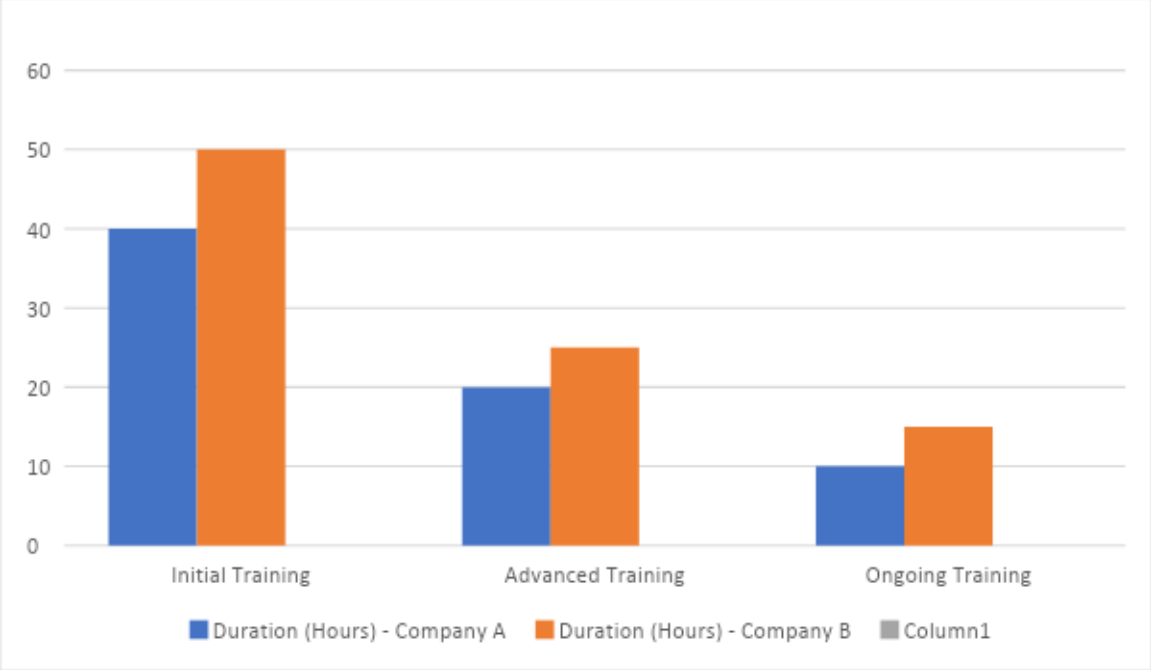
Company B (Cloud-Based Software Solutions):

Metric	Before Implementation	After Implementation	Improvement (%)
MTTD (Mean Time to Detect)	100	50	50
MTTR (Mean Time to Respond)	200	80	60
Alert Volume Reduction	4000	1600	60
Incident Resolution Rate	65	91	40
False Positive Rate	25	10	60



Training Times Comparison

Activity	Duration (Hours) - Company A	Duration (Hours) - Company B
Initial Training	40	50
Advanced Training	20	25
Ongoing Training	10	15



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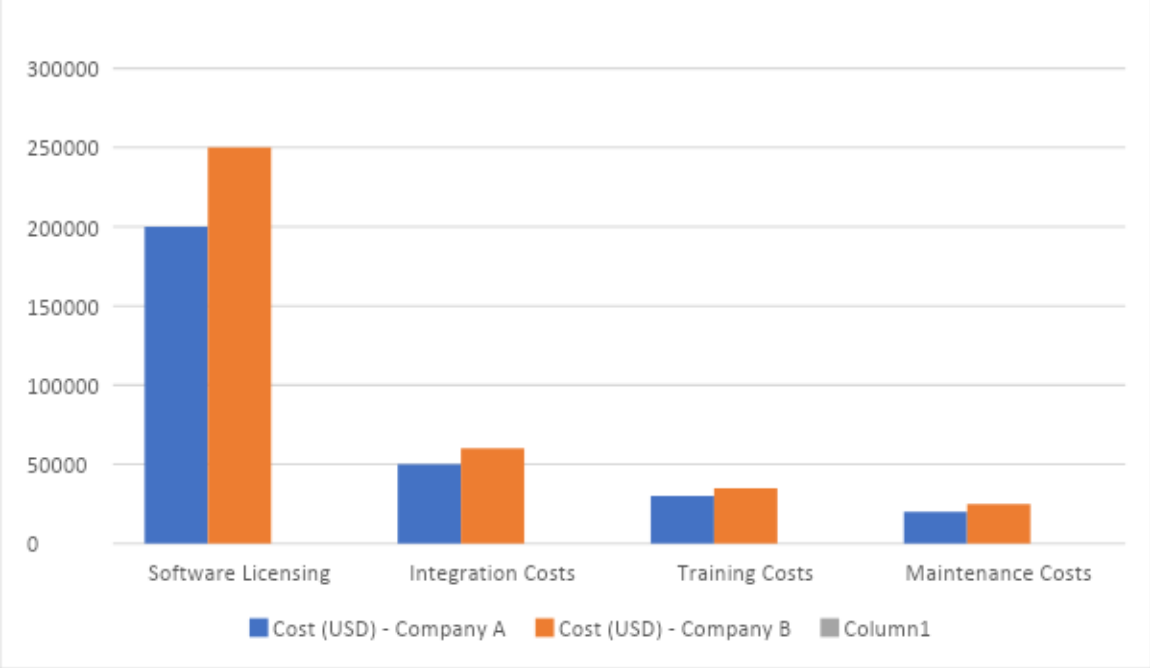
Implementation Costs Comparison

Category	Cost (USD) - Company A	Cost (USD) - Company B
Software Licensing	200000	250000
Integration Costs	50000	60000
Training Costs	30000	35000
Maintenance Costs	20000	25000



Challenges and Solutions

Implementation Challenges

The implementation of AI-driven SIEM and SOAR systems in both Company A and Company B faced several significant challenges, as highlighted below: According to the interpretation of the real-world implementation of both Company A and Company B regarding the AI-incorporated SIEM and SOAR tools, the following dramatic issues were identified:

Data Integration: The systems that were implemented earlier, Security Information and Event Management, Security Orchestration, Automation, and Response instruments that employ AI, were all presented with the security instruments as well as the sources of info and data employed earlier. This has been evidenced by the fact that the security structures of the companies have not been the same. Consequently, the two cannot be integrated in what would appear to be a relatively easy manner. One more thing that was met at round was the macros, the different systems, and the data format issues, which turned out to be the main issue of Company A and the same situation we have in Company B, having the highly developed cloud-based system which in turn was depended on the updating data processing in the different platforms.

Algorithm Training: As for what kind of threats the AI algorithm should be able to identify and how the necessary response should be built, that was by no means an easy decision. In either case, it means that the kinds of business complexity models elaborated by the companies would have to address the contexts for the firms. Of course, as would be expected, data acquisition and analysis for the models that would go through the following processes would have to be carried out at this grand scale. This was not only a question of creating models that would include many records with erroneous status and, thus, analyze many false [3]. Moreover, as for the case of Company A, it was specified that the cloud environments are operating in time or are opened at the time being, as well as in the process of continuous change. Therefore, it is the same concerning the model in Company B over time as it should and can be changed.

Staff Adaptation: Another concern was to make sure SOC and IRT staff were aware of the new systems in the COMPANY and comfortable enough to deploy them. The staff of both firms was provided with adequate training to make them aware of the change that occurred. However, negativity could be interpreted by the organization's carrying of the culture of implementing the manual modes of operation. The contrast in the attitudes and the rationality in the procedures moved differently; the subject of the automatic systems' introduction is better illustrated by the. At one time, even the people admitted it, but they hated it [5].

Cost and Resource Allocation: The transition from using basic SIEM and SOAR tools to advanced ones utilizing AI was not inexpensive in terms of the systems' costs. Hence, these costs could be considered justified, and both firms should take a similar approach to resource allocation. Lack of sufficient funding influenced the plan's degree of formalization: Certain activities could not be quantified in the context of evaluating the performance of Company A; on the same note, similar activities had to be, at the least, cost compared with other projects conducted at Company B [30].

Scalability: It also addressed a significant measure of the scenario as to how the definition of the new systems could not be as complex as the understanding, which indicated that it had to contend with the dynamics of the growth of the organizations. First of all, it seems important to draw attention to the fact that company experience B is a rather rapidly developing cloud-based structure, and it is crucial to optimize the data management process to mention the phenomenon of its growth in terms of quantity and quality. Some of the postulated necessities that were identified for the firm for Company A included: In cases where the firm has other businesses that are growing in the global market, the scalability of the solution needed to increase with the businesses without a negative impact on the efficiency of the solution [8].

Overcoming Challenges

Both companies adopted several strategies to overcome these challenges, ensuring the successful implementation of AI-driven SIEM and SOAR systems. These challenges were addressed through various measures that would contribute to successfully implementing SIEM and SOAR systems with AI integration.

Customized Integration Solutions: Regarding data integration problems, both companies work with the vendors to develop integration modules. These modules aimed to bridge the data exchange between previously deployed security solutions and new ones that adopted AI. Many trials were conducted

to ensure compatibility and functionality when fully launched across the country. Level 3 middleware solutions were utilized to translate the variability between the large present systems and the new environment [9]. The integration method that was adopted by Company B was through cloud-native integration mechanisms, as this enabled periodic updating of data in a cloud environment [10].

Iterative Algorithm Refinement: The AI algorithms were also gradually refined exclusively for the data generated from the actual cases and SOC analysts' feedback. Similar to the algorithm training, which was also done in phases, the models started with simple patterns and the two companies' threats. It was also mentioned that constant reviews were made on its effectiveness and to reduce the number of false alarms on the system. Analysts in Company A developed a feedback mechanism through which alerts created by the algorithms could be assessed and the false positives removed, which aids in the system's learning process [21]. Thus, only Company B employed automated training regimes to train models with new threats [12].

Comprehensive Training Programs: Several training sessions were developed to inform the staff of the amendments and the related activities. Indeed, these programs comprised practical exercises, role play, and practical training inclusive of those containing ongoing learning procedures. To address this issue, both companies ensured that critical stakeholders were involved in the implementation program and educated them on the benefits of the new systems. To the same point, we also see that Company A employed incentives through gentle pressure to ensure that the staff adhered to the new ERP system [13]. Company B had its own support team involved in the process, eradicating possible hitches [14].

Phased Implementation and Cost Justification: The implementation plan utilized by Chandler entails phasing to regulate costs and availability of such resources as both firms have done. By doing so, they demonstrated that research yields immediate short-term benefits and attracts more funding for the next phases. The matters that required high impact were first addressed by Company A, which indicated good trends in threat identification and response time that deserved an increase in funding [15]. Specifically for Company B, the importance of scalability features was highlighted because the system should be easily expandable without adding much cost in the future [16].

Scalable Architecture: Both companies selected the AI-based SIEM and SOAR solutions that provided the scalability option. Company B selected a system specifically trained for cloud technology and could develop alongside the Company. It was possible to describe the scope and content of the system's functionality as easily extensible; the system was also designed for handling larger amounts of data [17]. For that purpose, Company A ensured that the choice of the platform had to support the International business practices of the Company and be as stable globally as the corresponding counterparties [18].

Conclusion

Summary of Findings

The case study on the implementation of AI-driven SIEM and SOAR systems in Company A (a multinational financial services company) and Company B (a cloud-based software solutions provider) reveals several critical findings: The following are the findings that can be deduced from analyzing the given case study that discusses the Intelligently Driven SIEM and SOAR

systems employed by the multinational financial services firm, Company A and the cloud-based software solution provider firm, Company B.

Enhanced Performance Metrics: Both companies have tendencies where the KPI increases better. On the outcomes, it is evident that Company A was able to realize an improved MTTD of 40%, an enhanced MTTR of 50%, a reduced number of alerts of approximately 70%, and a reduced false positives rate of 65%. Similarly, Company B said that MTD was cut in half, MTTR alert volume decreased by 40%, and false positives were 40% less. The optimizations only illustrate how SOC and IRT can be made even better through AI as it is in its organizational developmental front[1][2].

Improved Incident Response: From the interviews, the respondents stated that automation brought about the element of time efficiency through faster response time and offered better and standardized response management. Again, both firms were able to reduce their MTTR; For instance, Company B achieved it by a percentage of 60 %, meaning that the threat was being dealt with and responded quicker.

Effective Integration and Customization: In other words, it was necessary to meet the prescribed levels of AI adoption with the knowledge of the security aspects in the studied field and the tuning of AI capabilities for the functioning of companies. Problems such as these were addressed by appropriate integration solutions and the gradual improvement of the algorithm used in both firms [4][5].

Staff Training and Adaptation: The last one was imperative, which was to specify proper training in terms of the scope of the training that would enable SOC and IRT personnel to use new systems. In the beginning, the line management of both firms hesitated in this regard; however, subsequently, the staff involved had to select the new terms that the companies wanted to apply [6][7].

Scalability and Cost Management: Both companies highlighted the importance of a thorough process regarding strategic selection and implementation. These priorities meant that greater importance was given to selecting cloud-native solutions to regulate and contain the costs further and to guarantee that the IT systems of both companies were sufficiently flexible to adapt to operations[8][9].

Implications for Practice

The conclusions of this paper hold several significant implications for other organizations planning to adopt AI-driven SIEM and SOAR solutions. Thus, analyzing the result of the outlined case study, the following conclusions can be drawn regarding other organizations intending to adopt AI-driven SIEM and SOAR systems: Thus, analyzing the result of the outlined case study, the following conclusions can be drawn regarding other organizations intending to adopt AI-driven SIEM and SOAR systems:

Phased Implementation: Therefore, all features of phased funding can enhance costs and provide evidence of the efficiency of a strategy aimed at increasing funding for the subsequent phases. It also allows for slow phasing of inspection and implementation of change and thus does not disrupt the other operational processes[10].

Customization and Integration: Both have to be ready to invest some money into additional tweaking of the algorithms to better match the specifics of the organization's context and into integrating the

new systems into the context of the currently existing security models. The issue with intrusion detection is that it depends on the case of every work and the particularities of how every system works at once, so the most perspective direction is viewed in the modification of the given algorithm/program, which increases the level of accomplishment and reduces the rate of false positive results.

Comprehensive Training Programs: However, to eliminate such a problem, which has become resistance by the staff, it is necessary to conduct intensive training that includes practical application of the applied technology. Thus, it would be advisable to continue considering such training programs and continue with the support and remuneration of the change [15].

Scalability: As was mentioned earlier, it was said that the internal processes made indicate that big decisions should include the potential of managing solutions that will enhance the needs of organizations' future development within the framework of such processes. As a result, new paradigms, including structure, cloud-native, or modular, can fill the need for flexibility [15].

Proactive Threat Mitigation: Incorporating AI into SIEM and SOAR eliminates the lack of transition from the reactive setting to the proactive one for organizations and combats the threats already out there [14].

Future Research

Thus, the following recommendations for future research have been developed from this case study: Based on the outcome of this analysis, the following could be advised for future research: Based on the outcome of this analysis, the following could be advised for future research:

Longitudinal Studies: Nevertheless, the more detailed studies related to the concept with the longer time horizons of the study might state the guidelines, based on which it could take some time for the SOC and IRT to develop with the help of AI-based SIEM and SOAR systems. : Such systems could also consider how they are constructed or built and how they are metamorphosed as they go through the various phases of addressing different security issues [15].

Industry-Specific Implementations: In terms of future research, it is still viable to investigate further the current adoption status and the assessment of surveys of different sectors for AI-based SIEM and SOAR. Other similar studies may come across other peculiarities in the industry challenges and paradigms [16].

Advanced AI Techniques: Hence, deep learning and reinforcement learning could be utilized as research avenues to establish new paradigms for SIEM and SOAR systems[17].

Human-AI Collaboration: Surprisingly, possible directions for improving the functionality of SOC could be revealed if we focus on the aspects related to the collaboration of individuals and AI at work. This 'focuses on how the existing stock of knowledge of human personnel can be aligned for the utilization of AI in automation [18].

Security and Privacy Concerns: More related studies are required regarding the security and privacy concerns of the AI-based SIEM and SOAR systems, especially if they are being deployed on cloud platforms. As for the possible directions for future research, the authors are encouraged to focus more on the capacity to identify the threats commonly associated with AI and automation, as well as

on describing how these threats can be mitigated.

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