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REHABILITATIVE INTERVENTIONS FOR ROBOTS CONVICTED OF CYBER CRIMES

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Abstract
Incredible empirical reports have shown that some robots may be indicted as suspects and accomplices of cyber crimes. The fear now is that these new criminality issues can gradually degenerate to the level such that some robotic technologies would be stereotyped and unduly criticized in some settings. Ethical dilemmas may suddenly amplify and the continuous usage, investment, profitability and growth of the entire robotic engineering sector may gradually suffer decline if such issues are not properly clarified. However, considerations that should actually constitute the elements of such cyber crimes and how investigators can acquire and process useful criminal data from the crime scenes are still unknown across the globe. Consequently, the global society wants to know how detectives will arrest robots, transcribe their statements, interrogate and detain them(if the need arises) and how the criminal courts will adjudge allegations of cyber crimes against robots especially if the complainants are also robots. Furthermore, most people want to know how criminal courts will convict and order the convicted robots to be rehabilitated. This paper uses qualitative zoom interactions to widely gather the perspectives of 24 software engineers and 6 robotic solicitors on the above issues. Thematic analysis of their responses explicitly elucidates the above issues and the necessity to integrate the human and non-human elements of robotic technologies together in other to adjudge the above allegations. We further suggest possible eight crime scenes, criminal liability and punishment for robots that are guilty of cyber crime son the basis of 8 simple considerations that subsume rehabilitation, deterrence, retribution, permanent disability, interdiction, lien, security interest and conditional sale.
Key words: Robot, Cybercrime, criminal liability, robotic courts, robotic remand.

1. Introduction

The topical advancement recorded in the field of human-robot interactions are craving for new empirical insights that will vividly explicate how to mitigate court cases and the growing

reports of cyber crimes allegedly committed by some robots in some geographic regions in recent time before they will widely spread to other regions of the globe (Kokpan, 2023). It may look strange to allege robots of cyber crimes but then, the fact is that a few findings have indicted some robots of crime. Nevertheless, there are no comprehensive solutions to lessen these new social problems till date. Fundamentally, robots consist of the human and non-human components (Siegwart et al, 2011). The human component of a robot is the legal owner of the person. The legal owner of a robot may be the manufacturer, creator, or person that purchases (or owns) the robot. The non-human component of a robot refers to all the modules such as hardware and software parts that symbolize a complete robot.

Furthermore, what should actually constitute the elements of the cyber crimes that should be used to adjudge the case if the law enforcement agents and judiciary have proved beyond doubt that the alleged robots are reasonably connected to the offense is another challenge confronting the above domain in recent time (Leenes et al, 2017). Another big task that most investigators may face on the above issues is how they can comprehensively acquire and process cyber criminal data that will relevant to the crime scenes and at the same time, enable them to achieve laudable and conclusive forensic investigation within the shortest time schedule. The reason is that robots are not human beings. Rather, robots are merely intelligent mechanisms of automaton that can automatically perform some responsibilities like human beings. Empiric shows that a good robot must be accurate in understanding, calculating, reasoning, perceiving relationships, generalizing and comparing two complex (or simple) events (or objects) together (Anat, 2020). It has also been proved that a good robot must be able to accurately learn from its previous experience, adapt to new situations, store information into its memory and retrieve the information from storage as at when due, etc.

Several scholars have shown that the field of robotics is rapidly advancing at an unprecedented speed (Parisi and Pi, 2021). For this reason, robotic technologies are increasingly integrated into various aspects of human existence. In Figure 1, for instance, industries are increasingly embracing and deploring robotic systems (such as robotic crane) whenever they foreseen that the operating cost they would incur in deploying human beings does not worth the benefits they can derive after the completion of the tasks. For this reason, some industries prefer to adopt robots to perform extraction and welding of metals, drilling of well water and seashores, electro-coating of metallic objects, etc. Robotic drones are tremendously helpful in military sector to spy, access hazardous territories and reduce collateral damage during systemic war and premeditated insurgencies that military can incur through the use of human combatants (Panichraksapong, 2020).

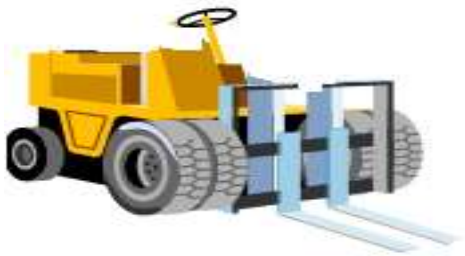

Figure 1: Robotic crane

The use of some robotic devices to perform clinical diagnosis of patients, surgeries and rehabilitation of dementia patients in clinical settings are ongoing scientific breakthroughs in the robotic technologies in recent years.

Negligence is a central consideration among the elements of cyber crimes in the above scenario (Dobrinoiu, 2019). Some robots may be accused of negligence if the investigations show that they exhibit act of carelessness. Besides, neglect of precautionary measures, lack of discipline at workplace, lack of vigilance at duty post and laxity can be the root causes of crimes that relate to negligence of duty. In other words, negligence of some robots can also occur due to omission, oversight, blunder or inevitable mistakes. Robots that are designed to detect and prevent cyber crimes may make mistakes like human beings. Robots may also be guilty of casualness like human counterparts. Casualness is a situation whereby the intruders successfully circumvent the intelligence of the robots while in unexpected mode (due to hesitancy, indecision and lack of commitment).

Experience with programming and troubleshooting of source codes suggests that some act of negligence that some robots may commit can be attributed to the inherent defects in the design of the robots. Defects may inadvertently occur during the creation and design of the internal components that constitute the intelligence of the robots. Design flaws can also occur in the software and hardware components, underlying algorithms, theories and mathematical concepts that manufacturers have used to optimize the efficiency of some robots. For instance, despite the fact that evaluators have critically assessed and certified that the above components of some robots are suitable for automating a well-known narrator in a specific society does not mean that the same robotic device will perfectly mimic the inbuilt narrator whenever it is deployed to deliver public lectures in all geographic locations. Flaws from factory that elude the notices of experienced software testers may occur in the components that should have established how the robots are designed to reason, learn from environment, solve problems, perceive the environment, emulate the orator by speaking (i.e. understand the phonology (speech sounds)), recognize both the semantics (meaning) and syntax (grammar)and understand the morphological arrangement of words in the language spoken by the orator (or the language that have been used as the medium of instruction to design the robots).

Negligence of some robots can equal occur due to the inability of the robots to respond to order (commission) from superior (or higher)bosses, directors, supervisors, managers, etc. In this case, the inbuilt rules (computer codes), sensors and the electric components of the robots are some of the internal components that should instruct the robots to respond and take certain actions at predefined time. The defectiveness of some robots that are designed to automate singers, musicians and composers(for illustrative purposes), may be traced to the electrical components, inbuilt rules and how the robots are designed to create, mimic, communicate and understand the pitch, rhythm, meaning and inbuilt sound. On the other hand, some robots that are designed to automate scientists, political figures, mathematicians, et cetera may

malfunction if the underlying software suddenly requires an upgrade or other forms of software maintenance. Errors may occur due to the presence or absence of unknown actions, novel events and descriptive objects that are strange to the pattern matching algorithms of some robots. Some robots may also malfunction if they suddenly lack the intelligence required to perfectly match complex events and abstract ideas in their environments with their inbuilt rules or signatures.

Besides, design flaws may inevitably occur in any of the components of some robots without prior notice. For example, the spatial information of some robots that are used for space technologies may be computed in error during the design and feasibility study of the project. The sensing components of some robots that deal with map reading, distance computation and detonation may suddenly be defective without prior warnings. For these reasons, it is possible that some military drones may occasionally malfunction. Troubleshooting of such robots can extend to the mechanisms that control how the devices perceive and construct spatial (visual) information, distance computation, relativity of the hyperbolic motion and manipulation of multidimensional images. Furthermore, it is possible that new defects that suddenly occur but the impact of such defects may hinder the ability of some robots to use other components of their bodies to accurately complete the tasks that would have averted the alleged criminal allegations. Essentially, troubleshooting of possible factors that can cause negligence in some robotic devices may further be extended to how the robots are designed to control and coordinate their bodily kinesthetic (or psychomotor dexterity), manipulate objects and conduct computational intelligence.

Victimologists suggest that the intelligence of some robots that are accused of cyber crimes may be attributed to their inability to suddenly distinguish individual feelings from the feelings of the victims of cyber crimes. Thus, troubleshooting of such robots can be extended to their inference engines before the investigators can decide on whether it is reasonable to grant (or not to grant) liability to the robots (Miller, 2015). It is also paramount for investigators to equally establish the primary intentions of the robots and the factors that actually motivate the robots to perpetrate (or seems to perpetrate) wrongdoing in the society. For example, a robot may not intentionally perpetrate cyber crime. However, its action may be constructively linked to intention to perpetrate cyber crime in some crime scenes.

Furthermore, there are three glaring gaps considering other aspects of some robots that can also be critically reviewed if the above possibilities do not generate the expected results. Robots are synthetic devices (objects) and they generally have mechanical shapes that enable them to accomplish particular tasks (Bryson et al, 2017).Some robots consist of electrical components that are designed to power, control and move their parts upwardly and downwardly, forwardly and backwardly, etc. Some robots also possess a set of inbuilt programming codes (source codes, rules, etc). These codes are designed to routinely instruct the entire components of the robotic system on what, when and how to perform designated tasks. Expired rules can suddenly stop the effective performance of the robots while already working to complete some designated tasks.

Many and nonjudgmental puzzling questions readily spring up on the above issues over-and-over. Yet, modern empirical studies have shied away from vividly accentuating and enlightening them. Rather, some studies believe that the procedure for criminalizing robots alleged of cyber crimes should be subjected to the capability of the robot to make, act and justify by communicating the reasons that outline its moral decisions. Contrarily, it has been said that some robots can only be criminalized in a country that has suitable regulations. Some scholars have generally argued that the manufacturers and end-users of some robots alleged of crimes can only be held liable by the courts of competent jurisdictions. Nonetheless, the elements of such legal conflict are yet to be accentuated by pragmatic claims (Bryson et al, 2017). Another disconnection is that there is no universally acceptable legal condition for treating cybercrimes that occurs due to human-robotic interactions and rehabilitations of the entities involved in the crimes across the globe. Therefore, this paper uses qualitative zoom interactions to widely gather the perspectives of 24 software engineers and 6 robotic solicitors on the above issues. Thematic analysis of their responses explicitly elucidates the necessity to integrate the human and non-human elements of cyber crimes together in other to adjudge the cyber crimes allegedly committed by some robotic innovations. One of the contributions of this paper is its ability clarify stricken issues concerning how to rehabilitate robots convicted for cyber crimes. The paper goes further to extend the available criminal liability and punitive interventions in other to integrate the human and non-human elements of crimes on robotic innovations together. The remainders of this paper are organized as follow: section 2 discusses related research, section 3 provides the fundamentals to the allegations of cyber crimes against robots and section 4 discusses the methodology for the design. Section 5 gives the results and analysis while section 8 concludes the paper.

2. Related paper

Robotic technology has advanced considerably in the last two decades (Siegwart et al, 2011). Most studies have made good progress in areas of the applicability of robots in manufacturing, agricultural, medicine, military, aviation and space industry. A team of scholars has collaboratively discussed the challenges in the regulation of robotic industry (Leenes et al, 2017).Rapid technological advancement and new techniques of programming in software engineering have made the regulation of robotic industry unachievable vision in some countries across the globe (Kokpan, 2023).

Evolution of criminal liability on robotic systems has been enumerated with the view to stimulate logical ideas and clear the controversies that some stakeholders have raised on fundamental aspects of robotic technologies (Bosakevych, 2016). Calo (2015) enumerated a number of salient issues such as the current limitations of the cyber laws if they are to be applicable to handle cases of cyber crimes in robotic industry in the USA. The legal implication of synthetic persons has been viewed both from the legal and technical points of view (Bryson et al, 2017).Nevertheless, the issues of elements and models of cyber crimes that are addressed in this paper have been grossly over-sighted over the years (Panichraksapong, 2020).

3. The fundamentals of Cyber crimes allegedly committed by Robots

The basis of cyber crimes allegedly committed by some robots is still under many research reviews (Dobrinoiu, 2019). Robotic devices are intelligent and powerful innovations and they are the appendages of software engineering and electronic industry. Some robotic devices have been tested and satisfied to be working well in various facets of human life. Recently, cosmopolitan studies suggest that robots can safeguard workers employed as loaders from impending dangers and energy they will expend in the course of loading and unloading cargoes, vehicles, ship, containers, etc. Robots have helped agencies to avert collateral damage during war and insurgency. Wearable assistive robotic pendants are worn by mild mental health patients to detect outpatients and self-discharge patients that wander away without notice from rehabilitation wards, homes, etc. Robotic mediators are on the increase to assist negotiators to avoid being kidnap whenever there are reasons to act as a link between two warring parties. Furthermore, the above technology has proved beneficial to several organizations such as steel and mental companies to avert occupational hazards associated with extraction of metals and the lifting, transporting and segmenting hot iron ores into warehouse. However, there are newly emerging issues that are threatening the continuity in robotic businesses across the globe if they are not promptly addressed(Bryson et al, 2017). Many studies are worried about the rate that some robots are being accused of lawlessness in the society.

Crimes that are frowningly condemned in civic societies such as stealing, murder, racial discrimination, stereotyping, racial profiling, traffic offence and insubordination to superior authority are now being said to have been committed by a quite number of robots in some parts of the globe. Of recent is the possibility of sudden surge in the rate at which some robots can commit cybercrimes. These issues have challenged the usual elements of criminal liability and the enabling criminal punishment for apportioning criminal liability in the above scenarios.

The fact is that cyber crime can fall into either the category of premeditated crime or unpremeditated crime. A premeditated cyber crime is an unlawful act that is committed with the use of Internet but planned before the perpetrator decides to execute the cyber act. In this case, the perpetrator of the cyber act intentionally carries out the offense. So, the perpetrator can be charged for premeditated cyber crime. Contrarily, unpremeditated cyber crime is an unlawful act committed with the use of Internet without prior planning before the perpetrator decides to execute the cyber act. In this case, the perpetrator of the offense unintentionally carries out the cyber act. So, the perpetrator can be charged for unpremeditated cyber crime. The above two narrations imply that an accused robot that is alleged of a cyber crime must have planned the act or just acted by sudden impulse. A robot is designed and configured for specific operation, task or responsibility in the society. For instance, how can a robot willingly or unwillingly perform an action that is contrary to the commands issued by its inbuilt rules and configurations? How can a robot that is not designed to steal intentionally or unintentionally logon to the Internet with the intention to use fake credit card to steal from an online grocery?

Another technical consideration in such allegation is that a robot may commit cyber crime by commission or omission. A robot may be acting under a command, boss or an authority. The investigators of the cyber crime against a robotic suspect will need to certify if there is somebody who remotely (or closely) commands the robot to commit the cyber crime. The investigators will then need to carry out the arrest of such facilitator (instructor) for further interrogation to determine the depth of involvement of the facilitator. A facilitator of a cyber crime is also an accomplice. An accomplice simply means a partner in crime. Complexities arise if the accomplice is a robot or many robots. The jurisdictions of the accomplice in relation to the jurisdiction of the cyber crime are issues of important consideration that affect the investigation and power of the courts to adjudge the case. A robot that is guilty of omission implies that it commits blunder to oversight operational procedures that can avert the alleged cyber crimes. A lot of factors can enable a robot to erroneously exclude job functions or standard procedure. Negligence on duty may cause a robot to commit fatal error. Some fatal errors may occur as a result of certain internal bugs in the components of the robot. Unfortunately, a quantity of fatal errors may be misinterpreted as cyber crimes especially if they are abnormal (or strange) attitudes that the society does not anticipate.

a. The Investigation and trial of Robots on the allegations of cyber crimes

The issues on how criminal courts may adjudge all models that indicate allegations of cybercrimes against robots when the complainants are also robots are issues that lack recent experimental proof (Dobrinoiu, 2019). Complainant is a person (plaintiff, accuser, etc) that brings an allegation to the police to investigate or court to judge. An allegation against a robot may come from human being (a person, or a group of people). Similarly, a robot (or a group of robots) may bring allegation against another robot (or a group of robots). How the detectives will arrest robots, take down the statements, interrogate and detain robots if the need arise are most disunited and puzzling debates in recent time. For instance, people want to know how will court order robots to be rehabilitated and it there are rehabilitation centers on ground to rehabilitate robots. Should courts order robots to be locked up or confined in a jail? If yes, how long can robots be remand in custody? Should robots be accorded the same rights as suspects in the custody of law enforcement agencies?

Robots can relate to people in human ways. Some of them that are design to mimic human beings have the cartilage that makes them appear like human form. Robots in human form can display attributes as opposed to that of animals. Yet, they are clearly not human in nature. Human rights are for human being. So, what rights should be accorded robots? What is the suitable deterrence that court should pronounce if certain robots are proved beyond doubt to be criminally liable to certain allegations? If there is need for judges to refer to comparable liability, how will the courts apportion criminal liability if both the complainants and the defendants are robots? What if investigations eventually indict the complainants that are human beings to have lied against the robots? Is there robotic court of justice in any jurisdiction across the globe? Juveniles are not tried in the same courts with adults according to most criminal laws. Courts are designed to pass retribution to proven offenders. So, can courts determine the age of robotics as at the time they commit criminal allegations? Should the age of a robot be

counted from its manufacturing date? What are the ages of the suspected robots to ascertain the legality of criminal courts to try them? Should criminal courts enforce developers or creators of robots to always publish the ages of their robotic devices? Another puzzling issue is that should courts find certain robots wanting, how will the courts enforce retribution to the robots? Is there specially built correctional centers for robots? How will courts determine if the robots are incapacitated or not given the fact that judiciary is to judge but not to design or test robots? Robots are products of industrial collaborations of my firms (Panichraksapong, 2020). So, which firm should be legally held responsible for a crime committed by a robot that they jointly manufactured? In what ratio should courts apportion liability if blames are to be apportioned to the contributing firms? Therefore, robot and human interactions newly require clear and deep perceptions in other to provide answers to the above puzzling statements and circumstance.

b. Issues and challenges with Robots

Optimal performance is a major drawback of most robotic devices. It is often difficult to select and implement best theories that will enable robots to exactly conform to the best standard required for automation to achieve 100 percent accuracy at all time and in all geographic settings. Most robots must rotate with directional steering wheel. Nevertheless, it is technically difficult to implement robots that will sense and caution themselves of act of lawlessness. Such robots should be able to rethink, premeditate the impact and penalties of being caught as suspects of cyber crimes. For instance, the sensor and actuators for the conversion of source of internal energy into robotic movement may fail to work well in some occasions whereby some robots are to be used as witnesses of judicial proceedings. The expected testimonies against the suspects may be subjected to inconclusive investigations. But then, it may be difficult to fix the flaws in such robots to continue to proceedings of courts on such case especially if the robots eventually become permanently incapacitated assistive devices. They may give false testimony and false bravery under oath of allegiance. Most robotic designs are products of Neural Networks (NNs), supervised or unsupervised learning algorithms. Each of these algorithms has severe limitations. Hence, we submit that forensic claims of robots should be properly scrutinized and complement by other methods to improve their accuracy.

Pattern kinetics is causing inconsistency in pattern recognition at unprecedented rate. Everything is in constant dynamic motion. Hidden patterns that some robotic devices are designed to recognize in cyberspace and other related events are poorly matched (mismatched) because they are also in constant dynamics. For instance, robots that are used for modeling how lawyers would review conveyance, verification of property, indemnity and documents as well as the content of such legal instrument usually vary from one country to another. For these reasons, robotic rules and mathematical capabilities of their underlying theories that work well in one country rapidly become insufficient to discern novel patterns in another country. In addition, racial discrimination and profiling are new flaws in the use of some robots to supplement policing in some settings. Some robots that work with biological neurons may use discriminative stimulus. Studies suggest that the stimulus that feeds robots with the information

about the action they should take may not be able to immediately detect and isolate facial differences in two or more closely related people.

4. Methodology

We gather some legal experts and researchers in the domains of robotic designs to brainstorm and think intensely about the above issues. We performed two brainstorming sessions through qualitative zoom interactions to identify and categorize the above issues. The perspectives of 24 software engineers and 6 robotic solicitors are gathered in two-phase data gathering modes. These result into several themes. Thematic analyses of their responses are statistically analyzed and core ideas of the entire results are discussed and presented below.

5. Results and analysis

Incredible empirical reports have shown that robots can be indicted as suspects of cyber crimes. Respondents believe that cyber crimes against robots may subsume password guessing, spam mails, unlawful espionage of dashboard, virus attacks, online shopping with fake identities, cyber extortion and cyber misinformation. Moreover, various considerations that should actually constitute the elements of cyber crimes in the above settings are discussed below.

a. New Elements and Punitive interventions for the Robots that commit cyber crimes

The results propose two themes regarding the robots that investigations and or the proceedings of courts have indicted for committing cyber crimes. Firstly, the results believe that robots that are intentionally programmed to commit crimes can be perpetrators of act of lawlessness in the society. Secondly, robots that are unintentionally programmed to commit crimes can commit some blunders or mistakes that some complainants may misconstrue to indicate the act of lawlessness in the society.

Crime scene	Complainant	Suspect	Witness
1.	Human being	Human being	Human being
2.	Human being	Human being	Robot
3.	Human being	Robot	Human being
4.	Human being	Robot	Robot
5.	Robot	Human being	Human being
6.	Robot	Human being	Robot
7.	Robot	Robot	Human being
8.	Robot	Robot	Robot

Figure 2: Robots and related crime scenes

Furthermore, we critically reviewed 8 potential cyber crime scenes. We observed that the cyber crime scene wherebyhuman being is the complainant, robot is the suspect and human being is the witness; or, human being is the complainant, robot is the suspect and robot is the witness can potentially lead to an alleged robot to be indicted, convicted or freed from the criminal

allegations. Similarly, the cyber crime scene whereby robot is the complainant, robot is the suspect and human being is the witness; or, robot is the complainant, robot is the suspect and robot is the witness can potentially lead to an alleged robot to be indicted, convicted or freed from the criminal allegations. Please, refer to the cyber crime scenes that are illustrated in number 3,4, 7 and 8 of Figure 2 above.

In addition, we submit that allegations of cyber crimes against robots can be treated in justice system but with the extension of the common criminal liability especially if there are no specialized justice systems in the jurisdictions of the crime scenes. In Figure 3, the results further develop and recommend 8 considerations that detectives and courts may regard as suitable criminal punishment for cyber crimes committed by robots. Such punitive interventions may be on the basis of rehabilitation, deterrence, retribution, permanent disability, interdiction, lien, security interest and conditional sale of the robots liable to be convicted.

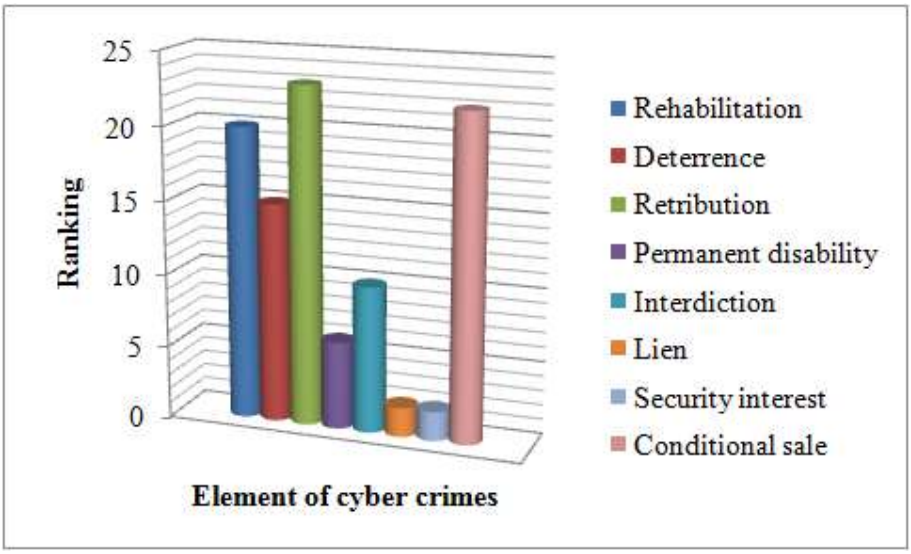

Figure 3: Human and non-human elements of cyber crimes

There is no doubt that some robots may need deterrence. They may need to be cautioned for showing negative motivational influences on others in the society. Courts can send communication that will make such robots and their legal owners (or employers) to afraid to try stop being lawless in the society. However, deterrence should not degenerate to intimidation. Otherwise, developers may gradually develop the feeling of discouragement or feeling of being regulated out of robotic market by superior fame or wealthy competitors. Therefore, deterrence must be applied on the basis of "rational motive" or "preventative motive". The motive of using deterrence should be defended by logical A motive that can be defended by reasoning or logical argument and convincing arguments accepted by law.

Robotic retribution is a justly deserved punitive intervention. It is a suitable penalty for a robot that is a suspect of cyber crime but the direction of its case appears to lead to conviction. Robotic retribution is an act of correctional intervention that is meant to correct (or discipline)

the convicted robot for its (lawlessness) wrongdoing in the society. We believe that robotic devices that have been proved to commit cyber crimes should be subject to punishment by law. Nevertheless, we argue that an empirical basis to justify the technical feasibility of a robotic device to attend a correctional institution to learn law-abiding skills can trigger several ethical dilemmas. Hence, robotic lawyers are advised to plead for clemency whenever it is inevitable for courts to sentence and inflict punishment on their clients (robots).

Robots can sudden become permanently disabled products. The mechanisms such as legged, wheeled and tracked skid that make a robot to move can be permanently rendered irreparable, malfunctioned and inoperative. Incapacitate is a circumstance whereby the judge may also examine the presence (or absence) of physical disability in a robot that could have made the robot unable to perform certain preventive actions that would have averted the crime. Participants argue that such consideration tends to provide answers to puzzling questions such as was the robot handicap or possess any disability before the act? Was the robot rules suddenly altered? Was there any foul play that tampered with the efficacy of the robot? What actually caused the robot to suddenly change? Who altered the inbuilt rules of the robot? What make the robot unable to perform the expected tasks (or actions) well? What unlawfully restrain the robot from performing its responsibilities well? Did the robot act under ecstasy? What was state of mind of the robot? Could it be that the robot was being carried away by overwhelming human audience or emotion? The above empiric results also point out that some robots may be products of domestic violence, operational abuse, victimization or victims of natural disasters. Unproved update of the inbuilt rules, unethical practices with robots, malicious downgrade, wrong usage or improper adaptation, etc are classified abuse in modern laws. Thus, investigators may seek for element that can indicate violation of industrial usage, robotic rights, etc. Useful questions can include "Could it be the robot is abused"? Was the robot hacked?

More so, consideration of the possibility of interdiction is meant to cross-examine a robot that is under judiciary review to determine whether the robot is a serial offender or new entrant. This element seeks to establish if there is need to pronounce a court order to prohibit (or ban) a robotic party from doing a certain activity in the society. Authoritative prohibition may be extended to the manufacturers of the robotic criminals. Such proscription may take the form of fine. Courts may consider additional elements and impact of the cyber crimes to temporarily or permanently disallow the company from further manufacturing robots.

Lien is used to describe the legal right of the complainants (or victims) to prefer to take the robot that is facing trial for cyber crime as his/her lawful property. This can occur if the robot (or robotic party) does not discharge agreed obligation (or adhere to contractual agreement between the complainant(s) and the robot (or robotic party)). Our experimental analysis further stipulates that security interest could be considered during court trials of robots accused of cyber crimes. As an ancillary or analogy to the option of lien, the victims of the cyber attack committed by the robots may approach courts to grant them the power to settle the dispute by acquiring or showing an interest in a robotic property of the owner that can secure (offset) the payment for the displeased obligation.

Finally, the findings indicate that it is technically possible to investigate the conditions of the robots and the presale agreement between the manufacturers and the owners of the robots. Consideration of whether a robot is sold under certain conditional sale worth examined. Feelers believe that there could be an agreement for a sale of robotic device such that the buyer (of the robotic device) will receive certain amount on the sold device only whenever the performance of the robotic device fails to meet the collateral agreement (or warrant) between both parties. In this case, it is imperative that robotic solicitors and judges seek for evidence of legal documents that were collectively signed by the warrantee and warrantor or guarantor during the presale of such robots. Investigators of cyber crimes against such robotic devices should also seek for forensic evidence that substantiates the initial conditions of the robots before the sales were done and correlate them with the present status of the robots.

b. Interventions to Rehabilitate Robots

This study reveals that convicted robots can be rehabilitated like human counterparts but in specialized manners. We argue that robotic rehabilitation can be correctional rehabilitation, physical rehabilitation and operational or vocational rehabilitation. Correctional rehabilitation of Robots is to provide probation, penal custody or parole for convicted robots. Physical (or therapeutic) rehabilitation of robots is to providing help for robots that show physical disability. Such physical therapies are meant to remove and reduce various forms of physical disabilities in the robots that underlie criminality.

Operational (vocational) rehabilitation of robots is meant to provide needed scientific training to the robots in deficient areas of operations with the aim of making the robots to function well and be law abiding innovations. The restoration (re-programming) of a robot that had been reduced by disasters such as fire, vandalizes, intruders, terrorists, etc.

6. Conclusion

Robotic technology has made great strides towards the improvement of human wellbeing in numerous aspects. Incredible empirical reports have shown that robots can be indicted as suspects of cyber crimes. Unfortunately, some robots are often subjected to severe criticisms and ethical dilemmas whenever they are suspects of cyber crimes. What should actually constitute the elements of the cyber crimes peradventure that some robots are proved to be suspects of cyber crimes and how investigators can broadly acquire and process such forensic data are other setbacks that are gradually subjecting most robotic technologies to severe threats, criticisms and ethical dilemma in recent time. The danger is enormous because it can directly affect the manufacturing, production and marketing teams that had earlier given their consent and assurance to the usage of robots in corporate and private sectors. Besides, experts believe that the continuity in the usage and growth of the entire robotic engineering sector may sooner or later require formal certification and explicit approvals in other to avert low patronage and mitigate constant allegations of criminality against some robots across the globe.

This paper also identifies that formal and explicit approvals of some robotic suspects begin to subject the people that give consent and permission to adopt them to embarrassment. In this

case, the promotional statements, endorsement and countenance on them are liable to be thrown into dust jackets. The continue usage and growth of the entire robotic engineering sector may sooner or later be covered by low patronage and dark shadow. The limits of the initial domains of all forms of criminal laws and how to extend them so that they can perfectly cover the new issues that are emerging as robotic devices are gradually replacing human beings are generating emotional confusions and debates across the globe. New issues that are calling for serious clarifications on the suitable measures to advance human-robot interaction and ethical standards in robotic crime analysis are other disunited parts of the above concerns. Thus, this paper has discussed the above empiric issues from the perspectives of software engineers and robotic solicitors. Qualitative zoom interactions further extends the existing criminal liability and criminal punishment to 8 simple considerations.

We suggest that robotic lawyers or solicitors should aware that robots are computerized innovations and they can be exonerated from criminal allegations with suitable sections of legislations. Robotic lawyers should look for suitable conditions that they can adopt to relieve robots from legal blames or negligence obligation. We believe that convicted robots can be subject to justly deserved punishment by law. Courts can order for the immediate review and upgrade of the programming components of the robots believed to have violated the laws due to the limitations of their inbuilt rules. Such robots may be disbanded or stopped from functioning temporarily or permanently depending on the gravity of the cyber offenses committed. We further submit that complainants should conduct legal research into cyber Act on robots before instituting legal proceedings against robots (or robotic party).

Society should understand that human-robot interactions are evolving on daily basis. Misunderstanding between human and robots should be settled out of court given that robotic technology is an immature domain at the moment. In essence, robots may be victims of cyber offenses, censure, condemnation, rejection and stigmatization. With the ways detectives are clamping down intruders across the globe, it might not be surprising that some hackers may deliberately automate robotic systems that they can delegate to perform crime on their behalves. Therefore, future research should delve into delegated crimes on robotic systems. Research is also needed to evolve suitable legislations that can safeguard robots and their owners from abuse, discrimination, stereotyping, unlawful detention, bad mouthing and unwanted conviction of robots (or robotic party) in criminal allegations.

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