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Digital Pilkada:

Have Local Elections (Pilkada) been Affected by Digitalization? Attainment, Challenges, and Policy Solutions

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Abstract: The advancement of digital technology forces humans to make adjustments in all aspects of life, likewise, with the local elections' holding (Pilkada). However, the conditions for each region in the Indonesian archipelago have different problems. Availability of telecommunication facilities, local elections (Pilkada) organizers, level of difficulty in *Frontier*, *Outermost*, and *Disadvantaged* Region (3T), community digital literacy level, and accuracy of results. Have the local elections (Pilkada) been digitalized? How far has it been achieved? What challenges are faced, and what are the solutions? Several studies on e-voting, even the local elections (Pilkada) digitization, have been carried out. This study is novel because it looks at the 2020 local elections (Pilkada) implementation from digitalization that was carried out in line with the COVID-19 pandemic. Due to data limitations and availability, this study only focuses on implementing local elections (Pilkada) in nine provinces. This study uses a qualitative method based on a literature review with a systematic review method. The study aims to reveal the achievements and challenges of digitalization in the implementation of local elections (Pilkada) along with policy solutions so that digitalization is more completed. Through analysis, it was found that the organizers of the local elections (Pilkada) have made efforts to realize digitalization. Various Subscriber Identity Modules (SIM) and applications have been created by the General Election Commission (KPU), the General Election Supervisory Board (Bawaslu), and the General Election Organizer Honorary Council (DKPP). It is hoped that digitalization will further increase the effectiveness, efficiency, and quality of service. Besides, the data shows that there are obstacles in the field, especially the availability of telecommunication infrastructure, which is very diverse in the nine provinces. Fundamentally, it is necessary to formulate regulations/policies that synergize the implementation of local elections (Pilkada) through the adoption of digital technology based on the internet of things (IoT), big data analysis, and artificial intelligence (AI). The local elections (Pilkada) digitization brings several benefits - more transparent, accountable, credible, practical, and economical. On the other hand, the community feels more of its services because the digital local elections (Pilkada) procession educates the public to elect local leaders with integrity.

Keywords: digitalization; local elections (Pilkada) digitalization

1. Introduction

During the COVID-19 Pandemic, the Government has established new normal conditions to be obeyed together to carry out development and community activities safely and comfortably. The Government and the community adapt to new habits in all areas of life, including preparing to implement local elections (Pilkada) on December 09, 2020.

The local elections (Pilkada) in 2020 were carried out simultaneously in 270 autonomous regions. The goal is to elect nine governors/deputy governors, 224 regents/deputy regents, and 37 mayors/deputy mayors. Local elections (Pilkada) during the COVID-19 pandemic was the first time it was carried out in the history of Regional Head Election (Pilkada). Its implementation must strictly comply with health protocols following the General Election Commission Regulation Number 6 of 2020 concerning the Implementation of Elections for the Governor and Deputy Governor, the Regent and Deputy Regent, and the Mayor and Deputy Mayor simultaneously. Continued in conditions such as Corona Virus Disease 2019 (COVID-19) as amended by General Election Commission Regulation (PKPU) Number 13 of 2020 concerning Second Amendment to General Election Commission Regulation Number 6 of 2020 concerning Implementation of Elections for Governors and Deputy Governors, Regents and Deputy Regent, and Mayor and Deputy Mayor Simultaneously Follow Up in Non-Natural Disaster Conditions Corona Virus Disease 2019 (COVID-19).

The most important thing that creates curiosity in the 2020 Regional Head Election (Pilkada) holding is the spirit of change, where local elections (Pilkada) organizers try to take advantage of digital technology advancement. The General Election Commission (KPU) as stipulated in Article 2 paragraph (2) PKPU Number 6 of 2020 explicitly defines that the Continuous Election, apart from being held on the principles referred to in paragraph (1), is also regulated by prioritizing the principles of health and safety, guided by protocols. Health, prevention, and control of Corona Virus Disease 2019 (COVID-19). Besides, it also regulates the stages of implementing local elections (Pilkada), which should or can be done online. Media in Network is an information channel used in public communication using the internet network (Article 1 Number 33). The use of internet networks indicates that the Regional Head Election (Pilkada) implementation has been based on digital technology, namely: the Internet of Things (IoT).

Digitalization of the local elections (Pilkada) is an effort to create new, innovative designs for the implementation of local elections (Pilkada) by adopting advances in digital technology. In this context, digitizing local elections (Pilkada) also creates opportunities for multi-stakeholder collaboration to succeed in the big agenda and on a national scale, especially those participating in the mass. Even though it has not been fully realized, activities towards digital local elections (Pilkada) have become a new phenomenon that should be considered by local elections (Pilkada) organizers, especially during the COVID-19 pandemic. Along with the development of digital technology, there are various views about digitalization; both conveyed by experts and practitioners as well as institutions/agencies, as revealed in Table 1.

Table 1. Definition of Digital/ Digitalization According to Experts/Agency

Experts/Agency	Definition
Gartner (2020)	Digitalization is the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business.
Wuryantai (2004, pp. 134–135)	Digitalization is a process in which all forms of information - numbers, words, images, sounds, data, or movement are coded in the way of bits (binary digits or commonly symbolized by representations of 0 and 1) that allow manipulation and transformation of data (bitstreaming). Digitalization also directs the convergence of product and information application processes that can perform various audio-visual and computational functions.

Experts/Agency	Definition
IEA (2017, p. 22)	Digitalization describes the growing application of ICT across the economy, including energy systems.
Kirchmer et al. (2017, p. 90)	Digitalization is defined as the integration of physical products, people and processes through the internet of things (IoT) and related information technology (IT) (McDonald, 2012; Scheer, 1999).
Legner et al. (2017)	In facing digital revolution, national and regional governments are increasingly defining digitalization as a strategic priority and are setting up large-scale initiatives to foster digital transformation of science, industry, and society.
Valenduc & Vendramin (2017, p. 126)	The term 'digitalization' is not the irruption of a new revolution, but the pervasive synergy of digital innovations in the whole economy and society [(citing Perez (2015)]
Gobble (2018, p. 56)	Digitalization refers to the use of digital technology, and probably digitized information, to create and harvest value in new ways.
Rachinger et al. (2019)	Digitalization (i.e., converting analog data into digital data sets) is the framework for digitalization, which is defined as the exploitation of digital opportunities. Digital transformation is then defined as the process that is used to restructure economies, institutions, and society on a system level (Brennen & Kreiss, 2016; Unruh & Kiron, 2017). While the latter embraces changes on all societal levels, digitalization utilizing different technologies (e.g., cloud technologies, sensors, big data, 3D printing) opens unforeseen possibilities. It offers the potential to create radically new products, services, and BM (Matzler et al., 2016).
Urbach & Röglinger (2019)	Digitalization reflects the adoption of digital technologies in business and society as well as the associated changes in the connectivity of individuals, organizations, and objects (Gartner, 2016; Gimpel et al., 2018).
Bican & Brem (2020)	digitalization is depicted " . . . as a socio-technological process of applying digitization techniques to broader social and institutional contexts that render digital technologies' infrastructures" (Sussan & Acs, 2017; Tilson et al., 2010)
Schaal et al. (2017)	Digitalization is not only a technological development, but also characterized by the following phenomena: (1) vastly increasing amounts of available digital data, (2) growing importance of digital networks, (3) interconnectivity (instead of separation!) of the analog and digital realm.

Source: Various sources. Processed Data. 2020

Currently, there are 3 digital technologies which optimally developed for use in the holding of general elections/regional head election, namely: i) internet of things (IoT); ii) artificial intelligence (AI); and iii) big data. This condition is in line with the OECD statement (2016, p. 110), Main and emerging digital technologies include: i) Internet of Things (IoT); ii) big data analytics; iii) artificial intelligence (AI); and iv) block chain; v) cloud computing; vi) photonic and light technology; vii) robotics; viii) modeling simulation and games; and ix) quantum computing. In addition to increasing use of the Internet and other ICT tools. OECD (2017, p. 108) also emphasized the emergence of new technologies that continue to influence digitization around the world. Disruptive Technology - defined as new Technology that replaces existing Technology, either by changing existing industries or creating new ones (Christensen, 1997) will likely change the face of manufacturing and services. Major changes are predicted to occur when the digitalization of local elections (Pilkada) is realized comprehensively, risks can be reduced, violations can be avoided, and disputes over local elections (Pilkada) results can be better managed, and all participants recognize local elections (Pilkada) results.

The development of digital local elections (Pilkada) requires emotional reactivity to explore all aspects of governance, both on a regional and national scale. Individual creativity is an idea, creative power, and invention to increase his work's added economic value to create jobs and prosperity in the future (Saksono, 2012, p. 96).

Digitalization has become the main driver for accelerating change and structuring the road to a more harmonious, hygienic, and humanist public service. Digitalization

has changed the world in its various spectrums in terms of life perspectives, new ways of thinking and acting, communication, and social interaction. Including implementing a government system that must rely on ideas, inspiration, imagination, and innovation to generate added value, increase performance, and benefit humans.

Ideally, the administration of a government system should adopt more digital technology developments. When the recruitment of government employees (State Civil Apparatus/ASN) has put forward digital technology, local elections (Pilkada), which is done digitally, become a necessity. The development of the digital era has transformed the bureaucracy into a humanocracy then manifested itself in the form of a digital bureaucracy or digitocracy (Saksono, 2019, p. 128). Through the digitalization of the government system's administration, it is hoped to create synergy between regional leaders who are humanist and with integrity, representatives of the community who are professional, have broad insight, are open, and represent the needs of their people. State Civil Apparatus (ASN) that is capable, skilled, and ethical. Also, communities that are responsive, adaptive, and participatory for the nation and state's progress.

Several concerns have arisen in the holding of digital local elections (Pilkada). Starting from the availability of telecommunications facilities, the readiness of local elections (Pilkada) organizers, the existence of Frontier, Outermost, and Disadvantaged Region (3T) and border areas, the digital literacy level of the community, and the accuracy of the results. This situation requires solutions both academically and at a practical level. Therefore, many studies on e-voting/e- local elections (Pilkada) have been conducted, such as Doesburg (2020), Hadiana (2011), Khan et al. (2020), Kshetri & Voas (2018), Neyman et al. (2013), Purwati (2015), Raj et al. (2020), and Risnanto (2013). The study of holding a digital Regional Head Election (Pilkada) during the COVID-19 pandemic was relatively new in Indonesia. This study aims to uncover the achievements and challenges of digitization in implementing a local (Pilkada) along with solutions so that the local elections (Pilkada) will further be digitalized.

In this context, it is time to think about and formulate the local elections (Pilkada) implementation digitally and even digitalize the general election system comprehensively. Have the local elections (Pilkada) been digitalized? To what extent has the Government made efforts to achieve digital local elections (Pilkada)? What challenges do you face in its implementation? What are the policy solutions that must be prepared? In this context, exploration of digital technology's use becomes strategic to form a mindset and culture that the holding of general elections can rely on the sophistication of digital technology because it can do it efficiently, effectively, and economically and even gives satisfaction to the voters.

2. Methods

This study uses a qualitative approach based on literature studies. The literature study chosen was a systematic literature review (systematic review/SRs). According to (Kitchenham, 2004, p. 1), systematic literature reviews (SRs) are a way of identifying, observing, and interpreting everything available that is relevant to a particular research question, topic, or phenomenon of interest. This study used primary data and secondary data (Kitchenham, 2004). Primary data is obtained through communication with resource persons at the Secretariat General of the General Election Commission, the Secretariat General of the General Election Supervisory Agency, and the General Election Organizer Honorary's Secretariat Council (DKPP). In addition, secondary data was collected from various information, documentation, news, and publications published by multiple institutions authorized to publish data, such as the Central Bureau of Statistics (BPS), Ministries/Non-Ministry Government Agencies.

Through a systematic review, empirical evidence is collected according to the eligibility criteria to answer specific research questions. The study aims to minimize

bias to provide reliable findings for formulating conclusions and making decisions (Liberati et al., 2009). The procedures used were:

a. Literature review, especially qualitative and quantitative data.
b. Searching internet pages to find scientific journals that review the latest findings.
c. Explore data/information related to the latest developments from the sources.
d. Analyzing and interpreting data.
e. Draw conclusions.

3. Results and Discussion

3.1. Regional Head Election (Pilkada) in Management Information Systems

Referring to the provisions of Article 1 Paragraph 7 of Law (UU) Number 7 of 2017 concerning General Elections, it is stated that the general election organizer is an organizing institution consisting of the General Election Commission, the General Election Supervisory Board, and the Honorary Council of General Election Organizers as a unit. The organizing function is to elect members of the House of Representatives (DPR), members of the Regional House of Representatives (DPRD), the President and Vice President, and elect members of the Regional People's Representative directly by the community. Referring to these provisions, the local elections (Pilkada) organizers are the General Election Commission (KPU), the General Election Supervisory Body (Bawaslu), and the General Election Organizer Honorary Council (DKPP). This study does not discuss different views on the local elections (Pilkada).

Until now, election organizers have always tried to improve the quality of performance by using a management information system (MIS) in an application system. The adoption of advances in information and communication technology (ICT) has been developed and dedicated to meeting basic needs to hold elections. Several MIS and applications that have been/are/will be used in the local elections are presented in Table 2.

Table 2. Management Information Systems (MIS) in the Scope of Election Organizers/ Pilkada

No.	Application Name/Website Address (URL)/Legal Basis/Time of Use		DKPP
	General Election Commission	General Election Supervisory Agency	
1	National Tabulation/SITUNG or (Vote Count Information System), Used in 2009. It is emphasized in Article 1 Number 30 PKPU No. 8 of 2018	Integrated Law Enforcement Center sg.bawaslu.go.id Used Date. 23 February 2017	SIPPEP
2	Voter Registration Information System (SIDALIH) Used in 2012 It is emphasized in Article 1 Number 46 and Article 40 PKPU No. 11 of 2018	Dispute Resolution Information System (sips.bawaslu.go.id) Used Date. April 10, 2018 Reaffirmed in Perbawaslu No. 2 of 2020	
3	PAW Management Information System for Members of DPR, DPD, and DPRD (SIMPAW), used in 2014. It is emphasized in Article 29 PKPU No. 6 of 2017	Gowaslu (gowaslu.bawaslu.go.id) Used Date. 16 July 2018	
4	Logistics Information System (SILOG) Used in 2014	2019 Election Reporting System (sislaplu2019.bawaslu.go.id) Used Date. 20 May 2019	
5	Nomination Information System Used in 2014. It is emphasized in Article 1 Number 30 PKPU No. 20 of 2018	General Election Supervisor Information System (sipp.bawaslu.go.id) Used Date. 20 June 2019	
6	General Election Organizer Information System (SIPP) Used in 2015	Participatory Monitoring Information System (sigap.bawaslu.go.id) Used Date. July 30, 2020	

No.	Application Name/Website Address (URL)/Legal Basis/Time of Use		DKPP
	General Election Commission	General Election Supervisory Agency	
7	e-Officer of Information & Documentation Management (e-PPID) Used in 2017	Form A General Election Supervision Result Report (formalhp.bawaslu.go.id) Used Date. 23 September 2020	
8	Information System for Budget Realization and Grant Monitoring (SIRAMAH) Used in 2018 It is emphasized in Kep. KPU No. 317/KU.04.10Kpt/02/KPU/VII/2020	Voter Data Analysis (analysisdp.bawaslu.go.id) Used Date. 23 September 2020	
9	Community Participation Information System (SIPARMAS) Used in 2019	Initial Support Data (data early support.bawaslu.go.id) Used Date. 23 September 2020	
10	Political Party Information System (SIPOL) Article 1 Number 29 and Article 52 PKPU No. 6 of 2018 Used in 2019	Reporting (reporting.bawaslu.go.id) Used Date. 6 October 2020	
11	Information System for Individual Election Participants (SIPPP) Used in 2019		
12	Campaign Fund Information System (SIDAKAM) Used in 2019		
13	Public Complaints Information System (SIDUMAS) Used in 2019		
14	Recapitulation Information System - Vote Counting (SIREKAP) PKPU in Process; Plans used in 2020		

Source: Various sources. Processed Data. 2020

All local elections (Pilkada) organizers have built MIS to support Pilkada implementation. KPU is the most progressive Pilkada organizer in preparing MIS for Election purposes. Currently, the KPU is building a Recapitulation Information System (for Vote Count) or SIREKAP for short; it is planned to use it in the 2020 Pilkada. Bawaslu, with its duties and functions, has built five (5) types of MIS in 2020, namely: i) SIGAP; ii) Form A LHP; iii) Voter Data Analysis; iv) Initial Support Data; and v) Reporting.

DKPP has also developed the application of the Ethics Court Information System for Election Administrators (SIPPEP). This application was used in 2017-2018. Since 2019-2020 this has been done with improvements and is planned to be developed again in 2021 to accommodate public service needs for complaints and trial needs. SIPEPP integrates four (4) systems, namely: i) Complaints; ii) The trial; iii) correspondence; and iv) Archives, which means the implementation of the activities of complaints, hearings, equality, and integrated archives immediately since data input, processes and outputs are published on the DKPP website.

The purpose of digitalization local elections (Pilkada) is to ensure that the process and results of regional elections are carried out in a practical, transparent, accountable, fast, efficient, precise, and accurate manner. Through the digitization of local elections (Pilkada), it is hoped that a more comprehensive and integrated Big Data will be built. Digitalis is also viewed from staffing, budgeting, financing, financial accountability; infrastructure, equipment, equipment, and other supporting facilities as inventory items; local elections (Pilkada) archives and documents, education, facilitation, and consultation, assistance, education, and advocacy.

Innovation is a necessity because it has the impetus to arouse local elections (Pilkada) organizers to develop other MIS, which is necessary for the successful implementation of local elections (Pilkada). Innovation will further develop when local elections (Pilkada) organizers collaborate on an innovation hub (i-hub) with local elections (Pilkada) observers and those with talents in building digital MIS local elections (Pilkada). As stated by Saksono (2020b), the innovation hub is a catalyst for innovation actors to interact and contribute to creating innovations that accelerate the development of the digital MIS Regional Head Election (Pilkada) (Saksono, 2020b, p. 10).

In the end, the resulting innovations can guarantee the quality of the implementation of the digital Pilkada and ensure that the commission is hygienic, harmonious, and humanist with prime, ultimate, and optimal performance. In his study, Saksono (2018) also emphasizes that by identifying the benefits and impacts of an innovation hub's existence, it can be seen the extent of work dynamics and regional leadership capabilities (Saksono, 2018, p. 118).

3.2. Challenges of Digitalization of Local Elections (Pilkada)

The digitalization of the local elections (Pilkada) is a long procession that requires the involvement of various parties and community participation. In the future, holding a digital local elections (Pilkada) will still have to face several challenges. The various challenges converged into three categories: i) administrative, ii) technical-operational, and iii) managerial.

Administratively, the local elections (Pilkada) are required to carry out matters related to correspondence, administration and office administration, and formulation of regulations/policies to implement the local elections (Pilkada). The administration in the implementation of the local elections (Pilkada) is relatively well and smoothly following the laws and regulations' provisions. There is no end-detail discussion of this matter.

At the local elections (Pilkada) digitization at the technical-operational level, several obstacles were found in the form of limited infrastructure, equipment, equipment, and other supporting facilities. Thus, requiring skills, tenacity, persistence, physical endurance, and caution of the organizers in their implementation. In this context, there are only regional analyzes in nine provinces, especially highlighted from the development of information and communication technology (ICT), the establishment of telecommunications infrastructure, and the digital divide between provinces implementing Regional Head Election (Pilkada).

The organizational context used in responding to the digital local elections Pilkada) challenge refers to Lukhanyu's view (2013) of The 7M's. In his article, it is stated that 7M's include: Manpower (human resources/HR), Material (necessary ingredients in Management), Machines (necessary tools), Money, Method (the art of doing), Management (functions of Management) and Moral Values (the way business is conducted) (Lukhanyu, 2013). Moral values are the essence of holding a local elections (Pilkada) digitally. Therefore, the review only focuses on the human resource (HR) aspects of the nine provinces described in the population data. The number of permanent voters according to the Fixed Voters List (DPT), the Human Development Index (HDI), the reading literacy activity index (Alibaca Index) accompanied by four constituent dimension index. In addition, the analysis is strengthened by presenting the dynamics of internet user penetration in Indonesia. A description of the conditions of the nine provinces implementing the local elections (Pilkada) paired with population data, 2020 local elections participants, human development progress, and literacy levels were presented in Table 3.

According to the Human Development Index (2019) published by central bureau of statistics, human development measurement uses several indicators that represent the three aspects of social development. The dimensions of longevity and healthy life are represented by indicators of life expectancy at birth (UHH), the dimensions of

Table 3. Local Election Conditions 2020 According to Total Population, DPT, HDI, & Alibaca Index

Province	Population (Thousand)*)	Permanent Voter (Person)****)	IPM***)	Index of Alibaca	ID Kc**)	ID Ak**)	ID Alt.**)	ID Bud**)
West Sumatera	5,441.2	3,719,429	72.39	38.57	78.50	21.60	43.80	29.80
Jambi	3,624.6	2,415,862	71.26	37.37	76.24	25.44	39.47	25.35
Bengkulu	1,991.8	1,374,430	71.21	37.41	77.55	21.41	37.36	31.59
Riau Islands	2,189.7	1,168,188	75.48	54.76	82.05	42.64	55.56	46.27
Central Kalimantan	2,714.9	1,698,449	70.91	33.86	77.29	17.66	34.66	27.80
South Kalimantan	4,244.1	2,793,811	70.72	37.00	75.99	21.78	41.37	27.38
North Kalimantan	742.2	424,221	71.15	42.86	76.75	27.22	42.61	37.89
North Sulawesi	2,507.0	1,831,867	72.99	40.20	80.35	22.61	42.49	33.82
Central Sulawesi	3,054.0	2,022,191	69.50	31.55	76.36	16.17	32.34	24.81
Total	26,509.50	17,448,448	-	-	-	-	-	-
Indonesia	268,074.60	100.359.152	71.92	37.32	75.92	23.09	40.49	28.50

Source: Various sources. Processed Data. 2020

Info:

*) Central Bureau of Statistics2020 (BPS), is the Projection Result of Indonesian Population 2010–2035 (Mid-Year/June). BPS, Population Census (PC) 2010 and Indonesian Population Projection 2010-2035.

**) Index Literacy Reading Activity (Alibaca) 34 Provinces (2019), Puslitjak Dikbud, BPP Kemendikbud.
IDKc. = Provincial Proficiency Dimension Index; IDAk. = Provincial Access Dimension Index; IDAlt. = Provincial Alternative Dimension Index; IDBud. = Provincial Cultural Dimension Index.

***) Human Development Index (HDI) 2019 (BPS).

****) General Election Commission Decision Documents from each Province Organizing Regional Head Election (Pilkada) concerning the Establishment of the 2020 Provincial Level Permanent Voters List (DPT).

education are represented by indicators of the length of schooling (HLS) and the average length of schooling (RLS), while the sizes of control of the resources needed for an approachable life with adjusted per capita expenditure indicators (BPS, 2020).

In the context of literacy, as stated by Saksono (2020b), the Central Government and Regional Governments are required to initiate an extraordinary literacy agenda and provide understanding to the public regarding the availability of space for literacy culture actualization. The literacy plan implementation will cover the literacy gap between the 2020 Regional Head Election (Pilkada) implementing regions (Saksono, 2020a, p. 105).

Digitalization has penetrated the lives of Indonesian society. One of the proofs is the 2018 Internet User Profile National Survey results published by the Indonesian Internet Service Providers Association (APJII). In this document, it is stated that internet user penetration reached 64.8% in 2018. It means that out of 264,161,600 Indonesians (projection of the central bureau of statistics), there are 171,176,717 internet users. Internet users for the 2017-2018 period increased by 27,916,716 or the growth of internet users experienced an increase of 10.12% in a year.

According to Survey Reports, Penetration & Behavior Profiles of Indonesian Internet Users (APJII, 2019) states the contribution of internet users per region of all internet users in Indonesia is still dominated by Java Island (55.7%) and followed by

Sumatra Island (21.6%), Sulawesi Island, Papua, and Maluku Islands (10.9%), Kalimantan Island (6.6%), and the islands of Bali and Nusa Tenggara (5.2%). When viewed from the area, it turns out that internet users in urban areas (urban) are 74.1%, while internet users in rural areas (rural) reach 61.6%. This is particularly surprising because people in rural areas have become active internet users. This situation proves that the population in rural areas is already digitally literate, so that only 12.5% difference of urban internet users. When viewed according to the age of internet users, the population aged 15-19 years is the largest user, reaching 91%.

The implementation of a digital Regional Head Election (Pilkada) will be faced with the availability of telecommunications facilities and the established level of information and communication technology (ICT) development in the Regional Head Election (Pilkada) area. Periodically, the central bureau of statistics (BPS) calculates the Information and Communication Technology Development Index (DI-ICT). DI-ICT is very important as a standard measure of the level of ICT development in a region that can be compared over time and between regions. In addition, DI-ICT can also measure the growth of ICT development, measure the digital gap between regions, and measure the potential for ICT development. In the calculation, 11 indicators compile DI-ICT divided into three sub-indexes, namely the access and infrastructure sub-index, the usage sub-index, and the expertise sub-index (BPS, 2019a).

As development progresses, access to and use of ICT has increased from year to year throughout Indonesia, as ICT DI 2018. There are four (4) categories of di-ict: high, medium, low, and very low. In 2018, the highest score for the sub-index was the expertise sub-index (5.76), followed by the access and infrastructure sub-index (5.34), and the usage sub-index (4.45). However, the fastest growth during the last two years occurred in the access and infrastructure sub-index, which increased by 5.05%. Meanwhile, the usage sub-index grew by 0.35% , and the skills sub-index increased by 0.17% (BPS, 2019b, pp. 23–24).

If you pay attention, it turns out that in Table 4, there are still gaps in ICT development among the provinces that host the 2020 local elections (Pilkada). Five provinces have moderate DI-ICT categories, namely: i) Riau Islands; ii) North Kalimantan; iii) North Sulawesi; iv) South Kalimantan, and v) West Sumatra. Meanwhile, four other regions are still in the low DI-ICT category, namely: i) Central Kalimantan; ii) Jambi; iii) Bengkulu, and iv) Central Sulawesi. This means that there is a digital divide between the nine (9) provinces that are implementing the 2020 Governor and Deputy Governor elections.

Table 4. Local Election Conditions 2020 According to Voting Place and its Distribution, DI-ICT, & Telecommunication Facilities

Province	Voting Place 5,441.2	Voting Place in S/V*)	DI-ICT 2018					Telecommunication Facilities 2018		
			A&I**)	P**)	A**)	DI-ICT	HP (%)	PS V/S**)	BTS V/S**)	BTS+S V/S**)
West Sumatera	12,548	1,158	5.65	3.96	6.37	5.12	88.91	1,236	1,692	723
Jambi	8,236	1,562	5.44	3.93	5.82	4.91	91.14	1,508	1,095	622
Bengkulu	4,341	1,513	5.50	3.61	6.20	4.88	88.27	1,490	583	392
Riau Islands	4,062	417	6.80	5.46	6.16	6.14	84.20	403	689	252
Central Kalimantan	6,045	1,572	5.45	4.06	5.60	4.92	88.87	1,342	972	478
South Kalimantan	9,069	2,008	5.82	4.53	5.44	5.23	87.03	1,947	1,392	738

Province	Voting Place 5,441.2	Voting Place in S/V*)	DI-ICT 2018					Telecommunication Facilities 2018		
			A&I**)	P**)	A**)	DI-ICT	HP (%)	PS V/S**)	BTS V/S**)	BTS+S V/S**)
North Kalimantan	1,572	482	6.03	5.40	5.96	5.76	91.19	423	283	179
North Sulawesi	5,809	1,839	5.73	4.55	6.10	5.33	91.60	1,754	893	578
Central Sulawesi	6,306	2,017	4.97	3.20	6.22	4.51	92.51	1,812	756	543
Total in Regional Head Election (Pilkada)	57,988	12,568	-	-	-	-	-	11,915	8,355	4,505
Indonesia	298,939	46,747	5.34	4.45	5.76	5.07	87.48	77,532	62,851	31,940

Source: Various sources. Processed Data. 2020

Note:

*) K/D = Distribution of Voting Place in sub-district/village.

**) A&I = Access and Infrastructure Subindex by Province; P = Usage Subindex by Province; A = Expertise Subindex by Province; HP (%) = Percentage of Population Owning Cellular Phones by Province and Number of Active Cellular Phones, 2016 in Urban & Rural Areas; PS V/S = Number of Villages/Sub-Districts Receiving Cellular Telephone Signals by Province, 2018 in Urban & Rural Areas (There is a Weak Signal + Strong Signal); BTSV/KS = Number of Villages/Sub districts that Have BTS Towers by Province, 2018 in Urban & Rural Areas; BTS+ S V/S = Number of Villages/Wards that Have Cell BTS by Province and Cellular Phone Signal Reception (There is a Strong Signal + There is a Weak Signal), 2018 in Urban & Rural Areas.

This situation indicates that the readiness to implement the local elections (Pilkada) digitally is only in five (5) provinces. Almost all residents have access to the internet and various information. However, the population in nine (9) provinces of the 2020 local elections (Pilkada) has moved towards an information society. Evidence for this is reflected by the level of readiness of infrastructure that has networks and access to ICTs (A&I), the intensity of ICT use in society (P), the impact on the resulting efficiency and effectiveness of ICT use, which depends on the expertise in using ICT (A). In addition, ownership of access to ICT infrastructure (A&I) is a prerequisite for holding a digital local elections. Likewise, the expertise (A) is needed to optimize the various SIMs or applications that support the local elections (Pilkada) that has been prepared by the local elections (Pilkada) organizer.

3.3. Local Elections (Pilkada) Digital Policy Solutions

The SIM card supporting the local elections (Pilkada) has been operated, and its use has been determined through regulations and/or decisions of each local elections (Pilkada) organizing agency. All parties have also felt the reliability and benefits of each MIS. However, there has not been a strong commitment to realizing the local elections (Pilkada) digitally. The urgency of organizing a digital Regional Head Election (Pilkada) must be regulated explicitly in one clause in the Law that regulates local elections (Pilkada).

As recommended by Saksono (2016), the next necessary process is policy formulation. The validity of the digital local elections Pilkada) requires regulation through legislation. The law is the basis for implementing digital elections based on empirical evidence, is more practical and logical in supporting the performance of regional government administration. It will reflect the local elections (Pilkada) leadership strength, good governance, regional innovation, economic growth, revenue

per capita, prosperity, and community welfare following local autonomy objectives. Because, in a digital local elections (Pilkada), a collaboration between ministries/Non-ministerial government agencies (LPNK) is required. The coverage of administrative, technical-operational, and managerial aspects in the context of a digital Regional Head Election (Pilkada) must be clearly and straightforwardly stated to reduce risks and not cause new problems in the future (Saksono, 2016, p. 133).

Through the digital local elections (Pilkada), organizers, local elections (Pilkada) participants, and the public will benefit. Some of the benefits/advantages include:

a. ease of administrators in implementing local elections (Pilkada) governance, while voters are increasingly practical in checking their status and/or the quality of their family/relatives on the Permanent Voters List;
b. every voter (compulsory to vote) can vote from his place of residence and according to the specified time duration, to avoid mass gathering at the Voting Place;
c. The cost of implementing the local elections (Pilkada) is more efficient because it does not need to hold and build voting booths, make ballot boxes, print ballot papers, supply ink, office stationery (ATK), and campaign props (APK), and campaign materials, including reducing the cost of the vote-counting process;
d. optimization of time utilization for all parties;
e. remove space dividers and bring the distance closer;
f. the organizers (District Election Committee and Voting Organizing Group) can save energy and not be tired;
g. Voters are registered in stages starting from the Voting Place to the General Election Commission through an automated system at the same time as the entry of choice chosen by a voter;
h. vote count results are obtained in real-time at the time the vote counting stages are carried out starting from the Voting Place to the General Election Commission; online voting and the public can watch it via live streaming or delayed broadcast.

From a literacy perspective, regional elections with a low reading index should formulate policies to improve public education through reading culture. This is where the importance of providing space and allowing people to participate and express their knowledge, aspirations, experiences, and opinions individually or in groups on the "process-implementation-evaluation" of regulations/policies (Saksono, 2013, p. 8). The goal is to create collective responsibility, common perceptions, increase public participation in voting, and increase public acceptability accompanied by a level of accuracy of results that can be accounted for through the digitization of local elections (Pilkada). Therefore, the Healthy Internet Use campaign can trigger a community literacy culture. People literate and aware of digital is the key to success in the Digital local elections (Pilkada).

4. Conclusion

Currently, the local elections organizers (General Election Commission, General Election Supervisory Body, and Local Elections Organizer Honorary Council) have always designed MIS to support the success of the local elections (Pilkada). The local elections (Pilkada) have been digitalized. Even though there are still limited telecommunication facilities, implementing the local elections (Pilkada) has explicitly stated the use of internet-based online media. Digitalization carried out by Regional Head Election (Pilkada) organizers has impacted and changed governance to be more practical, more comfortable, and straightforward. Digitalization results in transparency, accountability, ease of access, and increased public participation because of its perceived benefits for the voting community. It seems that the digitization of the local elections (Pilkada) will be a necessity and a trigger for significant and sustainable change in the implementation of the Pilkada, even possible for the general elections in the future.

Digital local elections (Pilkada) is a necessity for Indonesia. The government already has the supporting infrastructure for implementing the digital local elections (Pilkada). The public will also get benefit if the local elections (Pilkada) can hold digitally. Collaborative execution between Ministries/Agencies can overcome several challenges in information and communication technology, especially in the 3T-P areas, so that digitalization is more optimal and supports government performance. The central government and local governments are jointly developing ICT and preparing telecommunications facilities. The execution of the implementation is prioritized in several provinces that implement local elections (Pilkada) in 2021 and 2022.

Observing the rapid advancement of information technology, changes in society's digital culture, and the legality of digitizing the Regional Head Election (Pilkada), a legal basis is required in the form of a law. Policymakers are expected to be responsive and immediately prepare regularly for digital local elections (Pilkada). In the future, the digitalization of the local elections (Pilkada) will further reduce the price and cost of holding the local elections (Pilkada) and offer new opportunities and challenges for all stakeholders.

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