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The Process of Providing Security Protection in the Amazon E-Commerce System

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Abstract

In this discussion, entitled "The process of providing security protection in the Amazon e-commerce system" an in-depth elucidation has been done regarding the detailed study of the financial growth of Amazon due to the implementation of an efficient data protection system in the global scenario. Various information regarding the net revenue and net sales of Amazon has been discussed in this report with proper justification and market research-derived data and statistics. In the "Research methodology" section the research philosophy, research approach, research design, ethical considerations, and data collection method and source have been described. The researcher has chosen the deductive research approach for this study. The researcher has opted here for an explanatory research design. A secondary data collection method has been applied for this study. Thematic analysis has been done for the data analysis process. The conclusion part has described the different key market drivers responsible for the huge growth of Amazon's net income have been illustrated with proper explanations in this discussion. The researcher has tried to shed a little light on the international global market of this online giant since the time of the COVID-19 pandemic and during the post-pandemic era as the company has strengthened its web-based data security and protection services for the sake of customers.

Keywords

Cyber security, e-commerce system, e-commerce, amazon, online security, online security protection, websites.

INTRODUCTION

Online business includes online transactions involving the exchange of data and money as well as the purchase and sale of products and services. Over the period, with the increasing number of online business transactions, the number of security has also increased significantly The rule of e-commerce security ensures secure online transactions. It consists of regulations that protect those who make online purchases and sales of products and services. To preserve privacy, any actions that could expose customer information to unauthorised parties are forbidden. Customers' data or account information should only be accessible by the online retailer they choose. While the growth of e-commerce has made it easier to make transactions online, scammers have also become more active. Data on cybercrime show that the eCommerce sector is extremely open to assault. Amazon Payment Services protects clients by employing cutting-edge anti-fraud techniques that automatically evaluate transactions in real-time to detect fraudulent conduct. E-commerce, cloud technology, internet advertising, video streaming, and artificial intelligence are the core competencies of Amazon, a global technology company headquartered in the United States. It is considered a major economic and cultural influence worldwide. In this literature review research philosophy, research design, research method as well as data collection and sampling method will be discussed.

REVIEW OF THE LITERATURE

In the article, ***"Enhancement of e-commerce security through asymmetric key algorithm"*** it was discussed that electronic commerce makes it easier and less expensive for consumers worldwide to transact business. The fundamental security issues with internet commerce are discussed in this study. Any company taking part in electronic commerce must adhere to specified secure regulations that provide enough protection for transaction data to prevent security risks. The RSA encryption algorithm and the Fernet cypher encryption algorithm are the two multi-layer encryption methods that are suggested in this study based on security. A comprehensive and sophisticated encryption technique is produced using a multi-layer encryption algorithm. The benefits of numerous encryption methods are all combined into one algorithm in this process [6]. The encryption technology discussed in this article is the primary technique for keeping internet transactions secure. This research will help manage private and public key encryption and decryption between a sender and a recipient.

This paper, ***"A systematic review on the security of E-commerce systems"*** has discussed that The usage of the Internet for nearly everything since the advent of digitalization is not a recent development. It is used to its fullest potential in e-commerce platforms. The majority of consumers prefer to conduct their banking, shopping, sales, and purchases online. In e-commerce systems, it is utilised to the utmost extent possible. However, there are challenges as well as many advantages and benefits that e-commerce systems provide. One of the primary problems with it is security. The main goal of this essay is to examine how secure e-commerce platforms are [1]. This was achieved by a review of the literature from the preceding ten years and the publishing of multiple assaults against e-commerce websites yearly to serve as examples. This study will be helpful to

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scholars who are studying the security of e-commerce systems.

In ***"A Review of E-Payment System in E-Commerce"*** it was found that business transactions are continuing to move away from cash-based transactions and toward electronic-based transactions in the information and communication technology (ICT) Era and the digital innovation. The e-payment system was developed as a superior substitute for currency and trade barter, however, it wasn't designed to completely replace cash. Electronic payments may be considered a cashless payment method that makes use of electronic media. An essential component of internet commerce is the electronic payment system, or "e-payment," as it is frequently referred to [7]. To highlight the extent of the e-payment system, the technique employed by earlier researchers, and identify research requirements, this study will examine the literature on e-payment systems for use in e-commerce.

In "A Study of Artificial Intelligence and E-Commerce Ecosystem – A Customer's Perspective" it was discovered that the e-commerce industry has developed rapidly in a short amount of time. The sector's explosive expansion may be largely ascribed to the widespread use of "Data" and the development of a data-driven ecosystem [16]. The fact that each customer has a different bubble threshold for social data, financial data, and demographic information means that even though AI/ML systems have shown their hierarchical system of benefits within the e-commerce industry, a sizeable percentage of customers are still experiencing the negative value of such processes.

In the article, ***"Exploring Data Security Issues and Solutions in Cloud Computing"*** it was discussed that cloud computing is one of the computing sciences' most rapidly developing technologies [12] There are many advantages to cloud computing, but very few security worries. This paper explores the many issues with data protection in a multi-tenant cloud computing environment and offers solutions. This study also discusses the service delivery models and deployment strategies for cloud computing. Because data are so essential to Cloud Computing and enterprises, data leaks or manipulation can damage the public's trust in a company and lead to its demise.

The paper, ***"Integrating Machine Learning Technology to Data Analytics for E-Commerce on Cloud"*** explained the technical challenges faced by internet retailers and how cloud computing was created to solve them. The difficulties of building data analytics on cloud platforms will become clear once these hiccups have been resolved. The study goes through the main drivers for the company's adoption of cloud-based data analytics technology. This study also shows how to combine data analytics techniques with machine learning models to produce more in-depth analyses of e-commerce operations [25]. The Amazon SageMaker software is used to demonstrate how machine learning algorithms were introduced into the data analysis processes.

In ***"Systematic Review of Issues and Solutions for Security in E-commerce"*** it was discussed that customers lose faith in businesses as a result of security issues. Despite several studies on the security risk of e-commerce, cyber incidents still hurt platforms. This study aims to identify, enhance, and provide a thorough understanding of the security concerns in e-commerce. Fraud with credit cards is the most common security issue, according to data. Later, we'll discuss the other findings [10]. The findings of this study will also aid stakeholders in understanding and raising their level of awareness regarding security issues in e-commerce.

"Cybersecurity as an Essential Sustainable Economic Development Factor" employs the most significant cybersecurity threats as injury, theft of trade secrets, and payment fraud (Vasiu and Vasiu, 2018). This research provides a theoretical framework for understanding the key cybersecurity dangers by analysing a large data set, including legal cases, cybersecurity reports, and news articles. The results of the study highlight the importance of strengthening cybersecurity policies, procedures, and initiatives [23]. The report proposes some measures that could be adopted to foster a more conducive environment for increased and secure economic growth.

In the article, ***"Does self-regulation provide legal protection and security to e-commerce consumers?"*** This article examined self-regulation as a workable method for preserving consumer safety and legal protection in online transactions [2]. The study demonstrates differences in how self-regulation is implemented in the US and the EU using the normative legal research methodology. The research points to a self-regulation implementation strategy that takes into account the systems already in place in the US and the EU.

MATERIALS AND METHODS

This study was carried out using "research philosophy" to capture differing viewpoints or perspectives. The logical hypothesis proposed study outlines the techniques that must be implemented to collect information, analyse the data, and implement the subject of study. The theoretical orientation, framework, or paradigm is not taken into account while assessing the evidence that has been gathered [21]. Further, the "epistemological ideology" benefit enables the researcher to investigate the research issue in-depth while also integrating key discoveries.

To summarise the current discussion about the study subject, the researcher has used the "deductive approach". As a consequence, the group of action plans as methods that now the researcher adhered to and kept a close eye on while establishing and performing this study are represented as this design process. The study was able to establish the relationship between the research study and the study methodology throughout this process. This "deductive approach" has permitted the researcher to make extensive use of all accessible data and generate pertinent information from

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the data collection [25]. The study can try and explain how the research objectives connect to the information through this deductive methodological approach. Likewise, the study has utilized this research methodology to confirm that the researcher is relevant in providing the enabled information in the context of the study subject.

This study design illustrates the actual process used to carry out a strategy, from an existing theoretical underpinning to the gathering and data interpretation. To collect information and realise the diverse methods to draw conclusions that are suitable for the study's analysis, the researcher utilised a method of deductive research. Learning the target of the study topic that has been carried out by the researcher through this research procedure is one of the benefits of the "explanatory design." For the researcher who has successfully met all criteria for the research questions, this "explanatory research design" is beneficial [1]. But on the other hand, getting good results and digesting them all through the significant cases is successful for this adequate research method.

To gather frequent events and conclusions through the appropriate course of the study actions, the qualitative information collection method was utilised for this study. The method of qualitative research is a fantastic way for the study to collect data and summarize the study's questions and conclusions even while obtaining secondary information [15]. The study has adopted a variety of collection methods, including surveys, magazine books or publications, video analysis, and sight. On the opposing side, the researcher employs the empirical fact "qualitative data collecting approach" to gather pertinent data regarding the study topic.

The study topic's objectives were found by the researcher by using a "secondary data collection source." The researcher needs to gather evidence in addition to collecting data from internet data sources to keep the "truth." The primary research "formative evaluation" is also possible through multiple internet publications, sites, scientific papers, statistic information sources, forums, magazines, and much more. This is known as secondary data collection [13]. As a consequence, this method of data collecting is beneficial for the researcher who has gathered the data and also saves time and cash. Additionally, it is simple to collect a significant amount of information required for the full research topic.

Non-probability sampling process has been used to conclude relevant and convenient data, which is best suited for the researcher. Contrary to the probability sampling process where the research needs to select a group from the population first for the research and then draw inferences randomly by choosing anyone from that group, this non-probability one focuses on anyone at random without differentiating into a group [1]. Here, the advantage that a researcher gets is time and resource deduction because it does not require the classification of anything or anyone. The researcher thus can engage himself or herself in gaining data collection samples on that required time and monetary fund.

Table 1: Inclusion and exclusion criteria

Inclusion criteria	*exclusion criteria*
• The inclusion category includes the attributes that a group or a specific person must have to provide evidence for the research. • The researcher gathers data from 2019 to 2023 to initiate the process.	• Exclusion criteria remove the features which are not taken into account in the research work. • The participants who withdrew or became redundant for the motive are excluded from this criteria. • In other words, people who possess characteristics required in the inclusion criteria may possess other features which are useless in the research. • Through these criteria, such people and attributes are eliminated.

Thematic analysis has been done in conducting the research for the secondary qualitative data collection process, which in short concatenates the required factors of the data collection method. The thematic analysis proved to extenuate the research objectives by using codes. It is highly beneficial for expressing subjective data like a person's views and opinions on a particular topic. It permits the researcher to differentiate various ideas in such a way which will enable them to grasp the meaning [13]. The research question makes the researcher apply thematic analysis as this type of analysis is best suited for certain types of questions.

To substantiate any evidence of its legality, ethical aspects like transparency, validity and fact-reliability are always taken into account. The aim of the research ethics assures to uphold the participants' dignity and secure welfare. The research should assist the well-being of a culture or a civilisation collectively. Privacy, competence, honesty, justice, responsibility, beneficence, and non-maleficence are some of the ethical concepts of research [15]. The Data Protection Act is a reliable way for the researcher to collect data then process and at last in storing the evidence to be put in the research with validity in a legal manner.

RESULTS AND DISCUSSION

The Amazon Web Services (AWS) infrastructure has been created to meet the necessities of the finest security-sensitive companies. This system handles the identities, resources, permission, and access management at scale. Data protection is considered a priority in the case of E-commerce websites for the sake of customers' protection and the E-commerce organizations as well. Cloud service, video streaming devices and services, and most lately groceries with the addition of a whole food market have permitted the organization to directly compete with giant technology companies such as Netflix, Apple, Facebook, and Google.

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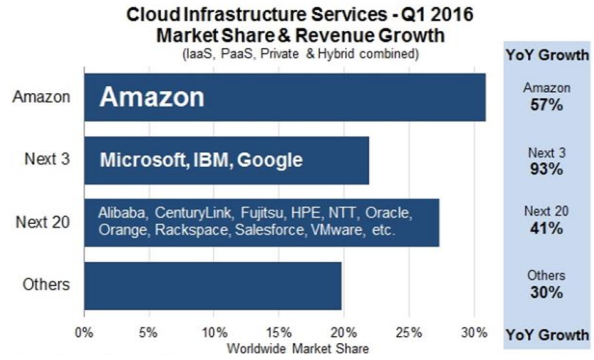

Figure 1: Revenue growth of various E-commerce businesses due to security protection.
(Source: techcrunch, 2023)

It is to be noted that, Amazon has implemented security protection services for providing data protection to customers. At that time Amazon had no different and unique identity and was the same as other small E-commerce companies worldwide and was suffering from scale problems [20]. Due to these scale problems, Amazon has created concrete internal systems for data protection that helped in the huge growth of revenue margin which was recorded at 57% in 2016. Amazon reached a huge market share of approximately 30% in the global market niche in 2016. Amazon has built the most secure cloud infrastructure system and it is predicted that Amazon will take up more than 30% of the market share by 2025 and which will be more than its three closest competitor companies, namely, IBM, Google, and Microsoft these three combined market values. Recently, several surveys have revealed that the company has recorded to reach business growth of nearly 10 billion U.S. dollars in the last year [19]. It was recorded that the revenue growth of Amazon for the twelve months ended 30th September 2022 was nearly 502 billion U.S. [3]. dollars and the year-over-year increase in revenue margin rate was estimated at 9.66%. the huge increase in online shopping during the global pandemic has enhanced the online store sales of Amazon which expanded to 197.35 billion U.S. dollars in 2020 responsible for 1% of Amazon's net revenue in 2020. This financial growth is expected to increase as consumers will shift more to online shopping services worldwide [20].

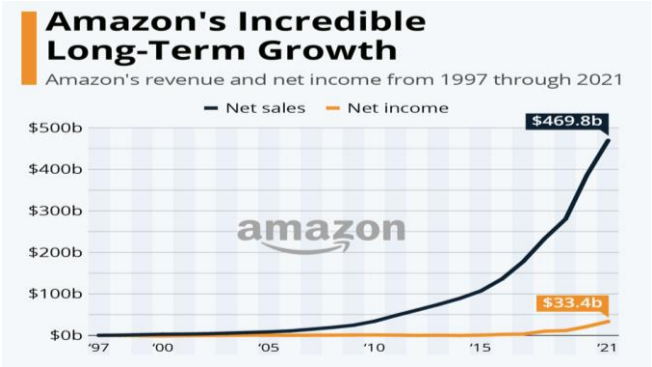

Figure 2: Amazon's revenue and net income from 1997 through 2021.
(Source: statista, 2023)

Since 1997, when Amazon began its journey the multinational retail organization has achieved huge long-term growth through 2021, the revenue and total income have enhanced after the global pandemic, and become a notable e-commerce business globally due to the implementation of data protection services [9]. The business growth of Amazon is very fast, since its launch, it has reached 180, 000 consumer accounts by December 1996 just after one year of complete business operations. Its revenue of Amazon has calculated at 502.191 billion dollars on September 30, 2022. Even so, just after the COVID-19 pandemic, its annual revenue of Amazon has been calculated at 469.822 billion dollars which have risen by 21.7% from 2020 [24]. In the last quarter part of 2021, the net income expansion of Amazon was just 3% in a year-over-year differentiation from the last quarter of 2020. Nonetheless, the e-commerce business of Amazon has grown hugely right after the pandemic [3]. Moreover, the perennial revenue of Amazon for 2020 was 386.064 billion dollars which entails a rise in business growth of 37.62% from 2019 [8]. The efficient security protection services of Amazon have improved its growth of revenue and were recorded more than 62 billion U.S. dollars in 2021. Before the global pandemic, the total income of Amazon became more than tripled from 3.03 billion U.S. dollars in 2017 to 10.07 billion U.S. dollars in 2018. That was the greatest yearly profit since its launch in 1997 [10]. Several market research surveys have predicted that the net revenue of Amazon will become 821.53 billion U.S. dollars by 2025 increasing from 386.06 billion U.S. dollars in 2020.

Figure 3: The huge financial growth of Amazon's cloud business.
(Source: statista, 2023)

As Amazon is a very famous E-commerce company for its well-known online shopping platform, although the most profit-making operating segment of amazon is not its online shopping services [8]. It is enough surprising that Amazon Web Services (AWS) is the most profitable functioning segment, Amazon Web Services is the cloud platform of this company giving the technical framework for numerous well-known online services estimated for 13% of Amazon's total sales and 62% of the organization's operating profit [3]. From the chart, it is clear that the cloud business segment of

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Amazon is the key growth driver in the last few years while solid security protection services are mainly responsible for this huge financial growth [4]. Through the last few years, the cloud business of amazon has expanded approximately eight-fold, enhancing the huge profit of the E-commerce company to higher levels that would be difficult to accomplish in its low-margin core business [9]. Several surveys revealed that more than 100 million customers are paying members of Amazon prime which is the subscription service launched by the company in 2005 that provides video and music streaming and has been strengthened by the use of strong security web-based services and now is the second-largest paid membership service in the world [10].

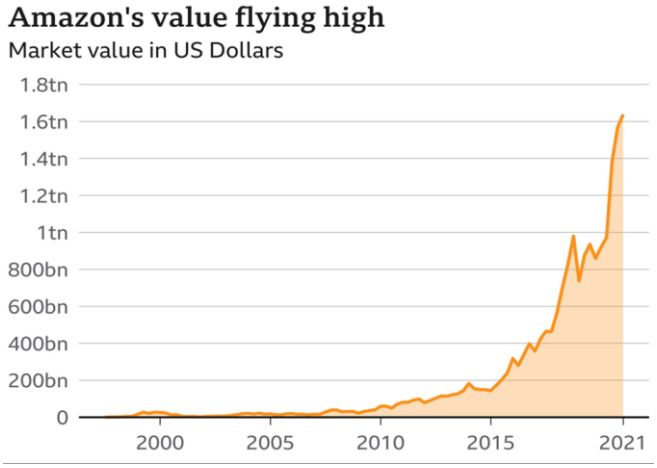

Figure 4: The market value of Amazon in U.S. dollars. (Source: bbc, 2023)

The innovation of Amazon is reflected in its huge financial growth margins. In 2018, Amazon became the most chosen E-commerce company and its market value was recorded at 1 trillion U.S. dollars after Apple [9]. Now, Amazon has acquired the third-highest market valuation in the United States, after Microsoft and Apple [3].

Table 2: Five threats and security measures for e-commerce websites

E-commerce security threats	***E-commerce security solutions***
E-skimming	Use secure software development practices
Cross-site Scripting	Use automated monitoring and inspection
Customer Journey Hijacking	Audit of web assets
Cross-site Request Forgery	Selection of third- and fourth-party scripts, plugins, and tools
Formjacking	Maintainance of safe JavaScript libraries

The tremendous success of the E-commerce company is also evident from its huge revenue margins. Sales for 2020 reached 386 billion U.S. dollars and the sales growth was 280 billion U.S. dollars. It was predicted the total profit of the company will reach nearly double to 21 billion U.S. dollars [18]. The huge rate of international growth of this online giant is possible by its solid data security and access system and also the expansion of the organization into various other business sectors all over the world [14]. The department of smart services Amazon expanded exponentially and experienced intense competition with Google and Apple in the 2010s. Now, Amazon has taken up 47% of the market share of all the online retail segments in the U.S. and dominates the retail sector in 2022. The company also accounted for 30% of the market share of all the online retail sections in the U.K. in 2022 [15]. Amazon has now become the third-largest retailer company for offering smart devices such as Echo speakers that are furnished with the artificial intelligence system of the company in the U.S. Implementation of effective data and network security services have helped Amazon to make such remarkable positions in the retail world [17].

CONCLUSION

From the above discussion, it can be concluded that the efficient data and network security system of Amazon has helped to improve its financial growth for the last few years. The cloud servicing system has helped the sales of Amazon to move forward through its huge expansion of retail services encompassing online store sales, third-party vendor sales, and prime subscription cash flow in the last two years, all have helped one another to grow the business profit. The Amazon web Services cloud infrastructure was built for providing the finest degree of data privacy and access management to consumers worldwide. Protecting the data of consumers is the priority of the business Amazon and is also the key driver of the huge revenue growth of Amazon even during the pandemic. The safe and secure data protection policy has created loyalty and trust in customers all over the world for choosing Amazon's various online services including groceries and smart devices too. Amazon has also invested much in E-commerce strategies, supply chain, and automation for enhancing the quality of customer services while implementing solid data protection technologies. It can be expected Amazon will become a more profit-making E-commerce company in near future with more efficient usage of data security systems.

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