Deep Web: A Residual of e-Public Administration

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Article History
Received: 4 February 2019 **Revised:** 11 March 2019 **Accepted:** 14 March 2019

Abstract
This article intention was to understand more about deep web, including dark web, as a critical part of stateless-based Public Administration paradigm. Therefore, the objectives of this research are as follows: (1) to investigate basic data and rough classification of deep webs, and (2) to suggest the solution for e-Public Administration. Documentary research and descriptive statistics like frequency and percentage were used in this study. The findings found that the top four of live deep webs were Non-English696 Sites (14.8%), Cryptocurrency 685 sites (14.5%), Media and Forum for uploading, downloading, and discussion 653 sites (13.8%), and Hosting 473 sites (10.0%). The activities in deep web were Non-English, Cryptocurrency, Media and Forum, Hosting, Under construction / Blank / Seized, Marketplace Drugs, Search Engines, Marketplace Commercial Services, Marketplace Financial, Blogs, Messaging, Private Web Site, Tutorials, Libraries and Wiki, Closed Website, Hacking, Whistle Blowing, Security, Marketplace Betting, P2P File Sharing, Cybercriminals, Dangerous threats, and Boards. In addition, Neural Network and Genetic Algorithm of AI and foundation of an autonomous public organization for controlling deep web in form of self-directed team under starfish organization-based structure were the best solutions for coping with the severe change in Public Administration.
Keywords: Dark Web, residual, e-Public Administration

Introduction
Internet by ARPANET since 1968 and World Wide Web by CERN since 1991 are two of the most important disruptive technology in the history of the world, especially third wave or information age, because they connect the world as follows: Internet is a comprehensive network of computer network whereas World Wide Web is a compatible software format for web pages, called “http” protocol, in order to access Internet from anytime and anywhere. (Ferrera, Lichtenstein, Reder, August, and Schiano, 2001; Horvath, 2006; Whitman and Mattord, 2012; Laudon and Laudon, 2019). With both of them, the world then has been flatly connected with the same standardized information technology (IT). This process of change is called “digital transformation.” After that, hyper-competitive economy has been one of the outstanding consequences of this change with high-speed transfer of data in 24*7 (Friedman, 2007; Goodwin, 2018; Lewis and Malmgren, 2019). The estimated size of World Wide Web according to the estimations of the numbers of pages indexed by Google, Bing, Yahoo! Search by worldwidewebsize.com on 17 February 2019 is at least 6.18 billion Websites (De Kunder, 2019).
However, they are just the top of iceberg that are easily accessible by standard search engines such as Google, Yahoo!, and Bing. The residual is the most well-known as Deep Web. Deep Web, Secret Web, Invisible Internet, and Digital Underground are interchangeable. The deep web is roughly 96% of total Websites, five hundred times larger than the surface Internet. The deep web is a set of Websites that is inaccessible by traditional search engines and normal Web browser, mostly used by many organizations for internal lawful purposes such as

membership records, academic databases, medical records, legal documents, scientific reports, government reports, internal specific respiratory, and so on. Furthermore, there are a set of Websites in the Deep Web dedicated for illegal affairs (such as drugs, weapons, assassins/killers, fraud services such as cloned credit card, hacking, pornography), called Dark Web or Dark Net, approximately 3% of total Deep Web. (Raghavan and Garcia-Molina, 2001; Hamilton, 2003; Goodman, 2016; Thomson, 2017; Dark Web News, 2019; Tarquin, 2019) Deep web and dark web are another challenge for e-Public Administration because they are beyond the public sector jurisdiction as well as cryptocurrency and blockchain (Gohwong, 2018a). Therefore, the objectives of this research are as follows: (1) to investigate basic data and rough classification of deep webs, and (2) to suggest the solution for e-Public Administration.

Methodology

Documentary research and descriptive statistics (such as frequency, percentage) were employed for 4,715 deep webs according to Dark Web News' data in this study (Dark Web News, 2019) due to time and budget limitation.

Basic Data of Deep Web

First, in general, deep web is defined a group of Websites that cannot be found and opened by traditional search engines and normal Web browser-such as Microsoft Edge, Mozilla Firefix, Opera, Google Chrome[3]. They are password-protection or need a specific software to access them. In overall, deep web focuses on legal affairs such as academic database for conference proceedings, Patent documents for public agencies, and so on (Goodman, 2016; Tarquin. 2019).

Second, web browsers for deep web are TOR (The Onion Browser), I2P, and Freenet. The most popular software for surfing deep web was Tor, written by Python, Rust, and C. It was developed by U.S. Navy and funded by the U.S. government (The Tor Project, Inc., 2015; Krishnan, 2016; Perry, Clark, Murdoch, and Koppen, 2018; Sigalos, 2018). However, deep web can be surfed without TOR. Tor2web, originally created by Aaron Swartz and Virgil Griffith, is a developing software, written by Python, for accessing TOR Onion Services from any standard browsers. It works as a proxy between users and deep websites by translating ".onion" or onion address into an https URL such as ".onion.to" or ".onion.city" or ".onion.cab" or ".onion.direct" or any other domains (HERMES Center for Transparency and Digital Human Rights, 2015).

Third, searching deep web can be done only by Web Search Engines such as The WWW Virtual Library (http://vlib.org/), Surfwax (http://lookahead.surfwax.com/), Stumpedia (http://www.stumpedia.com/), TechDeepWeb (http://techdeepweb.com/4.html), and DuckDuckGo (https://duckduckgo.com/) However, during 2014-2017, there was an easy way for searching deep web, Grams. Grams Website was the Google of dark web for searching a vendor or product from cross-marketplace searches, money laundering with Bitcoin from Helix Light, and for searching databases for TOR Websites. However, it closed since 2017 due to the problems of finance, data collection from the dark markets, and Website maintenance. (Krishnan, 2016; Stone, 2017; Dark Web News, 2019; Deep.Dot.Web, 2019; Grams, 2019).

[3] The user can add ".onion.to" behind the URL of Website or use Tor2web (https://www.tor2web.org/) in order to access deep web without using TOR, the most famous deep web browser. However, it does not protect security for user.

Rough Classification of Deep Web

According to Dark Web News' data, 4,715 deep webs, which was a subset of total deep webs, was the sample of the study (Dark Web News, 2019). The findings was shown in Table 1.

Table 1 The Classification of Deep Web

Category	Frequency	Percentage
Non-English	696	14.8
Cryptocurrency	685	14.5
Media and Forum	653	13.8
Hosting	473	10.0
Under construction / Blank / Seized	341	7.2
Marketplace Drugs	249	5.3
Search Engines	232	4.9
Marketplace Commercial Services	217	4.6
Marketplace Financial	197	4.2
Blogs	191	4.1
Messaging	171	3.6
Private Web Site	146	3.1
Tutorials	116	2.5
Libraries and Wiki	97	2.1
Closed Website	74	1.6
Hacking	73	1.5
Whistle Blowing	43	0.9
Security	30	0.6
Marketplace Betting	14	0.3
P2P FileSharing	8	0.2
Cybercriminals	5	0.1
Dangerous threats	3	0.1
Boards	1	0.0
Total	**4715**	**100.0**

According to the above findings, the top four of live deep webs were Non-English 696 Sites (14.8%), Cryptocurrency 685 sites (14.5%), Media and Forum for uploading, downloading, and discussion 653 sites (13.8%), and Hosting 473 sites (10.0%). The activities in deep web were Non-English (in Messaging, Media and forum, Blogs, Hacking, marketplace for Drugs, Under construction / Blank / Seized, Hosting Cryptocurrency, Marketplace Betting, Marketplace Commercial Services, Libraries and Wiki, Marketplace Financial, Tutorials), Cryptocurrency (such as "http://nt4ozq4yi5q6lf6q.onion" can exchange Bitcoin (BTC) for black money in form of bank accounts, credit cards, PayPal accounts (fiat currency) that the vendor will multiply 10x BTC of its customer), Media and Forum (such as Free Press with uncensored news and topics, Acropolis-a forum for Dark Market on Deep Web), Hosting (Anongw-a Deep Web Proxy, AnonPlus-a free Tor Hosting), Under construction / Blank / Seized (such as "http://idxnznd26gjzp4vf.onion" was hacked by U.S Immigration and Customs Enforcement with a message-"This hidden site has been seized.", Blank website), Marketplace Drugs (such as Cannabis, Stimulants, Ecstasy, Opioids, Benzos, Dissociatives, Psychedelic, Prescription), Search Engines (such as EasyONIONS, DuckDuckGo, not Evil), Marketplace Commercial Services (Akvilonom Store for electronics, AllInOne-a service for

Fake Documents such as Passport, Driver License, Bank Statement, Tax invoice, Utility Bills and so on from more than 25 countries), Marketplace Financial (such as credit cards, gift cards and pay pal accounts with reasonable price), Blogs, Messaging (such as OnionMail for Tor hidden services with cryptography), Private Web Site, Tutorials, Libraries and Wiki, Closed Website (such as BTGigs allows only old users for accessing its Website), Hacking (such as Agento Services offer Life Ruining, Private Investigation services, and hacking services), Whistle Blowing (such as Websites of Hermes Center for Transparency and Digital Human Rights), Security, Marketplace Betting, P2P File Sharing (such as DameTorrents, BitTorrent tracker service), Cybercriminals (organized criminal groups with former soldiers and mercenaries), Dangerous threats (such as virus, phishing), and Boards (for "Map Mos Maiorum"-one of the largest European Joint Police Operation for Schengen member states).

Discussion

The deep web is a residual part of e-Public Administration because it is a subset of my stateless-based Public Administration paradigm (Gohwong, 2018b). According to the findings, it revealed that deep web comprised both legal (such as Map Mos Maiorum for Schengen member states) and illegal affairs (such as drugs trafficking, cyber-attacks services, phishing, Bit Torrent for piracy, Betting, Credit Card Fraud, and Hacking, Forgery Market for fake documents, Abusive contents on blogs, illegal cryptocurrency, and so on). All illegal affairs beyond government's jurisdictions were the same three findings from three papers of Srirath Gohwong about cryptocurrency and cashless society (Gohwong, 2017, 2018a, 2018b) that every government could partially control money (both fiat currency and cryptocurrency) and illegal affairs now. The unbalance between advancement of new technologies (such as blockchain, cryptocurrencies, AI, IoT) and government capacity led to ineffectiveness of law enforcement that used Market mechanism-based policy instruments, such as legalization, liberalization, deregulation, and privatization. Private and people sector could easily violate law because government could not seriously enforce the law by discovering, deterring, rehabilitating, or punishing people who violate laws and regulations (Weimer and Vining, 1989; Durand and Vergne, 2013).

For example, law enforcement of Thai government toward cryptocurrency was not enough because she legalized only seven cryptocurrencies from 1, 639 currencies-Bitcoin (BTC), Ethereum (ETH), Ripple (XRP), Bitcoin Cash (BCH), Litecoin (LTC), Stellar (XLM), and Ethereum Classic (ETC) by enacting "the Emergency Decree on the Digital Asset Businesses 2018", "the Emergency Decree on the Amendment of the Revenue Code (No.19) 2018", and Office of the Securities and Exchange Commission (SEC)'s eleven regulations (such as criteria of algorithm, license fee for Digital Asset Businesses, and Prohibitions of provider in Digital Asset Businesses). In addition, there were at least 140 Privacy-based cryptocurrency from 1, 639 currencies that its users can do any transactions with anonymity from government by using advanced technologies like CryptoNote, CrytpNight, Zero-knowledge proof, and TOR. (Gohwong, 2018a, 2018c)

The solutions for deep web is based on my Neo-Pubic Administration by using AI such as Neural Network and Genetic Algorithm for finding solutions in public policy analysis. Neural Network should be used for capturing pattern of law violation in deep web by using machine learning whereas Genetic Algorithm should be employed for finding the best solutions for law enforcement of government agency. As I suggested in my previous papers, government should found an autonomous public organization for monitoring and controlling both deep web, especially dark web, and other advanced technologies (such as cryptocurrency, blockchain, IoT, and AI), with partnership with private sector and people sector in form of self-directed team under the Ori Brafman and Rod A. Beckstrom's starfish organization-based structure (Daft, 2005; Gohwong, 2015, 2018a).

Conclusion

The finding of this paper is just another piece of jigsaw puzzle of stateless-based Public Administration paradigm which is a residual for e-Public Administration. It revealed the reality that government with absolute power was just a page in Public Administration history. In addition, deep web, including dark web, under stateless-based Public Administration paradigm has changed Public Administration into a new area of study which is one of the most kept eyes on and least understood phenomenon on earth.

Limitation of the Study

Due to time limitation, the population here were only 4,715 deep webs according to Dark Web News' data on February 17, 2019 (Dark Web News, 2019).

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