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# Participatory Governance of Smart Cities: Insights from e-Participation of Putrajaya and Petaling Jaya, Malaysia

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**Abstract:** Participatory governance is widely viewed as an essential element of realizing planned smart cities. Nonetheless, the implementation of e-participation platforms, such as the websites and mobile applications of civic authorities, often offer ambiguous information on how public voices may influence e-decision-making. This study aims to examine the status of participatory governance from the angle of e-participation platforms and from the broader scope of linking e-platforms to a smart city blueprint. In order to achieve this aim, the study focuses on shedding light on the e-governance space given to smart city realization in a developing country context—i.e., Malaysia. The Putrajaya and Petaling Jaya smart cities of Malaysia were selected as the testbeds of the study, which used the multiple case study methodology and multiple data collection designs. The analyses were done through the qualitative observations and quantitative descriptive statistics. The results revealed that both of the investigated smart city cases remained limited in their provision of e-decision-making space. The inefficiency of implementing planned initiatives to link the city blueprints to e-platforms was also evidenced. The study evidenced that the political culture of e-decision-making is undersized in Malaysia, which hinders the achievement of e-democracy in the smart cities' development. This study has contributed a case report on a developing country's smart cities, covering the participatory issues from the angle of e-participation and e-platforms.

**Keywords:** e-democracy; e-decision-making; e-government; e-platform; citizen participation; smart government; smart city; Putrajaya; Petaling Jaya; Malaysia



**Citation:** Lim, S.B.; Yigitcanlar, T. Participatory Governance of Smart Cities: Insights from e-Participation of Putrajaya and Petaling Jaya, Malaysia. *Smart Cities* **2022**, *5*, 71–89. https://doi.org/10.3390/smartcities5010005

Academic Editors: Dujuan Yang, Dezhi Li, Yunfeng Chen and Pierluigi Siano

Received: 22 October 2021
Accepted: 13 January 2022
Published: 14 January 2022



## 1. Introduction

With the global trend of the development of smart sustainable cities, participatory governance has played a substantial role in achieving the smart state [1,2]. This is evident in the definition of realizing a smart city given by [3], that "a city [becomes] smart when investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance". Furthermore, in the seminal work of [4], smart governance mainly refers to participatory governance, which emphasizes participation in decision-making and transparency through new communication channels for the citizen to use, i.e., e-government.

In the conception of [5], e-government consists of delivering online services to citizens, the readiness of telecommunications infrastructure and human capital development. In particular, to provide online services, e-government needs to activate and facilitate its citizens' participation in e-platforms such as websites, mobile applications, social medias and other Internet-of-Things (IoT) platforms [6,7]. The design of e-platforms through e-participation must consider three levels, namely e-decision-making, e-consultation, and e-information [5]. In this article, e-participation serves as a proxy to inquire the participatory

governance. The smart city concept has become an ideal scenario where the dynamics of participatory governance has evolved [4,8]. The overall concept of participatory governance vis-à-vis e-government in city management lies within the scope of realizing the smart city and, from a wider perspective, sustainable city development that benefits the current and future populations (Figure 1).

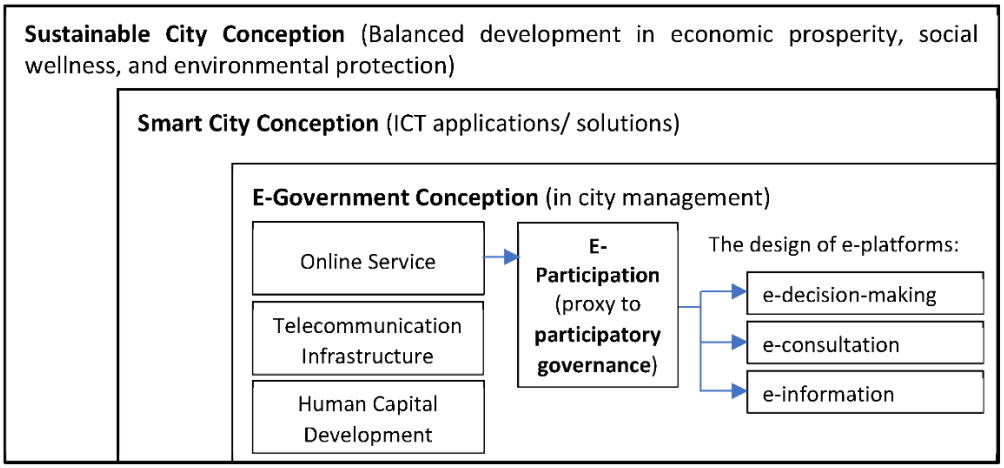


**Figure 1.** The relational conceptions of e-participation, e-government, smart and sustainable city, derived from [4,5,9].

In recent scholarly studies, assessments of e-participation platforms have been limited to the levels of e-information and e-consultation and have generally assessed governmental website portals [10–12]. A cross-country comparison study [13] revealed that the governmental portals of both Lisbon (Portugal) and Brasilia (Brazil) demonstrated intensive provision of information and online searches but less on human and responsiveness dimension. Another study of the e-participation portal [14], specifically the case of Estonia's Osale.ee, found that such e-platform lacked democratic participation; failed to attract people to join; and had regulatory limitation and ambiguity in integrating people's ideas/comments into policy-making process.

In Malaysia, the Malaysia Digital Economy Corporation (MDEC) has assessed governmental websites through the Provider-Based Evaluation (ProBE). As the latest ProBE assessment from 2016 shows, of the 622 participating websites from federal and local government departments and agencies, the item of 'presence of e-decision-making: publish outcomes of citizen feedback on services/national strategy/policy' ranked last among the 64 items assessed. Only 5% of the 622 websites complied with this item [15]. Another observation from the Malaysian Administrative Modernization and Management Planning Unit (MAMPU) [16] and agencies such as Malaysia Competition Commission (MyCC) [17], is that explanations for e-participation policies are overly focused on providing various types of e-information and conducting surveys for e-consultation, with only ambiguous details given about how public voices may influence e-decision-making. In fact, all three processes together actually comprise a complete definition of e-participation [5], as explained above.

Meanwhile, the availability of information and communication technology (ICT) infrastructure provisions, such as internet readiness and computer facilities, is sometimes ambiguously perceived as civic e-participation (see [18]). In fact, too few scholarly studies in Malaysia have evaluated e-participation. For instance, the e-service tools provided, like opinion polls, complaints, and feedback, as well as social media pages (such as on Facebook), generally failed to function effectively [18–20]. This is aligned with [15]'s summary that although most portals and websites include some forms of e-participation, there is a lack of innovative platforms that incorporate citizens' voices. A tool offering such a depth of e-participation, involving the injection of technology into government electronic service platforms that facilitate greater citizen involvement in political delib-

eration and the policy decision-making process (PMPs), is a myth under representative democracy [11,21]. Furthermore, no academic study was found to link e-participation and participatory governance to smart cities development in Malaysia.

Given the abovementioned issues surrounding authentic participatory governance and e-participation, the study intends to ask, "What is the status of participatory governance in smart cities through e-participation platforms?" Thus, taking the cases of Putrajaya and Petaling Jaya smart cities from Malaysia, this study aims to examine the status of participatory governance from the angle of e-participation platforms, such as websites and mobile applications, and from a broader scope, linking e-platforms to the implementation of smart city initiatives. These two cities were selected based on their leading roles in implementing smart cities in Malaysia.

Following this introduction, the next section reviews the literature on participatory governance and how it links to e-participation and smart city initiatives. The sections after that explain the multiple case study methodology, results, discussion, and conclusion.

## 2. Literature Review

Governance is a broad concept covering all aspects of the way a country is governed, including its economic policies, regulatory framework, and adherence to the rule of law. In traditional discussions, governance mostly relates to power [10,22]. Power can be divided into several types, such as monarchy, democracy, oligarchy, authoritarianism, and totalitarianism. In today's smart city discourse, scholars focus on how the democratic type of government contrasts or conflicts with authoritarianism [23]. The categorization of democratic government types, as shown in the Democracy Index 2020 [24], reveals four forms of regime: full democracy, flawed democracy, hybrid regime and authoritarian regime. Currently, the majority of countries fall into the first three categories, with about one-third under authoritarian control. A developing country like Malaysia is categorized as a flawed democracy [25]. It is ranked 39th out of 167 countries and has basic civil liberties in place; however, in other aspects of democracy, it exhibits weaknesses, such as governance problems [26].

Most places worldwide, regardless of whether they are located in the global north or south, have adopted the smart cities development policy [27,28]. However, which conditions indicate a democratic governance style is considered smart? From the literature, [4] mentioned that "smart governance comprises aspects of political participation, services for citizens, as well as the functioning of the administration." For [29], institutional factors (or smart government) are drawn from the discussion of smart community or smart growth initiatives. Regarding the corporate sector, IBM argued that smart government will do more than simply regulate economic and societal systems' outputs; thus, it will interconnect dynamically with citizens [30,31]. In the review of [32], the authors summarized six attributes of a smart governance system, which must be based on ICT, external collaboration and participation, internal coordination, the decision-making process, e-administration, and outcomes. Then, in [3], smart governance is referred to as a type of participatory governance.

While participatory governance is a relatively recent practice in the context of smart city or smart governance, collaborative and participatory governing principles are not [33]. The Nordic and Baltic countries such as Sweden passed their legislation to allow citizens to access to government process and public data since 1766; Estonia shaped the Public Information Act in 2000; and Denmark launched a healthcare reform program in 2002 to allow citizens to choose between different solutions [14,34,35]. Even before the smart city concept became popular in the early 2010s [36], cases of utilizing technology in assisting participatory governance have been recorded, such as the 1970's idea of democratic dialogue via teleconferencing, the Minerva Communications Tree which was introduced in the US; and the 1980s ICT-enabled deliberation among 'mini-populi' (i.e., a deliberative citizen forum/mini-publics) in Europe and the US [37–39]. Participatory governance strengthens local democracy by allowing citizens to participate in new contexts [40]. Participatory

governance is defined as the genuine participation of citizens and other organizations in the formulation of policies and strategies, the public sector's decision-making process, and the implementation of those decisions [35].

In smart city literature, participatory governance is incorporated into the practice of smart governance and moving towards the user/citizen-centric approach, in that the e-participation of citizens in decision-making is emphasized, alongside co-creation with citizens in city services [2,4,41]. In this article, the participatory governance in smart cities is examined through the proxy of e-participation concept. This approach is also similarly adopted by [13].

E-participation comprises of three main elements, namely e-information, e-consultation, and e-decision-making. According to [5], e-information is defined as enabling participation by providing citizens with public information and access to information without obstacles or upon demand, e-consultation means engaging citizens in contributions to and deliberation on public policies and services, while e-decision-making refers to empowering citizens through the co-design of policy options and the co-production of service components and delivery modalities. Thus, to measure citizen's e-participation in e-platforms such as government websites and mobile applications, in this study, the authors adopted in full the definition given by [5]. As concluded by many studies, e-participation can be easily confused by referring to e-information distribution on e-spaces and e-consultation through surveys and opinion seeking. The impact of e-platforms using new technologies, such as big data analytics and artificial intelligence as part of the fourth industrial revolution, remains unclear in terms of how its multiplication has translated into broader or deeper citizen participation [10,42,43].

A useful global example of fostering deeper citizen participation in a smart city is the e-platform 'Decide Madrid', introduced by Madrid City Council in Spain. This engagement platform is effective and, through its open-source software Consul, has been utilized in more than 33 countries [10]. This engagement system contains four major elements, namely debates, proposals, participatory budgets, and voting [44,45]. 'Debates' is an e-space where anyone can open threads on any subject and debate on the proposed topic. Next, another e-space, 'Proposals', allows citizens to create proposals and seek supports. Proposals which receive support from at least 1% of the adult population (age 16 and above) will be voted on and considered by the authority. The 'Participatory Budgeting' e-space allows citizens to continuously suggest the budget to spend on selected proposals. Finally, the 'Voting' e-space offers a voting system, whereby people can vote for or against motions and provide additional comments. Based on the above democratic processes, the authority will evaluate the legal, competence and economic feasibility of an initiative and decide whether to adopt or reject the proposal [46].

## 3. Methodology

The multiple case study approach was selected as the main methodological approach in this study. This approach applies more than one instrument as it uses bounded cases and examines the topic through multiple data collection methods [47,48].

In this study, two civic authority cases were evaluated: the Putrajaya Corporation and Petaling Jaya City Council from Malaysia. These two authorities were selected based on their leading roles in implementing smart cities in Malaysia. Putrajaya is one of the country's first intelligent cities since the Multimedia Super Corridor development in 1990s [46]. As the federal government administration centre, Putrajaya has been identified as a pioneer in Malaysia for publishing its city-level blueprint—the Putrajaya Smart City Blueprint (PSCB)—in 2019 and launching the Putrajaya Mobile Application (PMA) in 2016 [33,34]. Meanwhile, Petaling Jaya, a satellite township next to Kuala Lumpur, followed the steps taken by the Smart Selangor state and became the first city council to launch a smart command centre [41,49]. Petaling Jaya also launched a unique community engagement e-platform, PJKita, to gauge citizens' input and accumulate community volunteers to co-produce its vision as a smart sustainable city.

For multiple data collection methods, this study collected data from e-government platforms, namely the PJKita and the Putrajaya Mobile App, as well as related e-governmental websites and blueprint. Data collected from the e-platforms include the details of developers, dates of publications, contents of the platforms, and interactions from the platform users. While for the blueprint, data of the types of smart city initiatives, achievement status and timeline of initiatives related to e-platforms were gathered. The e-platform and blueprint observations were performed between December 2020 and August 2021. Besides, a number of site visits to, and participatory observations of, Putrajaya and Petaling Jaya cities, and casual interviews of a few informants were undertaken between 2017 and 2020.

To answer the study objectives, the analyses were done mainly on the qualitative observations and supported by quantitative descriptive statistics. Firstly, to examine the status of participatory governance in smart cities through the proxy of e-participation (this approach is also adopted by [13]), the e-government platforms were qualitatively observed from the angle of e-information, e-consultation, and e-decision-making as conceptualized in [5]. As explained in the literature review section, e-information was analysed through variability and accessibility of information to the public without obstacles or upon demand. E-consultation was examined through signs and responsiveness of engaging citizens in contributions to and deliberation on public policies and services, i.e., surveys and opinion seeking. At the same time, e-decision-making was scrutinized through the availability of co-design of policy options and the co-production of service components and delivery modalities such as debates, proposals, participatory budgets and voting [5,44–46]. Secondly, from the broader scope of linking e-platforms to a smart city blueprint, the achievement of planned initiatives was quantitatively examined through descriptive statistics and qualitative comparisons.

## 4. Results

### *4.1. The E-Platforms of the Putrajaya Mobile App, the PJKita Website, and Others*

At first sight, the Putrajaya Mobile App e-platform is attractive and presentable (Figure 2). The only official Putrajaya Mobile App, it was developed by a private company—Touchpoint International—and is administered by the Putrajaya ICT internal department. There are currently about 5000 downloads of the Putrajaya Mobile App. This figure accounted relatively for about only 5% of the total population of Putrajaya, which is 100,000.

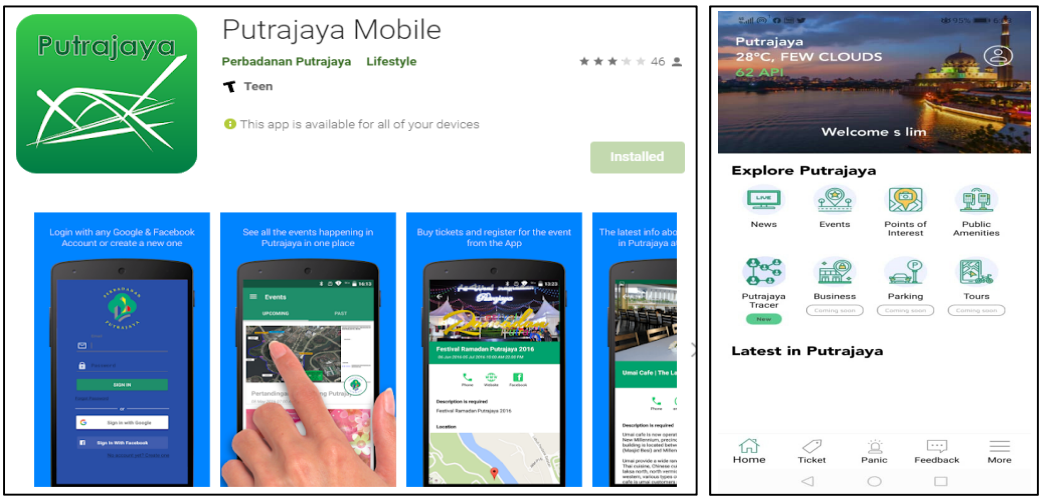


**Figure 2.** The user interface of the Putrajaya Mobile App.

For the purposes of e-information analysis, the Putrajaya Mobile App was launched in 2016 and currently displays eight events to explore. Among these, five of them were functioning, namely the News, Events, Points of Interest, Public Amenities and Putrajaya Tracer. Meanwhile, the status of each of the other three–Business, Parking, and Tours–was

'coming soon'. No activities were displayed under the 'Latest (happening) in Putrajaya'. At the foot of the user interface, users could obtain an event 'Ticket' from the app, 'Panic' call an emergency contact (the user must insert his/her contacts' details, such as those of their spouse), use 'Feedback' for feedback or link to a GPS location, which could be useful for the user to lodge complaints.

Furthermore, from the author's observation on 9 December 2020, from the seven news items displayed, one used the standard template, and the others were old activities dating back to 2018 or 2019 (Table 1). Overall, the app lacks a 'search' button for users to meet their needs immediately. The information displayed on the Putrajaya Mobile App is quite extensive. However, it challenges the user's patience as they must search manually for what they need. This design is considered less user-friendly and hardly encourages frequent visits from existing users. Furthermore, as declared in the 'About Us' section, the Putrajaya Mobile App is designed 'to enhance the cities relationship with its citizens, provides a smarter transportation and mobility experience, a smarter community to leverage profitable business opportunities and smarter infrastructure to increase security reassurance'. Yet, observations revealed that a lack of transportation or mobility information was provided.

**Table 1.** E-information displayed in Putrajaya Mobile App.

| Information | Observation as of 9 December 2020 |
| --- | --- |
| The Putrajaya News section:<br>Seven news items were uploaded on 22 July 2019 on Local Community Activities:<br>1. Kelas Kemahiran (Khat, English, Islam) Hujung Minggu, activity date: March–May 2018<br>2. More Putrajaya News (template)<br>3. Kursus Penternakan Kelulut, activity date: 24 April 2018<br>4. Putrajaya Drum Circle (no date)<br>5. Jom Bayar Kompaun/Saman, activity date: 14 August –30 September 2018<br>6. Pertandingan Melukis dan Mewarna, activity date: 17 February 2019<br>7. Car Free Day Putrajaya (no date) | All the news items were considered 'old' because the activities displayed were dated back to 2018 or 2019. |
| The Events section:<br>One upcoming event shown: Light and Motion Putrajaya (LAMPU) from 30 December 2020 to 2 January 2021.<br>39 past events displayed, for example, royal FLORIA Putrajaya, marathon events, etc. | Only one upcoming event was displayed, and most past events just stated the date, without further information or a picture gallery. |
| The Points of Interest section:<br>Many points of interest were displayed, including parks and landscapes, bridges, shopping facilities, hotels and resorts, mosques, sport, and recreation centres, Sisiran Putrajaya (a walkway), Persiaran Perdana (a boulevard), the Tasik Putrajaya cruise, Melawati Palace, PICC, floral landscaping, the Natural History Museum, National Heroes Square and government offices. | This section is supposedly designed for tourists. However, the authors observed that users had hardly left any comments. Little user interaction was observed, and the frequency of visits by visitors/users was not recorded either. |

For the purposes of e-consultations analysis, only 46 users left comments concerning the downloads and the average rating was 3.1 (Figure 3). These public reviews related to the issues of attractiveness (i.e., "not attractive"), usefulness (i.e., "complaint form is not easy"; "not helpful at all"), stability (i.e., "keep crashing") and expectation (i.e., "expect there will be more features"), thus identifying the areas for potential improvements.

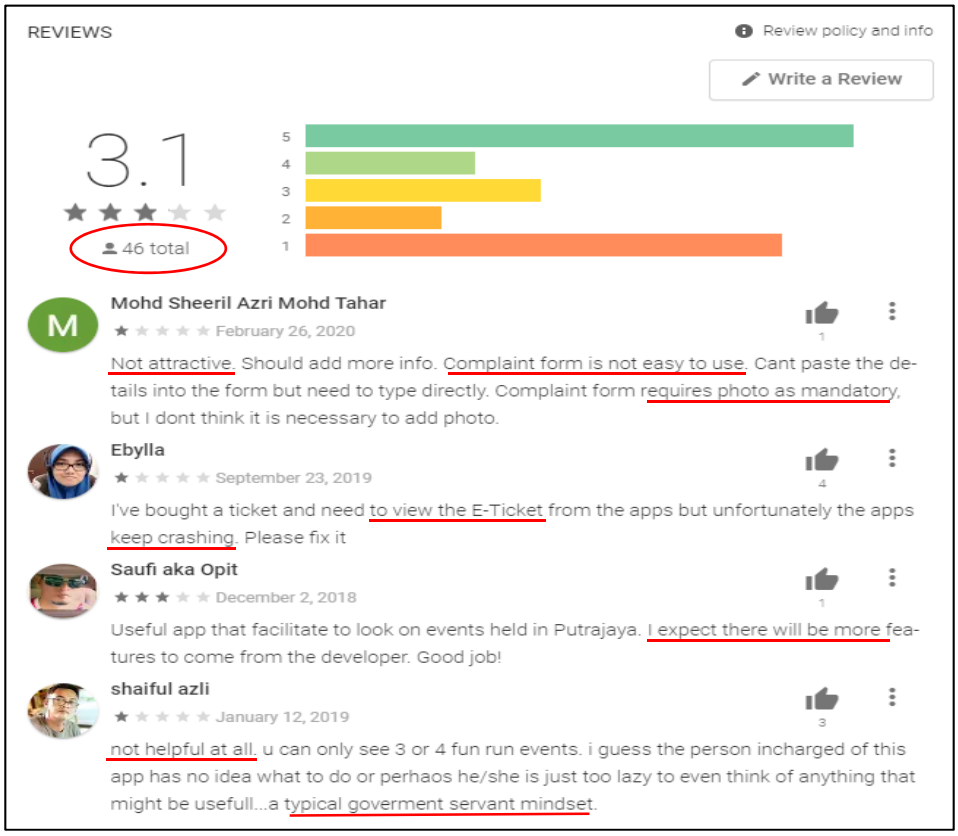


**Figure 3.** Reviews of the Putrajaya Mobile App.

From the responsiveness perspective, the author observed that the administrative response of the Putrajaya Mobile App to public comments was poor, and a typical answer was to ask users to wait for the updated version. The latest administrative response was at least a year old (dated 2 April 2018) and responded to a comment made on 31 May 2016 (Figure 4).

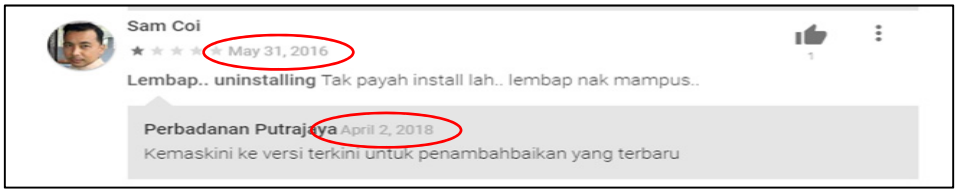


**Figure 4.** Example of official response from the Putrajaya Mobile App.

An analysis of e-decision-making revealed that no elements of debates, proposals, participatory budgets or voting were shown on the Putrajaya Mobile App.

Further e-platform analysis of the Putrajaya official website (https://www.ppj.gov.my), revealed an element of e-participation. However, unfortunately, when clicking into it, no activity was displayed (Figure 5). This observation by the authors were made on 9 December 2020 and again on 23 August 2021.

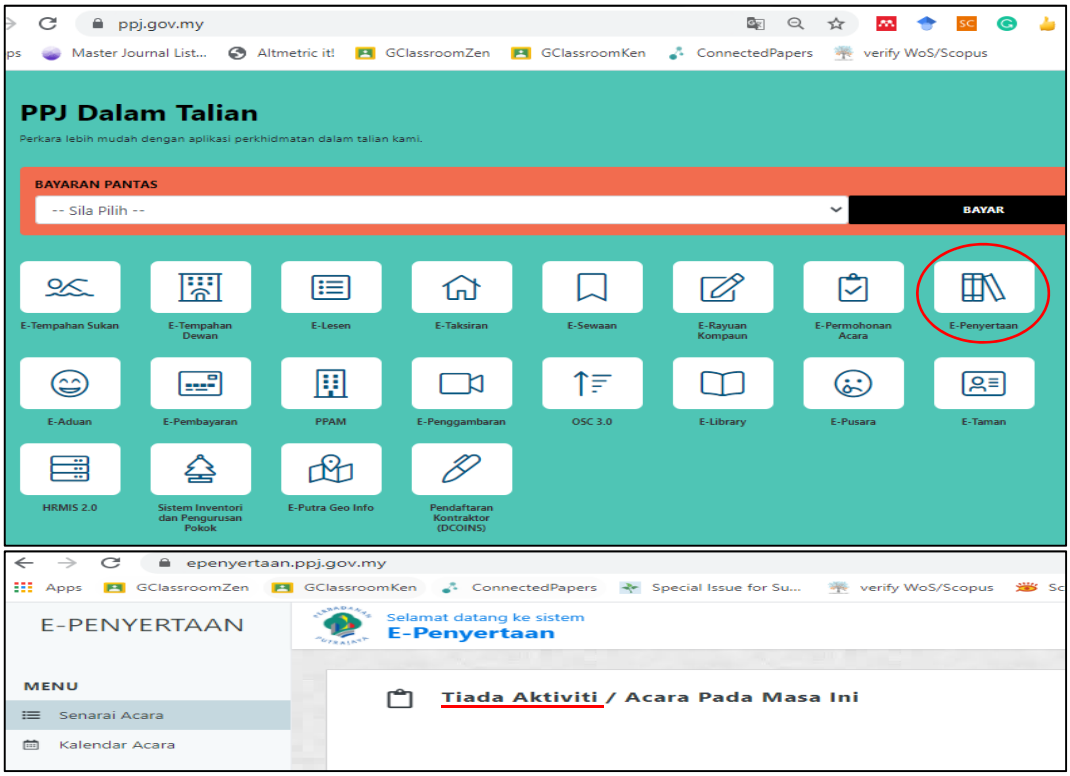


**Figure 5.** Inactive of the element of e-participation showed in Putrajaya official website.

Moving on to assess Petaling Jaya City Council, it had no unified Petaling Jaya City Mobile App, as Putrajaya does. Its public services were separately channeled through various e-platforms that had been designed by multiple parties. For instance, the reporting platform–Site Report MBPJ–had been created by a private company, Ultrack Technology Sdn. Bhd.; the Bazar platform–Bazar@PJKita–and the public city bus service–PJ City Bus–had been designed by the internal ICT MBPJ department, among others (Figure 6).


**Figure 6.** Various mobile apps from Petaling Jaya City Council.

This analysis focuses on the engagement platform, namely the PJKita website (https://www.pjkita2u.org, 9 December 2020). This website was established in 2018. Fifteen functions are available: Join Us, Q&A, Surveys, Message, Service, Support, Contacts,

SDG, Community, Ideas, D.4.C, Rewards, Job Post, Funding and City Index; there is also a PJ Interactive Map (Figure 7).


**Figure 7.** An engagement platform by Petaling Jaya City Council.

As of 10 February 2021, the total number of visitors recorded was 2624. This figure accounted relatively for only 4% of the whole population of Petaling Jaya, which is 620,000. The authors found that this website had an interesting homepage user interface. However, the authors noticed an unpleasant user experience, finding many idle/non-functional buttons or pages under construction, i.e., the Surveys, Rewards and City Index, Service Projects, Critical Contacts and Job Posts.

For the purposes of e-information analysis, this engagement platform provided information on topics such as Sustainable Development Goals (SDGs); it also mapped existing situations (such as floods or dengue cases) in various communities by administrative zones. Besides, this engagement platform applied the inclusivity concept, whereby under the D.4.C (Data for change—engaging and supporting the vulnerable through crowd-sourced data), it allowed disabled individuals, single mothers, and senior citizens to register themselves.

For the purposes of e-consultation analysis, this engagement website was unique as it allowed community users to register themselves as local champions and post updates and projects. At the time of writing, not many updates had been posted, while the viewer and response numbers were low (Figure 8). However, in the authors' opinion, if well maintained, this post can engage citizens effectively and increase the sense of belonging to the community and city. Besides, the website had a survey button, which listed a happiness index survey, a public transportation survey, a citizen insights survey and a parks and recreation survey. Unfortunately, these surveys were still under construction and could not be clicked.

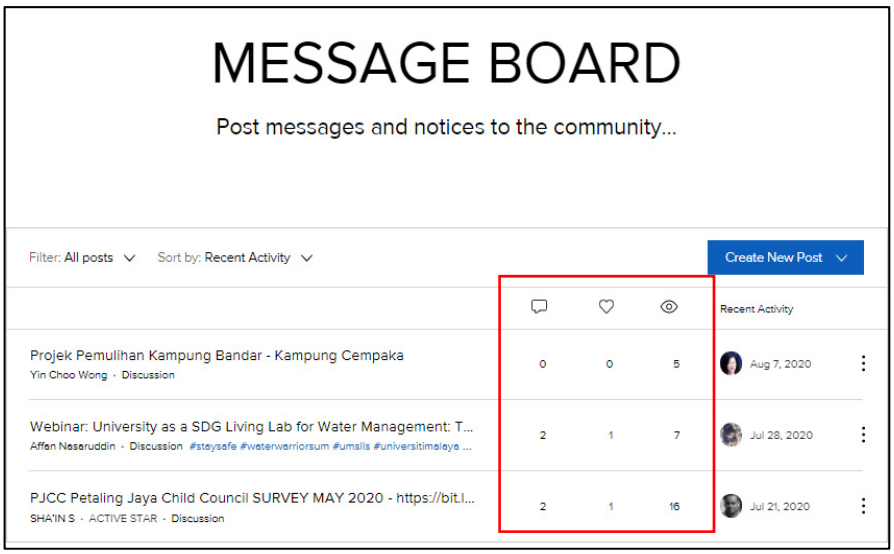


**Figure 8.** Availability of community posting under the PJKita website.

In terms of the e-decision-making analysis, some elements appear to cultivate co-decision-making with the community, for example, the availability of the Idea Bank and Funding buttons. However, at the time of writing, only one idea had been posted, namely "Gearing up for an ageing society". This had been posted on 25 September 2020 and had eight views, zero comments and no response from the authority (Figure 9). As for Available Funding and Grants for Projects and Initiatives within the City, there was also one post, with 13 views and no response from the authority. Other than the proposals, the elements of debates, participatory budgeting and voting were unavailable.


**Figure 9.** The only available community posting under the Idea section of the PJKita website.

Besides the engagement platform, the Petaling Jaya City Council had created many other websites. These included the official portal (http://www.mbpj.gov.my, accessed on 10 February 2021), which serves as the master portal for the individual links alongside other new domains. It features customer relations (embpj.mbpj.gov.my, accessed on 10 February 2021) and e-complaints (eaduan.mbpj.gov.my, accessed on 10 February 2021) systems. The official website provided extensive e-information for citizens, businesses and visitors; however, it lacked e-participation mentions. This shortfall could be addressed with a new customer relations system and an e-complaint website. At the time of writing, e-consultation was demonstrated through the availability of lodging complaints and surveys. There was still a lack of a clear sign that public proposals, debates, participatory budgeting or voting would be available.

### *4.2. The Linkage between the Putrajaya Mobile App and the Putrajaya Command Centre Compared to the Putrajaya Smart City Initiatives*

In terms of producing smart city blueprint, Putrajaya has published its Putrajaya Smart City Blueprint 2019. While Petaling Jaya as an early satellite township to Kuala Lumpur capital city since the 1950s, it has published many development plans that are constantly updating the city towards "a dynamic world-class metropolis". The vision stated under the Petaling Jaya Strategic Plan 2016–2026 is "Petaling Jaya–a leading, dynamic and sustainable city". The Petaling Jaya City Council is committed to driving this metropolis in line with the concept of sustainability, smart and resilient [47]. Thus, "smart" is one of the strategies and demonstrated under Governance–one of the four main thrusts of the Strategic Plan [47]. The initiatives planned under the Strategic Plan were general, and the City Council has yet to issue any particular smart city blueprint. An interview from a City Council officer revealed that the new Petaling Jaya Smart, Sustainable and Resilient City Blueprint is in drafting status and will be published soon. Thus, this subsection only discussed the case of Putrajaya.

The authors used the Putrajaya Mobile App and the Putrajaya Control Centre to assess the initiatives planned under the Putrajaya Smart City Blueprint 2019. Under the Blueprint, 92 initiatives were being designed. These initiatives were classified into three categories, namely quick win (initiatives to be launched in less than one year, starting in 2018); short-term (1–2 years; 2018–2020); medium-term (3–4 years; 2018–2022) and long-term (more than five years; 2018–2025).

Among the 92 initiatives, 55% (51) were existing initiatives that were to be expanded or enhanced, while 45% (41) were new or for the future. Table 2 shows that among the existing initiatives, the quick win type accounted for the highest percentage, with 35.8%, while long-term initiatives comprised the lowest, with 11.3%. Compared to the existing initiatives, the pattern of future initiatives is different, whereby the medium-term type was the highest with 48.7%, and the quick win type of initiative was the lowest, with 10.3%.

**Table 2.** The status and timeline of initiatives.

| Initiatives | Quick Win | Short Term | Medium Term | Long Term | Total |
|---|---|---|---|---|---|
| Existing (#) | 19 | 17 | 11 | 6 | 51 |
| (%) | 35.8% | 32.1% | 20.8% | 11.3% | 100.0% |
| Future (#) | 4 | 5 | 19 | 11 | 41 |
| (%) | 10.3% | 12.8% | 48.7% | 28.2% | 100.0% |
| Total (#) | 23 | 22 | 30 | 17 | 92 |
| (%) | 25.0% | 23.9% | 32.6% | 18.5% | 100.0% |

Note: Quick win (initiatives to be launched in less than one year of 2018); short term (1–2 years; 2018–2020); medium term (3–4 years; 2018–2022) and long term (more than five years; 2018–2025).

As shown in Table 3, for the quick win category, less than half (47.8%) of the items related to e-platforms, based on the evaluation of the Putrajaya Mobile App and Putrajaya

Command Centre. Of these 11 initiatives, only 27.3% had been achieved, meaning that the implementation of largely two-thirds was not progressing or not executed as planned. It is also important to highlight the existing initiatives of the quick win; the achieved rate of 22.2% is lower than the average of the quick win initiatives.

**Table 3.** Quick Win, Short Term Putrajaya in terms of integration/ related to Putrajaya Mobile App and Putrajaya Command Centre, evaluated as of 10 December 2020.

| | Quick Win | | | Short Term | | |
|---|---|---|---|---|---|---|
| | **Existing** | **Future** | **Total** | **Existing** | **Future** | **Total** |
| (a) Quantity of initiative | 19 | 4 | 23 | 17 | 5 | 22 |
| (b) Percentage related to e-platforms of (a) | 47.4% (9) | 50% (2) | 47.8% (11) | 70.6% (12) | 40% (2) | 63.6% (14) |
| (c) Achieved rate of (b) | 22.2% (2) | 50% (1) | 27.3% (3) | 41.7% (5) | 50% (1) | 42.9% (6) |

Note: Quick win (initiatives to be launched in less than one year of 2018); short term (1–2 years; 2018–2020); figures in brackets show the number of related initiatives.

For the short-term category, the percentages related to e-platforms (63.6%) and achieved rate (42.9%) were higher than those of the quick win initiatives. This means short-term projects targeted for completion at the end of the year 2020 were acceptably near to the average rate and were far more successful than quick wins.

Overall, the efficiency of governance in terms of initiative implementation was below the average value. For the quick win existing initiatives, for example, the authors found that many features had not been integrated into the Putrajaya Mobile App. These included automation ticketing and the cashless bus fare payment system, the supervisory control and data acquisition (SCADA) for pollution prevention control, land inventory and cadastral data, online licensing and facilities booking. As for the short-term existing initiatives, the API environmental monitoring index (measuring air quality values), lake water and wetland management, e-wallet and e-kiosk, smart application for business promotion, healthy diet information and education, information for dengue hotspots and non-smoking area were in pending status in terms of their integration into the Putrajaya Mobile App. On the other hand, the most notable achievement to date had been the Putrajaya Command Centre for traffic, safety and emergency response and monitoring. For a detailed evaluation of the initiatives, refer to Table 4.

**Table 4.** Evaluation of Quick Win and Short-Term Initiatives related to E-platforms in Putrajaya. (**a**) Quick Win Existing Initiatives. (**b**) Quick Win Future Initiatives. (**c**) Short-term Existing Initiatives. (**d**) Short-term Future Initiatives.

(**a**)

| **No** | **Initiative** | **Implementation Objective** | **Status** | **Achievement as of December 2020** |
|---|---|---|---|---|
| 1 | 1.2.2 Automation ticketing and payment system | Integrate with the Putrajaya Mobile | Pending | To date, it is not integrated with the Putrajaya Mobile App. |
| 2 | 1.2.3 Cashless bus fare payment system (i.e., e-wallet) | Integrate with the Putrajaya Mobile App | Pending | To date, it is not integrated with the Putrajaya Mobile App. |
| 3 | 2.1.3 Supervisory control and data acquisition (SCADA) for pollution prevention control | Citizens can access API value information 24 h a day | Pending | The Putrajaya Mobile App only shows a simple air quality API figure, not a detailed SCADA system. |
| 4 | 3.2.1 Putrajaya Mobile App | Create a more efficient management and maintenance regime | Achieved | The Putrajaya Mobile App was released on 15 April 2016 on Google Playstore. The current version is 2.6, updated on 3 Sept 2020, maintained by Touchpoint International Sdn Bhd. |

**Table 4.** *Cont.*

| | | | | |
|---|---|---|---|---|
| 5 | 3.4.1 Digitalisation of land inventory and cadastral data (land use governance) | Integrate all the applications into the Putrajaya Mobile App | Pending | To date, it is not integrated with the Putrajaya Mobile App. |
| 6 | 3.4.4 Complaints online | Integrate with the Putrajaya Mobile App | Achieved | Termed 'feedback' and organised into categories such as noise, lost and found, and illegal parking. |
| 7 | 3.4.6 Online licence application | Integrate with the Putrajaya Mobile App | Pending | To date, it is not integrated with the Putrajaya Mobile App. |
| 8 | 3.4.7 Online booking of venues | Integrate with the Putrajaya Mobile App | Pending | To date, it is not integrated with the Putrajaya Mobile App. |

(**b**)

| No | Initiative | Implementation Objective | Status | Achievement as of December 2020 |
|---|---|---|---|---|
| 1 | 1.1.2 Mobile apps for parking guidance | Integrate Putrajaya Mobile App and Putrajaya Park by Phone (directions to parking facilities) | Pending | To date, it is not integrated with the Putrajaya Mobile App. The Putrajaya Park by Phone app cannot be found on Google Playstore. |
| 2 | 7.4.1 City YouTube Channel | Offer live updates on YouTube and social media like Facebook and Instagram related to every event inPutrajaya, such as ceremonies, sporting events or carnivals | Achieved | Strange to put this as a future initiative as many videos had been uploaded since 25 February 2010. (https://youtube.com/c/perbadananputrajaya). However, achieving the target of updating 'every ceremony' is a challenging KPI to achieve. |

(**c**)

| No | Initiative | Implementation Objective | Status | Achievement as of December 2020 |
|---|---|---|---|---|
| 1 | 2.1.2 Air quality monitoring | Citizens can access API value information 24 h a day | Achieved | The temperature, weather and air quality API values are shown on the Putrajaya Mobile App homepage. |
| 2 | 2.1.4 Putrajaya lake and wetland management operational system (PLWMOS)–lake water quality, flora and fauna | Citizens can access information on lake water quality, wetland management and API values | Pending | To date, it is not integrated with the Putrajaya Mobile App. |
| 3 | 3.1.1 Putrajaya Command Centre (monitoring) | Provide the basic infrastructure needed to upgrade the city's capabilities and capacities in working towards Smart City status | Achieved | The Command Centre is functioning. |
| 4 | 3.4.5 Payment online/ application | Integrate with the Putrajaya Mobile App | Pending | To date, it is not integrated with the Putrajaya Mobile App. |
| 5 | 5.1.1 Panic Buttons | Integrate with the Putrajaya Mobile App | Achieved | The designed panic alert was linked to a predetermined close contact person named by the user. |
| 6 | 5.1.2 Putrajaya Command Centre (emergency response) | Provide an infrastructure for emergencies | Achieved | The Command Centre is linked to the police, the fire rescue service, Hospital Putrajaya and the Civil Service Department. |
| 7 | 6.1.1 E-Wallet and E-Kiosk | Integrate with the Putrajaya Mobile App | Pending | To date, it is not integrated with the Putrajaya Mobile App. |

**Table 4.** *Cont.*

| | | | | |
|---|---|---|---|---|
| 8 | 6.2.1 Smart application for city attractions | Integrate with the Putrajaya Mobile App | Achieved | City attractions were shown in the app. However, the lack of a 'search button' meant the experience was not as user-friendly as the results of a Google search. |
| 9 | 6.4.2 Smart application for business promotion | Integrate with the Putrajaya Mobile App | Pending | 'Coming soon' status found on the Putrajaya Mobile App. |
| 10 | 7.3.3 Healthy diet information and education | Integrate the MyNutri App with the Putrajaya Mobile App | Pending | To date, it is not integrated with the Putrajaya Mobile App. |
| 11 | 7.3.4 Information on dengue hotspot areas | Integrate iDenggi with the Putrajaya Mobile App | Pending | To date, it is not integrated with the Putrajaya Mobile App. |
| 12 | 7.3.5 Putrajaya Bebas Asap Rokok (PBAR) | Integrate non-smoking area information with the Putrajaya Mobile App | Pending | To date, it is not integrated with the Putrajaya Mobile App |

(**d**)

| **No** | **Initiative** | **Implementation Objective** | **Status** | **Achievement as of December 2020** |
|---|---|---|---|---|
| 1 | 3.4.8 Online registration system (forum/ workshop/ training) | Integrate with the Putrajaya Mobile App | Pending | To date, it is not integrated with the Putrajaya Mobile App. |
| 2 | 6.2.3 Tourism feedback (visitors to rate the sites and services) | Create an apps platform for collecting tourist feedback data and integrate this with the Putrajaya Mobile App | Achieved | The rating and comment system are available. However, very few ratings were found. |

## 5. Discussion

### *5.1. Underdeveloped Political Culture of E-Decision-Making on the E-Platforms*

The findings above allow the authors to observe that both e-participation cases—Putrajaya and Petaling Jaya smart cities—are ready to provide e-information to the public, given the mechanism of surveys and e-consultation to satisfy public complaints, although e-decision-making has somehow been ignored. The theme of e-democracy in these Malaysian smart cities remains in an immature condition, which was reflected in the unpleasant e-participation experience [41]. More precisely, this would be termed a 'flawed democracy' by the 2020 democracy index survey [24]. Basic civil liberties are respected in Malaysia, whereby the public can access government services information and channels for complaints and surveys. However, there are significant weaknesses in other aspects of democracy, such as the underdeveloped political culture and the low levels of political participation in e-decision-making.

The current e-platforms offered by Malaysia's two leading smart cities have demonstrated that citizens influencing the top-down agenda are immature and that there is great scope for improvement. The authors suggest that the urban policymakers in Malaysia learn from those 'full democracies', such as Spain, whose e-platforms have effective e-decision-making systems. The city of Madrid has been identified as one of the top Spanish smart cities and regularly ranked above the average in e-government empirical studies among European Union [50,51]. The Madrid City Council's leading initiative in terms of public participation is the award-winning portal Decide Madrid [52,53]. It is an e-platform powered by an open source that allows Madrid's citizens to engage with the local government in four ways, namely to initiate debates, create proposals, plan for participatory budgets and vote for the adoption of proposals [10,44]. The system is a true bottom-up approach that fulfils citizens' needs and co-produces together with them. The Decide

Madrid e-participation platform has an ideal design. To succeed in practical terms, such a platform needs high participation from citizens, the readiness of the e-platform design and an anticipated authority willing to allow this e-democracy realm to happen [46].

Using the Decide Madrid e-platform as a template, the author would like to make suggestions for the existing Putrajaya Mobile App and PJKita website. The Putrajaya Mobile App was primarily designed as an e-information platform to provide information to residents and tourists, but it is lacking in e-consultation and e-decision-making facilities. Thus, the whole app needs a revamp by improving the e-consultation space and adding an e-decision-making space. The PJKita is slightly better. It was mainly designed as a community engagement platform with e-information and e-consultation spaces to provide the public with information and gather local champions. The current e-spaces could be altered to suit the four main elements of Decide Madrid. Detailed suggestions are presented in Table 5.

**Table 5.** The suggestion to improve e-decision-making in Malaysian smart cities e-platforms design system.

| **Element** | **Malaysian Smart Cities E-Platforms** | |
|---|---|---|
| The element of E-Decision-Making | Putrajaya Mobile App, Putrajaya | PJKita website, Petaling Jaya |
| Debates | Not Available | Not Available |
| Proposals | Not Available | Not Available |
| Participatory Budgets | Not Available | Not Available |
| Voting | Not Available | Not Available for particular budget proposals |
| Scope to improve for E-Decision-Making | All the current contents were not related to e-decision-making and needed to be redesigned. | Can be improved accordingly:<br>-Ideas (improve to Debates)<br>-Message Board (improve to Proposals)<br>-Funding (improve to Participatory budgets)<br>-Community (improve to voting) |
| Scope not related and proposed to exclude/ modify in the new design platform; or depends on stakeholders' demand | -News<br>-Events<br>-Points of Interest<br>-Public Amenities<br>-Putrajaya Tracer (for COVID-19)<br>-Business (idle button)<br>-Parking (idle button)<br>-Tours (idle button) | -Join Us<br>-Q&A (1 posting)<br>-Survey<br>-Messages<br>-Service (zero postings)<br>-Support (1 posting)<br>-Contact (zero postings)<br>-SDG Projects<br>-D.4.C (Date for change)<br>-Job Post (zero postings)<br>-Rewards (idle button)<br>-City Index (idle button) |

### *5.2. Participatory Governance at a Crossroads in Terms of Realizing Smart Cities*

The second finding in this study was that the smart initiatives planned under the Putrajaya Smart City Blueprint had only achieved a below-average rate, where the Putrajaya Mobile App and Putrajaya Command Centre e-platforms are considered. The initiatives designed under the quick win (which ended in 2018) and short-term period (which were to end in 2020) were considered a booster, mainly to obtain public confidence and demonstrate the administrators' capability to govern and involve multiple stakeholders. However, these initiatives were partially achieved, which creates doubts that the Putrajaya government could advance towards the participatory style by employing ICT-related e-platforms.

The reason could be insufficient budgetary support, a lack of ICT expertise within the internal departments, political influence or the inefficiency of the governance in terms of daily operations and planning. But since Putrajaya, as the federal government administra-

tion centre, is strongly backed by federal government funding, and the ICT department also has the highest number of staffs employed [54], the authors postulate that the latter factors—political influence and operational efficiency—were more likely to have hindered the progress of the initiatives related to e-platforms. In an interview with a Putrajaya Mobile App developer, the informant hinted that the mobile app user interface and design have few problems. The real problem, the sluggish development, could be due to the mobile app internal operations and frequent changes in the top-down management of the Putrajaya Corporation. Technological (i.e., e-platforms), institutional (i.e., governance) and human (i.e., citizens) factors are essential in achieving the vision of a smart city [29,55], so the efficiency of governance and political interest is hugely important. If the initiatives were implemented as planned, they would surely gain higher public acceptance and confidence. For example, in the case of Osale.ee in Estonia and governmental portals of both smart cities of Lisbon (Portugal) and Brasilia (Brazil), the citizens want to see efficient and transparent governments that consider the citizens' voices in smart cities developments [2,13,33,56].

On the other hand, the smartness of e-platforms of both Putrajaya and Petaling Jaya cases were questionable (i.e., the e-platforms lacked a lot of functionality, and the number of civil participants/users were also very limited). The smart city of Madrid, with an effective e-participation platform of Decide Madrid and the embedded activities of aware and active citizens, is developing its (smart) participatory governance stably [46,53]. For both Putrajaya and Petaling Jaya cases, the authors argue that being administratively self-congratulatory as the country's leading smart cities and yet, limited in upholding the culture of participatory governance serve as a lesson to other countries/cities in the world: that smart cities vision will hardly be achieved if the institutional factor of participatory governance is tokenized [13,57,58].

For this reason, the authors suggest that governors of smart cities, rather than making self-claims or overly lauding projects as smart city initiatives, should focus on building the foundations of smart government, in this case, the participatory governance element [32], which is the aspect which needs to be enhanced. An authoritarian or tokenized governance style involving superficial levels of e-participation, i.e., providing abundant e-information and creating non-feedback surveys on e-consultation, is incompatible with smart urbanism. Conversely, the smart government should incorporate the advice of institutions and scholars, such as [4,10,32], to adopt the participatory governance style. This includes motivating citizens to participate, as well as genuinely sharing agenda setting and decision-making power, which thus allows greater e-democracy spaces for citizens to propose and vote for initiatives.

## 6. Conclusions

Smart cities are scenarios of government management reform [8,59]. The future of smart cities is essentially technocratic, requiring knowledge in algorithms for procurement and participation, as well as democratic, allowing residents to participate in the shared enterprise of city-making [33,60,61]. The topics of participatory governance and smart city are inseparable, as they are deemed central to future development debates [62–67]. This study has thoroughly examined the status of participatory governance through e-platforms that are mainly utilized in reliable realizations of smart cities. Through two cases in a developing country, namely the Putrajaya and Petaling Jaya smart cities in Malaysia, this study has found that the political culture of e-decision-making is underdeveloped. While for Putrajaya, the implementation of smart initiatives relating to e-platforms is also sub-standard. These findings are evidence of the flawed democratic state of Malaysia, and attention from policymakers is much-needed to rethink and realize higher levels of e-democracy as part of smart city planning and development.

There are a few limitations to this study. Firstly, the Petaling Jaya City Council has yet to publish a specific smart city blueprint like Putrajaya. A future comparative study could be carried out as the new Petaling Jaya Smart, Sustainable and Resilient City Blueprint will publish in the coming year. Secondly, the authors selected the e-platforms of mobile

applications and websites. The variety of e-platforms is large and keep developing for city solutions. In future research, scholars may expand the e-platforms subject to include official social media, Internet-of-Things (IoT) platforms or digital twins platforms that are developed using industrial revolution 4.0 technologies [68–71]. In brief, this study has contributed a case report on a developing country's smart cities, covering the participatory issues from the angle of e-participation and e-platforms. Furthermore, the evidence and suggestions given in this study may serve as a benchmark for other developing countries interested in a greater application of participatory governance, hence building greater e-democracy spaces for its citizens to allow them to fulfil their roles as smarter citizens.

**Author Contributions:** Conceptualization and methodology, writing—original draft preparation, software, formal analysis, investigation, data curation, and editing, S.B.L.; supervision, validation, resources, project administration, review and editing, T.Y. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** Data are contained within the article.

**Acknowledgments:** The authors wish to thank the managing editor and three anonymous reviewers for their invaluable comments and constructive critiques.

**Conflicts of Interest:** The authors declare no conflict of interest and have no financial or proprietary interests in any material presented/discussed in this article.

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