Intimidations and Assistances of Deep and Dark Web in Modern Era

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Abstract— Deep web harvesting is the necessity of the time. Deep web, also known as invisible web or hidden web is that portion of the World Wide Web from where the contents present cannot be fetched or indexed by traditional search engines such as Google, Yahoo, Excite, Bing etc. due to some technical limitations in them (Devine and Egger-Sider, 2001). A subset of deep web is the dark web. A Dark web is an overlay network that can only be accessed with specific software, configurations, or authorization, often using non-standard communications protocols and ports. Dark web is the stuff of crime novels. It is a hotbed of criminal activity where anything can be bought and sold. The Dark web is a dangerous place where illicit or underground activities are conducted. Dark web is a pool of black market which includes web sites that allow selling and purchasing of items such as hacking software/malware, counterfeit money, drugs, guns etc. The deep web and the dark web are estimated to be literally thousands of time larger than the visible web. This paper initially defines different layers of the web. The paper also explores the threats that the dark web possess to the modern world. In addition to this, the paper also elucidates the importance of deep web harvesting in our daily lives and explores the tools that could be used to find useful resources buried inside the deep web.

Keywords— Deep Web, Dark Web, Surface Web, Bitcoins, Bright Planet, Silk Roads, Tor Browser.

I.   INTRODUCTION

The deep web attracts most of us, frights some of us, but is used by almost all of us. The fact that the search engines only search a very minor portion of the web makes the deep web a very tempting resource. There is a lot more information present in the deep web that could not be even imagined. According to Bright Planet, a deep web harvester, the invisible web contains nearly 550 billion individual documents as compared to one billion of the visible web [1]. According to the research conducted in 2000 by Bergman and colleagues, deep web was found to be 400-550 times larger than surface web, comprising 200,000 webpages, 550 billion documents and 7,500 terabytes of information. Deep web includes resources such as the databases, pages containing images, audio, video, pdf, flash shock ware and compressed files, pages of private networks, spam pages, locked out contents, disconnected pages, real time contents and dynamically generated contents. Section II introduces the three types of web; namely; surface web, deep web and the dark web. Section III discusses how the deep and dark web possesses threats to the modern world by acting as a gateway for the hazardous pool of black market sites. Section IV highlights the other side of deep and dark web; the resources and knowledge databases hidden inside the deep and dark web that could be accessed for good intentions.

II.   RELATED WORK

Web today is the faster growing universe containing interlinked web pages and web apps, crowded with videos, photos and interactive contents. Web is the collection of public websites connected to the Internet worldwide, through with the client devices, such as computers and cell phones that can access its contents. Depending on the accessibility of the resources present in the web, it is divided into three layers: the Surface Web, the Deep Web and the Dark Web.

II.I.   SURFACE WEB

The Surface Web, also known as Visible Web, Indexed Web, Indexable Web, Clearnet, Crawlable Web, Public Web or Lightnet, is that portion of World Wide Web that is always available to general public and is easily searchable by traditional web search engines such as Google and Bing. Surface web is made up of static and fixed pages that do not depend on database for their contents. These are basically html files that reside on the servers waiting to be retrieved. Surface web contains web pages whose domain commonly ends in .com, .org, .net or similar variations. According to a survey, the indexed web contains at least 4.59 billion pages and dutch indexed web contains at least 216.5 million pages (August, 2017) [2].
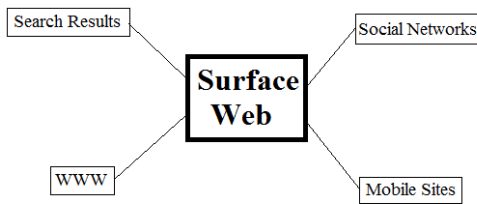
Figure 1: Contents of Surface Web

II.II. DEEP WEB

Beneath the surface web lies the most uncharted ocean called Deep Web, also known as Invisible Web, Deep Net or Hidden Web. Deep web refers to information or resources on web that could not be crawled or indexed by traditional search engines such as Google and Bing. Deep web contain all the contents that are behind a paywall, anything that is password protected (emails, online bank statements, office intranet, chat messages), or anything that is dynamically generated and does not have a permanent URL. Deep web also includes blocked sites, unlinked sites, private sites, non html contextual scripted contents, limited access networks and the Tor (The Onion Router) sites. According to reports, only 4% of the web is visible to public for use and the rest of 96% of web, which contains higher quality information than surface web, is hidden under the darkness [3] [4]. Majority of the deep web does not have anything illegal on it. Users are able to access most of this information, but only through specific searches that unlock where this information resides. Moreover, specialized search engines, directories, and wikis can assist to locate the data of deep web. Some of such specialized search engines are mentioned below [5]:

- DeeperWeb-Google's deep web search engine
- The WWW Virtual Library
- Surfwax
- IceRocket
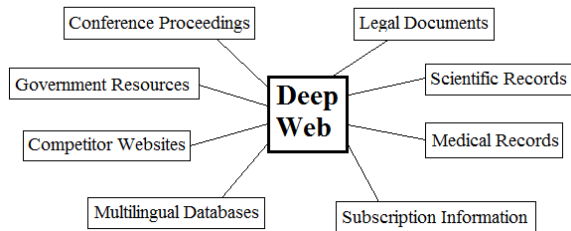- Grams Search Engine
- Stumpedia
- Freebase
- Anonymous Hacking Web

II.III. DARK WEB

Dark web, also called Dark Net, is the subset of deep web which include all sort of websites, both legal and illegal, including sites that sell drugs, counterfeit money, weapons, stolen credit cards and even sites for hitmen. Such sites are frequently used by terrorists and criminals to keep their dealings secret. The contents of dark net sites are intentionally concealed. The variety of sites of dark web is quite astonishing. Such sites require special software to access such as Tor, Freenet and I2P. For example, dark web sites with .onion domain can be accessed using the Tor (The Onion Router) network with the Tor browser bundle. Tor is the most widely used dark web browser.

In additional to Tor browser and dark web search engines, criminal wikis and hidden chatrooms also provide routes to access dark web's wares. On the dark web, simple addresses like 'google.com' are not used; rather, much longer and complicated URLs are used to access the site. For example, to visit dark web site 'Hidden Wiki', the URL 'kpvz7ki2v5agwt35.onion' is used [6]. Some of the dark web search engines are mentioned below:

- Darknet Marketplace
- Grams
- Onion.city
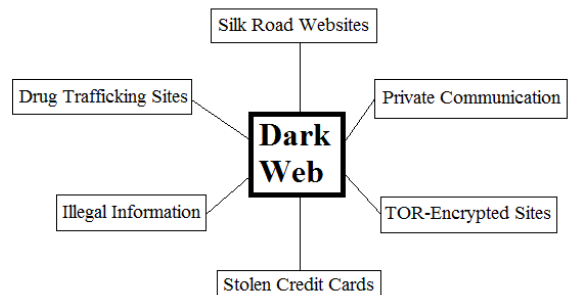- Onion.to
- Not Evil
- Hidden Wiki
- Onion Soup

Figure 3: Contents of Dark Web

Table 1 gives summarizing information on three types of web; namely surface web (visible web), deep web (invisible web) and dark web; including the contents they contain and the method to access them.

Figure 2: Contents of Deep Web

Type of Web	Accessibility/ Indexing	Contents	Accessed Through	Users

| Surface Web | Accessible and Indexed | WWW, Social Network, Mobile Sites, Search Results | Traditional Search Engines such as Google and Bing | Everyday users |
| Deep Web | Accessible and Non-Indexed | Government Resources, Legal Documents, Medical Records, etc. | Specialized Search Engines such as DeeperWeb and WWW Virtual Library | Advanced users |
| Dark Web | Restricted and Non-Indexed | Silk Road Websites, TOR Encrypted Sites, Illegal Information etc. | Special software like Tor, Freenet, I2P | Criminals, drug mafia |

Table 1: Types of Web
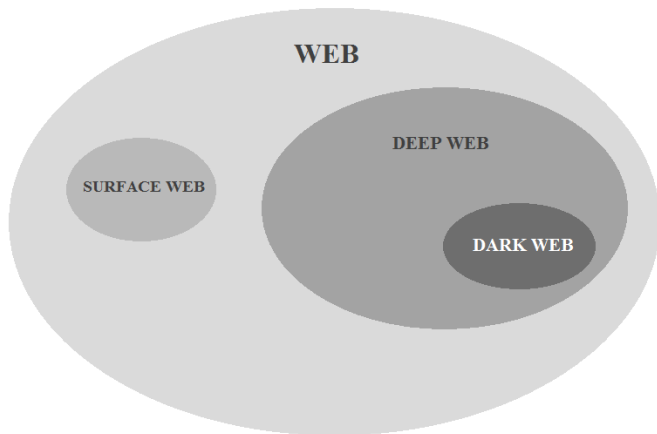
Figure 4: Three types of web

III. INTIMIDATIONS OF DEEP AND DARK WEB TO THE SOCIETY

Dark web possess a lots of threats to the modern world. Dark net is a hazardous pool of black market sites that sell drugs, hacking software, counterfeit money, weapons, porn sites, bitcoin tumbling, whistleblowers, crypto anarchists, stolen credit cards and even sites for hitmen. These websites are huge host to various cyber-crime and other all sorts of crime. Dark Web acts as a huge digital secretive network where hackers, criminals, terrorists, and pedophiles come to pursue their trade. In addition to providing a good trade market for terrorists and criminals and these sites also keep their dealings secret. Services on the dark web are not available without paying for them. Payments here are made conveniently through online digital cash such as bitcoin and dark coin, which works without a central repository or single administrator [7]. Through the use of mixing services like 'Bitcoin Laundry', bitcoin transactions become very difficult to track and are effectively hidden.

Just as criminal can rely upon the anonymity of the dark web, so too can the law enforcement, military and intelligence communities. They may, for example, use it to conduct online surveillance and sting operations. Even though the dark web makes law enforcement agencies job much more difficult, they have had a great deal of success in bringing down sites and arresting their users and people behind them. The most famous of these was the arrest of Ross Ulbricht, the person behind the most well-known drug markets, Silk Roads [8, 11]. Silk Road is one of the most notorious sites formerly located on the Dark Web. The Silk Road was an online global bazaar for illicit services and contraband, mainly drugs. Vendors of these illegal substances were located in more than 10 countries around the world, and contraband goods and services were provided to more than 100,000 buyers. It has been estimated that the Silk Road generated about $1.2 billion in sales between January 2011 and September 2013, after which it was dismantled by federal agents [9]. Table 2 lists of some hidden .onion dark web links with site name, status (whether site is up or down currently) and their links [10]. Table 3 shows a list of various items that can be bought from dark web [8], and Table 4 shows the services that make dark web a crime world [8].

S. No.	Link Name	Status	URL
1	AlphaBay Market	Up	http://pwoah7foa6au2pul.onion/affiliate.php?ref=2t61P1985
2	Acropolis Market	Up	http://acropol4ti6ytzeh.onion/auth/register/BCBTNUERXY
3	Agora	Down	http://agorahooawayyfoe.onion/register/Bp5xEYgG8h
4	Apple Market	Down	http://254iloft5cheh2y2.onion
5	Bloomfield	Up	http://spr3udtjiegxevzt.onion
6	Crypto Market	Down	http://cryptomktgxdn2zd.onion
7	DHL	Down	http://darkheroesq46awl.onion/
8	Dr D's	Down	http://drddrddig5z3524v.onion/session/register/D6CCEE
9	Dream Market	Up	http://lchudifyeqm4ldjj.onion/?ai=552713
10	French Dark Net	Up	http://s35ws7u7sj2g3uxm.onion/
11	Grams Search Engine	Up	http://grams7enufi7jmdl.onion
12	Hansa	Up	http://hansamkt2rr6nfg3.onion
13	IDC	Up	http://2qrdpvonwwqnic7j.onion/

14	Intelligence Black Market	Down	http://ibmarketh6fnr65q.onion
15	Leo	Down	http://leomarketjdridoo.onion/register/856aeda2b30778
16	Mr. Nice Guy	Down	http://niceguyfa3xkuuoq.onion/session/register/D6CCEE
17	Oasis	Down	http://oasisnvwltxvmqqz.onion
18	OutLaw	Up	http://outfor6jwcztwbpd.onion/indxx1.php
19	Oxygen	Down	http://o2oxycuvnwxhv73e.onion
20	Python	Down	http://25cs4ammearqrw4e.onion/market/task.php?register=1
21	Ramp	Down	http://ramp2bombkadwvgz.onion
22	Ru Tor	Down	http://xuytcbrwbxbxwnbu.onion/
23	Silk Road 3	Up	http://silkroad7rn2puhj.onion/
24	The Detox	Down	http://tdetox4obdz62tri.onion
25	The Magestic Garden	Up	http://2mybnercfcums5lj.onion
26	TheRealDeal	Down	http://trdealmgn4uvm42g.onion/
27	Tochka	Up	http://tochka3evlj3sxdv.onion/
28	Valhalla	Up	http://silkkitiehdg5mug.onion

Table 2: Dark web market links (sorted alphabetically according to link name)

S. No.	Item Name	Description
1	Drugs	An Illicit and prescription drug of every type is available either at individual level or dealer-level. Brainmagic, Agora Phishing, Mom4Europe, ExitSeven, CocaineMarket, DreamMarket are the websites that deal with drugs.
2	Counterfeit Currency	Bogus and replica money in huge qualities and cost is available, including euros, pounds, and yen. USD Counterfeits, Cheap Euros, 20 Dollar USD Notes are the websites that deal with counterfeit currency.
3	Forged Papers	Passports, driver's licenses, citizenship papers, fake IDs, college diplomas, immigration documents, and even diplomatic ID cards are available. United States Citizenship, UK Passports are the websites that deal with forged papers.
4	Firearms and Explosives	Weapons such as handguns and C4 explosives can be purchased from dark market. European Arms, GlobalGuns, Black Market are the websites that deal with weapons.
5	Hitmen	Service providers who accept bitcoin as payment are available for everything from private grudges to political assassinations. They provide photographic proof of the deed.
6	Human Organs	Live organs including Kidneys for $200,000, hearts for $120,000, livers for $150,000, and a pair of eyeballs $1,500 are available.

Table 3: Items that could be bought from Dark Web

S. No.	Service Name	Description
1	Cryptocurrency	Payments on dark web are made conveniently through online digital cash such as bitcoin and darkcoin, while keeping the real-world identities concealed.
2	Bulletproof Web-hosting Services	Some Web hosts, instead of making attempts to learn the real identities of their customers, welcome all types of contents and accept anonymous payments in bitcoin. Such services are usually found in places such as Russia or Ukraine.
3	Cloud Computing	Hackers and cyber attackers host their criminal malware with reputable firms such as Amazon Cloud.
4	Crimeware	All kinds of tools needed need to identify system vulnerabilities, commit identity theft, compromise servers, and steal data is available for cyber criminals.
5	Hackers For Hire	Hackers-for-hire are outsourced by organized cybercrime syndicates such as China's Hidden Lynx group claims up to 100 professional cyber thieves, some of whom are known to have breached systems at Google, Adobe, and Lockheed Martin.
6	Multilingual Crime Call Centers	Employees of crime call centers are always ready to play duplicitous role, such as providing job and educational references, initiating wire transfers, and unblocking hacked accounts. Such calls may cost around $10.

Table 4: Services provided on dark web that make it a crime world

IV.   ASSISTANCES OF DEEP AND DARK WEB TO THE SOCIETY

Despite of the intimidations and threats of deep and dark web, and there is a lot that the deep web can bring on a positive note. Dark web has numerous resources and knowledge databases that could be accessed with no restriction. For all of the good intentions, here are some of the benefits of the hidden Web.

- Anonymity and Concealment

Anonymity always results in freedom. The Tor web browser that is used to access deep and dark web provides anonymity. Tor is an effective censorship circumvention tool that allows its users to reach otherwise blocked destinations or contents. Tor protects the communications from bouncing around a distributed network of relays run by volunteers all around the world. It prevents Internet connection from learning what sites are being visited. It also prevents the visited sites to learn the physical location of the visitor. Journalists use Tor to communicate more safely with whistleblowers and dissidents. Non-governmental organizations (NGOs) use Tor to allow their workers to connect to their home website while they're in a foreign country, without notifying everybody nearby that they're working with that organization. Groups such as Indymedia recommend Tor for safeguarding their members' online privacy and security. Activist groups like the Electronic Frontier Foundation (EFF) recommend Tor as a mechanism for maintaining civil liberties online. Corporations use Tor as a safe way to conduct competitive analysis, and to protect sensitive procurement patterns from eavesdroppers [12].

- Freedom to express

Freedom to express is a direct consequence of anonymity. For example, if people living in countries that have an oppressive regime (e.g. North Korea) want to have more freedom, the dark web can help to establish that. These people can write blogs about their experiences in such countries on the dark web. Journalists and whistleblowers may also use dark web sometimes for similar reasons. Overcoming censorship is a positive feature that deep and dark net has allowed.

- Political engagements

The deep and dark web has result in a speaker for noble causes. Oppressive governments are a crude reality in the 21st century. Information is a very powerful weapon to this kind of regimes, and its citizen's movements on the World Wide Web are strictly monitored to avoid the spread of revolutionary ideas. Blocking websites, especially the ones related to social media, is a common measure in oppressive environments. It is in this context that browsers such as Tor appear as a solution to enable a safe communication line not only in a national level, it also allows international denounce certain situations. The deep and dark web has had a major role in recent historical events such as the Arab spring [13].

- Knowledge and awareness

The deep and dark web is the largest storehouse of virtual libraries. It is a great space for researchers, students and teachers, since what they can find in the deep and dark net will more probably not is available from standard search engines. Google (Google Scholar and Google DeeperWeb) and Microsoft (Microsoft Academic Research) for example allows deeper search into the dark web. Scientific findings that have not made public and could influence health and social beliefs of large populations can be found in the deep and dark web. Legal record databases that are buried inside web can be unveiled to see various court cases and court decisions. Certain technology (e.g. the iPhone 6s Plus) can be found on deep and dark web cheaper than that could be found on the Clearnet.

- Corporations and Governments

The dark web is a relatively safe place to keep and limit access to sensitive information, whether company records or political intelligence. Law enforcement uses the dark web to hide its identity while visiting websites and to create fake sites to bait wrongdoers.

- Other Benefits

Some of the domains that are blocked by ISP (Internet Service Providers) because of certain reasons can be accessed by going through the Tor network. Tor network bypasses the ISP's restrictions of blocked domains. Moreover, deep and dark web harvesting allows LEOs (Law Enforcement Officers) and intelligence agencies to have access to information at faster speeds. In addition to the fact that our information remains safe in dark web, it provides services like emails, I2P, Freenet, Tor, P2P, Tail OS and VPN.

V.   CONCLUSION

The deep web will continue to perplex and fascinate everyone who uses the internet. In this paper, I presented the three layers of the web in section II. The section III and IV discusses the two sides of deep and dark web; the negative side where the deep and dark web can threat the society and the positive side where they assist today's community. The dark web such as TOR represents a feasible way for malicious actors to exchange goods, legally or illegally, on a secret platform. On the other side, the deep and dark web is a vast portion of cyberspace, and offers invaluable resources that should not be overlooked by serious searchers. In today's unified comprehensive world, the dark net community will most likely continue to rise. It contains a fascinating volume of knowledge that could assist us progress technologically. The dark web just provides an easy

way to connect with people of parallel interests, and to facilitate further interaction.

VI.   REFERENCES

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