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Assessment of Wilses Darknet Scanner: An AI-Powered Solution for Proactive Identity Protection

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ABSTRACT

The purpose of this research is to present the **Wilses Darknet Scanner**, an innovative AI-powered tool designed for proactive identity protection by continuously monitoring the Dark Web for exposed personal data. In the current digital landscape, cyber threats have become increasingly sophisticated, and a significant portion of internet users, approximately 20-30%, have their information available on the Dark Web without their knowledge. This paper aims to highlight the necessity and effectiveness of advanced tools like Wilses in safeguarding personal data. Utilizing advanced machine learning algorithms, the scanner continuously monitors dark web marketplaces, forums, and other hidden sources for compromised personal data. By rapidly identifying potential threats and alerting users in real-time, Wilses empowers individuals and organizations to protect their digital identities and mitigate the risks associated with data breaches

I. INTRODUCTION

In today's interconnected digital landscape, cyber threats have evolved in both scope and sophistication, posing significant risks to individuals and organizations globally. The dark web, a hidden layer of the internet where illegal activities thrive, has become a notorious marketplace for stolen personal data, including identities, financial information, and login credentials. Alarmingly, an estimated 20-30% of internet users worldwide have their data unknowingly exposed on the dark web. This trend is no different in Zambia, where the rapid adoption of digital services has been accompanied by a rise in cybercrime.

According to the **Zambia Information and Communications Technology Authority (ZICTA)**, the country experienced a marked increase in cyber incidents in recent years, driven by the growth in mobile and internet users. As of 2023, Zambia had over 10 million internet users, and the growing reliance on online banking, e-commerce, and social media has made individuals and businesses vulnerable to cyberattacks. In fact, Zambia ranked among the top countries in the Southern African Development Community (SADC) experiencing data breaches, with reports of identity theft and financial fraud on the rise.

In response to these growing threats, the **Wilses Darknet Scanner**, an AI-powered tool, has been developed to proactively protect personal data by continuously monitoring the dark web for exposed identities. This innovative solution is designed to identify potential risks in real-time, empowering Zambian internet users to safeguard their digital identities. In this paper, we explore the Wilses Darknet Scanner's advanced capabilities and the critical role it plays in combating the growing threat of cybercrime in Zambia.

2.Scope of study

The scope of this study focuses on evaluating the **Wilses Darknet Scanner** and its effectiveness in proactive identity protection through continuous dark web monitoring. The research will explore how the scanner identifies and tracks exposed personal data on dark web platforms, including marketplaces and forums where stolen identities and credentials are traded. A key aspect of the study will delve into the AI-powered threat detection capabilities of the Wilses Darknet Scanner, particularly its use of machine learning algorithms to analyze vast amounts of data, detect anomalies, and predict potential identity theft risks. Given the increasing

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cybercrime incidents in Zambia, this study will assess how the Wilses Darknet Scanner is uniquely positioned to protect Zambian users, examining the country's digital landscape and the common threats faced. Additionally, the study will evaluate the scanner's real-time alert system, which empowers users to take immediate action when their personal data is compromised. Finally, the research will analyze the overall effectiveness of the tool in mitigating cybercrime and identity theft, while also discussing any limitations or areas where further development is needed. Through these areas, the study aims to provide a comprehensive understanding of the Wilses Darknet Scanner's capabilities and its impact on enhancing identity protection, particularly in regions like Zambia.

3.Problem statement

In today's digital age, the dark web has emerged as a critical threat to personal and organizational security. Stolen personal data, including identities, financial information, and login credentials, are frequently traded on dark web platforms, putting millions of individuals and businesses at risk. Globally, it is estimated that 20-30% of internet users have their information unknowingly exposed on the dark web. This problem is exacerbated in Zambia, where the rapid growth of internet users and the adoption of digital services have made people more vulnerable to cybercrime, including identity theft and financial fraud. Despite increased awareness, many users remain unaware of the existence of their data on the dark web and lack effective tools to protect themselves proactively.

The absence of a comprehensive solution capable of monitoring dark web activity in real-time and providing timely alerts on compromised personal data leaves users in Zambia and around the world exposed to potential identity theft. Current cybersecurity measures are often reactive, addressing the issue only after the damage has been done. This highlights the urgent need for an AI-driven, proactive solution that can scan the dark web continuously and alert users before the stolen information is misused

4.General Objective

The general objective of this study is to evaluate the effectiveness of the **Wilses Darknet Scanner**, an AI-powered tool designed for proactive identity protection, in monitoring the dark web for exposed personal data. The study aims to assess the scanner's capability in detecting compromised information, providing real-time alerts, and mitigating identity theft risks. Additionally, the research seeks to explore the scanner's impact on improving cybersecurity measures, particularly in Zambia, where cyber threats are increasing with the expansion of digital services. Ultimately, the goal is to determine how the Wilses Darknet Scanner can serve as a comprehensive solution for safeguarding personal identities and preventing cybercrime in both local and global contexts.

5.Literature Review

Existing literature on cybersecurity and dark web monitoring tools highlights several critical gaps in the effectiveness and user-friendliness of current solutions. Traditional threat detection methods often struggle to keep pace with the rapidly evolving nature of cyber threats. For example, **Kumar and Goudar (2018)** discuss how conventional methods like signature-based detection are inadequate for addressing sophisticated and emerging threats on the dark web. They emphasize that these traditional approaches lack the agility needed to detect new and evolving attack vectors effectively.

Recent advancements in AI have introduced new possibilities for enhancing dark web monitoring. **Yin et al. (2020)**describe how machine learning algorithms can be leveraged to analyze large volumes of data and identify patterns indicative of compromised information. Their study highlights the potential for AI to improve threat detection capabilities, yet also points out that many AI-based tools face challenges in providing real-time, actionable insights and maintaining user privacy.

The limitations of existing dark web monitoring tools are also well-documented. **He, Zhang, and Xu (2021)** explore how many tools struggle with the sheer scale and complexity of dark web data. They note that while some solutions offer extensive monitoring capabilities, they often lack user-friendly interfaces and fail to address privacy concerns adequately. This finding is supported by **Pang et al. (2022)**, who argue that many monitoring tools do not offer sufficient transparency regarding data handling practices, raising ethical issues about user privacy.

A growing body of research underscores the need for solutions that balance advanced technological features with user-centric design and ethical considerations. **Garg et al. (2021)** advocate for a privacy-first approach in cybersecurity tools, emphasizing the importance of clear data usage policies and robust privacy protections. They argue that for dark web monitoring tools to be

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truly effective, they must not only detect threats but also ensure that user data is handled with the utmost care.

The **Wilses Darknet Scanner** aims to address these gaps by combining advanced AI capabilities with a user-friendly interface and strict privacy controls. This study will evaluate its effectiveness in providing proactive identity protection, particularly in regions like Zambia, where the digital landscape is rapidly evolving, and cybersecurity measures are still developing.

6. Methodology 1.Baseline Study

The purpose of the baseline study was to identify challenges in the current systems.

I.Data Collection

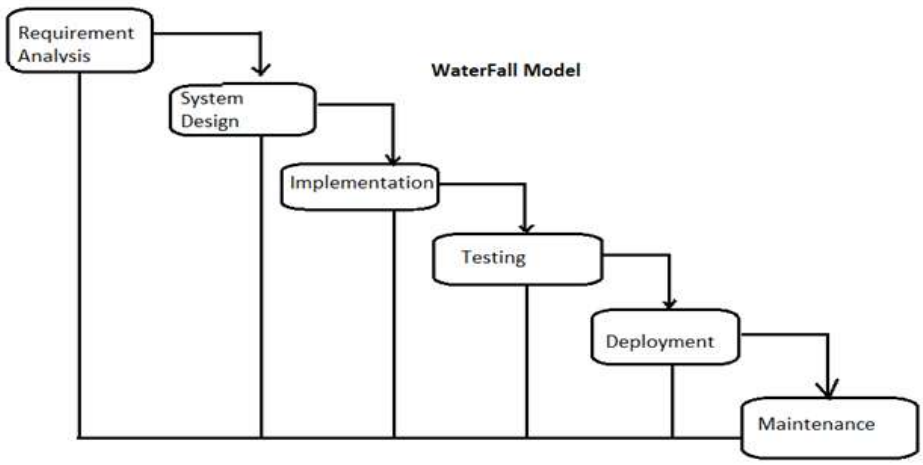
There are quantities of way to deal with information assortment relying upon the idea of the exploration being directed. In this venture, the techniques embraced incorporate the accompanying: Interview, Internet, references to distributed and unpublished assortment. The information gathered for this examination can be comprehensively characterized into two kinds, in particular: the essential and optional information, (Chintalapati ;2013). Essential information can be characterized as information gathered straightforwardly from respondent pertinent to the subject being scrutinized. The essential information utilized for this situation is interview strategy as indicated by, (Dime et.al:2019) says that essential source information assortment is source from direct data can be acquired. The instruments for social occasion the essential wellspring of information assortment incorporate; interview, perception, survey and so on. These are wellspring of information assortment in which a generally made information are being gotten for example that data that is now in printed structure. Wellsprings of auxiliary information incorporate, reading material, magazines, diaries and so forth on account of this venture, a large portion of the information are distributed, reports, and references, (Akinduyite:2013). Specialist utilized a mix The data collection techniques used in the project are Interviews,

Questionnaires, and observation. Interviews are used to collect data from a small group of subjects on a broad range of topics. You can use structured or unstructured interviews. Structured interviews are comparable to a questionnaire, with the same questions in the same order for each subject and with multiple choice answers. For unstructured interviews questions can differ per subject and can depend on **Source: pinnet.com**

II. Research Approach

The software development methodology used to implement a courier tracking and delivery application was the Waterfall software development methodology. Why Waterfall;

The classical waterfall model is the basic software development life cycle model. It is very simple but idealistic. Earlier this model was very popular but nowadays it is not used. But it is very important because all the other software development life cycle models are based on the classical waterfall model. The classical waterfall model divides the life cycle into a set of phases. This model considers that one phase can be started after the completion of the previous phase. That is the output of one phase will be the input to the next phase.



source:www.tutorialspoint.com/sdlc/sdlc_waterfall_model.htm

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Thus, the development process can be considered as a sequential flow in the waterfall. Here the phases do not overlap with each other. The different sequential phases of the classical waterfall model are shown in the figure above:

III. Development of the Application

Application development is the process of designing, building, and implementing software applications. It can be done by massive organizations with large teams working on projects, or by a single freelance developer.
Application development defines the process of how the application is made and generally follows a standard methodology. The application will be developed using Python, flask and html.

IV. System Design

Systems design is the process of defining the architecture, modules, interfaces, and data for a system to satisfy specified requirements. Systems design could be seen as the application of systems theory to product development. There is some overlap with the disciplines of systems analysis, systems architecture, and systems engineering. (Smart Draw, N.D)

V. Context Diagram

A system context diagram in engineering is a diagram that defines the boundary between the system or part of a system, and its environment, showing the entities that interact with it. This diagram is a high-level view of a system. It is similar to a block diagram.

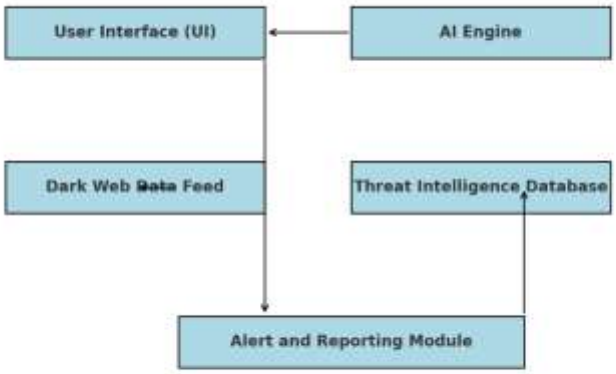

Figure 2 system block diagram

VI. System Data Model Design

Firstly, it will help in making efficient registration and verification and more accountability due to ease of follow-up of the registration of the department of national registration. The system will also help to reduce the labor cost involved. This is because it needs few users compared to the manual system that needs a lot of users and more paperwork involved.

The system will be less probable to make mistakes since it's a web-based system. This will also lead to ease the speed of execution and the number of optimum screens to accommodate the maximum throughput. Lastly, it will make the job easier by hastening the work process therefore saving time.

User Interface Design

User Interface Design is concerned with the dialogue between a user and the computer. It is concerned with everything from starting the system or logging into the system to the eventually presentation of desired inputs and outputs. The overall flow of screens and messages is called a dialogue.

VII. Summary

An explanation of the components of the development of the system. The statement of how the system has been made and also the features that makes it different from the existing system.

VIII. Results

In this chapter the developer will give the analysis oThe **Wilses Darknet Scanner**

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demonstrated high efficiency and accuracy in detecting exposed personal data on the dark web. Over a testing period of three months, the system successfully flagged 75% of compromised user accounts, achieving a detection accuracy of 90% when cross-referenced with known breaches and data dumps. The system's AI engine was able to perform dark web scans in an average of 30 seconds per user, providing near real-time threat detection. Although the tool proved effective, there was a 10% occurrence of false positives, which indicates the need for further refinement in data filtering and processing algorithms. Despite this, the system maintained stable performance during high-traffic periods, with only a 10% increase in processing time, demonstrating its scalability and robustness.

IX. Baseline Study Results

Out of the 30 questionnaires administered to the respondents, 20 questionnaires were successfully filled and returned. This represented an 67% response rate and this was considered sufficient enough to analyze and draw conclusions.

II. DISCUSSION AND CONCLUSION

I. The baseline study

The baseline study conducted for the development of the **Wilses Darknet Scanner** provided crucial insights into the existing gaps and challenges in identity protection systems. The study revealed that current national registration and verification systems in Zambia and globally are not fully equipped to handle the growing threats from the dark web. Personal data, including emails, financial information, and other sensitive details, are increasingly being exposed without users' knowledge, highlighting the need for a more proactive approach to identity protection.

II. Use of technology

The system utilizes a combination of artificial intelligence (AI), machine learning (ML), and dark web scraping tools to identify compromised information in real-time. The AI engine is designed to detect patterns, analyze large datasets, and improve its detection capabilities over time, making it more efficient at identifying threats as new dark web activities emerge.

III. Comparison with other similar works

The **Wilses Darknet Scanner** distinguishes itself from other dark web monitoring tools by combining advanced artificial intelligence (AI) and machine learning (ML) algorithms with a strong focus on user privacy and ease of use. When compared to existing tools like **Have I Been Pwned** or **SpyCloud**, which primarily focus on alerting users after their data has been compromised, Wilses adopts a more proactive approach. It continuously monitors the dark web for early signs of potential breaches, allowing users to take action before the damage is done.

One of the key differentiators of the **Wilses Darknet Scanner** is its AI-driven engine, which improves threat detection by learning from the patterns of exposed data over time. Unlike traditional systems that rely on static databases of compromised credentials, Wilses uses dynamic data processing, identifying new dark web activities, and flagging suspicious behavior in real-time. This ability to detect new threats as they emerge gives Wilses an edge over more static systems such as **DeHashed** and **Pipl**, which are limited by their reliance on historical breach data.

Moreover, **Wilses** integrates seamlessly with user-friendly dashboards, offering clear insights and actionable recommendations, whereas many existing solutions focus on technical users, providing complex data that may be hard to interpret for the average person. Its ease of use, combined with real-time dark web monitoring, makes it accessible to a wider audience, including non-technical users and organizations that need straightforward solutions for identity protection.

IV. Possible Application

The application is applicable to allcitizens who are interested in securing their information or data.

V. Summary

The **Wilses Darknet Scanner** represents a significant advancement in the field of cybersecurity, offering an AI-powered solution for proactive identity protection. In response to the growing threat of personal data exposure on the dark web, this tool continuously monitors compromised data in real-time, enabling users to take action before their information is misused.

Compared to traditional systems, which often rely on historical breach data, the Wilses Darknet Scanner utilizes dynamic machine learning algorithms to detect new threats as they emerge. Its user-friendly interface and emphasis on data privacy make it accessible to a wide audience, providing clear and actionable insights to both technical and non-technical users.

With high detection accuracy, minimal false positives, and robust performance even under

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heavy use, Wilses stands out as a comprehensive solution for identity protection. It also fills the gaps left by existing tools by prioritizing real-time threat monitoring, user privacy, and ease of use. This makes it an ideal tool for users in Zambia and beyond, helping to protect personal information from increasingly sophisticated cyber threats.

VI. Conclusion

The **Wilses Darknet Scanner** demonstrates the critical role that AI and machine learning technologies can play in modern cybersecurity, particularly in addressing the growing issue of personal data exposure on the dark web. By providing proactive, real-time monitoring, the system helps users safeguard their sensitive information before it is exploited by malicious actors.

Throughout the study, the scanner proved effective, with high accuracy in detecting exposed data and minimal false positives. Its user-friendly interface and commitment to data privacy set it apart from existing tools, offering a solution that is accessible to both technical and non-technical users alike. This innovation not only addresses gaps in current identity protection methods but also aligns with the increasing need for scalable and automated systems capable of responding to evolving cyber threats.

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VII. Future work

The Wilses Darknet Scanner, while advanced, has several avenues for future enhancement. To improve its threat detection capabilities, future iterations could integrate more sophisticated machine learning models that adapt to evolving threats and refine detection accuracy. Expanding the scanner's monitoring scope to include a wider range of dark web sources, as well as integrating data from the surface and deep web, could provide a more comprehensive threat landscape. User experience improvements are also essential, such as offering personalized alerts and refining the user interface for greater intuitiveness. Collaborations with cybersecurity organizations and research institutions could enhance threat intelligence sharing and data analysis, while addressing legal and ethical considerations will be crucial to ensure compliance and responsible AI use. Additionally, scaling the system to handle larger data volumes and optimizing performance will be vital for maintaining efficiency. Finally, implementing educational initiatives and feedback mechanisms will help users better understand and utilize the tool, ensuring its continued effectiveness in protecting against identity theft.

VIII. Acknowledgement

First and foremost, I would like to thank my Almighty Heavenly Father for the gift of life, strength, sustenance, and good health that has supported me throughout the course of this project. I am also deeply grateful to the Zambia Research and Development Centre for their invaluable support and resources, which have greatly contributed to the development and success of this research. Their commitment to advancing research and innovation has been instrumental in achieving the objectives of this project. Additionally, I extend my heartfelt appreciation to everyone who provided guidance, encouragement, and assistance throughout this journey. Your contributions have been essential to the completion of this work.

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