Invited lecture/Research

OSINT-Technologies: Applications and Challenges in the Digital Age

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Abstract:
The article examines the importance and application of open source intelligence technologies (OSINT) in today's digital age. OSINT is defined as the systematic process of gathering and analysing information from open sources to draw informed conclusions and make effective decisions. The application of OSINT-technologies is becoming an integral part of the strategic analytical process in areas such as cyber security, intelligence, law enforcement, intelligence and public safety.
The main focus of the study is a specific aspect of this broad spectrum – the OSINT Framework, which is a set of tools and resources for collecting and analysing information from open sources on the Internet. Using this framework allows us to study, monitor and analyse a variety of data to identify patterns, trends and potential threats.
The article defines the purpose of scientific research and in-depth analysis of OSINT, in particular the OSINT Framework, with the aim of understanding its structure, functionality and effectiveness in solving tasks in the field of intelligence, cyber security and data analysis.
The overall state of OSINT-technologies is defined by a wide variety of tools, including social networks, geospatial analysis, textual and visual information analysis, data mining platforms, and ethnographic analysis. The use of scientific methods and technologies in this area allows you to optimize the processes of data collection and analysis, providing more insights for making informed decisions.

Keywords: OSINT; OSINT Framework; Open source; Data collection and analysis

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1. Introduction

1.1. Background

In the modern digital era, characterized by the rapid development of information technologies and mass access to the Internet, OSINT technologies (open sources of information) occupy a decisive place in the context of gathering, analysing and using information. OSINT is defined as the systematic process of collecting and analysing information available in open sources in order to draw informed conclusions and make effective decisions. Gradually increasing in importance in numerous fields such as cyber security, intelligence, law enforcement, intelligence and public safety, OSINT technologies are becoming an integral part of the strategic analytical process. Thanks to the wide range of tools and methodologies they include, these technologies allow the study, monitoring and analysis of large volumes of information to identify patterns, trends and potential threats.
However, given the multifaceted nature and variety of OSINT tools, our study focuses on a specific aspect of this broad spectrum—the OSINT Framework. The OSINT Framework is a set of tools and resources aimed at collecting and analysing information from open sources on the Internet. Using this framework provides an opportunity to study, monitor and analyse a variety of data to identify patterns, trends and potential threats.

1.2. Scope of the article

The purpose of this article is to conduct a scientific study and in-depth analysis of open source intelligence tools known as OSINT. Focusing specifically on the OSINT Framework, the authors seek to uncover and explore the various aspects of this tool in the context of today's digital age. The main goal is to understand the structure, functionality and capabilities of this framework, as well as to evaluate its effectiveness in solving various tasks in the field of intelligence, cyber security and data analysis. The study is aimed at identifying the advantages and limitations of using OSINT tools, as well as providing science-based recommendations for their optimal use in various application scenarios.

1.3. Current state of OSINT- Technologies

Open source intelligence (OSINT) is a field that studies and uses open sources to obtain and analyse information that is available to general public. The primary goal of OSINT is to gain an understanding of a situation or object by processing and analysing public information. The development of technology and the increase in the amount of available information create wide opportunities for the use of OSINT in various areas.

Social networks and media:

Analysis of social media platforms: Includes activity monitoring, interactions, community analysis and key person identification.

Media monitoring: Monitoring news and content from various sources to get a complete picture of the situation.

Geospatial analysis:

Use of geodata: Involvement of satellite images, geographic information systems and other sources to determine the location of objects and study their spatial relationships.

Analysis of textual and visual information:

Natural Language Processing (NLP): Using NLP algorithms to analyse textual information, identify connections and emotions.

Computer Vision: Using computer vision technologies to analyse visual content such as photos and videos.

Data analysis platforms: Maltego,

Recorded Future: Specialized tools for integrating and analysing diverse information from diverse sources.

Ethnographic analysis:

Sociocultural learning: Understanding behavioural patterns and cultural differences to better contextualize the information received.

These tools are used in various fields, including security, intelligence, business intelligence, and others. The application of scientific methods and technologies in OSINT allows to optimise the processes of data collection and analysis, providing more insights for making informed decisions.

2. Methods

The article uses a multifaceted approach to achieving the goal. The research uses both theoretical and empirical methods, combining a comprehensive analysis of specialized literature with practical research. The theoretical base involves an in-depth study of the existing literature related to the use of OSINT technologies.

3. Results

The OSINT Framework is essentially a set of various tools and methods used to collect and scrutinize information available in the public domain (OSINT, 2023). This methodology aims to offer a structured and methodical way of sourcing and analysing data from diverse channels, including the internet, social media platforms, government records, and more.
Its purpose is to assist individuals and organizations in methodically and effectively analysis of information from open sources. The framework organizes digital resources into multiple categories, such as searching for individual profiles, analysing networks and others.
Each of these categories comprises specific online resources suitable for OSINT activities. For instance, the category dedicated to searching for people includes resources for finding details about individuals through social media profiles, online directories, and other similar platforms.
Similarly, the category for network analysis provides resources to gather details about digital infrastructures like IP addresses and subdomains. Utilizing this OSINT Methodology enables users to fully leverage the advantages of OSINT and stay vigilant against potential security threats (**Figure 1)**.

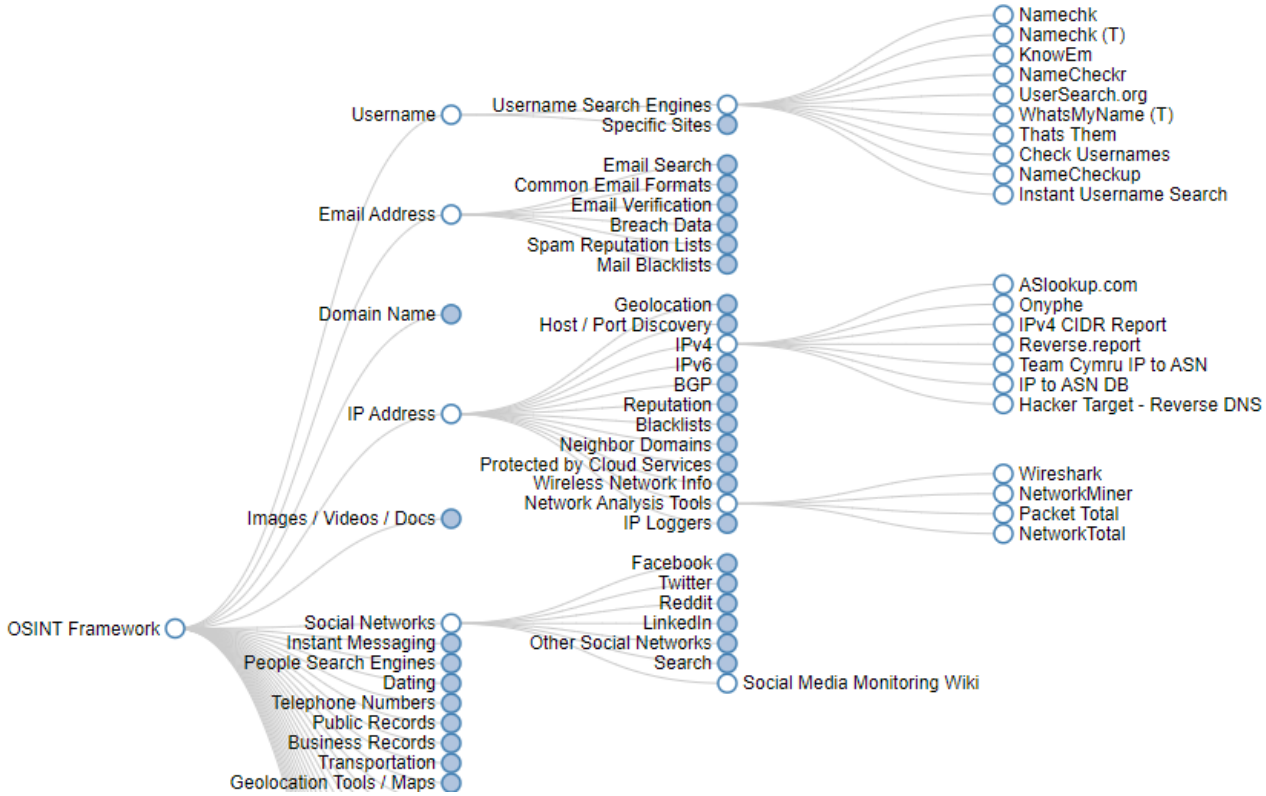

Figure 1. An example of programs and applications in the structure of the OSINT Framework.

4. Discussion

In summary, the article highlights the crucial role of open source intelligence technologies (OSINT) in today's digital landscape, with a specific focus on the OSINT Framework. This framework, comprising various tools, proves instrumental in systematically gathering and analysing information from open sources. The study emphasizes the versatility of OSINT tools, spanning social networks, geospatial analysis, textual and visual information analysis, and more.

Through a blend of theoretical and empirical methods, the research underscores the OSINT Framework's structured approach to data collection, offering specific categories for tasks such as individual profile searches and network analysis. The framework enhances the efficiency of OSINT activities, enabling users to extract valuable insights and stay vigilant against potential security threats. Overall, the article contributes to a deeper understanding of OSINT technologies, providing science-based recommendations for their effective application in intelligence, cyber security, and data analysis.

Reference

1. OSINT Framework [Internet resource]. Accessed 06.12.2023. Available from https://osintframework.com/