A DATA EXPLORATION APPROACH TO ELECTRONIC CRIME INFORMAL ECONOMY

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ABSTRACT: Despite the rapid escalation of cyber threats, there has still been little research into the foundations of the subject or methodologies that could serve to guide Information Systems researchers and practitioners who deal with cyber security. In addition, little is known about Crime-as-a-Service (CaaS), a criminal business model that underpins the cyber-crime underground. This research gap and the practical cyber crime problems we face have motivated us to investigate the cyber crime underground economy by taking a data analytics approach from a design science perspective To achieve this goal, we propose a data analysis framework for analyzing the cyber crime underground, CaaS and crime ware definitions, and an associated classification model. In addition, we develop an example application to demonstrate how the proposed framework and classification model could be implemented in practice. We then use this application to investigate the cybercrime underground economy by analyzing a large dataset obtained from the online hacking community.

Keywords: Cyber threats, Cyber Crime detection

INTRODUCTION

As the threat posed by massive cyberattacks such as ransomware and distributed denial of service attacks has grown, individuals, organizations, and governments have struggled to find ways to defend against them. In 2017, ransomware known as WannaCry was responsible for nearly 45,000 attacks in almost 100 countries. The explosive impact of cybercrime has put governments under pressure to increase their cybersecurity budgets. United States President Barack Obama proposed spending over

$19 billion on cybersecurity as part of his fiscal year 2017 budget, increase of more than 35% since 2016. Global cyberattacks such as WannaCry and Petya are executed by highly organized criminal groups, and organized or national-level crime groups have been behind many recent attacks. Typically, criminal groups buy and sell hacking tools and services on the cybercrime black market, wherein attackers share a range of hacking- related information. This online underground market is operated by groups of attackers, and it in turn supports the underground cybercrime economy. The cybercrime underground has thus emerged as a new type of organization that both operates black markets and enables cybercrime conspiracies to flourish.

Because organized cybercrime requires an online network to exist and to conduct its attacks, it is highly dependent on closed underground communities, such as Hackforums and Crackingzilla. The anonymity these closed groups offer means that cybercrime networks are structured differently than traditional Mafia-style hierarchies, which are vertical, concentrated, rigid, and fixed. In contrast, cybercrime networks are lateral, diffuse, fluid, and evolving. Since cyberspace is a network of networks, the threat posed by the rise of highly professional network-based cybercrime business models, such as Crimeware-as-a-Service (CaaS), remains mostly invisible to governments, organizations, and individuals.

Even though Information Systems researchers and practitioners are taking an increasing interest in cybercrime, due to the critical issues arising from the rapid increase in cyber threats, few have attempted to put this new interest on a solid foundation or develop suitable methodologies. Previous studies have not analyzed the underground economy behind cybercrime in depth. Furthermore, little is known about CaaS, one of the primary business models behind the cybercrime underground.

This research gap, and the practical problems faced by cybercriminals, motivates our study. We take a data analytics approach and investigate the cybercrime economy from a design science perspective. To achieve this goal, we propose a data analysis framework for analyzing the cybercrime underground to guide researchers and practitioners; define CaaS and crimeware to better reflect their features from both academic research and business practice perspectives; use this to build a classification model for CaaS and crimeware; and build an application to demonstrate how the proposed framework and classification model could be implemented in practice. We then evaluate this application by applying it in a case study, namely investigating the cybercrime economy by analyzing a large dataset from the online hacking community.

This study takes a design science research approach. Design science creates and evaluates information technology artifacts intended to solve identified problems. DSR involves developing a range of IT artifacts, such as decision support systems, models, frameworks, tools, methods, and applications. Where behavioral science research seeks to develop and justify theories that explain or predict human or organizational phenomena, DSR seeks to extend the boundaries of human and organizational capabilities by creating new and innovative artifacts. DSR's contribution is to add value to the literature and practice in terms of design artifacts, design construction knowledge (e.g., foundations), and/or design evaluation knowledge (e.g., methodologies).

This study follows these DSR guidelines and contributes design artifacts, foundations, and methodologies. In particular, DSR must demonstrate that design artifacts are implementable in the business environment to solve an important problem, so we provide an implementable framework rather than a conceptual one. We also create a front-end application as a case example to demonstrate how the proposed framework and classification model could be implemented in practice. In addition, this study contributes to design theory.

As for foundations, DSR should have a creative development of constructs, models, methods, or instantiations that extend the design science knowledge base. This study therefore adds to the knowledge base by providing foundational elements such as constructs (definitions, frameworks, and applications), a model (classification model), a method (analysis), and instantiations (applications). There is an overall lack of understanding, both in research and practice, of the nature of this underground and the mechanisms underlying it.

As for methodologies, the creative development and use of evaluation methods provide DSR contributions. Accordingly, this study uses dynamic analysis to conduct an ex-ante evaluation of the classification model. It also conducts an ex-post evaluation of a front-end application using observational methods (case examples). From a practical perspective, this study also provides practitioners with useful insights by making suggestions to guide governments and organizations in all industries in solving the problems they face when preparing for attacks from the cybercrime underground.

LITERATURE SURVEY

This research gap and the practical cybercrime problems we face have motivated us to investigate the cybercrime underground economy by taking a data analytics approach from a design science perspective. To achieve this goal, we: (1) propose a data analysis framework for analyzing the cybercrime underground; (2) propose CaaS and crimeware definitions; (3) propose an associated classification model, and (4) develop an example application to demonstrate how the proposed framework and classification model could be implemented in practice. We then use this application to investigate the cybercrime underground economy by analyzing a large data set obtained from the online hacking community. By taking a design science research approach, this paper contributes to the design artifacts, foundations, and methodologies in this area. Moreover, it provides useful practical insights to practitioners by suggesting guidelines as to how governments and organizations in all industries can prepare for attacks by the cybercrime underground.

Title: Unveiling the Cybercrime Underground: A Data-Driven Design Science Perspective

Authors: Priya Nandini; Rakesh Varma

Abstract: Despite the rapid escalation of cyber threats, there has still been little research into the foundations of the subject or methodologies that could serve to guide Information Systems researchers and practitioners who deal with cybersecurity. In addition, little is known about Crime-as-a-Service (CaaS), a criminal business model that underpins the cybercrime underground. This research gap and the practical cybercrime problems we face have motivated us to investigate the cybercrime underground economy by taking a data analytics approach from a design science perspective. To achieve this goal, we propose a data analysis framework for analyzing the cybercrime underground, CaaS and crimeware definitions, and an associated classification model. In addition, we develop an example application to demonstrate how the proposed framework and classification model could be implemented inpractice.

We then use this application to investigate the cybercrime underground economy by analyzing a large dataset obtained from the online hacking community. By taking a design science research approach, this study contributes to the design artifacts, foundations, and methodologies in this area. Moreover, it provides useful practical insights to practitioners by suggesting guidelines as to how governments and organizations in all industries can prepare for attacks by the cybercrime underground.

Title: An Effective Data Analytics Approach to Cybercrime Underground Economy Using Ml Methodologies

Authors: A. Swarupa Rani, G. Manasa

Abstract: To achieve this goal, we propose (1) a data analysis framework for analyzing the cybercrime underground, (2) CaaS and crime ware definitions, and (1) an associated classification demonstrate. In addition, we (1) build up an example application to demonstrate how the proposed framework and classification model could be actualized in practice. We at that point utilize this application to investigate the cybercrime underground economy by analyzing a large dataset obtained from the internet hacking community. By taking a design science research approach, this examination adds to the design of artifacts, foundations, and methodologies in this area. Additionally, it gives helpful practical bits of knowledge to practitioners by proposing rules as to how governments and organizations in all businesses can prepare for attacks by the cybercrime underground.

SYSTEM ANALYSIS

EXISTING SYSTEM

Because organized cybercrime requires an online network to exist and to conduct its attacks, it is highly dependent on closed underground communities (e.g., Hackforums and Crackingzilla). The anonymity these closed groups offer means that cybercrime networks are structured differently than traditional Mafia-style heirarchies [4], which are vertical, concentrated, rigid, and fixed. In contrast, cybercrime networks are lateral, diffuse, fluid, and evolving. Since cyberspace is a network of networks, the threat posed by the rise of highly professional network based cybercrime business models, such as Crimeware-as-a-Service (CaaS), remains mostly invisible to governments, organizations, and individuals

DISADVANTAGES OF THE EXISTING SYSTEM

- The existing work has little is known about Crime-as-a-Service (CaaS),a criminal business model that underpins the cybercrime underground.

- This research gap and the practical cybercrime problems we face have motivated us to investigate the cybercrime underground economy by taking a data analytics approach from a design science perspective.

PROPOSED SYSTEM

We take a data analytics approach and investigate the cybercrime economy from a design science perspective. To achieve this goal, we (1) propose a data analysis framework for analyzing the cybercrime underground to guide researchers and practitioners; (2) define CaaSand crimeware to better reflect their features from both academic research and business practiceperspectives; (3) use this to build a classification model for CaaS and crimeware; and (4) buildan application to demonstrate how the proposed framework and classification model could beimplemented in practice. We then evaluate this application by applying it in a case study, namely investigating the cybercrime economy by analyzing a large dataset from the online hacking community.

ADVANTAGE OF PROPOSED SYSTEM

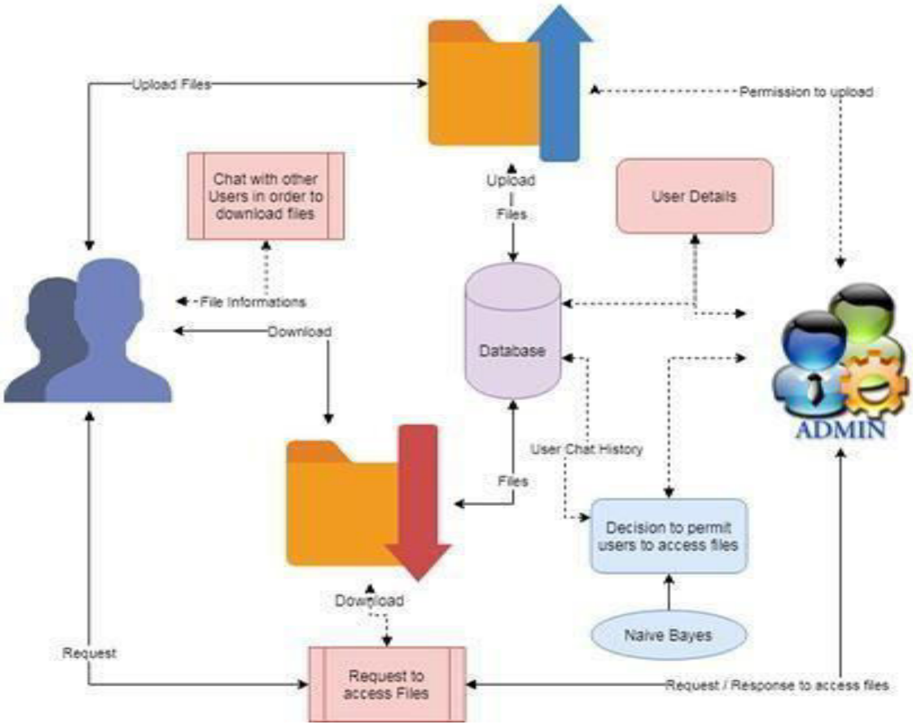
- In the business practice field, an exploit is defined as "a program created specifically to exploit a vulnerability, in other words simply trying to take advantage of an error in the design or programming of a system or application," and is used to obtain

- administrator privileges on a system. We thus define an exploit as a program or script that exploits vulnerabilities in applications, servers, or clients

- Ransomware: Ransomware is a type of malicious software that disables the functionality of a computer in some way . We thus define ransomware as malicious software that encrypts a victim's data to extort money from them.

- Rootkit: The business practice literature defines a rootkit as "a program that allows someone to obtain root-level access to the computer". We thus define a rootkit as a piece of malicious software that enables administrator-level access to an operating system or computer network.

Architecture



IMPLEMENTATION

MODULES DESCRIPTION

Admin

Here the admin is the main module, the admin can directly login with the application and the admin after his successful login can perform some actions like view users, addcyber crime words, view crime words.

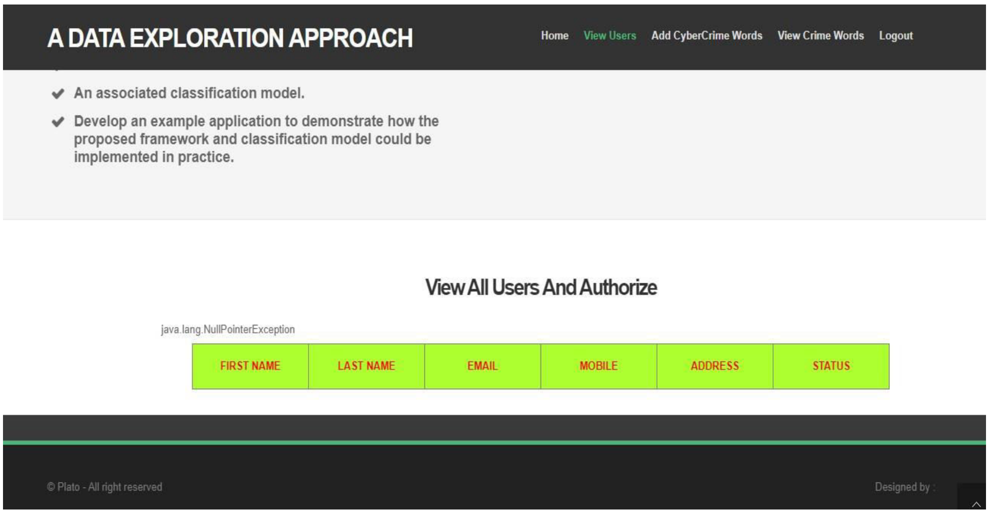
User

The user is the module should register with the application and the user should be authorized by the admin then only the user can able to login with the application and the user after his successful login can perform the following actions such as public content, view published content, view shared content by the other users.

Cyber Crime Detection

The cyber crime detection is the module to analyze the data which consist of the cybercrime related information. If the information found then that file will detect by the detector and also the detector can detect the file which is published by the attacker for providing the unavailable resource to the users.

RESULTS



- ✓ An associated classification model.
- ✓ Develop an example application to demonstrate how the proposed framework and classification model could be implemented in practice.

View All Users And Authorize

java.lang.NullPointerException

FIRST NAME	LAST NAME	EMAIL	MOBILE	ADDRESS	STATUS

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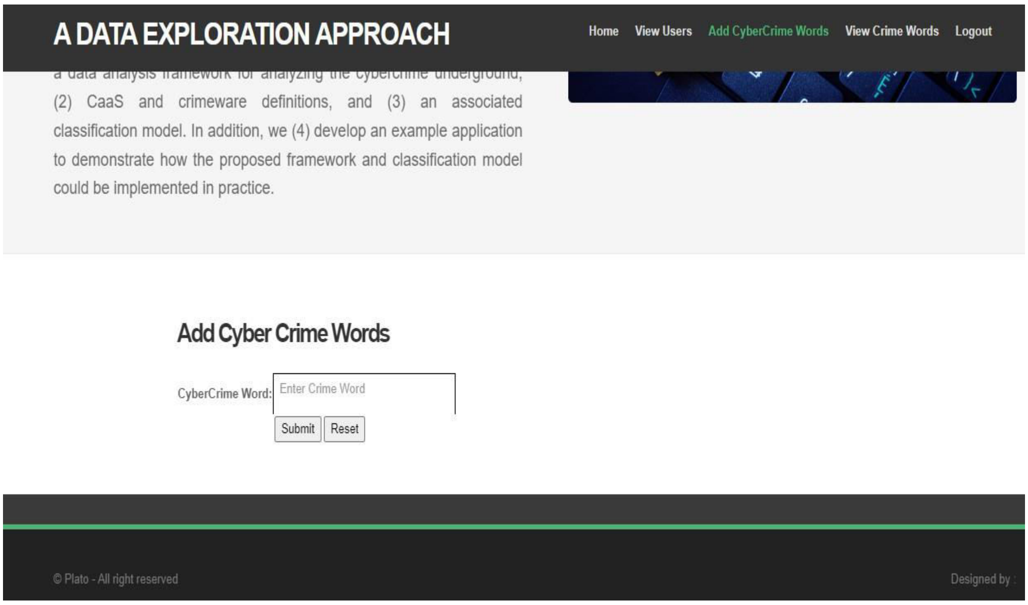
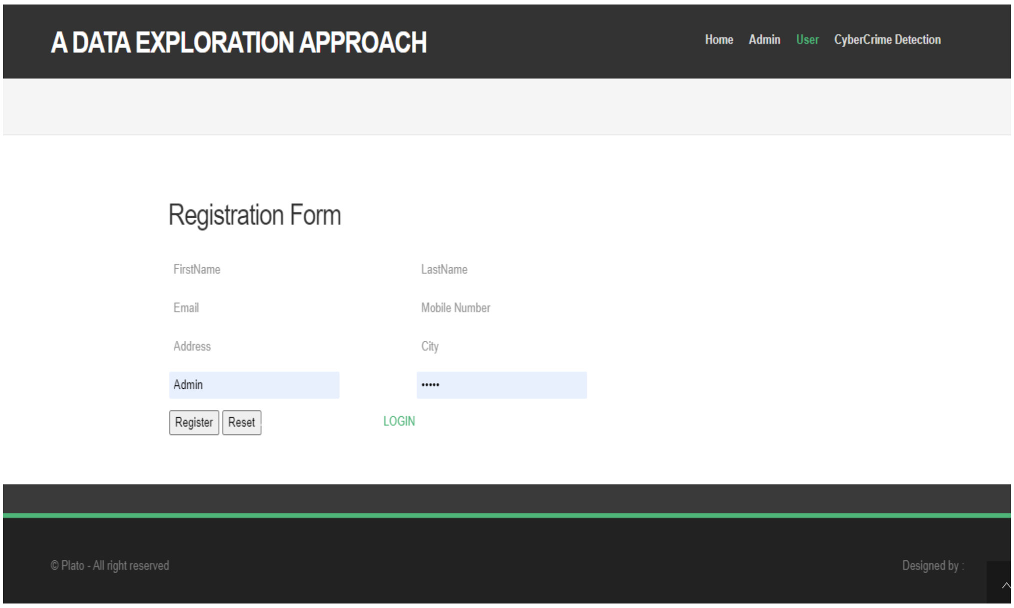
Designed by :



a data analysis framework for analyzing the cybercrime underground, (2) CaaS and crimeware definitions, and (3) an associated classification model. In addition, we (4) develop an example application to demonstrate how the proposed framework and classification model could be implemented in practice.

Add Cyber Crime Words

CyberCrime Word: Enter Crime Word



Registration Form

FirstName LastName

Email Mobile Number

Address City

Admin •••••

CONCLUSION

Proposed data analysis framework can be used to enhance specialized task forces. This study suggests that organizations in all industries should attempt to gain a deeper understanding of the nature of the cybercrime underground. For example, they should be aware that there are cybercrime underground markets where hacking tools are sold. More importantly, these tools could be based on vulnerabilities in their organizations, products, and services. Governments and organizations therefore need to increase their technical capabilities when it comes to analyzing large-scale datasets of different types. Although the proposed framework andclassification model are of particular use to companies mentioned specifically by the cybercrime underground, the framework can also be used to analyze more general types of issues commonly encountered in practice. In this regard, legal and technical training is neededto reduce the impact of cyberattacks.

Furthermore, governments and private sectors must strengthen their technical infrastructure and invest in legal and technical training for their teams. Such training will empower professionals to handle digital evidence, understand cyber laws, conduct forensic investigations, and develop stronger security protocols. Collaboration between public and private entities is also essential to facilitate the exchange of threat intelligence and best practices. By integrating AI-driven tools and automation into cybersecurity operations, organizations can improve incident detection and response times. Ultimately, this framework serves not only as a defense mechanism for high- risk targets mentioned in the cybercrime underground but also as a valuable tool for addressing broader cybersecurity challenges encountered in everyday operations.

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