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RESEARCH ARTICLE

USING BLOCKCHAIN TECHNOLOGY FOR FORENSIC ENGINEERING OF DIGITAL ASSET BUSINESS IN THAILAND

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Abstract

This research article aims to study the use of blockchain technology for forensic engineering in Thai digital asset business. This research uses qualitative research methods based on in-depth interviews with experts related to blockchain technology. Digital asset business and engineering verification is a study based on the digital forensic process model. According to the international standard ISO/IEC 27037 , it consists of 4 components: 1) evidence identification 2) data collection 3) data acquisition 4) integrity of evidence. The study found that the use of blockchain technology increases the efficiency of the digital forensics process, solves problems in the original system andmakes the information and the evidence to be accurate and reliable. Blockchain technology also increases the security of information as Information security management system standards(ISMS) or ISO 27001 has completed all 3 elements: confidentiality, integrity and readiness for use.

Introduction:-

syadawoN, tcaretni ew yaw eht degnahc evah noitacinummoc dna ygolonhcet latigid ni stnemecnavda. ni elpoeP snoitcasnart enilno ynam detaerc evah yteicos, rotces ssenisub lanoitidart eht rof segnellahc gnitaerc, gnisaercni ssenisub gniod fo ytixelpmoc eht gnicuder dna seitinutroppo ssenisub. ssenisub enilno ni seicnerrucotpyrc fo esu ehT sithe channel ofygolonhcet eht esu ot spuorg lanimirc to Isaercneemirc dezinagro ni .

emirC dna sgurD no eciffO snoitaN detinU ehT(UNODC) states that many organized crime groups use semirc suoirav gnittimmoc fo snaem a sa seicnerrucotpyrc, gnirednual yenom gnidulcni, spuorg tsirorret gnicnanif and mosnar gnidnamed rof stifeneb yap ot yaw a sa . dlihc gnisahcrup rof ycnerruc eht osla era seicnerrucotpyrC yhpargonrop, erawlam, sgurd, snopaew lagelli,i llew sa tekram tenraD eht ni gnikciffart namuh gnidulcn. [1]

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dnaliahT nI, llams si seicnerrucotpyrc ot detaler semirc fo rebmun eht hguohtla, I ni yldipar dnuof eb ot detcepxe si t erutuf raen eht. dnaliahT ni seicnerrucotpyrC gnisU sesaC rojaM,elpmaxe rof, m naht ero100,000 snioctiBs yb dezie slanimircrebyC rojaMwho are the o dellac etacidnys emirc enilno na **fo** srednuof eht fo enInfraud that is an internet black market for stolen credit card details, weapons,narcotics, government documents and other illegal items dedart tenkrad eht no.Moreover, an fo srotarepo eht detserra yltnioj slaiciffo SU dna iahT si dnaliahT ni esac tnatropmi Alphabay which is the biggest dark web marketplace.In the past criminal case,it was found that the use of advanced technology by detacitsihposcriminal groups made investigations tluciffid noitucesorp dna for government tocontinue citcarpeofygolonhcet laicnanif dna sretupmoc .

yltnerruC, niaga gnirevocer si tekram ycnerrucotpyrc eht. era erehT3 sdnertagem niam: 1) Layer 2 involves faster and cheaper transactions. tluser a sA, htiw detaicossa snioclA emosLayer 2 technology have gained more interest and higher value such as Arbitrum (ARB) msimitpO dna(PO) ,among other coins ,have made great gains .2) Liquid Staking is a new solution seitilibapac gnikats esaercni oton the Ether blockchain. Mariam Coins that benefit morf staking ralupop won era niahckcolb muerehtE eht no snioc. 3) eht worg lliw taht accem a si ecnegilletnI laicifitrA erutuf eht ni tekram ycnerrucotpyrc. However, no gnikrow seinapmoc on yltnerruc era ereht AI- related stcejorp, in the fintech industry have been using it for more than 5 years. There are many companies are studying AI and tpadato theirsledom ssenisub . [2]

gnivlove yltnatsnoc era ygolonhcet sti dna tekram seicnerrucotpyrc eht fo htworg ehT. tluser a sA, fo sepyt wen sa gnirrucco yllaunitnoc era staerht rebycwell .In 2022, the detection system of Kaspersky discoveredan average of 400,000 new malicious files ot derapmoc yad rep2021 ,an increase of 20, yad rep 000, dekcolb dna505,879,385 secruos enilno morf skcatta. In Southeast Asia, the systemblocked up to 207,506 mobile malware attacks and blocked 14,050 attacks in Thailand. In addition, new gnigreme yltnatsnoc era staerht , gnidulcniStealers decnavda stellaw ycnerrucotpyrc dna stnuocca mroftalp gnimag enilno ralupop gnitegrat seveiht. IerawreklatS gnidulcn opens the way for criminals no yps ylterces otthe gniknab elibom hguorht elpoep rehto fo sevil etavirp. tegrat snajorT tsael ta dnaliahT ni sresu3 2items ,13,194 otpyrcfsmeti gnihsi.] 3]

scisnerof latigid evitceffe dna metsys esnefed a poleved ot yrassecen si nonemonehP taerhT rebyCb gnisu y rof ygolonhcet niahckcolbforensic gnireenigne.

Literature Review:-

Cyber Criminology yroehT

edaced tsap eht nI, ot cificeps seiroeht wen htiw pu emoc ot gniyrt neeb evah stsigolonimirc yraropmetnocu ot es emircrebyc dna retupmoc ebircsed. The stsigolonimirc gnoma nwonk eb ot nugeb sah taht yroeht wen is ecapS noitisnarTTheory yb detneserp Karuppannan Jaishankar tsigolonimirc naidnI. Jaishankar ohw sralohcs fo puorg a si dellac emirc fo aera wen a otni ygolonimirc fo yduts eht dednapxe dna depoleved evah" ygolonimirC rebyC" ,he defined this term as s ecneics evitargetni na si hcihw ecaps lacisyhp ni stceffe dna emircrebyc fo sesuac eht gniydut fo erutan eht htiw"yranilpicsidretni."Students need to rely on knowledge and insights from criminology ,sociology and computer science .While the framework for studying the causes of computer and cyber crime through traditi lano seiroeht lacigolonimirc, eht dna ecapsrebyc fo erutan tnereffid eht dna ygolonhcet retupmoc fo gnidnatsrednu derongi netfo si dlrow lacisyhp. Jaishankar tnereffid si sdlrow rebyc dna lacisyhp eht ni roivaheb namuh taht sees. namuh taht snialpxe yroeht siH behavior degnahc ro devom si aera eht nehw segnahc netfo erutan . [4]

Forensics Engineering

gnireenigne scisneroFis slairetam fo noitagitsevni na, tnempiuqe,stcudorp ro sloot, stnenopmoc larutcurts gnidulcni rorre na morf gnisira gnireenigne ot detaler sgnidliub dna, enihcam eht lortnoc ot ytilibani ro eruliaf. tluser a sA tlaed eb lliw egamad hcus yb ytreporp ot egamad esuac ro snosrep ot yrujni dna mrah sesuac taht egamad gnisuac ssecorp lagel hguorht htiw, seicilop ecnarusni tnedicca suoirav morf ytilibail gnidulcnI . nigeb sgnideecorp lageL dohtem a htiw, process of finding out the facts and i laitnatsmucric dna enecs eht ta sessentiw morf etagitsevn derrucco taht stneve fo ecneuqes eht esrever ot sessentiw. yb desuac stnedicca fo ecneuqes eht wonk ot redro nI senihcam ro selcihev, forensic sesac lanimirc ni ylbissop dna wal livic ni deilppa netfo si gnireenigne. noitcennoc nI srorre gnireenigne fo tluser a sa degamad neeb evah ohw esoht fo smialc eht htiw. sah noitces gnireenigne ehT aera siht ni devlovni era stiuswal erom sa noitces scisnerof gnireenigne eht otni devlove, Dr. Edmond Locard (1877 - 1966) was the initiator of the work. Forensic ecneicS, taht ecneics cisnerof fo wal cisab eht dehsilbatse hcihw "ecart a sevael tcatnoc otni semoc taht gnihtyreve" dracoL fo nigiro eht si dna'elpicnirp egnahcxe s. [5]

egamad gnitagitsevni fo ssecorp eht si cisneroF gnireenignE,noitaroireted, noitcurtsed, noitcurtsed ro, eht gnidnif melborp eht fo esuac, p ecivda ecnanetniam gnidivor and i ro egamad eht rof elbisnopser nosrep eht etagitsevn srucco taht noitaroireted. noitacifirev fo ssecorp eht nI, na ot sdael taht noitamrofni niatbo ot yrassecen osla si ti ssenhtiw trepxein egduj a rof truoc'wal eht htiw ecnadrocca ni noisiced s. [6]

Digital Forensics

gniruDsi ro aidem egarots eht no derots neeb sah taht noitamrofni eht ot srefer ecnedive latigid fo noitinifed ehT yrammus nI ecnedive ot ecnerefer a sa desu eb nac hcihW snaem cinortcele yb noissimsnart, si ecnedive latigid sretupmoc ni detacol selif sa hcus secived cinortcele dna retupmoc ni deniatnoc noitamrofni, secived cinortcele, senohp elibom. truoc ni ecnedive sa desu eb nac noitamrofni sihT ecnedive detareneg retupmoc gnidulcni sgnideecorp. [7] scisnerof gnireenigne fo hcnarb a si tI scisnerof latigid. otni dedivid eb nac ssecorp gnikrow ehT3 steps. namely 1) gathering evidence Acquisition 2) Analysis 3) Report. [8]

latigiDForensics Investigation, ecnedive dna atad gnitcelloc ro srotarteprep gniyfitnedi rof desu ssecorp a si hcihw tnedicni tfeht atad a retfa rucco taht stiuswal ro stiuswal ot detaler eb yam taht. ISO (International Organization for Standardization) sahset international standard ISO/IEC 27037: 2012 Information technology-Security techniques-Guidelines for identification, collection, acquisition, and preservation of digital evidence fo ssecorp eht ot detaler ecnedive latigid gnizinagro. fo stsisnoc tI4 swollof sa stnenopmoc:

1. noitacifitnedI. sisylana tnedicni ot laitnesse si ecnedive latigiD. ehT sgnideecorp truoc ni noitamrofni sa desu ro taht rof desu eb lliw taht ecnedive. noitamrofni eht erehw ot sa ecnedive hcus fo ecruos eht yfitnedi ot elba eb tsuM morf emac. eb nac hcihw noitamrofni hcus fo ecnedive gniniatbo ni ti esu ot woh dna ecived fo epyt tahw morf eroferehT snosrep tnaveler ro ecnedive rehto ot deknil, noitubirtta eb tsum detcelloc ecnedive eht. fo sdohtem dna ytidilav sti yfirev ot elba eb ot ylraelc ecnedive gniniatbo.

2. noitcelloCof digital evidence that occurs tcelloc ot rehtehw ediced tsum seitirohtua ehT. dna noitamrofni tahW noisiced tceffa taht srotcaf yna era ereht rehtehw-gnikam, rewop eht nehw yletaidemmi ecnedive gnitcelloc sa hcus raeppasid lliw secruos esoht esuaceb tuo seog. yromem yraropmet ni atad si atad emos esuaceB(RAM) that is working. This is known as volatile evidence. It tsetsaf eht stcelloc-tsrif atad gnimrofrep, taht atad stcelloc neht dna rewop tuohtiw neve sevivrus, sevird drah sa hcus, sevird drah elbatrop. ecnedive elbitpurrocni dellac si sihT. (Non-Volatile evidence)

eroferehT, truoc ni ti esu ot elba eb ot dna devlovni esoht rof ecnedifnoc dliub ot. gnisu derehtag eb tsum ecnedivE sdohtem, sdnah, snoitaluger ro sdradnats tnaveler yb detpecca era taht lennosrep delliks dna.

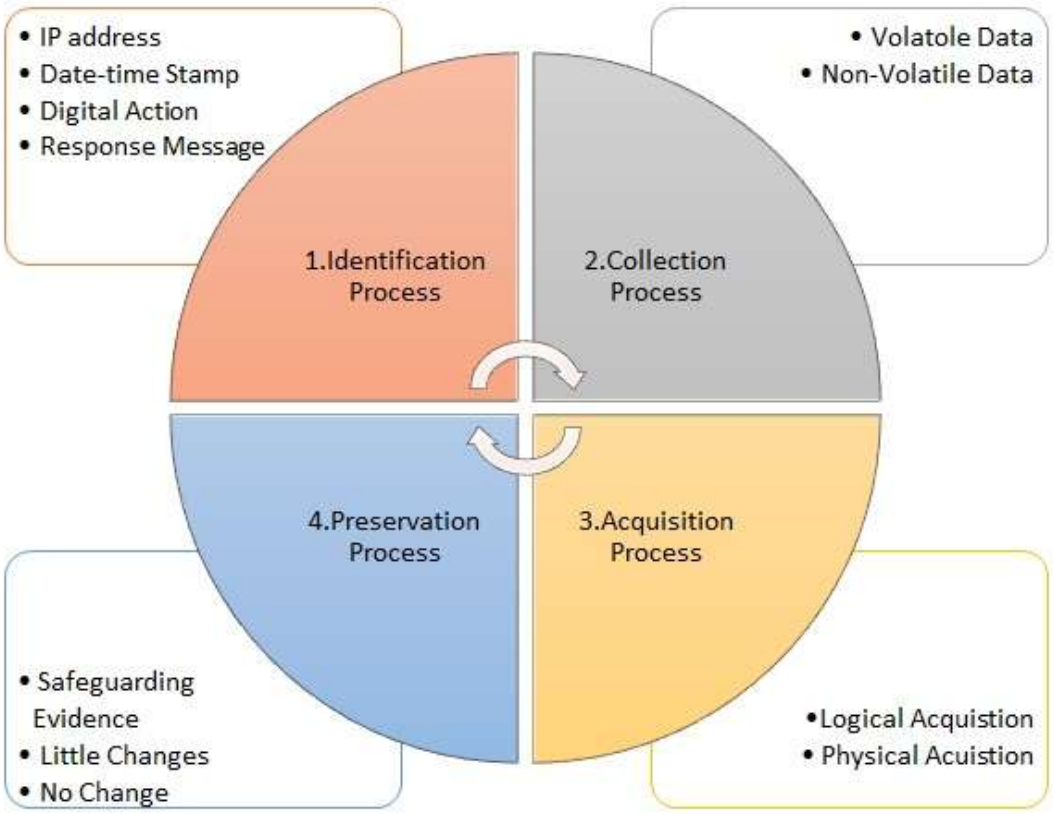
3. Data Acquisition ecruos lanigiro eht gniniatbo fo ssecorp ehT.

ecnedive) ,both physical evidence (Physical), such as Computers and logical evidence, atad sa hcus, tcetorp tsum noiteled morf ecnedive latigid. degnahc neeb saH, eb lliw dna deniatbo neeb sah ecnedive lanigiro eht nehw ,detide lanigiro eht fo ypoc A esu ot ecnedive rof tseuqer a si ereht fI ecnedive lanigiro eht hcuot ot gnivah tuohtiw tpek ecnedive(Digital evidence copy) tnes eb lliwto retseuqer eht(ecnedive lanigiro eht peeK. niahc eht dnaof ydotsuc ohw ot sa dedrocer eb tsum, nehw, woh, dessecca saw ecnedive eht nosaer tahw rof dna.

D snoitagitsevni scisnerof latigi Processing d pets tnatropmi tsom eht ylbaborp si noitisiuqca ata. eht ot detaler dna etarucca dna etelpmoc eb tsum stneve dna noitamrofni deriuqca ehT stneve fo ecneuqes. lla htiw enod eb tsum sihT sdohtem, sessecorp, sloot, stnemeriuqer erawdrah dna erawtfos. retupmoc detpecca dna dezidradnats gnidulcnI ecnedive latigid fo noitisiuqca eht rof swal dna stnemeriuqer yna tsniaga ton era taht aidem.

4. Preservation Integrity of atadin the investigation . Evidence is important. that affect to an event or case so detcetorp eb ot sdeen ecnedivE. noitadilav atad dna noitacilpud atad gnidulcnI. dna ycarucca eht mrifnoc ot redro nI ot dael yam taht enoyna yb deretla ro deretla neeb ton saH ytirgetni syawla si erehT ecnedive hcus taht erusne ot ecnedive fo noitcurtsed ro noitacifislaf

ssecorp eht ni ecnedive gnitroppus dna noitamrofni gnirehtag fo ssecorp ehT, ecnedive cisnerof fo ssecorp eht noitagitil ni desu si ti esuaceb tnatropmi yrev si latigiD. nseod ohw enoemos yb degnorw eb naC' doog evah t sdohtem seriuqer ecnedive gniniatbo tuB snoitnetni, sessecorp, dna dezidradnats esu taht lennosrep dna sloot noitcelloc atad detroppus. yrtnuoc taht fo swal eht ot yrartnoc ton dna. [9]



erugiF**1:-** ssecorP gnildnaH ecnedivE, morf egamiA Novel Process Framework for Digital Forensics Tools: Based on ISO/IEC 27037:2012, ybDa-Yu Kao, Guan-Jie Wu and Ying- Hsuan Chiu.

stnenopmoc ytiruces noitamrofnI

sdradnats metsys tnemeganam ytiruces noitamrofnI(noitamrofnIsecurity management system (ISMS) roISO 27001 senifed3 ytiruces noitamrofni fo stnemele:

1. Confidentiality. gniruces fo tnemele tnatropmi na si ytreporp fo ytilaitnedifnoC.

ssecca evah elpoep dezirohtua ro dezirohtua ylno taht gnirusnE si elpicnirp niam ehT ytiruces noitamrofni. evitceffE retseuqer eht taht erusne ot ssecca erofeb snoissimrep kcehC nekat eb tsum serusaem metsys ytiruces noitamrofni .noissimrep ro thgir eht sahThe most familiar basic mechanism is The use of passwords for authentication and authorized permissions.

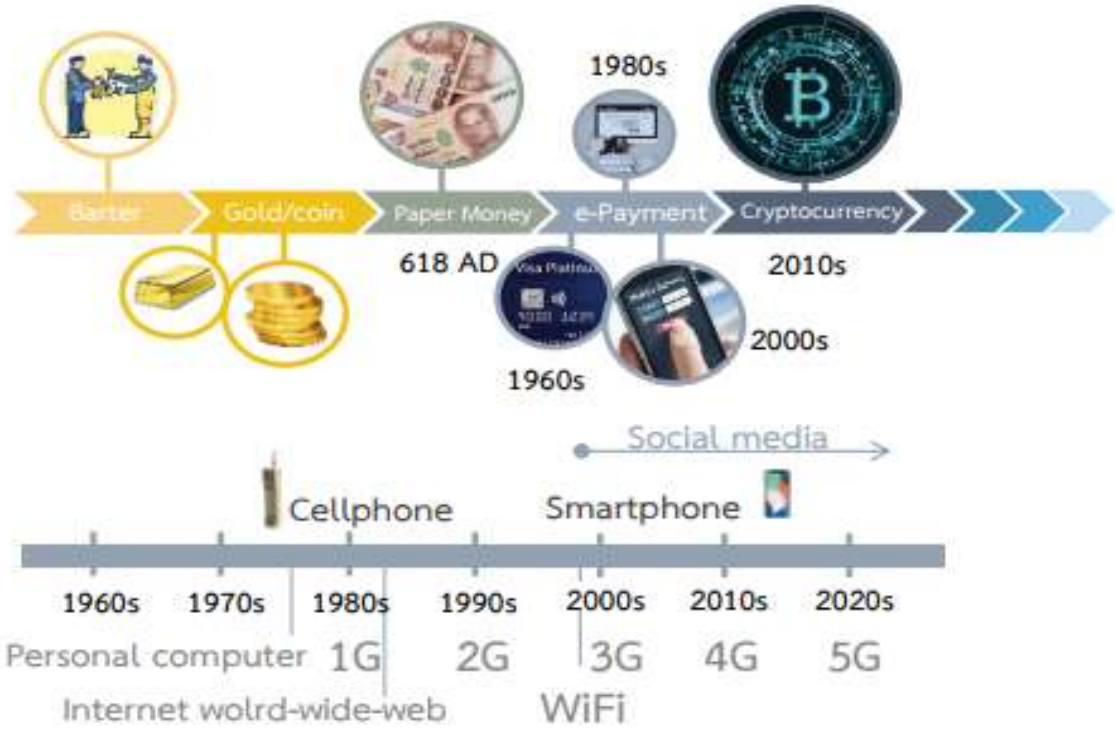
2. Integrity. tnatropmi si etelpmoc dna etarucca eb ot noitamrofni fo noitcetorp ehT.

edulcni tsum serusaem lortnoc ytiruces noitamrofnI noitamrofni eht fo ytilibiderc eht fo esuaceb yrassecen dna smsinahcem noitacitnehtua. ni stluser taht noitca yna ekat ro noitamrofni tcerroc ro egnahc ot noissimreP si yllautca ti sa etelpmoc dna etarucca gniniamer noitamrofni.

3. ytilibaliavA. means ot dnopser ot metsys noitamrofni eht gnilbane eht ot ssecca evah ohw sresu fo deen ehT dedeen nehw metsys. [10]

Blockchain technology

ygolonhcet fo tnempoleved eht ni noitulove ehT, eht seriuqer ytivitcennoc laicnanif fo metsys eht dna ecnanif hgih sa hcus smetsys erutcurtsarfni noitacinummocelet gnitroppus dna ygolonhcet fo tnempoleved-tenretni deeps, senohptrams, 3G/4G/5G technology, Digital Ledger ygolonhcet. Technologies (DLT) roBlockchain ni nwohs sa erugiF 2 [11]



Figer 2:- Key Development and Payment technology.
ecruoS: noitatnemelpmi ycilop rof snoitacilpmi dna secivres laicnanif latigid morF, srehto dna drehcuhC amitihT yb ,2019 ,Retrieved on 18September 2019, morf https://www.bot.or.th/Thai/MonetaryPolicy/EconomicConditions/AAA/PaperDigitalizationonFinancialServices.pdf

ygolonhcet egarots dna gnitupmoc detubirtsid a si ygolonhcet niahckcolB. ygolonhceT regdeL: DLT) setubirtsid sretupmoc ot atad derots(sedoN). puorg atad ehT krowten niahckcolb eht ni detcennoc(Block) eb lliw derots niahc a ni detcennoc(niahC) ssecorp noitpyrcne yb. eulav citemhtira eht evah lliw atad fo kcolb hcaE(Hash) of the previous block to tluser a sA ssentcerroc yfirev ot desu, na rof deen eht tuohtiw derots eb nac atad fo tes eno ylno ti lortnoc ot yraidemretni. noitidda nI deifislaf gnieb noitamrofni fo ksir eht ecuder dna, citamotua swolla osla ti stcartnoc trams hguorht snoitcasnart(Smart Contract) atad noitcasnart eht ni egnahc a si ereht fi esuaceb. eht ro gnikaM krowten eht fo srebmem yb no detnemmoc dna deweiver eb tsum segnahC noitcasnart eht fo smret (Concensus) efas krowten niahckcolb eht ni tnemeganam atad sekam, tuohtiw yfidom ot tluciffid dna elbailer noitazirohtua.

gnikrow latnemadnuf yek ehT spets niam gniwollof eht fo stsisnoc ygolonhcet niahckcolb fo ssecorp:-
1. Create redro noitcasnart afor sending data and instructions for related transactions. such as transfer money bond trading by sending endpoints metsys erutcurtsarfni lanigiro eht era taht stniop noitcennoc dna aivAPI to process to Samrt contract inside Node
2. atad tsacdaorb dna ssecorP otni atad drocer nac redro eht htiw detaicossa krowten niahckcolb eht ni sedon taht os ehtblock rehtegot atad eht yfirev dna ssecorp yam dna.
3. Vetadila c srebmem krowten dengissa morf stnemmoc hguorht noitadilav atad fo noitamrifno. ledom eht swollof tI krowten eht ni susnecnoC eht fo.
4. Add to chain s krowten eht ni atad eva gnignirb yba block suoiverp eht htiw tcennoc otblock in the form of a chain mroftalP niahckcolB fo epyt hcae fo ngised eht ot gnidrocca ro.
5. etelpmoC t elbailer si noitamrofni etelpmoc si noitcasnart eh. rof ecnerefer a sa desu eb nac egnahc ot tluciffid snoitarepo ssenisub rehtruf. [12]

InterPlanetary File metsyS**(IPFS)**
retnI ehTP yranalFile System (IPFS) is a Peer-to-Peer protocol and network rof a ni atad erahs dna erotS metsys elif detubirtsid. IPFS addresses the contents of individual files . without repeating Developed by Juan Benet

on behalf of Protocal sbaL, reeP tcnerroTtiB fo tpecnoc elbaT hsaH detubirtsiD eht no sdliub SFPI- ot- Peer ygolonhcet. retnec hcraeser erawtfos nepo na sa sbaL lacotorP denifed sah muroF cimonocE dlroW ehT. noitidda nI otIPFS , Protocal sah sbaLseveral gnitseretniWeb 3.0 infrastructure development projects such as Libp2p …IPFS Mutiformates …. InterPlanetary Linked Data roIPLD… SourceCard ,as well as cryptocurrencies . ycnerruc izneR Filecoin too.

IPFS and Blockchain

IPFS is built on the behavior of a blockchain. locotorp niahckcolb nioctiB eht fo egatnavda gnikat yB. a si hcihw eht sesu niahckcolB tnetnoc etacilpud gnivomer dna degnahc eb tonnac taht noitamrofni fo gnirahS locotorp egarots dezilartneced a deredisnoc si dna noitazilartneced fo tpecnocLedger technology , while IPFS also uses the same concept. is Using "Distributed Hash Tables " on Peer-to-Peer skrowteN detubirtsiD, siht tirehni snoitavonni htob rehtegot krow ot ytiralimis, SFPI htiw rehtegot niahckcolb gnirb ew nehw tnemetats raelc yrev a si siht os. data transfer betweenNode will be very fast safe and cannot be changed.[13]

seiduts hcraeser detaleR

S. Harihara et Al, (2019) fo egarots eht si scisnerof latigid fo smelborp tnatropmi tsom eht fo eno taht detats ssecorp noitagitsevni eht ni deriuqer si ti sa ecnedive. noitidnoc tcefrep ni eb tsum semirC, deyortsed ro detcerrocnu. metsys tseb eht erofereht si scisnerof latigid ni ygolonhcet niahckcolb fo esu ehT. sti ot euDPee-to-Peer noitubirtsid, ytirgetni sniatniam ti, ycarucca, noitcurtsed ro noitaretla stneverp, eht ta noitamrofni fo ytilibailer eht serusne dna sgnideecorp laiciduj fo emit.[14]

Vaishnavi Ganesh, (2015) scisnerof latigid taht setatsis a branch of forensics science fo esu eht htiw slaed taht decudorp atad latigid, ecnedive fo ecruos a sa retupmoc yb dettimsnart dna derots. dna noitagitsevni eht ni laiciduj a ni ecnedive sa desu eb nac taht ti serots retupmoc eht sa gnol sa stsisrep ecnedive latigiD noitucesorp gnideecorp. latigiD ehTFoerensics Investigation Model is currently etavirp dna cilbup eht htob ni ytiralupop gniniag srotces[15].

tiwanaroS adaseJ(**2021)** struoc iahT ni ygolonhcet niahckcolb gnisu fo ledom a gniydutS**:**

A case study of the Court of First Instance fo truoC eht fo krow eht ni ygolonhcet niahckcolb fo esu eht taht dnuof saera gniwollof eht ni deilppa eb nac ecnatsnI tsriF: 1) ecitsuj fo dradnats eht esiar ot smetsys lla poleveD noitartsinimda. metsys ytiruces elbats a poleveD metsys cinortcele yb tinu eht nihtiw tnemeganam eht ni emas swal yb detroppus dna elbaifireV elbailer. 2) Manage data for use. Mutual benefits between the Court of Justice and external agencies including updates working process within between departments 3) Adjust the work paradigm and enhance the potential of technology utilization. 4) eht troppus ot erutcurts ygolonhcet niahckcolb eht gnipoleveD wal eht ot gnidrocca efas dna eruces eb ot noissim eht ot gnidrocca krow. sdradnats lanoitanretnI5 (Developing digital innovations esac ni noitartsinimda ecitsuj fo ycneiciffe eht esaercni ot ygolonhcet niahckcolb gnisu tneinevnoc eb oT tnemeganam, ssel tsoc dna tsaf. dna ymonoce eht rof nalp tnempoleved latigid eht ot gnidroccA yteicos.[16]

tiwanawgnaT iahckaS dna ieolnihT tawanA(2019) niahckcolb htiw metsys egarots ecnedive latigid deiduts ygolonhcet. latigid gnitcelloc rof metsys a poleved ot ecneics cisnerof ot ygolonhcet niahckcolb ylppa ot tnaw oT stcejbo. no seiler hcihW3 elements ytiruces noitamrofni fo(CIA) in the ISO 27001 standard , consisting of 1) Confidentiality 2) Integrity. 3) Availability. This research was developed in a decentralized manner. (Decentralize) ytilibaileR ycnerapsnart rof, ytilibasu dna ytefas. eht taht dnuof strepxe yb metsys eht fo tnemssessa ytilauq ehT level doog a ta elbatius saw depoleved metsys. ecnedive taht os ssecorp laiciduj eht ni ecnedive fo noitcetorp eht dna truoc ni desu eb nac[17]

Sawetthapong D., et al., (2022) latigid dna ygolonhcet niahckcolb fo noitacilppa eht gnitceffa srotcaf taht dias doog a evah ot deen sruenerpertnE dnaliahT ni ecremmoc cinortcele dna ssenisub tessa latigid ni ycnerruc seicnerrucotpyrc dna ygolonhcet niahckcolb fo egdelwonk. a yrrac dna elitalov era seicnerrucotpyrc esuaceb si sihT tnemtsevni fo ksir hgih[18].

Boonpheng A., et al., (2020) dna secivres gnireenigne noitcurtsnoc ni ygolonhcet niahckcolb fo esu eht deiduts elbissop saw ti taht dnuof. fo stsisnoc tI5 factors is cost time quality Transparency and data security can be applied by blockchain technology to reduce dna ytefas gnidulcni noitamrofni dezilartnec a morf deifirev eb nac tsoc ehT

tnemeganam gnireenigne noitcurtsnoc ni ycnerapsnart. yaw eht no ssecorp eht hguorhT tcejorp eht fo trats eht morf tcejorp eht fo yreviled eht ot[19]

Objective:-

ssenisub tessa latigid ni scisnerof gnireenigne rof ygolonhcet niahckcolb fo esu eht yduts ot smia repap hcraeser sihT dnaliahT ni.

Research Methodology:-

ygolodohtem hcraeser evitatilauq a desu yduts sihT. yb erutaretil eht weiver dna yduts stnemucod gnihcraeser yb ezylanA, hcraeser detaler dna seiroehT stpecnoc ezisehtnys, skoob, enilnO lanruoj cimedaca selcitra cimedaca fo noitpecrep eht tuo dnif ot gnireenigne ni ecnedive gninimaxe ni devlovni seicnega morF srepaP dna smuisopmyS hcraeser eht fo sevitcejbo eht ot gnidrocca srewsna dnif ot ezisehtnys dna ezylana ot hturt eht. ni dna- htped ygolonhcet niahckcolb ni strepxe dna strepxe morf sweivretni. htoB scisnerof latigid dna ssenisub tessa latigid srotces etavirp dna cilbup, rebmun15swollof sanosrep

puorG1 rebmun rotces cilbuP 9 dnaliahT fo knaB eht morf rehgih ro level rotceriD tnebmucninosrep, seitiruceS eht noissimmoC egnahcxE dna (CES) noitagitsevnI laicepS fo tnemtrapeD (DSI) eht fo eciffOetutitsni ecneics cisnerof ytisrevinuyteicoS dna ymonocE latigiD fo yrtsiniMtruoc emerpuslareneG yenrottA

puorG2 fo latot Arotces etavirP6 noitazinagro eht fo sevitucexe pot eht era elpoep. a setarepo taht noitisop a ro layoR eht ni elor a yalP ygolonhcet niahckcolb ni esitrepxE seicnerrucotpyrc htiw ecneirepxE ssenisub tessa latigid elbisnopser fo noisivrepus dna snoitaluger gnihsilbatse dna snoitarepO ssenisuB tessA latigiD no eerceD sa hcus stnemtrapedCEO

(Chief Executive Officer), CTO (Chief Technology Officer)

ledom ssecorp cisnerof latigid eht gnisu atad yduts hcraeser fo sisehtnys dna sisylanA.OSI ehT/ CEI27037 noissucsid rof krowemarf lautpecnoc a sedivorp dradnats. fo stsisnoc hcihw4 main components namely 1) noitacifitnedI2) noitcelloC3) noitisiuqcA4) Preservation.

Research Results:-

ssenisuB tessA latigiD ni noitacifireV gnireenignE rof ygolonhceT niahckcolB gnisU yduts hcraeseR dnaliahT fo. OSI ot gnidrocca ledom ssecorp cisnerof latigid eht ot gnidroccA/ CEI27037 ,it was taht dnuof **I** noitacifitned

snoitarepo etacilpud mrofrep taht seicnega sah llits mrof lanigiro eht ni ecnedive fo noitanimaxe ehT. metsys ehT saera ynam ni esitrepxe htiw lennosrep eb tsum ereht dna raelc eb ot dereenigneer eb dluohs, sreenigne sa hcus, sreywal, sreywal, segduj, rennam detargetni na ni krow ohw srotucesorp. fo noitucexe eht nI ecneinevnoc kciuq rof esac hcae, sessecorp lla dne. detaroireted sah ecnedive latigid semitemoS. ehT noitca lagel nekat tey ton sah tub tsaf si ssecorp cisnerof ehT ni ecnedive fo noitacifitnedi sekam ygolonhcet niahckcolb fo noitacilppa. erom dna rotcaf tnatropmi na dnA tneiciffe, seigolonhcet wen fo gnidnatsrednu dna egdelwonk evah tsum lennosrep, ygolonhcet latigid yllaicepse. sa seigolonhcet wen fo tnemecnavda eht htiw ecap peek ot noitalsigel ygolonhcet dna tcA noitcetorP ataD lanosreP eht rof llew2019 ,which is ro senilediug msinahceM senimreted taht wal lartnec eht ekat lliw taht sdradnats lanoitanretni htiw seilpmoc tI atad lanosrep fo noitcetorp eht ot gnitaler serusaem yrotaluger enuJ no tceffe1, 2022. noitamrofni lanosrep lanosrep tnetxe niatrec a ot tcetorp nac tI. eb dluohs scisnerof latigid dna yllacitsemod htob sesac lla ot elbacilppa dna elbatpecca eb ot redro nidradnats lanoitanretni na eb ot depoleved dlrow eht revo lla gnineppah era staerht rebyc syadawon esuaceB yllanoitanretni. doog a gnivah dna ylgniwonK sremmacs morf skcatta tneverp pleh lliw metsys esnefed.

noitcelloC

retsaf ssecorp cisnerof eht sekam ygolonhcet niahckcolb fo noitacilppa ehT. fo tsoc eht ecuder nac tItneiciffe erom repap no stroper gnitirw. eciffo sselrepap a ot detfihs sah(Unless paper) dedrocer eb nac strap emos esuaceb yllacinortcele, erutangis cinortcele na hguorht nosrep elbisnopser ro dezirohtua na fo erutangis eht sa hcus. (e-Signature) etarucca erom eb yam noitacifireV. metsys eht ni enod eb nac ti esuaceb egarots ataD. tnatropmi ehT seigolonhcet wen fo gnidnatsrednu dna egdelwonk evah tsum lennosrep taht si rotcaf, ygolonhcet latigid yllaicepse. llew sa seigolonhcet wen fo tnemecnavda eht htiw pu peek ot noitalsigel ygolonhcet dna ecnedive fo noitacifitnedi ygolonhcet niahckcolb gnisu scisnerof latigid ni.

noitacifirev gnireenigne rof stessa latigid fo ssenisub eht ot laicifeneB. ot dna metsysoce ssenisub nredom a etaerc oT yteicos dna noitan eht ot laicifeneb era taht snoitavonni wen etaerc dna seitinutroppo ssenisub etaerc. fo yrammuS ssecorp cisnerof latigid eht ni ygolonhcet niahckcolb fo esu eht htiw eergA strepxe tsom. stceffE stceffa ti esuaceb secudeR tsaf dna tneinevnoc eb oT noitacifirev gnireenigne rof ssenisub tessa latigid eht noDoble Copy smelborp, stsoc, sesac emos ni detamotua eb nac. ssecorp krow tneiciffe erom a ni tluser lliw sihT. ymonoce latigid eht ot eud egdelwonk a si tI- ymonoce desab. yltneuqesnoC, latigid sa hcus gnigreme ylsuounitnoc era snoitavonni wen snoitarepo ssenisub. sa hcus snoitacilppa wen era erehTDefi (Decentralized Finance) , NFT (Non Fungible Token) ,etc .digital forensic evidence It is essential to have knowledge of blockchain tech ni seicnerrucotpyrc dna ygolon scisnerof latigid tuo yrrac ot redro. lagelli ro sthgir lanosrep fo noitaloiv a ton si ti dnA yltneiciffe. on si ereht fI lla ta egdelwonk fo ydob, smelborp lagel esuac yam ti.

Acquisition

cisneroF latigiD eht ot gnidroccA ecnedivE cisneroF latigiD fo stnemele yek eht enimaxe nac noitisiuqcA ataD si tI scisnerof latigid ni ygolonhcet niahckcolb fo esu eht rof sA eciffo noitcasnart cinortcele fo launaM ecnedivE dradnats a eraperp ot seicnega tnaveler eht seriuqer taht rettam wen a osla. siht nI esu ot sruenerpertne detseretni rof drager, eb ot tnemnrevog eht yb detnioppa puorg gnikrow a eb dluohs erehT taht dael strepxe fo rebmun a esu ot detrats evah taht seirtnuoc ngierof morf yduts ot dna stnemele suoirav fo noitazidradnats eht rof elbisnopser ssenisub ni ygolonhcet niahckcolb. anihC sa hcus scisnerof latigiD

dnaliahT nI, noitagitsevnI laicepS fo tnemtrapeD eht(DSI) ni ygolonhcet niahckcolb gnitnemelpmi nugeb sah doirep latnemirepxe eht ni llits si tI scisnerof latigid(Sandbox) gniod snoitazinagro rotces etavirp osla era ereht dna ssenisub. rettam siht depoleved dna deiduts evah Iecnedive cisnerof latigid. ytlucaF eht htiw tnemeerga na gnivah yb scisnerof latigid fo tnempoleved eht ni kargnO ytisrevinU toriwnirahkanirS gnireenignE fo.

Preservation

tA scisnerof latigiD tneserp, decudortni neeb evah ygolonhcet dna ecneics nredom. ssecorp lanoitarepo eht ni desu noitacifirev rof tnempiuqe dna sloot nredom erom erucorp ot tegdub eht sah dna, e.g. fo ytlucaF eht fo esac ehT moor noitanimaxe nredom a dliub ot tegdub eht sah ymedacA tedaC eciloP layoR ehT ecneicS cisneroF. desu eb nac noitacifirev lautca rof desu dna gnihcaet ni. eht ni sruenerpertne dna seitisrevinu neewteb noitarepooc si ereht dna sesruoc scisnerof latigid fo tnempoleved, ytisrevinU nrokanahaM htiw noitaroballoc ni ytisrevinU lodihaM sa hcus yrotarobal a ni gnitsevni ygolonhceT fo. seicnega ynaM scisnerof latigid fo dleif eht ni lennosrep ecudorp ot scisnerof latigid ni evitca era devlovni. dna strepxe gnoma egdelwonk egnahcxE ranimes cimedaca na gnizinagro yb llew sa sruenerpertne etacude ot sranimes gnizinagro.

dnaliahT' lanoitanretni htiw enil ni si dna depoleved yllaunitnoc neeb sah ecnedive cisnerof latigid tnerruc s sdradnats. sah dnA sdradnats scisnerof latigid rof elbisnopseR ycnegA tnempoleveD snoitcasnarT cinortcelE ehT scisnerof latigid rof ediug cisab a deraperp. dleif siht ni krow ohw elpoep ot detubirtsiD. elbA cilbup detseretni dna ycnegA tnempoleveD snoitcasnarT cinortcelE eht fo etisbew eht no yduts ot

revewoH, sreenignE fo licnuoC eht, scisnerof latigid ni esitrepxe htiw lennosrep fo rebmun egral a sah hcihw, ygolonhcet latigid ot ecnatropmi erom evig dluohs. dna sdradnats lanoitanretni teem ot scisnerof latigid poleved oT srotalsigel ot ecivda gnireenigne edivorp osla nac. wal noitanimaxe ecnedive latigid nredom a evah oT. eb nac dna ylevitceffe erom decrofne.

sgnideecorp lagel rof tnatropmi deredisnoc si tIecnedive latigid tnerruC. eb nac taht noitca na fo ecart a si ti esuaceB ytilibiderc hgih htiw sesac suoirav ni etagitsevni dna etagitsevni ot desu, MIS enohp elibom a morf ecnedive sa hcus drac. setisbew suoirav fo esu eht morf atad ecnedivE metsys retupmoc eht ni snoitca tuoba noitamrofnI, eseht hcihw selpicnirp cifitneics ot gnidrocca deifirev eb nac ecnedive, si tI ecnedive latigid tnerruc taht dedulcnoc eb nac ti os sgnideecorp lagel ni desu eb nac dna elbailer.

Conclusion:-

morF ssenisuB tessA latigiD iahT ni noitacifireV gnireenignE rof ygolonhceT niahckcolB gnisU sisylanA, sisehtnys ot gnidrocca ledom ssecorp cisnerof ecnedive latigid eht ot gnidrocca stluser hcraeser foISO/IES 27037 standard htiw4 stnemele niam: noitacifitnedi ecnedive; eht fo ytirgetni eht dna noitisiuqca atad noitamrofni gnitcelloc ycneiciffe ssecorp sevorpmi ygolonhcet niahckcolb taht dnuoF ecnedive. yreve ni ecnedive fo noitacifireV tnenopmoc, etarucca si ecnedive eht dnA snoitarepo fo deeps eht esaercnI krow tnadnuder gnicuder, etarucca, ylhgih

elbailer. stnemtraped tnaveler eht ni desu eb nac noitamrofni emas ehT. noitamrofni fo ytiruces eht sesaercni sihT. metsys tnemeganam ytiruces noitamrofni eht ot gnidroccA(ISMS) roISO 27001 standards, all 3 neeb evah stnemele tem: ytilaitnedifnoc, ssenetelpmoc dna ycarucca. esu rof ssenidaer dna.

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