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THE RELATIONSHIP BETWEEN PUBLIC INFORMATION OPENNESS AND ICT DEVELOPMENT

Harun Al Azies[1,2*], Ishak Bintang Dikaputra[1]

[1]Study Program in Informatics Engineering, Faculty of Computer Science, Universitas Dian Nuswantoro, 50131, Semarang, Indonesia
[2]Research Center for Materials Informatics, Faculty of Computer Science, Universitas Dian Nuswantoro, 50131, Semarang, Indonesia

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Corespondent Email:
harun.alazies@dsn.dinus.ac.id

Abstract. *The relationship between Information and Communication Technology (ICT) development and the level of Public Information Openness (KIP) holds significant implications for inclusive and sustainable societal development. This study employs statistical analysis, including Pearson correlation, to examine this relationship across Indonesian provinces in 2022. Findings indicate a positive correlation between ICT development and KIP. Access to ICT infrastructure and ICT usage show significant correlations with IKIP levels across various provinces. Provinces with better ICT development generally exhibit higher KIP levels. However, the relationship with ICT skills is comparatively weaker, indicating other influencing factors on ICT literacy within the community. The conclusion drawn from this research is that ICT development positively contributes to enhancing Public Information Transparency in Indonesia. Therefore, further efforts are needed to support equitable ICT development, enhance digital literacy, and strengthen public information transparency, enabling the population to effectively harness information and communication technology.*

Abstrak. Hubungan antara perkembangan Teknologi Informasi dan Komunikasi (TIK) serta tingkat Keterbukaan Informasi Publik (KIP) memiliki implikasi penting pada pembangunan masyarakat inklusif dan berkelanjutan. Penelitian ini menggunakan analisis statistik, termasuk korelasi pearson, untuk menganalisis hubungan ini di provinsi-provinsi Indonesia pada tahun 2022. Hasil penelitian menunjukkan bahwa ada hubungan positif antara perkembangan TIK dan KIP. Akses infrastruktur TIK dan penggunaan TIK memiliki korelasi yang signifikan dengan tingkat KIP di berbagai provinsi. Provinsi-provinsi dengan perkembangan TIK yang lebih baik umumnya memiliki tingkat KIP yang lebih tinggi. Namun, hubungan dengan aspek keahlian TIK tidak sekuat yang lain, menandakan adanya faktor-faktor lain yang memengaruhi keahlian TIK di masyarakat. Kesimpulan dari penelitian ini adalah bahwa perkembangan TIK berperan positif dalam meningkatkan Keterbukaan Informasi Publik di Indonesia. Oleh karena itu, diperlukan upaya lebih lanjut untuk mendukung pengembangan TIK yang merata, meningkatkan literasi digital, dan memperkuat keterbukaan informasi publik agar masyarakat dapat lebih efektif memanfaatkan teknologi informasi dan komunikasi.

1. INTRODUCTION

he development of information and communication technology (ICT) has revolutionized the landscape of information, communication, and societal interactions around the world [1], [2]. The digital era has emerged as a fundamental engine in the creation of a more democratic, inclusive, and open society [3]. The Central Information Commission (KI) of the Republic of Indonesia has provided data on the Public Information Openness Index (IKIP), which provides crucial context for this research [4], [5]. According to KI Pusat RI statistics, the IKIP value in 2022 was 74.43, up significantly from 71.37 in 2021. This increase in the IKIP value is significant because it occurred uniformly across three dimensions of the environment: political, economic, and legal. This marks the starting point of the renewal of this research[6]. Furthermore, the Central Bureau of Statistics (BPS) has formulated three important indicators in ICT development, namely ICT Infrastructure Access, ICT Usage, and ICT Skills, referring to the methodology used by the International Telecommunication Union (ITU) [7]. These indicators provide a comprehensive overview of ICT development in a country and are crucial in understanding the role of ICT development in the context of public information openness. The novelty of this research lies in the integration between the improvement of public information openness, reflected in the increase in IKIP value, and ICT development, measured through indicators such as ICT Infrastructure Access, ICT Usage, and ICT Skills generated by BPS and referring to ITU standards [1], [8]. This research will explore the deeper relationship between these two aspects to understand how ICT development can influence public information openness and vice versa [9]

With accurate data and standardized methodologies used by the ITU as guidelines, this research aims to identify and analyze how ICT development, measured through indicators such as ICT Infrastructure Access, ICT Usage, and ICT Skills, contributes to public information openness measured through IKIP. Through a quantitative approach, this research will answer important questions, such as whether positive developments in ICT development indicators are related to the improvement of public information openness or vice versa. The results of this research are expected to provide a better understanding of the role of ICT development in promoting public information openness, as well as its implications for building a more inclusive and sustainable society in this digital era [10]. Furthermore, the even increase in the IKIP value across three environmental dimensions indicates improvements in various aspects of public information openness, which may have positive implications for ICT development [11], [12]. This research is also expected to provide valuable insights to governments, public institutions, and other stakeholders in developing more effective policies and strategies to enhance public information openness and ICT development in various national contexts. Thus, the novelty of this research lies in an interdisciplinary approach that combines relevant data and methodologies to produce new insights into the relationship between public information openness and ICT development.

2. MATERIALS AND METHODOLOGY

In this section, detailed explanations of data sources, variables under analysis, and critical stages in analyzing the relationship between public information openness and the development of ICT in Indonesia will be provided. This methodology aims to gain a deeper understanding of the interaction between these two phenomena in the context of Indonesia in 2022

2.1. Data Sources and Research Variables

The research being conducted relies on secondary data sources. Secondary data is information that others have already collected or compiled and that researchers utilize for analysis or research purposes. This study uses secondary data as the foundation for its investigation of the relationship between public information openness and ICT development. Secondary data includes public information openness statistics published by Indonesia's Central Information Commission for the Index of Public Information Openness, as well as ICT development data acquired from the BPS (Statistics Indonesia) using the International Telecommunication Union (ITU) methodology [13]. This covers information about ICT

infrastructure access, usage, and skills. All study factors are based on data from 2022.

2.2. Analytical Stages

In this study, the Pearson correlation analysis method [14], [15] is utilized to determine the relationship between Indonesia's Index of Public Information Openness (IKIP) and the Index of Information and Communication Technology (ICT) Development by Province in 2022. The analytical steps begin with the acquisition of data from relevant sources. This information is sourced from Indonesia's Central Information Commission for IKIP values and the BPS, which employs the International Telecommunication Union (ITU) methodology for the ICT Development Index. This data includes statistics on the levels of public information openness and ICT development across Indonesia's provinces. The general equation to calculate the Pearson correlation coefficient (r) between two variables *X* and *Y* is given by[16], [17], [18]:

$$r = \frac{\sum_{i=1}^{n}\{(x_i - \bar{x})(y_i - \bar{y})\}}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2}\sqrt{\sum_{i=1}^{n}(y_i - \bar{y})^2}} \quad (1)$$

Once the data is collected, data exploration is conducted to understand the characteristics of the data to be analyzed [19], [20]. This step aids in comprehending the underlying data for analysis. Subsequently, Pearson correlation calculations are performed to assess the linear relationship between the IKIP value and the Indicators in the ICT Development Index [21]. The results of this analysis yield correlation coefficients [22], reflecting the extent of the relationship between the two variables [23]. The correlation results are then interpreted. If the correlation coefficient approaches 1[24], it indicates a strong positive relationship between IKIP and the ICT Development Index. Conversely, if it approaches -1, it suggests a strong negative relationship [25], [26]. If it approaches 0, it indicates no significant linear relationship between them [27], [28]. Additionally, statistical significance tests are conducted to ensure that the relationships found in the analysis are not merely due to chance but possess strong statistical significance [29]. The findings of this analysis will aid in understanding how public information openness and ICT development interact at the provincial level in Indonesia in 2022 [30]. The implications of these findings will contribute to the development of public policies and better development efforts in the future.

3. RESULTS AND DISCUSSIONS

3.1. Overview of ICT Development in Indonesia

The development of Information and Communication Technology (ICT) in Indonesia has shown positive progress over the last five years. In 2018, the ICT Development Index reached 5.07 and continued to rise, reaching 5.85 in 2022. This progression reflects significant efforts and investments in improving ICT infrastructure and the utilization of information technology across various sectors. In a deeper analysis, three sub-indices depict key aspects of ICT development: ICT access and infrastructure, ICT usage, and ICT skills. The most rapid growth occurred in the ICT usage sub-index, increasing by 2.83 percent. This indicates that Indonesian society is increasingly active in utilizing information and communication technology in their daily activities. Meanwhile, the ICT access and infrastructure sub-index grew by 0.69 percent, while the ICT skills sub-index increased by 0.50 percent. This demonstrates overall improvements in all aspects of ICT development, with the most striking increase in technology usage.

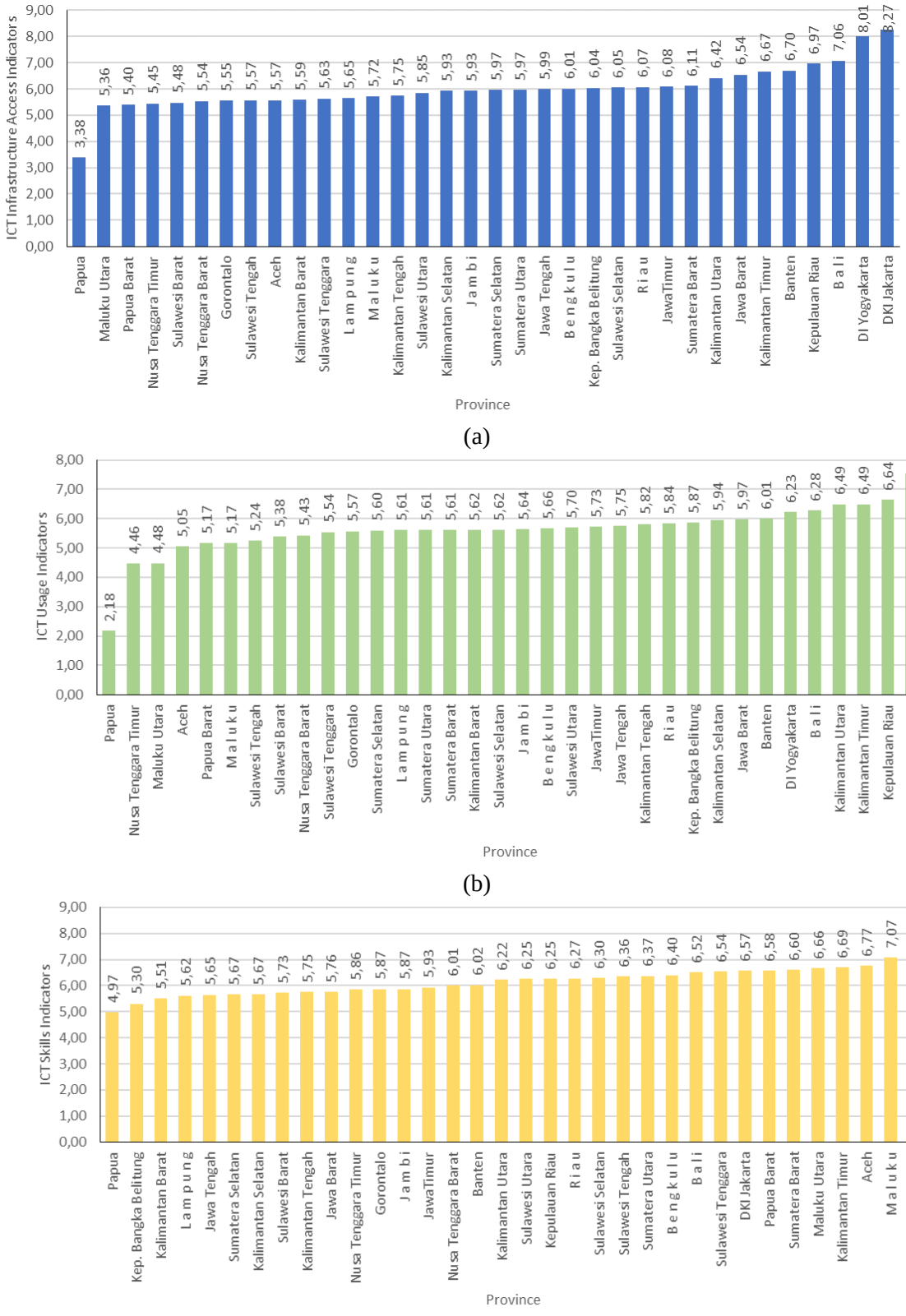

Figure 1 Overview of ICT Infrastructure Access Indicators (a) ICT Usage Indicators (b) ICT Skills (3) by Province in 2022

The importance of information technology and communication in society is also reflected in the increased internet penetration. The percentage of individuals using the internet

(internet penetration) continues to rise annually, increasing from 62.10 percent in 2021 to 66.48 percent in 2022. This trend is driven by the public's need for quick and easy access to information, as well as the availability of infrastructure enabling broader internet coverage. The provincial ICT Development Index also experienced growth in 2022, reflecting improvements in ICT development across provinces in Indonesia. However, it is noteworthy that three provinces experienced a decline in the ICT Development Index in 2022: DKI Jakarta, North Sulawesi, and Papua.

Over the past three years, DKI Jakarta has consistently been the province with the highest ICT Development Index in Indonesia, reaching 7.64 in 2022. Meanwhile, the province with the lowest ICT Development Index is Papua, with a value of 3.22 in the same year. The gap in ICT development between provinces tends to widen, with the difference between the highest and lowest ICT Development Index increasing from 4.31 in 2021 to 4.42 in 2022. This underscores the need for special attention to reduce this disparity and ensure equitable ICT development across Indonesia. To achieve sustainable and inclusive ICT development, continued investment in infrastructure, digital literacy enhancement, and community empowerment in utilizing information and communication technology for economic and social progress is essential.

In 2022, the Central Information Commission (KI Pusat) of Indonesia announced the results of the Index of Public Information Openness (IKIP) in Indonesia, providing insights into the extent to which public information can be accessed by the community. This announcement result offers crucial insights into the level of transparency and openness of information nationwide. In 2022, Indonesia's IKIP value reached 74.43, indicating that the level of public information openness falls within the "moderate" category. This is a positive sign reflecting progress in efforts to improve access to public information across Indonesia. More importantly, the increase in IKIP values was consistent across the three measured environmental dimensions: political, economic, and legal. The final IKIP result in 2022, 74.43, reflects strong commitment from the government and other stakeholders to enhance access to public information nationwide. The significance of this data is not only limited to the national level but also in mapping IKIP values per province. Only three provinces achieved a "good" category in terms of information openness, namely West Java, Bali, and NTB (West Nusa Tenggara), with impressive values. Meanwhile, the majority of provinces, 30 provinces, are in the "moderate" category, indicating room for improvement. However, North Maluku Province faces challenges with a "poor" category.

3.2. Overview of Public Information Openness in Indonesia

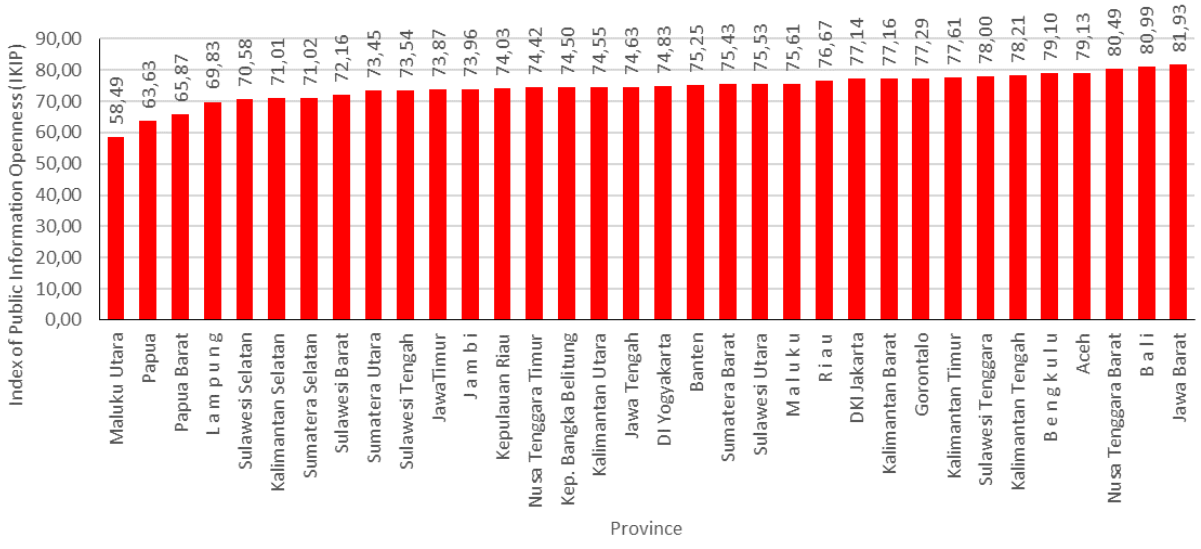

Figure 2. Index of Public Information Openness (IKIP) by Province in 2022

These results provide a clear picture of the variation in information openness levels across various provinces in Indonesia. It also emphasizes the importance of continuous efforts to enhance transparency and public participation in decision-making at both local and national levels. In the evolving digital era, efforts to improve public information openness remain a key priority in building a more inclusive and sustainable society. Easily accessible data and information for the public are vital foundations for good governance, accountability, and sustainable development in Indonesia

3.3. The Relationship Between Public Information Openness and ICT Development Indicators

The relationship between Public Information Openness (PIO) and Information and Communication Technology (ICT) Development Indicators in 2022 is an important aspect in understanding how transparency and access to information can influence the development of information and communication technology in a country. In the context of Indonesia, this relationship provides valuable insights into how progress in information openness can affect ICT development.

3.3.1 Correlation between Y (IKIP) and X1 (ICT Infrastructure Access Indicator)

This correlation has a value of approximately 0.4429 (Figure 3). It indicates a positive relationship between the level of public information openness and ICT infrastructure access. This means that provinces with higher levels of public information openness tend to have higher levels of ICT infrastructure access linearly. Additionally, the significance in Table 1, with a low p-value (0.0087), indicates that this relationship has statistical significance, implying that the relationship is not occurring by chance.

3.3.2 Correlation between Y (IKIP) and X2 (ICT Usage Indicator)

This correlation has a value of approximately 0.5359. It indicates a stronger positive relationship between the level of public information openness and ICT usage. This means that provinces with higher levels of public information openness tend to have higher levels of ICT usage linearly. The very low p-value (0.0011) suggests that this relationship is highly statistically significant.

Table 1. Results of Statistical Significance of Correlation

Variable		P-value
Y (IKIP)	X1 (ICT Infrastructure Access Indicators)	0.0087
Y (IKIP)	X2 (ICT Usage Indicators)**	0.0011
Y (IKIP)	X3 (ICT Skills Indicators)	0.4302

Note: ** significant α 5%

3.3.3 Correlation between Y (IKIP) and X3 (ICT Skills Indicator)

This correlation has a lower value, approximately 0.1398. It indicates that the relationship between the level of public information openness and the ICT skills indicator is positive, but the relationship is not strong linearly. The high p-value (0.4302) indicates that this relationship does not have high statistical significance.

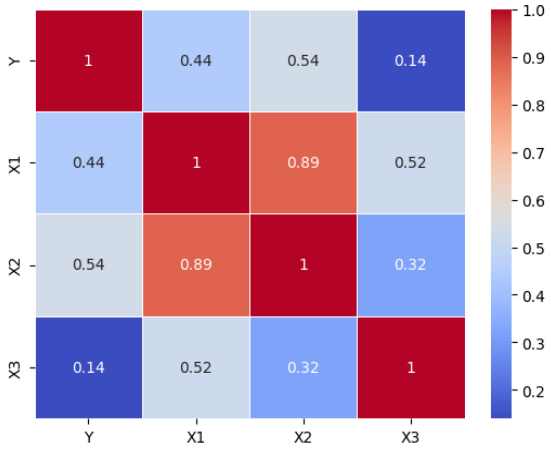

Figure 3. Correlation Plot between Public Information Openness and ICT Development Indicators in 2022

Based on the results of this correlation analysis, it can be concluded that there is a positive relationship between the level of public information openness and the indicators of ICT infrastructure access and ICT usage in these provinces. However, the relationship with the

ICT skills indicator is not as strong as with the other two indicators and does not have high statistical significance. These findings provide initial insights into how public information openness may be related to ICT development at the provincial level in 2022.

4. CONCLUSIONS

Based on the analysis of the relationship between Public Information Openness (PIO) and Information and Communication Technology (ICT) Development Indicators in Indonesia in 2022, several important conclusions can be drawn. First, there is a significant relationship between the level of Public Information Openness and ICT Development. The positive correlations observed, particularly in the aspects of ICT infrastructure access and ICT usage, indicate that in provinces with higher levels of PIO, the population tends to have better access to and utilization of ICT. This underscores the importance of transparency and access to information as key factors in supporting ICT development nationwide. Furthermore, the positive impact of PIO on ICT Development is also evident in the growth of ICT infrastructure and digital literacy. Provinces with better PIO levels tend to have more developed ICT infrastructure, creating an environment conducive to broader usage of information technology.

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