Exploiting the dark triad for national defense capabilities

Dimitris Gritzalis

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What is all about?

The problem:
An insider as a severe threat to national defense

The theory:
Narcissists tend to turn insiders

The defense:
Reveal narcissists

The data source:
Online Social Networks and the Web 2.0

The tool:
NEREUS Framework
The problem: The Insider threat

Insider threat was the **top priority to protect** for 2014

Insiders are persons who:
- are legitimately given access rights to a Critical Infrastructure
- misuse their privileges and violate security policy

Insiders consist the **top source** of data breaches

Source:
The theory: The Dark Triad

• **Dark Triad personality traits**
  - Narcissism: Inflated self-view and focus on themselves
  - Machiavellianism: Manipulative personality
  - Psychopathy: High impulsivity and thrill-seeking, along with low empathy and low anxiety

• Dark Triad traits are used to extend Five Factor Model (FFM) to represent **socially malevolent behavior**

• The wealth of data provided by OSN users has opened the door to a new way of **analyzing personality**

• Ability to **exploit narcissism** personality trait
  - Narcissism trait is also examined by Shaw and the FBI

**Sources:**
The defense: Open Source Intelligence

Open Source Intelligence (OSINT) is produced from publicly available information, which is:
- Collected, exploited and disseminated in a **timely** manner
- Offered to an **appropriate** audience
- Used for the purpose of addressing a specific **intelligence requirement**

**Publicly available** information refers to (not only):
- Traditional media (e.g. television, newspapers, radio, magazines, etc.)
- Web-based communities (e.g. social networking sites, blogs, etc.)
- Public data (e.g. government reports, official data, public hearings, etc.)
- Amateur observation/reporting (e.g. amateur spotters, radio monitors, etc.)


**SOCMINT** is produced from Online Social Networks & the Web 2.0
The data source: Web 2.0 & Online Social Networks

Source: http://socialmediatoday.com/
The tool: The **NEREUS** Framework

<table>
<thead>
<tr>
<th>NEREUS Framework</th>
<th>OSN: Twitter</th>
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**Tools used for the open data analysis**

<table>
<thead>
<tr>
<th>Science</th>
<th>Theory</th>
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<tbody>
<tr>
<td>Informatics</td>
<td>Graph Theory</td>
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<td></td>
<td>Content Analysis</td>
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<tr>
<td>Sociology</td>
<td>Theory of Planned Behavior</td>
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<td>Social Learning Theory</td>
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**Application:** Insider threat detection/prediction, influential users detection, means of communication evaluation, etc.
The NEREUS Framework in a nutshell

Predicting & identifying potential insiders

Researchers’ compliance with ethical standards

Legal Expert

YES

Critical infrastructures National security Public interest

Twitter Users

Content generation

Twitter

Crawling & storing

Our crawling server

Klout score queries

Klout score server

Legend

Web 2.0 Medium: Twitter
Domain Expert: Psychologist

Information Security & Critical Infrastructure Protection Laboratory

Category | Influence valuation | Klout score | Usage valuation
---|---|---|---
Loners | 0 - 90 | 3.55 - 11.07 | 0 - 500
Individuals | 90 - 283 | 11.07 - 26.0 | 500 - 4,500
Known users | 283 - 1,011 | 26.0 - 50.0 | 4,500 - 21,000
Mass Media & Personas | 1,011 - 3,604 | 50.0 - 81.99 | 21,000 - 56,900

Content Aggregator

Usage intensity valuation

Indegree/oudegree aggregator

Influence valuation

User classification according to categories

Ver. 2.11.14, 24.11.2014
The dataset utilized

• Focus on a Greek **Twitter** community:
  - Context sensitive research
  - Utilize ethnological features rooted in locality
  - Extract and analyze results

• Analysis of **content** and measures of **user influence** and **usage intensity**

• User Categories: Follower, Following, Retweeter

• Graph:
  - Each user is a node
  - Every interaction is a directed edge

• **41.818 fully crawled users** (personal & statistical data)
  - Name, ID, personal description, URL, language, geolocation, profile state, lists, # of following/followers, tweets, # of favorites, # of mentions, # of retweets

**Twitter** (Greece, 2012-13)

- **1.075.859 users**
- **41.818** fully crawled users
- **7.125.561 connections** among them
Graph theoretical and content analysis

Strongly connected components:
- There exists 1 large component (153.121 nodes connected to each other) and several smaller ones

Node Loneliness:
- 99% of users connected to someone

Small World phenomenon:
- Every user lies <6 hops away from anyone else

Indegree Distribution:
- # of users following each user
- Average 13.2 followers/user

Outdegree Distribution:
- # of users each user follows
- Average 11 followers/user

Usage Intensity Distribution:
Weighted aggregation of: {# of followers, # of followings, tweets, retweets, mentions, favorites, lists}

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Important cluster of users
Conclusions

- Web 2.0 produces vast amounts of crawlable information and OSINT can transform it into intelligence.
- OSINT can assist in detecting the Dark Triad traits (narcissistic behavior, etc.).
- OSINT can help in predicting insiders, in predicting delinquent behavior, and in enhancing national defense.
- OSINT intrusive nature dictates use for specific purposes, according to law.
References


