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## Implications of Digital Technology for Criminal Law Enforcement: Challenges and Opportunities in the Age of Digitalization

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**Abstract:** This research aims to investigate the impact of technology and innovation on justice in law enforcement in the digital age. In the ever-evolving digital age, technological developments such as big data analytics, artificial intelligence, and digital forensics have transformed the landscape of law enforcement operations. This research outlines the positive and negative impacts of such technologies on justice in the legal system. The findings of the literature review indicate that the utilisation of technology in law enforcement has the potential to enhance the efficiency of investigations, evidence analysis, and detainee monitoring. However, there are also concerns related to the protection of privacy and the security of data that warrant consideration. Moreover, the unequal access to technology and data can pose a threat to the principles of justice. This research will enable the relevant stakeholders in law enforcement and public policy to comprehend the implications of technology and innovation for justice. Furthermore, it provides a foundation for future researchers to conduct more in-depth empirical research on these issues.

**Keyword:** digital, technology, law.

### INTRODUCTION

In the context of the rapidly evolving digital age, the advent of technology and innovation has had an indelible impact across all facets of life, including law enforcement. Digital transformation has opened the door to a myriad of remarkable advances in how we

access, analyze, and process pertinent information within the justice system. The exponential growth of technology and innovation has had a profound effect on numerous domains of human activity, including the legal realm. In the digitalized era, the incorporation of technology has become a fundamental aspect of law enforcement. Nevertheless, the rapid advancement of technology frequently outpaces the development of positive law, namely legal regulations governing the use of technology.

In his book, *Code and Other Laws of Cyberspace*, Lawrence Lessig posits that computer code plays an essential role in defining the norms and regulations governing behavior in the digital domain. He emphasizes the need to grasp the impact of technological advancement on the organization and administration of justice.

Richard Susskind, another prominent figure in the field, has also made significant contributions to the understanding of the intertwined relationship between technology and law. As a leading legal expert in the field of technology and law enforcement, Prof. Susskind has highlighted the significant impact of technology on the practical and theoretical aspects of law enforcement. His conceptualizations of "Online Courts" and "The End of Lawyers?" have initiated crucial discussions about the evolution of law enforcement.

The advent of new technologies has made the business landscape increasingly complex, costly, and risky. The changing business processes, high competitive pressures, and drastic and rapid changes in technology itself have made it imperative for companies to adapt. Technological innovation is a critical resource and a sub-system of the organization. As such, technology has a significant bearing on the company's ability to remain competitive and achieve long-term profitability. In the current market, companies must pay attention to technological opportunities and leverage them to support business strategies and improve operations and services. It can be argued that the long-term success of an organization or company is contingent upon their capacity for responsiveness and adaptation to technological innovation.

In this era of turbulence, the advent of information and communication technology has profoundly impacted the social, economic, and legal landscapes. Technology has become a primary driver of change in a multitude of human endeavors, including communication, work, and interactions within one's surroundings. Rapid developments in technology such as the internet, artificial intelligence (AI), automation, and cloud computing have brought about significant advances, yet also present a number of complex legal issues.

The advent of new technologies has created unprecedented possibilities and raised new issues that affect individuals, corporations, and governments. One of the main challenges is how the law can adapt rapidly to meet these technological challenges. In this digital age, the law cannot rely on regulations that have been in place for decades as technology continues to evolve at a breakneck pace.

The most evident instances of legal challenges are observed in the domains of data privacy and security, intellectual property in the digital world, cybercrime, and the regulation of the sharing economy. Furthermore, ethical considerations surrounding the utilization of technology, particularly in the context of artificial intelligence, are receiving increasing scrutiny. On the other hand, debates pertaining to the limitations of free speech, surveillance, and monitoring activities in the digital realm, as well as the individual rights associated with the utilization of personal data, are increasingly intricate.

The necessity for more expeditious and pertinent legal review and adaptation is further compounded by the aforementioned challenges. Consequently, this paper seeks to investigate the role of law in addressing these challenges within the context of the digital age. The comprehension of the technological alterations currently underway, along with their impact on everyday life, provides a foundation for exploring the ways in which the law may facilitate the accommodation of these technological developments while safeguarding people's rights and values within an increasingly interconnected and digitalized global landscape. In light of

these considerations, this paper will delineate the aforementioned challenges, the measures that certain countries have implemented to address them, and the legal and ethical implications that arise in the context of technological developments.

## METHOD

The research methodology employed herein is that of a literature study. The literature study method entails a systematic review of a multitude of books, magazines, journals, and other pertinent sources, which are then subjected to a rigorous examination. This method of inquiry is employed with the objective of elucidating the underlying sources of knowledge and insights that have been previously articulated. The objective of this literature study is to enhance the understanding of the issues under investigation and to provide a foundation for analyzing the impact and innovation of technology in law enforcement during the digital era.

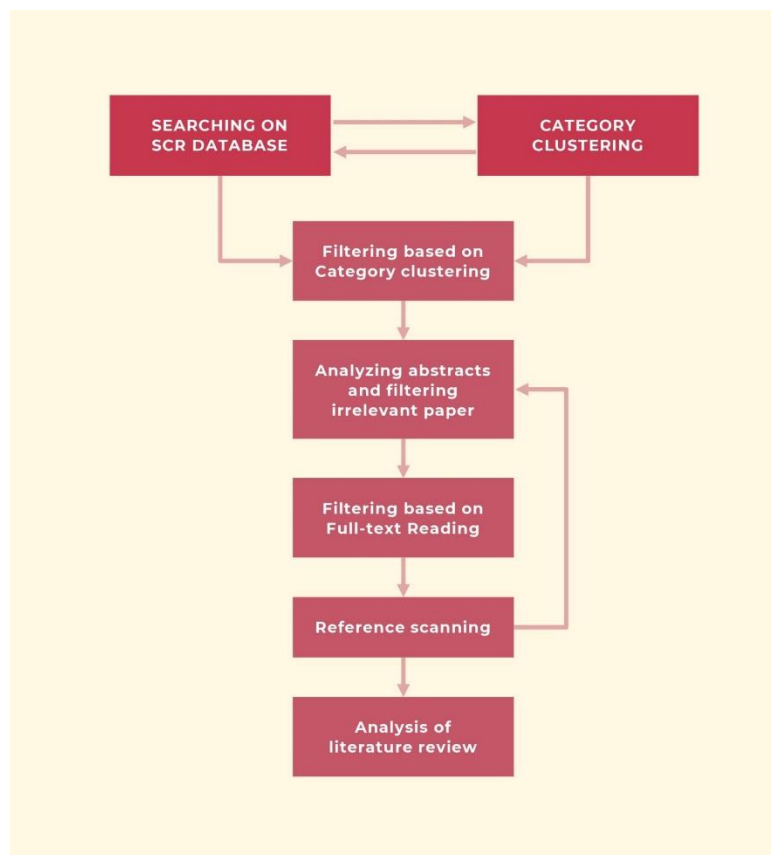


Figure 1. Literature Study Method

## RESULT & DISCUSSION

The phenomenon of life has become increasingly pervasive in global formats, offering novel alternatives that not only address aspects of life, including national legal life, but also aim to invigorate global life. This can be observed even as localism is disseminated globally. Following the advent of independence, Indonesia sought to establish a national law based on the nation's identity through legal development. Indonesian law is primarily oriented towards written law. The legal framework that is currently in effect is based on positivism, a doctrine that focuses on formal, physical action and has the ability to reach national jurisdiction based on territorial boundaries. In light of the advent of information technology, it is necessary to examine the legal meta-narrative in the context of these new developments. Life, in its increasingly prevalent global formats, offers new alternatives that address aspects of life, including national legal life, while at the same time striving to enliven global life and spread localism. The contemporary manifestation of law is the product of a historical process

involving the reciprocal relationship between law and society and the evolution of the modern state. This modernity is characterized by the following attributes 1) It is in written form; 2). The law applies to the entire territory of the state; 3). Law is an instrument employed by society to implement political decisions.

The necessity of written law in modern countries, which are increasingly complex and diverse, is self-evident. Written law formalizes, rigidifies, and inflexibilizes the law, making it the exclusive domain of authorized authorities. It is therefore antithetical to the principles of legal certainty and justice.

The advent of technology has had a profound impact on the accessibility of justice. The following paragraphs will examine some of the ways in which technology has influenced this accessibility. 1). Equitable Access: Technology can facilitate access to justice for individuals residing in remote or challenging geographic regions. For instance, courts may utilize information technology to enable self-broadcasting users to navigate the court system (through general information on the court website); 2). Online Legal Services: Furthermore, technology can facilitate the expeditious and straightforward provision of legal services. For instance, bold apps can be employed to file legal applications or to access legal information; 3). Ease of Access to Legal Information: Technology can also facilitate the speedy retrieval of legal information. For instance, court websites can provide data on court schedules, court decisions, and other legal data.

However, the utilization of technology can also have a detrimental effect on the accessibility of justice. One such consequence is the disruption of the accessibility of technological information, which is caused by factors associated with the evolution of technology and the lack of availability of technological resources. Moreover, it is plausible that the actions of private sector technology developers may unwittingly compromise the fundamental principles underlying the rule of law, which have been established within the framework of the justice system. Therefore, it is imperative to conduct a comprehensive assessment of the impact of technological change on the judicial process. This will ensure the continued accessibility of justice.

The rapid advancement of technology over recent decades has profoundly transformed the human condition. One domain significantly impacted by this technological revolution is the challenges associated with its implementation. Law enforcement agencies are confronted with numerous obstacles when utilizing technology, including concerns about data privacy and security, an increasing complexity in technology, as well as resource sustainability.

The growing use of technology by law enforcement agencies has given rise to concerns over privacy and security, particularly given the ease with which personal data can be collected, stored, and used. In this era of pervasive data collection, individuals, governments, and organisations alike must recognise the challenges involved in ensuring the protection of personal information. The risk of data being misused or falling into the wrong hands increases as more data is gathered and stored.

The prevalence of cybercrime and hacking further complicates efforts to secure sensitive information. One of the most significant challenges in our digital age is the extensive collection of data. The advent of the Internet, social media, and interconnected devices has led to an exponential growth in the amount of data about individuals being collected. This data can include highly personal information, such as name, address, phone number, web browsing history, purchasing habits, and so on. Extensive data collection can give rise to concerns regarding privacy. The potential misuse of personal data, without the consent of the individuals involved, is an important issue (Acquisti, A., & Grossklags, J. 2005).

Another challenge is the potential misuse of data collected by third parties. In the current era, a multitude of companies amass personal data from their customers, employing the information for various applications, such as targeted advertising and consumer analysis.

However, there is an inherent risk that such data might be misappropriated by unauthorized individuals, or utilized for purposes that were not originally intended, including extortion and identity theft. The misuse of data by third parties represents a significant threat to individual privacy (European Union Agency for Fundamental Rights, 2019).

In addition, inadequate security systems represent a further challenge to the protection of individual privacy. The occurrence of cyberattacks involving the theft of personal data is becoming increasingly common. Malicious actors can steal data in a variety of ways, including phishing attacks, malware, and system hacks. The presence of weaknesses in security systems can result in the leakage of personal data and consequently threaten individual privacy (Solove, D. J. 2008).

As technology becomes more sophisticated, it also becomes more intricate. This can make it challenging for law enforcement agencies to keep pace with the latest developments and utilize them effectively. The use of encryption and other security measures can also impede law enforcement's ability to access information that may be pertinent to an investigation.

A report from the U.S. Department of Justice's Office of Justice Programs (DOJ) indicates that law enforcement agencies have implemented a range of technological advances to enhance operational efficiency and outcomes. This has been particularly evident in light of reduced resources, increased public scrutiny, and heightened expectations regarding police conduct. Nevertheless, there is a notable lack of empirical data concerning the prevalence and utilization of technology among law enforcement agencies in the U.S. and the factors that shape their selection and deployment.

One significant obstacle to the adoption of technology in security agencies is financial constraints. Municipalities that allocate budgets to security agencies for law enforcement must recognize that effective solutions cannot be obtained at a low cost and cannot be postponed indefinitely. The problem of digital evidence management persists, and as agencies wait to address the problem, the challenges continue to grow. The most significant technology challenge facing law enforcement has nothing to do with infrastructure, storage space, or hardware. It has to do with the mindset of leaders. In light of the constraints on resources and the inevitable attrition of personnel from the field, law enforcement agencies must ensure that they have the requisite technology to enhance their operational efficiency. This will entail a more rigorous examination of their mobility and communication solutions, with a view to adopting specialized software applications that digitize and automate manual processes and facilitate communication.

The utilization of technology in law enforcement can be costly, and there may be limited resources available to invest in new technology or maintain existing technology. Furthermore, the rapid pace of technological change implies that investments in technology will quickly become outdated or obsolete.

A report from the Office of Justice Programs indicates that budgetary constraints represent a significant obstacle to the adoption of technology. Additionally, a survey of federal IT professionals identified security concerns, time constraints, workforce skills gaps, the presence of numerous competing priorities, and inflexible legacy networks as the primary challenges to digital transformation efforts.

In summary, the use of technology in law enforcement presents both opportunities and challenges. While technology can assist law enforcement agencies in becoming more effective and efficient, it also necessitates careful consideration of privacy and security concerns, as well as continued investment in resources and training to keep pace with the latest developments.

Innovations in the justice system to ensure justice include the use of artificial intelligence, online courts, and research and development. The following paragraphs provide further details on each of these innovations.



The Indonesian Supreme Court has developed an AI-based system, designated as Smart Assembly, with the objective of assisting in the determination of the composition of judges for cases at all levels of the justice system. The utilization of this artificial intelligence system, as indicated by the Chief Justice of the Supreme Court, will continue to be developed in the future, including in the courts of first instance and appellate level, with the intention of assisting the performance of case handling while still not ignoring the role of humans. As the primary driving force, it is evident that the advancement of technology in the modern era has led to the integration of intelligent devices that are capable of providing accuracy and precision in assisting our duties and work in providing the best service for justice seekers.

The application of AI has the potential to enhance the accuracy and efficiency of the legal process. However, it is crucial to maintain the primacy of human judgment and decision-making within this process.

The utilization of artificial intelligence systems will continue to be developed in the future, including at the courts of first instance and appellate level. These systems will assist the performance of case handling, but their use will not negate the necessity for humans to be involved in the process. As the primary driving force, it is evident that the advancement of technology in the modern era has led to the increasing use of intelligent devices that are capable of providing accuracy and precision in assisting our duties and work in providing the best service for justice seekers. Ongoing research and development can help identify new avenues for innovation and improvement in the justice system. These innovations have the potential to enhance the efficiency, accessibility and fairness of the justice system as a whole. Nevertheless, it is crucial to guarantee that these technological advances are implemented in a manner that upholds human rights and the principles of the rule of law, whilst avoiding the perpetuation of bias or discrimination.

In the digital age, one of the most significant challenges is the protection of data privacy and security. As the use of online services increases, the vulnerability of individuals' personal data to misuse also grows. Tech and app companies often collect user data for various purposes, including customised advertising, behavioural analysis, and product development. However, the question remains: to what extent can this data be used without violating individuals' privacy?

A number of major incidents, including the Cambridge Analytica scandal involving Facebook, have demonstrated the extent to which personal data can be exploited for political or commercial purposes without the knowledge or consent of individuals concerned. Consequently, the implementation of rigorous regulatory frameworks and transparency in data usage is of paramount importance. Some countries have enacted stringent regulations, such as the GDPR (General Data Protection Regulation) within the European Union, which gives individuals the right to oversee the management of their personal data and requires companies to protect this data.

The digital world presents significant challenges related to intellectual property and copyright. The internet facilitates the easy distribution of digital content, such as music, movies, books, and software. However, it also facilitates the detection and spread of copyright infringement, which is a concern for content creators.

For content creators, the primary challenge is to protect their works from theft and misuse. Meanwhile, for users, questions arise regarding the extent to which the content they purchase can be owned and shared in a digital environment. This has resulted in debates about the use of DRM (Digital Rights Management) and open access to digital content.

Cybercrime represents a significant challenge in the digital age. Cyberattacks can result in the damage of critical infrastructure, the theft of sensitive data, or the impairment of the reputation of individuals and companies. The types of attacks include website hacking, the installation of malicious software (malware), distributed denial of service (DDoS) attacks, and identity theft, among others.

The investigation and prosecution of cybercrime cases presents a significant challenge due to the potential involvement of perpetrators who may operate beyond the jurisdictional boundaries of a single country. The role of cyberpolice is to identify and pursue these perpetrators, but this requires the support of strong international cooperation.

One of the primary obstacles to be overcome in navigating technological advancements is the imperative to modify existing regulations and legislation. As new technologies continue to emerge, it has become evident that the existing legal framework may no longer be sufficient in addressing the novel issues that these technologies have introduced. One such issue is data privacy, where the laws that were crafted before the advent of the digital age may no longer be adequate in protecting individuals' personal data that is stored digitally.

Faced with this necessity, many countries have adopted a proactive approach, formulating novel regulatory frameworks to acknowledge the challenges posed by technological developments. These frameworks combine traditional aspects of law with an appreciation of modern technology. One such example is the European Union, which implemented the General Data Protection Regulation (GDPR). The GDPR provides individuals with stronger rights and protection with regard to their personal data.

In adapting legal frameworks to accommodate technological developments, legal principles serve to provide important guidelines. These principles, which include general principles such as fairness, freedom of speech, and human rights, require an interpretive lens that considers the nuances of new technologies and their implications for the law.

A pertinent legal tenet is that of transparency. In the digital age, individuals are entitled to be apprised of how their data is amassed, utilized, and stored by organizations and corporations. This principle informs regulatory frameworks requiring entities to furnish clear and transparent details to individuals concerning the usage of their data.

Another relevant legal principle is that of proportionality. This principle demands that regulation be balanced and proportionate to its intended purpose. When implementing regulations pertaining to technology and data use, it is essential to consider the necessity of protecting individual rights without unduly impeding innovation and beneficial technological advancement.

Law enforcement and judicial institutions play a pivotal role in the enforcement of technology-related laws. To effectively investigate and pursue cases pertaining to cybercrime, privacy violations, and other digital law violations, these institutions must possess a profound understanding of technology and data issues.

It is similarly important to ensure that the relevant agencies are adequately trained and equipped with the necessary resources to perform their duties. They must be able to handle digital evidence, trace cybercrime, and understand the encryption technologies employed in online communication.

In addition to legal challenges, the adaptation of law to technology also raises a number of ethical challenges. One such challenge is how to regulate the use of technologies that may have adverse social or psychological impacts.

For instance, the deployment of artificial intelligence (AI) in decision-making processes, such as employee selection or credit determination, may give rise to concerns regarding discrimination and bias. It is therefore imperative that regulatory frameworks consider how these technologies can be utilized in a manner that does not disadvantage specific individuals or groups.

Another significant ethical challenge pertains to the regulation of the use of technology in surveillance and monitoring. While it is undoubtedly necessary to protect security and prevent crime, the overzealous or intrusive use of technology in monitoring individuals may infringe upon their fundamental right to privacy and freedom.

In light of these ethical quandaries, it is imperative that the law take into account societal values, individual rights, and the ethical principles underlying law in the digital age.

Furthermore, open discussion and public involvement in formulating ethical regulations are of paramount importance.

## CONCLUSION

It can be concluded, therefore, that technological developments and innovations have a significant impact on justice in law enforcement in the digital age. Technological advancements enable increased efficiency in legal processes, easier access to information, and the use of new tools for investigative purposes. However, challenges related to privacy, ethics, and inequality of access must also be addressed. It follows that efforts should be made to ensure that technology and innovation support, rather than hinder, the principles of justice in the legal system. The consequences of recent studies on the influence of technology and innovation on justice in law enforcement can have either positive or negative outcomes. The positive effects may include increased efficiency within the legal system, while potential negative consequences include infringements on individual data privacy and the inappropriate use of technology in law enforcement. By understanding these consequences, governments, legal bodies and technology developers can collaborate to develop solutions that strike a balance between efficiency and fairness in contemporary law enforcement.

## REFERENCES

- Alawiyah, F. (2012). The Access and Distribution of Higher Education. *Kajian*, 17(3), 301–328.
- Hasibuan, E. J., Pulungan, W., Siregar, M., & Muda, I. (2021). Tourism Communication in Development Sipirok City, South Tapanuli Regency. *International Journal of International Relations, Media and Mass Communication Studies*, 7(2), 33-45.
- Kadir, A., & Tarigan, U. (2018). *Peranan Dinas Tata Kota dan Pertamanan dalam Upaya Peningkatan Pelayanan Izin Mendirikan Bangunan (IMB) di Kota Tanjungbalai*.
- Koloay, R. (2016). Perkembangan Hukum Indonesia Berkenaan Dengan Teknologi Informasi Dan Komunikasi. *Jurnal Hukum Unsrat*, 22(5), 16–27.
- Lucas, M. (2023). *The impact of technology on the criminal justice system Danial Khan Department of public health*, . Yale University.
- Muda, I., Hasibuan, E. J., Pulungan, W., & Siregar, M. (2022). Tourism Potential Of Percut Village, Percut Sei Tuan District, Deli Serdang Regency. *International Journal of Progressive Sciences and Technologies*, 30(2), 160-165. <https://doi.org/http://dx.doi.org/10.52155/ijpsat.v30.2.3927>
- Muda, I., Hasibuan, E. J., Siregar, M., & Pulungan, W. (2022). Harmonization Village based on Dalihan Na Tolu in Sibadoar Village, Sipirok District, Selatan Tapanuli Regency, Indonesia. *Path of Science*, 8(10), 4001–4007. <https://doi.org/10.22178/pos.86-4>
- Natamiharja, R., Putri, R. W., Banjarani, D. R., & Setiawan, I. (2022). *Perlindungan Keamanan Digital Di Era Society 5.0 dan Implementasinya di Indonesia*. 61.
- Putri, M. C., & Sinaga, E. M. C. (2021). DISRUPSI DIGITAL DALAM PROSES PENEGAKAN HUKUM PADA MASA PANDEMI COVID-19. *Jurnal Rechts Vinding: Media Pembinaan Hukum Nasional*, 10(1), 79. <https://doi.org/10.33331/rechtsvinding.v10i1.625>
- Santoso, M. H., Hutabarat, K. I., Wuri, D. E., & Lubis, J. H. (2020). Smart Industry Inkubator Otomatis Produk Pengereng Ikan Asin Berbasis Arduino. *Jurnal Mahajana Informasi*, 5(2), 45-53.
- Santoso, M. H. (2021). Application of Association Rule Method Using Apriori Algorithm to Find Sales Patterns Case Study of Indomaret Tanjung Anom. *Brilliance: Research of Artificial Intelligence*, 1(2), 54–66. <https://doi.org/10.47709/brilliance.v1i2.1228>



- Sihombing, M., & Tarigan, U. (2017). *Efektifitas Organisasi Unit Pelayanan Teknis (UPT) Dinas Pendapatan Provinsi Sumatera Utara Binjai Dalam Penyelenggaraan Pelayanan Publik*.
- Siregar, M. (2021). Hubungan Antara Kepercayaan Pelanggan Dengan Loyalitas Pelanggan Terhadap Online Shop. *JURNAL PENELITIAN PENDIDIKAN, PSIKOLOGI DAN KESEHATAN (J-P3K)*, 2(1), 83–88. <https://doi.org/10.51849/j-p3k.v2i1.97>
- Tarigan, U. (2018). *Analisis Kualitas Pelayanan Publik dalam Rangka Meningkatkan Penerimaan Pajak Bumi dan Bangunan di Kecamatan Rantau Selamat Kabupaten Aceh Timur*.
- Tarigan, U., & Dewi, R. (2018). *Evaluasi Prosedur Pelayanan KTP Elektronik di Kantor Camat Kecamatan Medan Belawan Kota Medan*.