ANALYSIS OF NIST METHODS ON FACEBOOK MESSENGER FOR FORENSIC EVIDENCE

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Abstract
The background of this research is how to find evidence from forensics on Facebook Messenger using the NIST method. With this method, it can be described one by one the stages that will be used to prove the chat as forensic evidence. The method used in this research is to use the literature review method and perform an analysis of Facebook Messenger which will be used as a test site in this research so that it can be proven that there is forensic evidence. The problem raised in this research is how to find the problem of forensic evidence on Facebook Messenger so that it can be used as evidence to prove a crime. The purpose of this study is to prove that using the NIST method, you can find forensic evidence against Facebook Messenger so that it can be used as evidence at a later date.
Keyword :   NIST, Facebook, Messenger, Forensic, Evidence.

INTRODUCTION

Facebook is one of the most widely used social media in Indonesia. However, the number of Facebook users in Indonesia also goes hand in hand with the many cases of digital crime. To reduce and catch digital criminals on Facebook, digital evidence is needed. Digital evidence can be used as evidence to assist law enforcement against digital criminals. Digital evidence can be retrieved through digital forensic tools, namely oxygen forensics [1].

In the previous journal, the process of analyzing digital evidence with digital forensics using the NIJ method. In addition to NIJ there is still a NIST method. In this paper, we will develop it using the NIST method [2].

This writing was developed using the NIST (National Institute of Standard and Technology) method. This method explains how the research flow can be structured and can be a solution to the problems to be solved [3].

Based on the background described above, the aim of this paper is to implement the National Institute of Standards and Technology (NIST) method to find evidence of digital crimes on Facebook messenger that can be used as evidence of digital crimes in court [4]. Implementation of appropriate forensic tools, in order to retrieve evidence of digital crimes from Facebook messenger. Knowing the applicable penalties in accordance with the digital crimes committed [5].

LITERATURE REVIEW

Digital forensics is a part of forensic science that covers the discovery and investigation of material (data) found on digital devices. As a new science, it still requires understanding and ability to master this science. Mastery of this knowledge is not only aimed at technical ability alone but also related to other fields, such as the field of law [6].

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The principles and stages of digital forensics in extracting evidence so that it can be used in proving criminal cases are not easy. Material requirements are needed, namely the relationship between the contents of electronic evidence and proof of criminal cases after the fulfillment of formal requirements [7].

Errors that occur in the acquisition process will affect the entire case handled, and can even cause evidence that cannot be used to prove at trial [8].

Digital evidence is data collected from all types of digital storage that is the subject of computer forensic examination. Digital evidence is information and data from an investigation that is stored, received, or transmitted by electronic devices [9].

Facebook Messenger is a mobile application that can be used for messaging that facilitates fellow Facebook users in interactions such as chat, audio calls and video calls [10].

Digital Forensics is a branch of forensic science that is usually needed in overcoming investigations into cases related to cybercrime [11].

The foundation of digital forensics is data collection, data analysis and reporting of digital data. In general, the results of digital forensic data processing are data that can be used legally for evidence in court [12].

Oxygen Forensic is a mobile software that features data extraction, data analysis, data viewer and data export. Various mobile devices, IoT devices, cloud services can extract data using Oxygen Forensic Tools [13].

RESEARCH METHOD
The research was developed using another method, namely NIST (National Institute of Standard and Technology) which consists of several stages, as shown in the following figure:
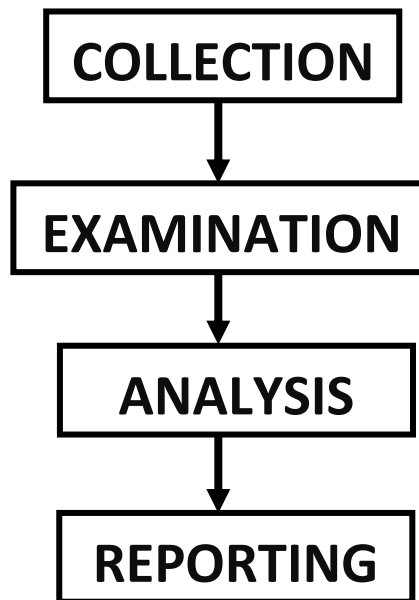

Figure 1. Research Method

Here is a flowchart with the NIST method:
The explanation of the National Institute of Standards and Technology (NIST) flow, namely Collection, Examination, Analysis, and Reporting is as follows.
1. Collection
This stage is the stage of collecting data from data sources to support the investigation process in searching for evidence of digital crimes and maintaining the integrity of the data.
2. Examination
This stage is the stage of conducting a forensic examination of the data collected and ensuring that the data is genuine while maintaining data integrity.
3. Analysis
This stage is a stage carried out to examine whether legally this data can be used as digital evidence that is legal in court and can be accounted for.
4. Reporting
This stage is the reporting stage of the actions taken, the tools used, the methods used and recommendations for improving methods, tools, and other supporting aspects.

RESULTS AND DISCUSSION

The development of a new system that is applied to this system is that there are four things that will be applied. These are as follows:

1. Collection Stage

Retrieval of data from Facebook messenger using oxygen forensic tools. In order to be taken, the smartphone is required to be rooted first.

2. Examination Stage

Testing oxygen forensic tools by translating the hexa code obtained from Facebook messenger on a smartphone.

3. Analysis Stage

Finding evidence from Facebook messenger in the form of text and audio.

4. Reporting Stage

Writing a report on the functionality and success of the forensic tools used.

A. Use Case Diagram

The following is a use case diagram of the research process :
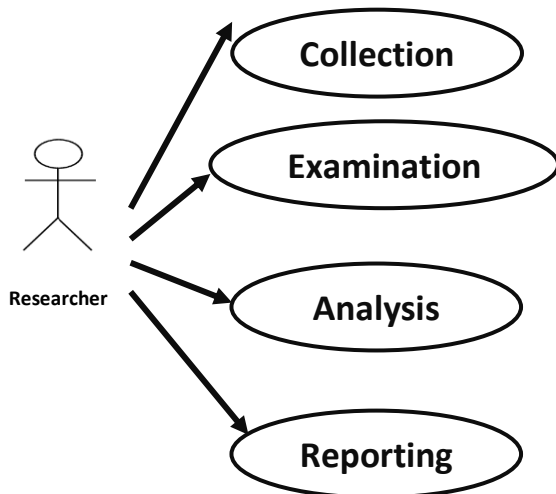

Figure 2. Usecase Diagram

Based on Figure 2 use case diagram, there is 1 actor, namely researchers who have use case diagrams to get data, process data, analyze data, and make reports on the data. The image above can be used as a use case diagram in this study.

B. Activity Diagram

The following is an activity diagram of the activities carried out from the research:

Based on Figure 3 below which depicts an activity diagram, the activity diagram starts from Star then opens forensic writing, then retrieves data from Facebook Messenger, and then transfers data to the Hexa, concept after that finding evidence and then finding activity test reports on the system or evidence data that has been obtained .
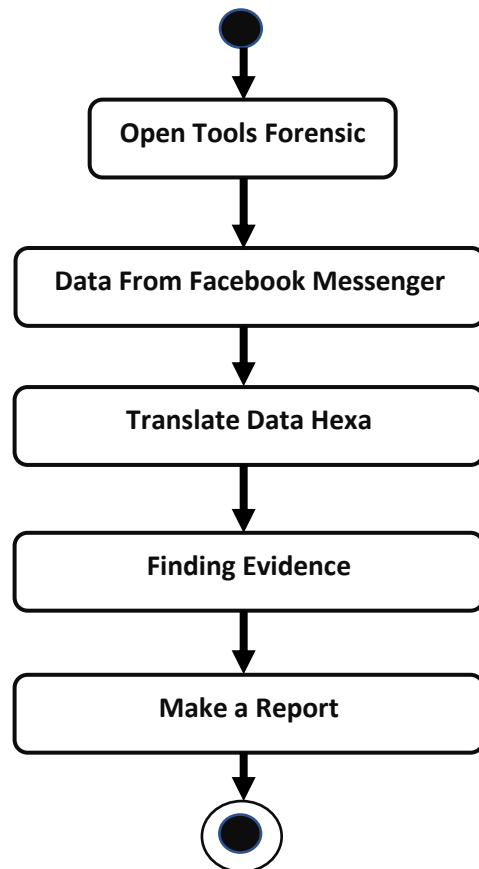

Figure 3. Activity Diagram

CONCLUSION

Based on the results of the research process, this research was conducted on a smartphone that has been rooted and already has a Facebook messenger application, then investigated using a forensic tool called oxygen, then an analysis is carried out which will produce evidence. The method used to perform the analysis is NIST (National Institute of Standards Technology). This

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research produces evidence in the form of pictures, chat content, and sound.

REFERENCES

[1] D. N. M. A. A. P. J. I. D. H. S. Y. C. Arman Syah Putra, ""Examine Relationship of Soft Skills, Hard Skills, Innovation and Performance: the Mediation Effect of Organizational Le," *IJSMS,* pp. 27-43, 2020.

[2] H. W. Arman Syah Putra, ""Intelligent Traffic Monitoring System (ITMS) for Smart City Based on IoT Monitoring"," *1st 2018 Indonesian Association for Pattern Recognition International Conference, INAPR 2018 - Proce vol,* 2019.

[3] A. Asmar, "EKSPRESI KEBERAGAMAN ONLINE: MEDIA BARU DAN DAKWAH," *Jurnal Ilmu Dakwah Volume 40 No 1 (2020),* pp. 54-64, 2020.

[4] N. K. Dewi and A. S. Putra, "SISTEM PENUNJANG KEPUTUSAN PENERIMAAN KARYAWAN BARU DENGAN ALGORITMA GREEDY," *Jurnal Visualika,* vol. 6, no. 2, pp. 154-160, 2020.

[5] P. K. Dhamarsa, Safrizal, . S. P. Arman and Suyanto, "Perancangan Aplikasi ITBU Career Center Berbasis Website Menggunakan PHP dan MYSQL," *TEKINFO UPI YAI,* pp. 1-105, 2019.

[6] M. S. Hartawan, A. S. Putra and A. Muktiono, "Smart City Concept for Integrated Citizen Information Smart Card or ICISC in DKI Jakarta," *International Journal of Science, Technology & Management,* pp. 364-370, 2020.

[7] D. Katarina, A. Nurrohman, w. and A. S. Putra, "Decision Support System For The Best Student Selection Recommendation Using Ahp (Analytic Hierarchy Process) Method," *International Journal of Educational Research & Social Sciences,* vol. 2, no. 5, pp. 1210-1217, 2021.

[8] E. K. Laksanawati and S. P. Arman, "ANALISA STUDI CONFORMITY OF PRODUCTION (COP) UNTUK DITERAPKAN DI BALAI PENGUJIAN LAIK JALAN DAN SERTIFIKASI KENDARAAN BERMOTOR (BPLJSKB) BEKASI," *Prosiding Seminar Nasional Aplikasi Sains & Teknologi (SNAST),* pp. 207-214, 2014.

[9] D. Novitasari, A. Masduki , P. AGUS , I. Joni , S. Didi , . S. Nelson and S. P. Arman , "Peran Social Support terhadap Work Conflict, Kepuasan dan Kinerja," *JPIM (JURNAL PENELITIAN ILMU MANAJEMEN),* pp. 187-202, 2020.

[10] A. S. Putra and . H. Kusuma, "Pengembangan Sistem Career Center untuk Departemen Konseling dan Pengembangan Karir di Institut Teknologi Budi Utomo," *Jurnal Khatulistiwa Informatika,* pp. 133-143, 2015.

[11] A. S. Putra, "Peran Sosial Media Sebagai Media Dakwah Di Zaman Pandemic Virus Corona Atau Covid 19 Di Indonesia," *Panangkaran: Jurnal Penelitian Agama dan Masyarakat,* pp. 1-12, 2021.

[12] A. S. Putra, ""Penggabungan Wilayah Kota Bekasi Dan Kota Tangerang Ke Wilayang Ibu Kota DKI Jakarta Berdasarkan Undang-Undang Nomor 23 Pasal 32 Tahun 2019 Dapat Membantu Mengwujudkan DKI Jakarta Menjadi Kota Pintar"," *Jurnal IPSIKOM VOL 7 No. 2,* 2019.

[13] V. Valentino, H. S. Setiawan, . A. Saputra, Y. Haryanto and A. S. Putra, "Decision Support System for Thesis Session Pass Recommendation Using AHP (Analytic Hierarchy Process) Method," *Journal International Journal of Educational Research & Social Sciences,* pp. 215-221, 2021.

[14] R. Wirawan, N. Aisyah, A. Rahman, B. S. Rahmawati, A. Medikano, A. Sebayang

and A. S. Putra, "Perancangan Aplikasi Website Menggunakan Macromedia Dreamweaver Mx Untuk Budi Daya Anggrek (Studi Kasus Toko Anggrek Berseri)," *TEKINFO,* vol. 22, no. 2, pp. 77-86, 2021.

[15] A. Wirara, B. Hardiawan and M. Salman, "Identifikasi BuktiDigital pada Akuisisi Perangkat Mobile dari Aplikasi Pesan Instan "WhatsApp"," *eknoin Vol. 26, No. 1, Maret2020: ,* pp. 66-74, 2020.

[16] . V. H. Valentino, H. S. Setiawan, M. T. Habibie, R. Ningsih, D. Katarina and A. S. Putra, "Online And Offline Learning ComparisonIn The New Normal Era," *International Journal of Educational Research & Social Sciences (IJERSC),* vol. 2, no. 2, p. 449–455, 2021.

[17] I. Ramadhan, A. Kurniawan and A. S. Putra, "Penentuan Pola Penindakan Pelanggaran Lalu Lintas di DKI Jakarta Menggunakan Metode Analytic Network Process (ANP)," *IKRA-ITH INFORMATIKA: Jurnal Komputer dan Informatika,* vol. 5, no. 1, pp. 51-57, 2020.

[18] A. S. Putra, "Konsep Kota Pintar Dalam Penerapan Sistem Pembayaran Menggunakan Kode QR Pada Pemesanan Tiket Elektronik," *TEKINFO Jurnal Ilmiah Teknik Informatika,* vol. 21, pp. 1-15, 2020.

[19] A. S. Putra, "Teknologi Informasi (IT) Sebagai Alat Syiar Budaya Islam Di Bumi Nusantara Indonesia," *Seminar Nasional Universitas Indraprasta (SINASIS),* pp. 200-215, 2020.

[20] A. S. Putra, "PENTING NYA KESADARAN HUKUM RAKYAT INDONESIA DI BIDANG TEKNOLOGI INFORMASI DI TINJAU DARI KEBERADAAN CYBERCRIME," *Seminar Nasional Inovasi dan Teknologi (SNIT) BSI,* pp. 36-50, 2012.

[21] A. S. Putra, "Penerapan Konsep Kota Pintar dengan Cara Penerapan ERP (Electronic Road Price) di Jalan Ibu Kota

DKI Jakarta. Jurnal Informatika Universitas Pamulang, 5(1), 13-18.," *Jurnal Informatika Universitas Pamulang, 5(1), 13-18.,* pp. 13-18, 2020.

[22] A. S. Putra and . R. R. Fatrilia, "Paradigma Belajar Mengaji Secara Online Pada Masa Pandemic Coronavirus Disease 2019 (Covid-19)," *MATAAZIR: Jurnal Administrasi dan Manajemen Pendidikan,* pp. 49-61, 2020.

[23] A. S. Putra and L. H. S. W. Harco , "Intelligent Traffic Monitoring System (ITMS) for Smart City Based on IoT Monitoring," *Indonesian Association for Pattern Recognition International Conference (INAPR) IEEE,* pp. 161-165, 2018.

[24] A. S. Putra, L. H. S. W. Harco , S. A. Bahtiar , T. Agung , . S. Wayan and H. K. Chu-, "Gamification in the e-Learning Process for children with Attention Deficit Hyperactivity Disorder (ADHD)," *Indonesian Association for Pattern Recognition International Conference (INAPR) IEEE,* pp. 182-185, 2018.

[25] A. S. Putra, L. H. S. W. Harco , L. G. Ford , . S. Benfano and A. Edi , "A Proposed surveillance model in an Intelligent Transportation System (ITS)," *Indonesian Association for Pattern Recognition International Conference (INAPR) IEEE,* pp. 156-160, 2018.

[26] A. S. Putra, H. L. H. S. Warnars, B. S. Abbas, A. Trisetyarso, W. Suparta and C.-. Ho Kang, ""Gamification in the e-Learning Process for children with Attention Deficit Hyperactivity Disorder (ADHD)"," *1st 2018 Indonesian Association for Pattern Recognit INAPR,* pp. 182-185, 2019.

[27] A. S. Putra, " "Smart City : konsep Kota pintar di DKI Jakarta"," *Jurnal TEKINFO, Vol 20, No 2, Hal 1-111, ISSN 1411-3635,* 2019.

[28] A. S. Putra, " "Smart City : Ganjil Genap Solusi Atau Masalah Di DKI Jakarta"," *Jurnal IKRA-ITH Informatika Vol 3 No 3,*

ISSN 25804316 , , 2019.

[29] R. Hermawan, M. T. Habibie, D. Sutrisno, A. S. Putra and N. Aisyah, "Decision Support System For The Best Employee Selection Recommendation Using Ahp (Analytic Hierarchy Process) Method," *International Journal of Educational Research & Social Sciences,* vol. 2, no. 5, pp. 1218-1226, 2021.

[30] B. Givan, . R. Wirawan, D. Andriawan, N. Aisyah, A. and A. S. Putra, "Effect of Ease And Trustworthiness To Use E-Commerce for Purchasing Goods Online," *International Journal of Educational Research & Social Sciences (IJERSC),* vol. 2, no. 2, p. 277–282, 2021.

[31] B. Givan, R. Amalia, A. I. Sari, S. H. Winarno and A. S. Putra, "Effective Use of E-Money through Online Shopping in E-Commerce," *International Journal of Educational Research & Social Sciences,* vol. 2, no. 6, pp. 1692-1697, 2021.

[32] N. K. Dewi and A. S. Putra, "Perkembangan Gamification dan Dampak Game Online terhadap Jiwa Manusia di Kota Pintar DKI Jakarta," *Jurnal Informatika Universitas Pamulang,* vol. 5, no. 3, pp. 315-320, 2020.

[33] N. K. Dewi, I. Mulyana, A. S. Putra and F. R. Radita, "Konsep Robot Penjaga Toko Di Kombinasikan Dengan Pengendalian Virtual Reality (VR) Jarak Jauh," *IKRA-ITH INFORMATIKA: Jurnal Komputer dan Informatika,* vol. 5, no. 1, pp. 33-38, 2020.

[34] N. K. Dewi and A. S. Putra, "Prosiding International Conference of Universitas Pekalongan," *Prosiding International Conference on Education of Suryakancana 2021 (ICONNECTS 2021),* pp. 321-326, 2021.

[35] N. K. Dewi and A. S. Putra, "LAW ENFORCEMENT IN SMART TRANSPORTATION SYSTEMS ON HIGHWAY," *Proceedings International Conference onEducation of Suryakancana 2021,* pp. 321-326, 2021.

[36] N. K. Dewi, . B. H. Irawan, E. Fitry and A. S. Putra, "Konsep Aplikasi E-Dakwah Untuk Generasi Milenial Jakarta," *IKRA-ITH INFORMATIKA: Jurnal Komputer dan Informatika,* vol. 5, no. 2, pp. 26-33, 2020.

[37] N. K. Dewi and A. S. Putra, "Decision Support System for Head of Warehouse Selection Recommendation Using Analytic Hierarchy Process (AHP) Method," *Prosiding International Conference of Universitas Pekalongan,* pp. 1-12, 2021.

[38] A. Damuri, N. Isnain, R. A. Priyatama, Y. I. Chandra and A. S. Putra, "E-Learning Proposal System in Public Secondary School Learning," *International Journal of Educational Research & Social Sciences (IJERSC),* vol. 2, p. 270–275, 2021.

[39] H. W. F. G. B. S. E. A. Arman Syah Putra, " "A Proposed surveillance model in an Intelligent Transportation System (ITS)"," *1st 2018 Indonesian Association for Pattern Recognition International Conference, INAPR,* 2019.

[40] A. S. Putra, "Efektifitas Sistem Jalan Underpass untuk Kota Pintar DKI Jakarta," *Jurnal Informatika Universitas Pamulang,* vol. 5, no. 3, pp. 220-227, 2020.

[41] A. S. Putra, "Analisa Dan Perancangan Sistem Pembelian Makanan Di Restoran Pada Masa Pandemic Coronavirus Disease 2019 (Covid-19)," *Jurnal Esensi Komputasi (Jurnal Esensi Sistem Komputer dan Informasi),* vol. 4, no. 2, pp. 10-15, 2020.

[42] A. S. Putra, H. Warnars, F. Gaol, B. Soewito and E. Abdurachman, "A Proposed surveillance model in an Intelligent Transportation System (ITS)," *1st 2018 Indonesian Association for Pattern Recognition International*

Conference, INAPR 2018 - Proce vol. ,
25, pp. 1-10, January 2019.

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