Cyber Crime in Pharmaceutical Companies

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ABSTRACT

Purpose: The purpose of this paper is to aware people about cyber security in pharmaceutical companies and how to prevent them.

Cybercrime is a crime that involves a computer and a network. The computer may have been utilized within the commission of a wrongdoing, or it may be the target or it is the use of a computer as an instrument for unlawful activities such as committing extortion, identity theft, or damaging privacy.

Design/ Methodology/ Approach: This paper portrays around the common zones where cyber crime usually occurs in pharmaceutical companies and how to prevent them. The paper also show the studies made on top 10 world pharmaceutical companies and top 10 Indian pharmaceutical companies on the basis of their origin, revenue and net profit.

Findings: Cybersecurity ventures anticipated that worldwide harms caused as a result of cybercrime would cost up to $6 trillion annually by 2021 and $10.5 trillion annually by 2025.

Paper Type: Student Research Initiative

Introduction

Pharmaceutical companies have most basic information which ought to be ensured. That's why companies have strict industry rules with respect to the defending of protected health information (PHI). That's why it needs most viable cyber security administration program.

Pharmaceutical companies have urgent need to increase cyber security because now they have adopted the use of resources such as third party vendor, automation tools, etc, which are more prone to cyber threats.

These days companies are getting to be more advanced and subsequently ought to increase cyber security.

These companies have access to sensitive data like PHI, drug patent, data related to pharmaceutical tech.

So, if information is stolen it can lead to serious consequences like clinical trials, reputation damage, lost of revenue etc.

Third party vendors

In this digital age of increased demand of time bound efficient work most pharmaceutical companies resort to third party vendors to carry out daily operations like insurance, treatment centers, manufacturers, data management etc.

However third party vendors may not take their network security as seriously as their clients may want to; one common reason being less financially capable than their clients. As a result hackers are more likely to target these third party vendors for a data breach to access company files.

A data breach can not only affect the operations of an organization but also cause reputational and possibly financial damage as well. This is why its important to adopt third party risk management measures like

Making inventory of third party vendors

- Delineating responsibilities among third party vendors
- Establishing fixed cybersecurity policies
- Limiting access to vendors
- Enable continuous user monitoring
- Action plan for third party incidents
- Performing regular audits

Ransomware

Ransomware could be a sort of pernicious computer program (malware) that undermines to distribute or pieces get to to information or a computer framework, more often than not by scrambling it, until the casualty pays a emancipate

expense to the assailant. In numerous cases, the deliver request comes with a due date. In the event that the casualty doesn't pay in time, the information is lost.

However its worth noting that in case of pharmaceutical companies hackers are unlikely to look for patient data rather, they would look to interrupt operations to leverage ransom for stolen data.

Statistically with respect to securityscorecard's 2019 healthcare cybersecurity report have also shown that healthcare industry ranks thirteenth out of eighteen in DNS health when compared to other major US industries.

- Having incident response plan
- Having system backups
- Restricting internet access
- Participate in cybersecurity information sharing programs
- Apply the principles of least privilege and network segmentation

Phishing attacks

Phishing is the false utilize of electronic communications to betray and take advantage of clients. Phishing assaults endeavor to pick up delicate, private data such as usernames, passwords, credit card data, arrange accreditations, and more. By posturing as a legitimate individual or institution by means of phone or mail, cyber assailants utilize social designing to control casualties into performing particular actions—like clicking on a malicious link or attachment—or willfully uncovering private data.

Increased security measures against phishing include

- multi-factor authentication
- limited employee network access.
- Inspecting and analyzing web traffic
- "Sandboxing" inbound email, checking the safety of each link a user clicks
- Rewarding good behavior, perhaps by showcasing a "catch of the day" if someone spots a phishing email

The internet of things

in recent years, the pharmaceutical industry has grasped the internet of Things (IoT), which alludes to a framework of interrelated computing gadgets and computerized machines that have the capacity to communicate and exchange information over a network.

This helps to streamline access to critical documents and patient information as well as use big data to monitor industry trends and trial success.

However they face major cybersecurity and privacy loopholes. According to Ponemon industries, 80 percent of IoT and 71 percent of mobile applications aren't tested for security vulnerabilities, which can be a issue. If an unsecured device is on the same network as your other devices, hackers can use that device as a gateway to your systems.

All data being gathered and information being stored should be accounted for.

Each device being connected to the network should be configured with security in mind.

Each device should be physically secured.

The organization's security strategy should be built on the assumption of compromise.

Employee error or negligence

Human errors are a major driver of data breaches across nearly all industries. The 2020 Data Breach Investigations Report by Verizon ranked social engineering attacks as the 2nd highest cause of data breaches.

Social engineered attacks which leverage human behaviour and vulnerabilities can be carried out through baiting, pretexting, and quid pro quo. not only high-level personnel butlower-level managing employees may also be targeted.

Mitigation measures for this involve

employee educational training and awareness of common attack methods

Update corporate security policy.

Use the principle of least privilege. The easiest and most reliable way to secure data access is to deny all access by default. Allow privileged access only when needed on a case-by-case basis.

Monitoring employees.

The pharmaceutical industry discovers, creates, produces, and markets drugs or pharmaceutical drugs for utilize as medications to be administered to patients, with the point to cure them, inoculate them, or ease the indications. Pharmaceutical companies may bargain in nonexclusive or brand medicines and medical devices. They are subject to a assortment of laws and directions that oversee the protecting, testing, security, viability and marketing of drugs.

Pharmaceutical companies are very essential.

Furthermore 10 global companies and 10 Indian companies are compared on the basis of revenue, net profit, number of countries they serve, their strategies etc.

Following are the top 10 world pharmaceuticals company

S. No.	Company	Founded	Founder	Headquarters	Products
1	Johnson and Johnson	1886	Robert wood Johnson, Jameswood Johnson, Edward Johnson	One Johnson & Johnson Plaza, New Brunswick, New Jersey, U.S.	Johnson baby product, Neutrogena, skin & beauty products, clean and clear facial wash etc.
2	Hoffmann-la Rouche	1896	Fritz Hoffmann □ la Rouche	Basel, Switzerland	Pharmaceutical products for cancer treatment, virus disease and for metabolic disease
3	Pfizer	1849	Charles Pfizer Charles F. Erhart	New York City, U.S	Pharmaceuticals, generic drugs, over the counter drugs , vaccines, diagnostics, contact lenses
4	Bayer	1863	Friedrich Bayer	Leverkusen, North Rhine-Westphalia, Germany	Veterinary drugs, diagnostic imaging, general and specialty medicines, diabetes care
5	Novartis	1996	Johann Rudolf Alexander clavel	Basel, Switzerland (Global Commercial) Cambridge, Massachusetts, United States	Pharmaceuticals, generic drugs, over the counter drugs , vaccines, diagnostics, contact lenses

S No.	Company	Revenue (19-20)	Net Profit	No. of Countries they serve
1.	Johnson and Johnson	US$ 82.584 Billion	US$14.714 Billion	175
2.	Hoffmann-la Rouche	Us $ 65.21 Billion	Us$ 16.84 Billion	100
3.	Pfizer	us$41.908 Billion	US$9.615 Billion	125
4.	Bayer	US $ 53.02 Billion	US $ 4.98 Billion	80
5.	Novartis	US $ 48.66 Billion	US $ 8.07 Billion	155

S. No.	Company	Founded	Founder	Headquarters	Products
6.	Merck & co.	1891	Theodore Weicker George Merck	Kenilworth, New Jersey, United States	pharmaceuticals, generic drugs, over the counter drugs , vaccines, diagnostics, contact lenses
7.	Glaxosmith-kline	2000	Glaxo Wellcome, SmithKline Beecham	London, England, UK	Pharmaceuticals, vaccines, oral healthcare, nutritional products, over-the-counter medicines etc.
8.	sanofi	1973	Elf Aquitaine	54 Rue La Boétie Paris, France 75008	Pharmaceuticals, generic drugs, over-the-counter drugs, vaccines, diagnostics, contact lenses, animal health etc.
9.	Abbvie	2013	Richard A. Gonzalez, Michael Severino	Lake Bluff, Illinois, United States	Pharmaceutical drugs: Humira (adalimumab), Imbruvica (ibrutinib), Venclexta (venetoclax), Zinbryta (daclizumab), Kaletra (lopinavir), Norvir (ritonavir) etc.
10.	Abbott	1888	Dr. Wallace Calvin Abbott	Abbott Park, Illinois, United States	Branded generic medicine. Medical devices. Diagnostic assays nutritionals etc.

S No.	Company	Revenue (19-20)	Net Profit	No. of countries they serve
6.	Merck & co.	Us $ 47.994 Billion	Us $ 7.067 Billion	180
7.	Glaxosmith - Kline	Us $ 48.28 Billion	Us $ 8.12 Billion	160
8.	Sanofi	Us $ 43.98 Billion	Us $ 3.44 Billion	170
9.	Abbvie	US $ 45.804 Billion	US $ 4.622 Billion	70
10.	Abbott	US $ 34.608 Billion	US $ 4.495 Billion	160

Following are the top 10 Indian companies.

S No.	Company	Founded	Founder	Headquarters	Products
1.	Sun Pharma	1983	Dilip Shanghvi	Mumbai, Maharashtra India	Pharmaceuticals, generic drugs, over-the-counter drugs, Vaccines, Diagnostics, contact lenses etc
2.	Divis Laboratories	1990	Murali Divi	Hyderabad, Telangana India	Naproxen, gabapentin, dextromethorphan
3.	Dr. reddy Lab ltd.	1984	Kallam Anji Reddy	Hyderabad, Telangana India	Pharmaceuticals, generic drugs, over-the-counter drugs, vaccines, diagnostics, contact lenses, animal health etc.
4.	Cipla	1935	Khwaja Abdul Hamied	Mumbai, Maharashtra, India	Pharmaceuticals and Diagnostics
5.	Aurobindo Pharma ltd.	1986	V. Ramprasad Reddy K. Nityananda Reddy	Hyderabad, Telangana India	Pharmaceuticals, generic drugs, over-the-counter drugs, vaccines, diagnostics, contact lenses, animal health etc.

S No.	Company	Revenue (19-20)	Net Profit	No. of Countries they Serve
1.	Sun pharma	US $ 4.7 BIILION	US $ 530 MILLION	100
2.	Divis Laboratories	US $ 780 MILLION	US $ 190 MILLION	95
3.	Dr. reddy Lab ltd.	US $ 2.4 BILLION	US $ 270 MILLION	100
4.	Cipla	US $ 2.5 BILLION	US $ 220 MILLION	52
5.	Aurobindo Ltd.	US $ 3.3 BILLION	US $ 400 MILLION	150

S No.	Company	Founded	Founder	Headquarters	Products
6.	Biocon	1978	Kiran Mazumdar-Shaw	Bangalore, Karnataka, India	Biologics, Small Molecules, Branded Formulations, Research Services
7.	Cadila Healthcare	1952	Ramanbhai Patel	Ahmadabad , Gujarat, India	Pharmaceuticals, generic drugs, over-the-counter drugs, vaccines, diagnostics, contact lenses, animal health etc.
8.	Lupin Ltd.	1968	Desh Bandhu Gupta	Mumbai, Maharashtra, India	Pharmaceuticals, generic drugs, over-the-counter drugs, vaccines, diagnostics, contact lenses, animal health etc.
9.	Alkem Laboratories	1973	Samprada Singh	Mumbai, Maharashtra, India	Pharmaceuticals, generic drugs, over-the-counter drugs, vaccines, diagnostics, contact lenses, animal health etc.
10.	Torrent pharmaceuticals	1959	U. N. Mehta	Ahmadabad , Gujarat, India	Pharmaceuticals, generic drugs, over-the-counter drugs, vaccines, diagnostics, contact lenses, animal health etc.

S No.	Company	Revenue (19-20)	Net profit	No. of countries They serve
6.	Biocon	US $ 920 MILLION	US $ 100 MILLION	120
7.	Cadila Healthcare	US $ 4 2.1 BILLION	US $ 300 MILLION	58
8.	Lupin Ltd.	US $ 2.2 BILLION	US $ 38 MILLION	70
9.	Alkem Laboratories	US$1.2 BILLION	US$160 Million	48
10.	Torrent Pharmaceuticals	US $ 1.1 BILLION	US $ 140 MILLION	40

Conclusion:

There are numerous ways through which a person can commit cybercrime on cyber space. Cyber crime is an offense and punishable by law. We have seen common sorts where cyber crime in Pharmaceuticals Company can occur as often as possible. Therefore appropriate measures should be taken to prevent cyber crime.

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Annexure 1

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Instances where selected sources appear: 57

Reviewers Memorandum

Reviewer's Comment 1: The study is based on a very appropriate and emerging theme i.e Cyber-crimes. A lot of studies are being conducted on the theme of cybercrimes these days, but it has not been discovered much in relation with pharmaceutical industries.

Reviewer's Comment 2: With their adoption of resources such as third-party vendor, automation tools, etc, which are more prone to cyber threats, pharmaceutical companies have urgent need to increase cyber security, as it has access to customers sensitive information, which once stolen can lead to serious consequences like clinical trials, reputation damage, loss of revenue etc.

Reviewer's Comment 3: The study is purely based on the secondary data, which has highlighted top 10 world pharmaceutical companies and top 10 Indian pharmaceutical companies on the basis of their origin, revenue and net profit. Inclusion of primary data could further improve the quality of the work done.

Citation

Conflict of Interest: Author of a Paper had no conflict neither financially nor academically.

Editorial Excerpt

The article has 38% of plagiarism which is the accepted percentage as per the norms and standards of the journal for the publication. As per the editorial board's observations and blind reviewers' remarks the paper had some minor revisions which were communicated on a timely basis to the authors (Naman) and accordingly all the corrections had been incorporated as and when directed and required to do so. The comments related to this manuscript are noticeably related to the theme "**Cyber Crime in Pharmaceutical Companies**" both subject-wise and research-wise. This paper studies. The study focuses on cybercrimes in relation to the pharmaceutical industries and the need to preventive measures for it. Pharmaceutical companies have access to sensitive data like PHI, drug patent, data related to pharmaceutical tech etc. These companies' days are getting to be more advanced hence are more prone to cybercrimes and subsequently ought to increase cyber security. Overall, the paper promises to provide a strong base for the further studies in the area. After comprehensive reviews and editorial board's remarks the manuscript has been categorised and decided to publish under "**Student Research Initiative''** category.

Acknowledgement

The acknowledgment section is an essential part of all academic research papers. It provides appropriate recognition to all contributors for their hard work and effort taken while writing a paper. The data presented and analyzed in this paper by (Naman) were collected first handily and wherever it has been taken the proper acknowledgment and endorsement depicts. The author is highly indebted to others who had facilitated in accomplishing the research. Last but not least endorse all reviewers and editors of GJEIS in publishing in a present issue.

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