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Government-Driven Participation and Collective Intelligence: A Case of the Government 3.0 Initiative in Korea

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Abstract: The Park Geun-hye Administration of Korea (2013–2017) aims to increase the level of transparency and citizen trust in government through the Government 3.0 initiative. This new initiative for public sector innovation encourages citizen-government collaboration and collective intelligence, thereby improving the quality of policy-making and implementation and solving public problems in a new way. However, the national initiative that identifies collective intelligence and citizen-government collaboration alike fails to understand what the wisdom of crowds genuinely means. Collective intelligence is not a magic bullet to solve public problems, which are called "wicked problems". Collective deliberation over public issues often brings pain and patience, rather than fun and joy. It is not so easy that the public finds the best solution for soothing public problems through collective deliberation. The Government 3.0 initiative does not pay much attention to difficulties in gathering scattered wisdom, but rather highlights uncertain opportunities created by collective interactions and communications. This study deeply discusses the weaknesses in the logic of, and approach to, collective intelligence underlying the Government 3.0 initiative in Korea and the overall influence of the national initiative on participatory democracy.

1. Introduction

Linus's law: "Given enough eyeballs, all bugs are shallow" [1].

The past decade has given rise to collective intelligence with the prevalence of crowd-sourcing and open-source software. With the help of the rapid advancement and pervasion of information and communication technologies (ICTs), the wave is not merely for software development and innovation of entrepreneurs and businesses, but governments around the world also make efforts to solve public problems in a more creative way through gathering the wisdom of crowds. South Korea is no exception. The Park Geun-Hye administration of Korea, since its beginning (January 2013), has put forth the Government 3.0 initiative to increase the level of transparency and citizen trust in government. The incumbent administration defined Government 3.0 as "a new paradigm for government operation to deliver customized public services and generate new jobs in a creative manner by opening and sharing government-owned data to the public and encouraging communication and collaboration between government departments" (see the website for more information in detail [2]). This new paradigm seeks public sector innovation in three directions: transparent government, competent government, and service-oriented government. One of its key strategies involves encouraging and facilitating citizen-government collaboration and collective intelligence, thereby expecting to improve the quality of policy-making and implementation and solve public problems in a creative way.

Some academics provide a theoretical, empirical rationale for collective intelligence as a new approach to public administration. Most of public problems can be called "wicked problems", which are hard to understand and involve various individuals, groups, and organizations [3–5]. Collective intelligence may be effective to solve public problems characterized as wicked ones. Even though professional experts and practitioners gather and deliberate collectively, they cannot consider various segments of public services completely (i.e., who can be possibly discriminated from the services?) [6,7]. Their ideas for improving public services often face cold responses from citizens because realities are full of considerable challenges that they cannot see at their offices. In turn, citizens who frequently use the public services may have the wisdom that helps easily solve wicked problems. Not only public service delivery, but policy-making and agenda-setting, can benefit from the wisdom of crowds.

However, the Government 3.0 initiative in Korea, from which the incumbent administration seeks to draw collective intelligence, has not been free from concerns about inefficiency, ineffectiveness, and inequality inherent in processes and the results of collecting scattered wisdom and solving public problems. The Korean national government looks confused between collective intelligence and citizen-government governance, thereby missing important values that the wisdom of crowds creates. Solving public problems is fundamentally different from finding a business solution. Collective deliberation over public interests mostly requires patience and pain from participants. Promoters of the Government 3.0 initiative do not consider challenges and barriers against efforts for collecting scattered intelligence; rather, they biasedly shed light on only opportunities from collective intelligence.

To address limitations of the national initiative and suggest further implications for improvement, this article discusses the following two issues: first, how does the Government 3.0 initiative ultimately influence participatory democracy (i.e., ideally all members of a population can make meaningful contributions to decision-making)? Second, what are pros and cons of efforts to gather collective intelligence via the Government 3.0 initiative? The rest of the paper is structured as follows: Section 2 explores the working definitions of collective intelligence and the concept in the context of the Government 3.0 initiative; Section 3 proposes a theoretical framework for analyzing participatory democracy; Section 4 discusses cases of the Government 3.0 initiative; and the final section addresses concluding remarks.

2. Background for Discussions

2.1. Conceptualizing Collective Intelligence

The term "collective intelligence" has been used in diverse contexts and, thus, its working definitions are various [8–13]. Among them there are common conceptual components. One of the key conceptual properties is heavy emphasis on the wisdom of crowds. In its colloquial usage, wisdom is not a neutral word in the side of its values. It seldom addresses negative and malicious ideas and thoughts, but it connotes positive and hopeful values in large. When people talk about the wisdom of crowds, it hints at a progress that leads them to a better, more desirable state than now. The wisdom that can lead to social development draws from processes for collecting scattered intelligence.

Second, collective intelligence conceptually guarantees independence and decentralization as the reason why the wisdom of crowds gathers, built upon a high level of democracy. A core assumption is that intelligence is everywhere and everyone can have intelligence [10]. The process that collects diverse ideas and opinions should depend on unbiased fair evaluation on the quality of those ideas and opinions. Decision-making based on structural elitism and political compromise does not promise a real solution of wicked problems. Although political compromise and negotiation oftentimes help settle pubic problems, elitism and stakeholder politics would fail if evaluation on ideas and opinions is truly open to all. Mature democracy requires citizens to have basic conditions of participatory democracy: political interests, political knowledge, and political efficacy [14–17]. For collective intelligence, an individual citizen should have keen attention to social issues, sufficient knowledge and

experience for deliberation and discussion, and efficacy as a feeling that his or her participation will result in contributing to himself or herself and the entire society. Only when owning these conditions as an individual citizen, he or she can have independence of reasoning and suggest an idea for a society with his or her free will [16,18].

Third, ICTs have played a vital role to raise the feasibility of collective intelligence. As one can think of arena discussion in ancient Athens as the oldest process to collect wisdom that individual citizens have, collective intelligence is not a novel concept created recently. Nonetheless, with the help of ICTs, today's public has become more interested in social issues and are able to more efficiently and effectively take part in discussing the issues than ever. Especially, Web 2.0 (with respect to social media and social networking sites) in a recent decade has dramatically enhanced accessibility to, and convenience in, processes to collect intelligence. Like this, technological advancement has successfully driven the creation of collective intelligence in an efficient and effective way.

Finally, the term "collective" connotes "selective" as a subsequent process after collecting scattered wisdom. Collective intelligence implies that spontaneous ideation naturally selects a better idea. Presuming the presence of a certain group that can make a better idea lies against the original spirit of collective intelligence. That is no different from elitism. If scattered pieces of wisdom are collected, the best intelligence would look conspicuous in a community for ideation warranting participatory democracy. The ideation community, which is hard to define, is not a specific formal group but rather a more spontaneously self-organizing gathering online and/or offline. Collection necessarily means selection by various participants.

2.2. Collective Intelligence in the Government 3.0 Initiative

As shown in Table 1, the Park Geun–Hye administration in Korea promotes the Government 3.0 initiative for public sector innovation on the side of transparent government, competent government, and service-oriented government. Collective intelligence is related to the strategy for citizen-government governance in transparent government.

Table 1. Government 3.0 strategies.

Visions	Strategies
Transparent government	Proactive disclosure of public information Private sector use of public data Citizen-government governance
Competent government	Inter-organizational collaboration Knowledge-based administration Big data-driven scientific administration
Service-oriented government	Citizen-customized services One stop service for entrepreneurs Enhancing accesses for the information poor

For the national initiative, citizen-government governance means collaboration across all policy processes with the help of the diversification of channels for participation online and offline. Table 2 describes information posted in the homepage of the Government 3.0 initiative [2]. This provides a background for discussing how the Korean government sees collective intelligence.

Among various viewpoints of critique, the priority issue for discussion is that the government fails to distinguish between citizen-government collaboration, citizen engagement, and collective intelligence. Even though these have overlaps, to some extent, and potential for mutual synergies, the pure meaning of collective intelligence should not intend that the government utilizes collective intelligence in its will and for its own purpose. A government agency may build and design a venue for collective intelligence in its own manner, but the agency would damage basic principles and virtues of collective intelligence if the agency intervenes in order to motivate participation and sets the ways

of participation in the venue. The term "citizen-government governance", which the government did not clearly define yet, could be defined as a mechanism where citizens and their government make a collaborative decision together in partnership. Collective intelligence originally means a phenomenon where the wisdom scattered across individual citizens with independence and autonomy is spontaneously collected without any leader (elite or external force). Even if a government may encourage and empower citizens to participate in policy processes through a good design of discussion venues and skillful moderation of discussions, its intentional intervention into participatory processes dampens the original virtue of collective intelligence.

Table 2. Citizen-government governance through Government 3.0.

Directions	*Diversifying channels for participation*
	● Activating participation offline and online
	● Reflecting various opinions
	Institutionalizing citizen-government governance
	● Specifying basic principles, supporting organizations, and strategies of citizen-government governance and citizen participation
Achievements	*Excellent cases*
	● Citizen concerns reporting (through the e-People homepage)
	● Citizen-driven crowd funding
	● Citizen-government joint policy workshop
	● Residential opinions pre-review
	Quantitative performance
	● Continuous increase in the number of online policy discussions (discussion cases, comments, and participating agencies)

The second point of critique is that the Government 3.0 initiative supposes the result of citizen participation as success. The quantitative increase of participation (the number of participants, the number of participation venues, and the frequency of participation), however, does not always guarantee a good result. The Government 3.0 initiative seeks to diversify channels for participation and draw opinions from various segments of a population. If so, would the government then be satisfied? Would participation guaranteeing inclusiveness and diversity enhance participatory representativeness in policy processes? Would the consequence of such participation improve the quality of public polices and public services? Though there are no clear answers to these questions, the government seems to consider guaranteeing participatory inclusiveness and diversity as a magic bullet for confirming legitimacy of policy processes. If the government uses an idea that many citizens commonly propose for public policies, the policies would gain a greater level of legitimacy, compliance, and citizen satisfaction. Nevertheless, raising the level of inclusiveness and diversity in participation cannot always make sure of the best result—the creation of the best idea (intelligence).

Third, there is little evidence that such practices, as in Table 2, can be transferred to other local governments and ministries. The government should take an in-depth approach to the following concerns rather than blind benchmarking. What could government agencies learn from such benchmarking practices? How could the lessons from the practices be applied and generalized to different situations? While some agencies boast of their successful cases, others might regard posting the benchmarking cases to the government homepage as a tacit push that forces them to make good cases for Government 3.0. Success and failure of all policies and programs depend on their own particular contexts [19].

The fourth issue around the Government 3.0 initiative is how the government should evaluate success and failure of participation. Does success mean activating an arena for participation by many citizens? How can the government prove that a collective product would make a significant contribution to improving the quality of policies and services? If it is difficult to prove, can a mature level of democracy, in terms of participatory discussions, mean success? It is not easy for

the government to answer these questions. Since collective intelligence inevitably contrasts against expert-centered elitism [1], the lack of procedural rationality (participation lacking inclusiveness, diversity, and representativeness) cannot be compatible with substantial rationality (participation producing a successful result). Given open competition of ideas, collective intelligence can, supposedly, be not just "procedurally rational" but naturally "substantially rational". For example, open-source software supposes that not one, but many, have a precise eye detecting a bug in software. However, solving public problems is not the same as solving technical ones because procedural rationality in public affairs does not always warrant substantial rationality. The ideal logic of collective intelligence for ideation may not work for addressing public problems.

Finally, quantitatively gauging collective intelligence seems less meaningful than qualitatively reviewing the performance in depth. In Table 2, the incumbent administration recognized the year-by-year increase in online policy discussions as an achievement of Government 3.0. Does the rise in the frequency of online discussions imply the potential creation of collective intelligence? Collective intelligence should be reviewed not by simply measuring the frequency of comments and the number of participants, but by evaluating substantive effects on polices and services.

3. A Frame for the Analysis: Four Aspects to View Citizen Participation

Since citizen-government governance, as one of the focal points of the Government 3.0 initiative, highlights citizen participation, this section discusses the relationship between collective intelligence and participatory democracy with a focus of the national initiative. Collective intelligence addressed in the initiative is analyzed in the following four dimensions derived from theoretical and empirical research: (1) motivation of participation; (2) purpose of participation: (3) player of participation: and (4) arena of participation.

3.1. Motivation of Participation: Why Does One Participate?

Previous literature found amateurism (participation for leisure and hobbies) and altruism (participation for contribution to society) as major motivators for participation in collective intelligence [20–26]. These two mechanisms for motivation are not necessarily exclusive but, rather, oftentimes appear simultaneously. Other reasons include external motivation, such as materialistic incentives and career development [27], and human relationships [28]. Motivated by these factors, semi-professionals (so-called amateurs) take part in developing open-source software. In this case, ideation of semi-professionals may outperform elitism based on professional expertise. However, interests in public affairs are disparate from those in product design and software development. If a government wants to know the determinants of diversity and activeness of citizen participation in collective intelligence, it should take a close look at substantive reasons of participation in public matters.

Many ordinary individuals that participate in a discussion for improving public services know about public services well because they have used the services for so long. They are willing to participate in the discussion without any external force and mobilization. Though they are not aware of the process through which the services are delivered and the amount of resources needed for the process, the fact that they are stakeholders and service users is, itself, meaningful for their participation. The participation, based on their efficacy, arises from a contribution to society and an expectation for raising the quality of their own life [14–17]. Individuals basically take part in discussions to improve their own life, but they do not join only for themselves. For citizens that invest their own time in discussion (consumption of time as an opportunity cost), enhancing the quality of their own life and improving their society and government are considered equally important. Amateurism and altruism, as motivation, can work for collective intelligence at the same time.

In line to this argument, the approach of the Government 3.0 initiative is misleading in the confusion between citizen-government governance and collective intelligence. One rarely participates in the governance mechanism to fulfill governance itself. His or her purpose is quite clear. Citizen

participation in collective intelligence is a manifestation and active expression of self-interest. This consists of the principle of liberal democracy in which pursuing self-interest results in promoting interests of the whole society. Both participating in a discussion and voicing out in a participation arena count on personal choice. Therefore, the process through which collective intelligence is converged among various opinions from diverse individuals should be considered a kind of collective choice. If citizens and government are not commonly interested in a certain issue (if they do not care about the issue that government sets as an agenda), they would not help organize and solidify the governance system. If the government mobilizes citizens with appeal to citizenship and public interests, participants would not likely be ordinary citizens representing diverse segments in a population, but rather civic activists with their special stakes. Overestimating individual commitment to public interests ignores a basic spirit of capitalism. Adam Smith said [29] (p. 16): "It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest". Like this, participation based on their regard to their own interest advances the interest of the society. Collective intelligence also draws from voluntary participation driven by their own interest, not by compelled governance.

Many governments foster various venues of citizen participation. However, citizens may feel that they are asked to participate in the venues to assist their government and collaborate on government workings. In the theoretical stance of public choice, all of the individual citizens and government bureaucrats seek their own interest, thereby advancing the interest of the whole society. That is the essence of capitalist principles. Collective intelligence is no different. Given an arena open to all possible ideas, the final result of discussion would be collective intelligence that can advance the interest of the society. Hence, a government should not use collective intelligence in order to legitimate policies that it bolsters. The government should make efforts to know why citizens participate in processes for collective intelligence.

3.2. Purpose of Participation: Participation for What?

The Government 3.0 initiative includes collective intelligence as a core strategy of transparent government. The term "transparency" is an ambiguous, broad, and unclear concept in both colloquial and academic usage. Government 3.0 in Korea mostly addresses transparency in terms of data (opening public data [30]) and information (disclosing public information [31]). The initiative, thus, aligns the operating definition of transparency to open data and the freedom of information.

However, there is an increasing confusion around the object of transparency, which means what should be transparent. As Table 3 shows, what one is aware of can be categorized as data, information, knowledge, or wisdom. These four concepts are hierarchically structured in terms of meaning and value. The transfer from data to information, to knowledge, to wisdom needs more human inputs and gains meaning, value, and applicability [32–34]. The reverse manner, from wisdom to knowledge, to information, to data, is characteristic of computer inputs, programmability, and algorithms. Transparency in terms of what should be transparent looks much clearer comparatively in data and information than knowledge and wisdom [32–34]. In the context of knowledge-sharing and collective intelligence, what does transparency mean?

The use of collective intelligence for a greater level of transparency is controversial to a considerable extent. Collective intelligence means the wisdom of crowds. The national government aims to gather collective intelligence in terms of policy processes (agenda setting, policy-making, and policy analysis and evaluation) and public service provision. If the wisdom is to know why (see Table 3), would the wisdom of crowds that the incumbent administration collects tell the government why? If not, the process for collective intelligence driven by the government is failing to get the true wisdom from crowds. The government seems to assume that transparency in the processes of collective intelligence eventually make a good result. Citizen participation to collect the wisdom is meaningful only when a society gains substantial rationality by drawing the genuine wisdom from the process. Transparency in the process is only one of the mechanisms to bolster procedural rationality of

citizen participation. Simply enabling anyone to participate and see into the process does not create collective intelligence.

Table 3. The conceptual hierarchy of data, information, knowledge, and wisdom. (Source: Ackoff [32], Rowley [33], and Zeleny [34].)

	Key concepts	Terms in Government 3.0
Data	• Know nothing • Symbols representing properties of objects and events • Products of observation	• Open data
Information	• Know what • Data processed to be useful • Answers to who, what, where, and when questions	• Freedom of information
Knowledge	• Know how • Application of data and information • Answers to how questions	• Knowledge-sharing through collaboration
Wisdom	• Know why • Evaluated understanding of knowledge	• Collective intelligence through citizen-government governance

The government needs to diagnose whether the processes for collective intelligence stay in sharing information and/or knowledge (not going forward to creating wisdom). Hyper-optimism makes one expect that exchanging necessary information, collaborating on a common purpose, and sharing knowledge derived from the collaboration will ultimately create wisdom to solve public problems. However, the wisdom lies beyond knowledge sharing. It is an evaluated understanding of knowledge, as described in Table 3. Collective intelligence requires mutual understanding and evaluation of the knowledge. The wisdom of crowds relies on discussion by those with knowledge. It is not a product easily made by casual talks. The result of the processes for collecting intelligence is considered rhetorical, such is the wisdom of crowds, but many of the ideation practices are far from competitive among selected pieces of knowledge. If the mechanism for collective intelligence does not go beyond sharing information and knowledge, the government would fail to acquire the wisdom from crowds.

3.3. Player of Participation: Who Participates?

Academics have applied "participation by whom" as a criterion to evaluation of citizen participation, chiefly focusing on three concepts: inclusiveness, representativeness, and diversity [35–39]. Inclusiveness, as an antonym of exclusive participation, implies that every citizen should have an equal opportunity to have an influence on the whole process of policy-making. Representativeness means that all groups, segments, and classes of a society representatively take part in policy-making. Diversity, distinguished from proportionate representativeness, is a normative condition that policy-making should open to various opinions whether a group belongs to a minority or a majority.

The three conditions are not easy to achieve. Having equal opportunities is not equivalent to enabling equal participation. Evaluation on equal opportunities may be quite subjective. This is called "politics of recognition" [40]. In spite of institutional support for equal opportunities, those who have not participated in policy-making tend to think that they do not have equal opportunities for participation. It is also difficult to guarantee inclusive participation. Failure in moderation of discussion can often make recognition of less equal participation. Intervening moderation enforces inclusiveness of participation but impedes autonomy of collective intelligence.

Theoretical discussions on participatory democracy and deliberative democracy have addressed representativeness as a vital condition of political participation. Habermas stressed wealth and education as basic conditions of deliberative democracy in modern Western Europe [41]. Participants in deliberation belong to the bourgeoisie, who have wealth and education as a foundation of autonomy

from their state. Many academics apply this criterion to cases of collective intelligence, but a common finding is the likelihood for the better-educated and affluent to over-represent the population in advanced countries [42]. In reality, both offline and online political participation support their dominant status.

Nevertheless, their participation is still necessary for direct democracy. Digital democracy has a mobilizing effect, by which the Internet encourages and empowers political participation of those who have not participated in the existing mainstream democracy, but the newly-mobilized participation may not guarantee a positive result. One example was an open participation experiment in national agenda-setting in the very first month of the Obama administration. Many U.S. citizens posted their own ideas for national agenda-setting to the White House homepage. The top ranked agenda was, surprisingly, marijuana legalization, while the second one was economy and employment. No one sees this result as the collection of sound ideas drawn from the U.S. middle class. The lesson is that opening for all might result in opening for weirdness, nonsense, and threats to a society.

Though Habermasian antecedents—wealth and education—of citizen participation are pivotal to deliberative democracy, not all discussions require deliberation and, thus, wealth and education as conditions for autonomy from the state. The quality of participants is relative to the types of democracy. In this sense, simple representativeness can be considered more important in improving public service delivery. For that, professionals in each policy domain make efforts to improve services with their expertise, but ordinary residents put their ideas to participatory mechanisms with their own feelings and recognition of the services they used. In this case, immediate sense and feeling can be more important than deliberation. Collective intelligence is also useful not only for reasoning, but for wisdom in the emotional and sensual dimension. Brabham found that crowd-sourced advertisement gained more attention from customers than did one made by experts on New York's Madison Street [27]. In line to this example, a government can derive wisdom from the collection of ordinary citizens' feelings and senses to improve public services in the citizens' eyes.

Excessive diversity on the side of opinionating does not always create a good result. Too many ideas increase the cost of collecting intelligence scattered across the population. A problem is that no one knows a priori how diverse is diverse enough and who belongs to those with necessary diversity. Both mass participation (random selection of ordinary citizens) and activist participation (dominant participation by civic groups with causes) may often fail to collect intelligence.

3.4. Arena of Participation: Where Does One Participate?

Where one participates is a key issue in the public sphere, the concept that Habermas devised as an arena of public deliberation [41]. Between the late seventeenth and the early eighteenth centuries, the public sphere meant voluntary meetings of bourgeois citizens for liberal discussions of politics, arts, culture, and society prevalent in Great Britain, France, and Germany. Habermas named the historical process of re-feudalization as structural transformation of the public sphere, by which it comes to lose its original function as a critique of politics in the infiltration between the state and a civil society by modernization. Today's arena for citizen participation that a government provides is not a true public sphere, but rather a manifestation of demonstrative publicity. Individuals in such a pseudo-public sphere mobilized for the demonstrative effect are not organized as critical participants, and the quality of their critique unavoidably falls down.

This view can be regarded as too strict a criterion. However, pseudo-participation for demonstrative publicity lacking critical audience recurs in contemporary empirical evidence. Hindman [42] pointed out that many cases of online participation are not as democratic as people expect. When a government predetermines an agenda, and discussion proceeds, the result of the discussion depends on the setting. Exclusively using particular websites and platforms enables someone's participation, but disables others'. For instance, when a government listens to comments on Facebook as a main channel of social media, it does not include non-users of Facebook in the social media audience. Whether online or offline, arbitrarily creating the public sphere where collective

intelligence draws from may hinder the productive critique of government workings, or such a pseudo-public sphere made by a government may amplify pro-government opinions of certain groups or segments. Compared with a pure meaning of the public sphere, collective intelligence through citizen-government governance sounds like a paradoxical and oxymoronic phrase.

Notwithstanding, contemporaries cannot help but accept the existence of demonstrative publicity. If so, citizens would have to make their own voices in the arena that a government provides. Those who have expectations and efficacy of participation should raise the following questions: Does a voluntary discussion by an association of some individuals deserve keen attention from other citizens? Unless a government succeeds in bridging (connection between groups) among discussion groups with strong bonding (solidarity within a group), would it create collective intelligence rooted in inclusiveness, representativeness, and diversity of participation? To what extent does a government policy reflect collective intelligence derived from online discussions? Can anyone express his or her own ideas without any limit in the government-held discussion? Is the participation in the government-held discussion the fast way for civic inputs to public policy? Does using mass media and the Internet as incarnations of demonstrative publicity influence the effect of participation? A government should discuss these questions in depth.

An accumulation of empirical evidence has shown advantages and weaknesses of the online public sphere by comparing between the online and offline public sphere [43–49]. With favorable conditions (e.g., a clear agenda and seamless communication), online discussion can be more efficient in time and cost than offline discussion. However, a discussion based on face-to-face interaction has its own merits. Important is what kind of public problem is being discussed. The pattern of discussion and communication, the organization of the public sphere, and the attitude of participants depend on what kind of public problem people discuss.

Fans of the online public sphere believe in equalization in the socioeconomic status of participants [44–51]. Empirical studies revealed that an increasing number of online participants belong to the lower level of household income and education. Here is a caveat: equalization in the socioeconomic status of participants in the online public sphere is one thing, and guaranteeing the quality of collective intelligence is another.

4. Cases of Citizen-Government Governance

This section discusses five ongoing cases in the aspect of the aforementioned criteria. Table 4 summarizes the cases. The Government 3.0 committee introduces the following cases as early successful practices of collective intelligence.

Table 4. Cases of citizen-government governance.

Case	Motivation of Participation	Purpose of Participation	Player of Participation	Arena of Participation
Road Inconvenience Reporting App	• Enhancing the quality of life • Altruism	• Improving services • Information sharing	• Any citizen (drivers and passengers)	• Smart phone
Citizen Concerns Reporting App	• Enhancing the quality of life • Altruism	• Improving services • Information sharing	• Any citizen	• Smart phone
Citizen Safety App	• Enhancing the quality of life	• Improving services • Information sharing	• Any citizen	• Smart phone
Citizen Auditing App	• Justice	• Improving a society • Information sharing	• Any citizen	• Smart phone
Online Policy Discussion	• Policy efficacy	• Improving policies • Sharing knowledge and wisdom	• Any citizen	• Homepage

4.1. Road Inconvenience Reporting App

The Ministry of Land, Infrastructure, and Transport (MOLIT) developed a GPS-based smartphone application for road inconvenience (e.g., pothole, crack, and overhead drops) reporting. Previously, road users mostly reported their inconvenience to the police, but police officers are not in charge of taking this task as a priority because their priority mission is not to care about road inconvenience. Road users are not aware of who they report to. The Road Inconvenience Reporting App is a consolidated channel for the reporting across geographic jurisdictions, and it pinpoints the precise location of inconvenience. Requesting a government to care about individual inconvenience in using public goods, such as roads, ultimately enhances the interests of a whole society. The more reports of road inconvenience the government receives, the higher the quality of the road and the level of road infrastructure become. The decrease in the number of traffic accidents lowers social costs and administrative costs for responding to citizen complaints.

However, unless reporting itself entails idea creation, the app cannot be considered collective intelligence. The app does not go beyond an efficient tool for collecting complaints and concerns about roads, and it does not go forward to a venue that collects ideas for improving roads. This is the misunderstanding of a government that more participation in any area will create collective intelligence.

4.2. Citizen Concerns Reporting App

The Ministry of Interior (MOI) is operating a smartphone app through which people can report daily inconveniences, such as street light outage, pothole, street cleaning, illegal parking, etc. MOI can know where the report was made through GPS, and then a jurisdictional government agency in charge can immediately care about the concern. Anyone can upload photos and short movie clips of the spot on the app without personal verification.

Despite its expandability, the app is not free from the concern about the digital divide, especially the usage divide. Only some can use the app. There is an external positive effect because the reporting of some users gives others benefits and, thus, increases the interests of the society. However, this also ends up with the collection of citizen complaints without proposing ideas for improvements. The use made by limited segments of the population fails to reproduce the efficacy of participation.

4.3. Citizen Safety App

The Korean National Police Agency provides the system of sharing safety information through citizen participation. Closed-circuit television (CCTV) and street cameras have played a crucial role to enhancing security. Residents may have important information in their smartphone and automobile camera (so-called black box). The police, alone, cannot solve security problems. For scientific investigation and prevention, it gathers and analyzes all of these pieces of security-related, visual information that citizens own.

Is this kind of information gathering collective intelligence? An insight can arise from fragmented pieces of information, and professional analysts can solve a criminal case with the help of insight. However, a critical clue can be a single important piece of a photo or movie clip, not a collection of many individual reports. If so, can we say that there is any collective intelligence? This app is efficient and effective for sharing visual information between citizens and the police, but this is significantly below what collective intelligence implies.

4.4. Citizen Auditing App

"Let it be" is never a solution to public problems. Citizens may see various kinds of seemingly illegal activities around their daily life (e.g., restaurants not posting the information about where food materials come from, neighbors dumping garbage out of trash cans, individuals selling and/or purchasing medicine out of drugstores, university laboratories neglecting regular safety checks,

construction fields that do not post safety notices, etc.), which are difficult to be reported to the police because these are not obvious crimes. Letting it be increases negative externalities, and the whole society inevitably takes the damage. The Citizen Auditing App was launched for such reporting.

Whistleblowing by internal members can be considered the most effective way to find corruption in organizations and societies. Even though reporting from a certain inside person can advance the interest of the whole society, this kind of activity cannot be regarded as collective intelligence. Citizens assist their government in that they do what a government should do, and this can be considered as citizen-government governance. Yet, this is not the case that many citizens collaborate on a common issue to solve wicked public problems.

4.5. Online Policy Discussion in the e-People Webpage

Sinmungo (Big Drum), the system of handling complaints against the government from the fifteenth to the nineteenth century, was the first step towards giving the people a say in government affairs. It was reborn as the e-People homepage [52] by integrating all channels of administrative organization to the people to upgrade the whole function of administrative judgment and corruption reporting, as well as petition, proposal, and policy discussion services. Especially, the channel for policy discussion deserves attention. The national government uses it as a tool for direct democracy. This enhances procedural democracy by taking participatory processes as important.

However, the online policy discussions in e-People have not concluded neatly. The discussion channel is advantageous for in-depth discussion of issues pertinent to the whole nation, but the government should know the difficulty in confirming substantial rationality in these kinds of discussions. Instead, participants feel policy efficacy, through which they expect that public policies will reflect their participation in policy-making processes.

5. Further Discussion and Concluding Remarks

This study casts the following implications to national initiatives for government-driven participatory democracy, like Government 3.0. First, a government should clarify why it collects intelligence scattered across the population. Government 3.0 in Korea aims to promote transparency, for which the national government uses collective intelligence through various mechanisms of citizen-government governance. However, a government-driven or government-intervening process loses the genuine meaning of collective intelligence. The label "citizen-government governance", itself, is not basically consistent with autonomy and independence as the original spirit of collective intelligence. What transparency in Government 3.0 means may help improve procedural rationality, but it is not directly related to substantial rationality. Many participate in improving public services via online and mobile vehicles, but citizen engagement is not, per se, a creation of collective intelligence through participatory democracy. Though one expects that sharing information from participants increases efficiency and effectiveness of public services, he or she cannot assert that this kind of information sharing is ideation, strengthens mutual trust and partnership, and enhances participatory democracy.

Second, opening an arena for discussion does not warrant that the final fruit of discussion will end up with collective intelligence. The performance of participatory democracy is evaluated in a set of various criteria. Inclusiveness, representativeness, and diversity are only some of the criteria, and satisfying these criteria does not guarantee a collective conclusion as the best solution. Instead, the efforts to make the process of discussion the best may raise the likelihood for the discussion to end up with the best result. Collective intelligence cannot be a result of mechanical processes made by mobilized participation.

Third, a government should select and pay attention to one critical wicked problem among others, for which it can derive collective intelligence from the population. Not all wicked problems are solved by ideas from the crowds. A government needs to dig out the areas where collective intelligence is possible and probable. This requires scrutiny.

Fourth, a government should research and analyze various levels and patterns of citizen participation. It should know who participates, why they participate, where they participate, and what they create. If its role is to induce substantial and active participation, knowing how to mobilize citizens, what kind of insights it needs, and what kind of arenas they prefer enables the effective design of the public sphere. There are two different kinds of civic inputs: inputs for public services and inputs for public policies. A government can take two different approaches. The latter requires more sophisticated attention than the former.

Finally, a government needs to clearly notify citizens of how public services and policies reflect collective intelligence. Collective intelligence echoes in the digital sphere with the perception that participation helps raise the quality of life; whereas, the use of collective intelligence as a tool to legitimate the government's decision and judgment distorts ideals of participatory democracy. Additionally, it is not desirable to boast of the fact itself as performance and/or achievement that a government opens an arena for discussion.

Conclusively, this study, focusing on the case of Government 3.0 in Korea, argues that collective intelligence is not the output made from mechanic processes but rather the result painfully gained by collective deliberation. In the age of digitization in citizen-government governance, a government seems to under-evaluate difficulties inherited in collective efforts for participatory democracy. It is time to reconsider what the role of a government in participatory democracy should be.

Conflicts of Interest: The author declares no conflict of interest.

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