Article

ABC as a Multi-Lens Sustainability Reporting System in Smart Cities

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Abstract: There is a very short list of theoretical and empirical studies on the role of management accounting tools in the sustainability of smart cities. While the majority of these studies have addressed this role from the perspective of openness, participation, and hybridisation, others have addressed it in terms of economic, social, and environmental sustainability. Despite their early efforts often focusing on institutionalisation and governmentality processes, their analyses did not address how management accounting tools can be used to achieve sustainable goals, particularly in developing countries with a political and cultural character. This study aims to explore how an activity-based costing/ABC system is configured within urban development organisations to internalise cultural and political sustainability values at the smart city level. It applies a politico-cultural model and uses a case study approach from an Egyptian state-owned smart city enterprise. The findings reveal smart city culture and political/government compliance in the implementation of the ABC system, enabled by enterprise resource planning/ERP technology, within state-owned enterprises/SOEs. This system, seen as an emerging field, was created as a multi-lens reporting system on their political and cultural sustainability in smart cities. While political sustainability refers to SOEs' compliance with the ABC system, cultural sustainability refers to the embodiment of national smart city values in their system implementation. This sustainability costing system of a political and cultural nature has also created recursive dynamics, exemplified by the powerful role of ERP-ABC reports in making participatory sustainability decisions at various organisational and governmental levels for smart cities.

Keywords: smart cities; sustainability reporting; activity-based costing; culture values; compliance

1. Introduction

Much has been written about smart cities in the past two decades e.g., [1–5], defined as the "modern paradigm" of urban management and governance that internalises early participatory and multi-level practices of accountability and sustainability within urban organisations. Despite the multiplicity of theoretical and empirical perspectives on "the idea of" smart cities [3,6,7], there is "no agreement" in the existing literature on the enduring concept, dimensions, variables, and practices of smart cities, which vary from sustainable development contexts to contexts based not only on highly investigated economic, social, and environmental conditions [5] but also on political and cultural values. The sustainability cognition of smart cities is seen as a collective set of technology-mediated urban development activities/projects through which multi-level actors/parties (such as central governments, city councils, and sustainability organisations) ensure a dignified life for citizens [8]. As argued by Ferraris et al. [1], the urban sustainability of smart cities is viewed through the lens of "opening up" public government services to citizens, by

removing barriers to innovation and entrepreneurship. While Vilajosana et al. [5] view smart city sustainability as a self-sustainable operating model based on big data flows, Secinaro et al. [3] view it from a "hybridisation" perspective where the performance of smart cities is assessed through inter-institutional collaboration between different actors, networks, and levels. As such, another paper by Secinaro et al. [4] sees smart city initiatives as a hybrid model of sustainability management and accountability. Public service organisations can benefit from "hybrid solutions" to manage smart city sustainability activities. In line with this, Lebrument et al. [2] see "participation" as a smart city sustainability activity or variable where sharing political efficacy, public administration satisfaction, and a sense of belonging are seen as drivers of citizens' intention. Although these studies have provided useful theoretical and empirical frameworks about the purported relationship between smart cities and urban development that often manifests itself in various elements of sustainability such as participation, openness, and hybridity, or at best such as economic, social, and environmental sustainability, their early-stage analyses did not address the potential implications of accounting (especially management accounting techniques) in recognising this relationship between smart cities and sustainability.

Few smart city accounting and reporting studies have emerged, but they mainly focus on non-financial sustainability governance and financial management issues within urban organisations and possible solutions. Among other scholars in other contexts, focusing on smart governance in the Egyptian city council context, Alsaid [9] addresses the hybrid role of sustainability performance measurement that combines social and economic indicators into a single procedural protocol. In the same context, focusing on the institutional dynamics of smart cities, Alsaid [10] examines the powerful role of multi-level management accounting techniques, namely sustainable ERP. From the institutional logics perspective of the smart water project in Egypt, Alsaid and Ambilichu [11] explore the influence of field-level institutional pressures on the implementation of a sustainability performance measurement system in a hybrid social enterprise. Although these and some other recent studies e.g., [12,13] have provided early theoretical and empirical analyses from various smart city sustainability contexts, their analyses were less in-depth and concerned with the "political" and "cultural" sustainability of national smart city projects and their combined influence on shaping cost accounting and management systems within urban organisations. These studies have only reported the operational issues of smart city management, accountability, and governance. The majority have only analysed "opportunities" and "challenges" in smart city governance and sustainability management within organisations. These early studies were limited to studying economic and social sustainability policy and smart city environment management using specific accounting and control techniques, e.g., benchmarking, emissions disclosure, economic disclosures, environmental sustainability, and climate change adaptation [13]. At best, few have analysed the role of management accounting in the emerging field of smart city/governance [12], but they have focused on the conflicting (in-tension) role of performance management and measurement in smart cities. These early-stage studies were also conducted in 'non-compliance' contexts with smart city sustainability reporting.

From the above, the present study contributes to this emerging literature and field of smart city sustainability reporting. It aims to explore the cultural values and political compliance of smart cities in the emerging implementation of a cost-based sustainability reporting system, known as the ERP-ABC system, within urban organisations. In this theoretical sense, the study fuels the existing literature by exploring not only the influence of multicultural smart city values on ERP-ABC implementation within an urban organisation but also exploring compliance with cost-based cultural sustainability reporting in participatory urban policy making at various city and organisational levels. In an empirical sense, it feeds into the aforementioned literature on the political and cultural dynamics in ERP-ABC system implementation within a smart city organisation, exemplified by the 'unintended' emergence of cost-based cultural sustainability reporting in the context of a developing economy and intense pressure for political compliance, Egypt. Taken together,

the overarching research question is: How has the ERP-ABC system played "multiple roles" within urban organisations in the political and cultural sustainability of smart cities? To better understand the two smart city sustainability elements (political and cultural) presented in this study, the main question is divided into two distinct but inter-related sub-questions. The first is: How has the ERP-ABC implementation within urban organisations become a multicultural value in the sustainability of smart cities? The second sub-question is: How has compliance with cost-based cultural sustainability reporting played a political role in shaping participatory decisions at various city and organisational levels? As analysed below, the rationale for this is that after the sustainable development goals/SDGs, the state government has forced smart cities to report their sustainability costing activities. The ABC appears to be an appropriate tool for reporting smart city sustainability cost activities and analysing the cost-per-activity movement. Therefore, it was curious and interesting to find out what is unknown about how management accounting tools can be used on a larger scale at the SOE level to achieve sustainable goals, particularly in Arab Spring countries such as Egypt [14], which experienced a revolution about 10 years ago.

This study applies Hofstede's [15] political cultural model to explain the multiple roles of an established ERP-ABC system and related cost sustainability reporting in smart cities. As mentioned above, the previous literature has revealed 'limited' theoretical and empirical analyses of smart city sustainability reporting. Most of the previous studies have presented their analyses based on the frameworks of institutional theory [9,10], institutional logics theory [11], and governmentality theory [12]. Although these studies have provided useful accounting analyses of smart cities, their early analyses did not address the emerging field of cost-based political cultural sustainability reporting within smart city organisations, which are currently characterised by multiple cultural values and compliance with cost sustainability disclosures in developing countries compared to developed countries. With Hofstede's [15] political cultural model, the present study extends previous analyses with other angles of smart city sustainability reporting. This specific model helps consider the multiple roles (herewith cultural and political) that activity-based cost sustainability reporting (ERP-ABC reporting) plays in shaping smart city decisions within urban organisations operating under the state's military leadership and support as in the case of Egypt (see below). Compared to the above frameworks, Hofstede's [15] political cultural model also establishes the theory's assumption of "political power", which manifests itself in "compliance" with cost-based cultural sustainability disclosures, as analysed below. Within this compliance, multiple cultural values [15] have emerged in the implementation of the case company's ABC system, reflecting the political and cultural dynamics of the organisational reporting system. As below, compared to previous frameworks, multiculturalism and political power/compliance [15] help us to understand the multiple roles of cost sustainability reporting in improving the transparency of city markets, gaining legitimacy for city funders, and fulfilling the social expectations of investors, regulators, and other stakeholders.

This study uses a qualitative single-case study methodology. Most of the previous studies have focused on applications of quantitative methodologies and analytical methods, as evidenced by content and regression analyses [8]. This is in line with Grossi et al.'s [16] call for the importance of broadening existing smart city analyses using more case studies. The present study adds another interpretive case study to the literature and analyses, examining smart city reporting in its natural situ. With a state-owned urban enterprise (hereinafter referred to as YOU for the sake of confidentiality) in Egypt, data were mainly collected from semi-structured interviews. YOU is a leading urban company appointed by the state government to implement smart city sustainability projects across Egypt [14], including smart healthcare, smart water, smart electricity, and more. As below, YOU has been influenced not only by the smart city cultural values of ERP-ABC's internal application but also by compliance with cost-based cultural sustainability disclosures that have played a powerful role in shaping its political decisions (e.g., smart service pricing) and urban developments.

This study fuels the literature with additional findings and implications. As below, and in line with Hofstede [15], the case findings reveal the multiple roles (political and cultural) of the ERP-ABC system within urban organisations in smart cities. While the ABC system achieves cultural sustainability by integrating smart city cultural values into existing cost management practices, it also achieves political sustainability by complying with cost sustainability reporting in participatory urban policy making at various levels of smart cities. This has established the dynamics between cultural values at the (macro) smart city level and the (micro) implementation of the ABC system within urban organisations. This is consistent with Zanellato and Tiron-Tudor [17], who advocated Hofstede's [15] cultural values in the application of non-financial sustainability reporting in European SOEs. The present findings also show compliance with smart city reporting, which is exemplified by cost sustainability reporting of a political and cultural nature in the Egyptian context. This political compliance/requirement has led to the unintended implementation of the ABC system within urban organisations so that they can disclose activity-based cost information for sustainability activities. Although this is in line with Alsaid [10] advocating the importance of embedding political dynamics in smart city performance measurement analyses, these early analyses from the Egyptian context fail to address political power/compliance and cultural values as a matter of national sustainability [16] in the emerging field of smart city reporting. Furthermore, compared to the previous literature, the case findings reveal recursive dynamics, exemplified by the political role of cost-based cultural sustainability reporting in shaping decisions within urban organisations. This agrees with Cohen and Karatzimas [8], who support the importance of smart city reporting in urban planning and development decision making and the positive impact of these reports in opening a strong accountability channel for "dialogue" between smart city organisations and stakeholders from funders, regulators, and investors.

The rest of this study is structured as follows: Section 2 explains Hofstede's [15] theoretical model and Section 3 explains the methodology. Section 4 analyses the findings and Section 5 discusses them with the literature. Section 6 concludes this study and opens up future research proposals.

2. Hofstede's [15] Political Cultural Model

This study adopts the theoretical model and values of Hofstede [15]. Despite the multiple applications of this particular model in accounting research [18], the present study applies this model in the emerging field and literature of smart city sustainability reporting. As shown above, most of the previous frameworks have addressed the issues of smart city management, accounting, and governance from the perspectives of institutions, institutional logics, and governmentality. To extend these earlier analytical views, this study addresses "cultural multiplicity" and "political compliance", proposed by Hofstede [15], in the emerging implementation of an ABC system within an urban organisation. Compared and contributing to previous smart city analyses, Hofstede [15] adds two analytical dimensions: cultural values and compliance. As Hofstede [15] has argued, the theoretical underpinnings of these cultural values have been established and solidified on the basis of political leadership and compliance theory. This means that these two dimensions are 'interrelated', as shown in the case analysis below for ERP-ABC implementation. As analysed below, multiple cultural values have emerged in the implementation of the ERP-ABC system within urban development organisations to reflect smart city sustainability reporting requirements. Sustainability is achieved by internalising national smart city values in the selection of organisational systems. Meanwhile, political leadership and power dynamics have emerged in regulatory compliance with cost-based cultural sustainability reporting, which plays a powerful role in participatory urban decision-making processes.

Hofstede's [15] main theoretical dimension is the multiculturalism of organisational systems, which is manifested in multiple cultural values within organisations. Organisational culture, as defined by Hofstede [15], is the collective values of the mind that distinguishes members of one human group from another. Power distance is one of these

organisational culture values, meaning the extent to which organisational members are satisfied with the distribution of power in the organisation. There are two degrees of power distance: while a high degree indicates an equal distribution of power between different organisational structures and levels, a low power distance indicates an unequal distribution of power, which leads to conflicts within organisations. Individualism/collectivism is another cultural value that influences the formation of business philosophy within organisations. Individualism means that organisational members act through personal preferences, rights, and contracts with others and are likely to manage organisational profits for their personal interests. Collectivism means that organisational members work as a team that pursues the same business goals to achieve the social welfare of the different shareholders without conflict. Masculinity/femininity is also another cultural value, referring to a type of organisation in the selection of its operating systems. While masculinity refers to organisations in which competition, achievement, assertiveness, and material rewards for success are preferred, femininity refers to organisations that are most expressive of cooperation, humility, concern for the vulnerable, and quality of life. Uncertainty avoidance is another value to consider when choosing operating systems within organisations. It refers to how organisational systems respond to uncertainties in the surrounding environment. There are two degrees of uncertainty avoidance within organisations. A high degree of uncertainty avoidance means that organisations govern their internal systems with certain laws, regulations, and guidelines. Any change within these organisations is seen as a business risk and threat. From their business perspective, "what is different, is dangerous," and they are intolerant of unorthodox ideas, as Hofstede [15] argues. A low degree of uncertainty avoidance refers to adventurous organisations that treat change as an opportunity for development and improvement in their structures, systems, and practices. They are in a more flexible position where ambiguity tolerance is acceptable.

Another Hofstede [15] cultural value, which has also an influence on the choice of organisational systems, is the long-term orientation/Confucian dynamism. This refers to the business strategy when choosing operating systems within organisations: long-term or short-term orientation. Long-term organisations adopt a more realistic and future-oriented approach in implementing their systems and structures. However, short-term organisations maintain traditional systems, practices, and norms while viewing societal change with suspicion. The last cultural value of Hofstede [15] during the implementation of organisational systems is indulgence. It refers to the extent to which operational systems within organisations are implemented to meet employee requirements, social expectations, and decision-making processes. There are two categories of organisations: indulgent and restraint. Indulgent means that organisational systems allow the free gratification of human desires for the enjoyment of life and pleasure. Restraint refers to relatively restricted control by rigid social norms, which reflect the organisation's suppression of people's satisfaction. By relating these cultural values (above) to the case data below, these multiple values have been established and incorporated into the implementation of the ABC system within the case firm. It empirically appears that taking these cultural values into consideration has become one of the political requirements of urban sustainability in Egypt's 2030 strategic plan [14] for smart cities' governance, accounting, and accountability. The output of the ERP-ABC system is cost-based cultural sustainability reporting, detailing the operational costs of the sustainability activities the case company incurred to implement the post-revolution smart city projects.

In addition, Hofstede [15] distinguishes it from other smart city reporting analyses with compliance, which means the influence of political power and leadership on shaping operational systems within urban organisations. As Hofstede [15] has argued, organisations must comply with multiculturalism (mentioned above) in their operational systems to ensure political legitimacy and social expectations. This theoretical dimension reflects the (macro–micro) dynamics between enforcement regimes at the political and field level and selected practices at the organisational level. This also indicates recursive (micro–macro) dynamics, reflecting the powerful role(s) that organisational reporting plays in shaping

politically and culturally sensitive decisions [15], as illustrated below in the present case of participatory smart city decisions. As below, political power is seen in the compliance of SOEs (e.g., YOU) with cost-based cultural sustainability disclosures (ABC reports). With Egypt's 2030 urban development strategy [14], a new SOE regulation for non-financial sustainability reporting was launched in 2017, reflecting a new form of political and cultural dynamics in the country's new political and government leadership after the 2011–2013 revolution. Under this regulation, the state government has pressured smart city sustainability organisations, particularly SOEs (e.g., YOU) compared to others, to comply with the so-called "cost-based cultural sustainability reporting" regulation.

3. Methodology

This study adds another case study from a state-owned smart city organisation (YOU) in Egypt. The particular choice of the Egyptian urban development context resulted from the recent smart city projects adopted by the state government after the revolution. These projects have been/are implemented not only based on the country's economic, social, and environmental aspects but also by keeping in mind the country's political and cultural values. The revolution was a "historic movement" [19] of the country's political and military leadership toward urban sustainability, which currently requires cost-based sustainability disclosures. This is seen as a stepping stone for urban organisations (e.g., YOU) to implement the ABC system of political and cultural character [20]. Compared to other smart city case studies/contexts, the Egyptian case/context witnesses "compliance" [21] with cost-based cultural sustainability reporting in Egypt's 2030 urban governance and accountability strategy [14]. With this, YOU—as an SOE—has implemented ABC's politically and culturally sensitive system of smart city cost sustainability reporting. According to YOU's [20] urban sustainability bulletin, cost sustainability reporting has played multiple roles and shaped participatory decisions at various city and organisational levels. As analysed below, ABC reporting is viewed not only as multicultural cost reporting but also as political sustainability reporting with which a company can comply with government legitimacy and social acceptance as an SOE. This reflects the multiple roles of the ABC system in achieving the political and cultural sustainability of the smart city.

At YOU, data were collected from semi-structured interviews (July–September 2022). This included four visits to the smart city case company, and 17 interviews were conducted with 14 key members in various executive structures and departments, focusing on those involved in implementing an ERP-ABC system as a political cultural sustainability reporting system. As shown in Table 1, this included the director of the board, the financial manager, two senior cost managers, two urban governance managers, the executive head of the ABC department, five ABC accountants, and two sustainability reporting employees. The board director, the financial manager, and the ABC head met twice. Four semi-structured follow-up interviews were also conducted online (January 2023) with the ABC head, senior cost manager, sustainability reporting employee, and ABC accountant, who had met previously. They asserted that no key data from the main physical interviews had been altered. Each interview took about one to two hours, depending on the daily workload. The majority of these interviews were recorded, and the language used was English. The categories of interviewees were public managers, former government officials, and politicians. Their smart city sustainability field experience ranged between 12 and 15 years, and their ages ranged between 40 and 56 years. Their academic and professional qualifications were often PhD (doctor of philosophy), MBA (master of business administration), and ACCA (association of chartered certified accountants). As shown in Table 2, one interview guide was used, but the way the questions were presented differed from interviewee to interviewee based on their different job roles and smart city accountabilities. This "multiplicity" [22,23] of the case company interviewees, roles, experiences, and qualifications largely served to avoid potential bias in their responses. In addition, to further enhance the validity and reliability of the above interview data, the opportunity was given to participate in some informal "side-by-side" discussions [23] with the executive members, during which they expressed

their appreciation for ABC's political and cultural implementation within the company as an SOE. Although these discussions were not allowed to be recorded, relevant notes were taken. After the board director's approval, two formal senior management "meetings" [24] were also attended and noted, where ABC-based sustainability reports were discussed, and relevant smart city cost management decisions were made.

As recommended by Parker and Northcott [22], the case study data were "manually" analysed. The rationale, compared to other possible qualitative analysis software (e.g., NVivo 12), was to avoid any misunderstanding of the interviewees' quotes and their exact meanings. As described above, potential bias was avoided through the triangulation/multiplicity of data collection methodological tools such as semi-structured interviews, informal sideline discussions, and formal senior management meetings. The analysis was processed in three inter-related stages. The first stage focused on (re)reading the data transcripts and (re)listening to the interview recorders to extract the main empirical issues/elements related to the main research question/sub-questions. Among others, as shown in Table 2, the most important issues were related to Egypt's 2030 urban strategy for smart cities; smart city sustainability activities; political support for city sustainability activities; smart city projects, costs, and financing; compliance with cost sustainability reporting; ABC as a reporting system on political and cultural sustainability; ABC reporting transition into sustainability reporting; and smart city cultural values YOU considers when implementing the ABC system to ensure political legitimacy and social expectations. The second stage clustered these issues in the form of a "tree coding" [23,24], categorised into two themes and codes, as shown in Table 2. The first theme, coded as CV, combined issues related to multiple values in the ABC cultural sustainability. These included ABC's ability—as a system—to evenly distribute organisational power among operational departments or the so-called "power distance" in the theoretical sense of Hofstede [15], ABC's ability to aggregate operational departments into a single procedural protocol for cost sustainability reporting (i.e., "collectivism"), ABC's ability to provide activity-based cost sustainability information for successful smart city decisions ("masculinity"), ABC's ability to avoid sustainability risks and threats in smart city activities ("uncertainty avoidance"), ABC's ability to provide long-term cost information for smart city sustainability activities ("long-term orientation"), and ABC's ability to satisfy employees and meet their business and welfare requirements within the case smart city company ("indulgence"). The second theme of the analysis, coded as PC, grouped empirical elements related to (known as Hofstede's [15] "political") compliance with cost-based cultural sustainability reporting in participatory smart city decision making. These included ABC's strong role in achieving smart city cost sustainability for public healthcare, human development, learning and development, infrastructure, scientific research, and eco-friendly activities. Then, together with Hofstede [15] and the literature, the third stage of analysis theorised the above themes/concepts into two different but inter-related roles for the ABC system in smart city cost sustainability. As linked in Table 2 and analysed below, the cultural role of the ABC system is represented by integrating the multicultural values of national smart city projects into the organisational implementation of the system. Its political role is to comply with cost-based cultural sustainability reporting in participatory urban policy making at various city and organisational levels.

Table 1. A glimpse of case study interviews and interviewees.

(14) Interviewees	Interviewees' Categories	Age	Academic and Professional Qualifications	Practical Experience	(17) Main Interviews (July–September 2022)	(4) Ex-Post Interview(ee)s (January 2023)	Interview Duration (F2F and Online)	Tape Recorded or Notes Taken
Director of the board	politician	56 years	PhD	15 years	2	-	1.30 h	noted
Financial manager	government official	54	MBA	12	2	-	2 h	recorded
ABC department head	public manager	53	CPA	11	2	1	1.30 h	recorded
Two urban governance managers	public managers	47–48	MSc, MBA	13–14	2	-	1 h/each	recorded
Two senior cost managers	government officials	49–50	PhD, ACCA	13–14	2	1	2 h/each	recorded
Two sustainability reporting employees	politicians	49–50	ACCA, ICAEW	12–13	2	1	1 h/each	recorded
Five ABC accountants	government officials, public managers	40–45	MSc, MBA, ACCA	12–15	5	1	1.30 h/each	recorded, noted

Table 2. Field elements with Hofstede's [15] theoretical themes.

Theoretical Themes [15]	Field Elements (Interviews, Discussions, and Meetings)
Multiple cultural values in the ABC application as a smart city sustainability reporting system (coding: CV)	CV1: Egypt's 2030 urban sustainability strategy for smart cities. CV2: Smart cities and sustainability activities. CV3: Political support for smart city sustainability activities. CV4: Smart city sustainability projects, costs, and funds. CV5: Compliance with smart city sustainability reporting. CV6: ABC as a smart city sustainability reporting system. CV7: ABC reporting transition to sustainability reporting. CV8: Smart city cultural values YOU should consider when implementing the ABC system to ensure government legitimacy and social expectations. CV9: ABC's ability to distribute organisational power evenly among operational departments (power distance). CV10: ABC's ability to collect departments into a single process for sustainability cost reporting (collectivism). CV11: ABC's ability to provide activity-based cost information for successful smart city decision-making (masculinity). CV12: ABC's ability to avoid business risks and threats in smart city sustainability activities (uncertainty avoidance). CV13: ABC's ability to provide long-term cost information for smart city sustainability activities (long-term orientation). CV14: ABC's ability to satisfy employees and meet their business and welfare requirements (indulgence).
Political compliance with cost-based cultural sustainability reporting in participatory smart city decision making (coding: PC)	PC1: SOEs' sustainability reporting with the above smart city cultural values as a political output of the ABC system. PC2: External pressures from smart city investors, regulators, and other stakeholders for cost-based cultural sustainability reporting. PC3: Compliance with politically sensitive cost-based cultural sustainability reporting. PC4: ABC-based smart city sustainability reporting formats. PC5: Sustainability cost activities in smart city reporting of a political and cultural nature. PC6: City public healthcare sustainability cost activity. PC7: City human development sustainability cost activity. PC8: City learning and development sustainability cost activity. PC9: City infrastructure sustainability cost activity. PC10: City scientific research sustainability cost activity. PC11: City eco-friendly sustainability cost activity. PC12: ERP-enabled ABC functionalities and reports on smart city sustainability activities. PC13: The cultural and political roles of multi-lens ABC reports in shaping participatory sustainability cost management decisions at various smart city and organisational levels.

4. Empirical Findings

4.1. Multiculturalism in the ABC Implementation as a Smart City Sustainability Reporting System

At YOU, the smart city cultural values have influenced the ABC implementation as a cost sustainability reporting system. The financial manager explained that YOU is a state-owned smart city enterprise, and ERP-ABC implementation is seen as political compliance by the state government. The political purpose of this government compliance is to improve the transparency of smart city sustainability reporting in response to the regulatory requirements of Egypt's 2030 urban governance strategy. With increased disclosure requirements for national sustainability and accountability bodies (e.g., investors, regulators, and financiers), and as an organisational attempt to gain legitimacy and social expectations, the company has implemented an ABC system taking into account the different cultural values of the national smart city project policies. These values, derived from national smart city cultures/principles in Egypt's 2030 government and political strategy for urban governance and accountability, are manifested in strength, integration, achievement, risk avoidance, long-term orientation, and employee enjoyment of the chosen operating systems and structures within smart city organisations. As the director of the board confirmed, these multiple cultural values of their systems and decision-making structures have been shaped due to their historical experiences in the emerging field of smart cities across Egypt. Since 2017, as an SOE, the company has been signed by the central government to carry out certain cost-sustainability activities to transform cities into smart cities. These politically and culturally sensitive activities, as analysed in Section 4.2, are represented by the case company's contributions to city public healthcare, human development, learning and development, scientific research, infrastructure, and the environment.

In this smart city context, apart from the technical functionalities of the ERP-ABC system, the ABC implementation has reflected Hofstede's [15] national cultural value of power distance within the case company. As the financial manager explained, for smart city governance and disclosure compliance, the ERP-ABC system not only integrated the departments involved in city sustainability activities within the case company but also integrated the company's senior management, local governments/city councils, and other accountability bodies. This new (cost-based cultural sustainability reporting) system constitutes a dialogue cost-accounting technique through which YOU can effectively manage the external and internal power dynamics between the various executive members of the company and the city. The ERP-ABC system is seen as a smart city sustainability reporting tool with which YOU can comply with cost disclosures for city sustainability activities. This reporting is a smart city governance tool through which different city members can assess the company's sustainability performance in new urban cities and related operational cost activities. YOU's smart governance manager agreed and added:

> ABC's implementation was compliance to improve the city's sustainability reporting system. This was not just to face government compliance for city governance but also to gain legitimacy and citizen acceptance. Using ABC, the company has established clear cost sustainability structures and practices for the various city and company members. In these dynamics, they have become business partners in a single sustainability reporting system, increasing power relationships in participatory urban decision-making.

These ABC dynamics have contributed to Hofstede's [15] collectivist cultural value implementation of smart cities. Prior to ERP-ABC, as a cost accountant explained, the company was producing stand-alone sustainability reports, which reflected total cost figures and aggregated analytics. With ERP-ABC, after complying with integrated sustainability disclosures in 2017, the company can measure and report activity-based sustainability costs for each smart city. Activity-based cost sustainability reporting has collectively linked the ERP-ABC system with the company and city executive members responsible for implementing sustainability cost activities in each city. This reporting has not only facilitated the collective work [15] of sustainability cost accountants but also increased the quality of

cost-based cultural sustainability disclosures that reflect the company's contributions to urban development values. A senior cost accountant said:

> Compliance with smart city reporting, enabled by ERP-ABC, has resulted in coordination between the different executive departments regarding the accounting method used to measure and analyse sustainability cost activities, rather than independent measurement and reporting practices as in the past. This has shown ABC's importance, as a collective reporting system that brings together various relevant departments and executive teams, in shaping participatory decisions within the company.

This successful ABC implementation has reflected Hofstede's [15] cultural value of masculinity within the case company to achieve smart city sustainability activities analysed below. At YOU, two cost accountants explained that with ERP-ABC, the company has successfully disclosed activity-based sustainability costs for each smart city as required by the government. This has had a positive impact on participatory decision-making processes by smart city investors, regulators, financiers, and other stakeholders. Therefore, the ABC implementation is seen as a source of success within the company for smart city governance, government legitimacy, and social acceptance. To illustrate, one sustainability reporting manager explained that the application of the ABC system is seen as a successful enterprise resource to monitor the cost-per-sustainability movement of smart cities. Through this, the company can identify which urban sustainability activities should be improved or removed in each city based on the needs of its citizens. During board meetings, the reporting manager added:

> In 2020, the annual cost-based cultural sustainability report revealed cost increases in public healthcare sustainability activity in New Cairo City. After investigation, the reason was that the company was providing large-scale foreign medicines to public hospitals in this city for free. After the company's agreement with the city government, low-cost local medicines were made available instead of expensive foreign medicines.

These ABC reports have helped avoid cost risks for sustainability activities in the uncertainty of the smart city, leading to Hofstede's [15] cultural value of uncertainty avoidance within the case company. A senior cost sustainability manager explained that due to the environmental conditions of some cities, a company's sustainability teams face uncertainty about whether they are implementing sustainability activities in these cities. This problem was exacerbated in the past by the inability of the old costing system at the time to provide detailed activity-based cost analyses and reliable sustainability performance measurements. This has largely imposed ambiguity around the company's sustainability investments and media decisions in the city. This shows that ABC adoption as the activity-based cost sustainability reporting system has revealed the company's ability to adopt a new organisational culture of smart city reporting, practically known as cost-based cultural sustainability reporting. The financial manager provided a working example that prior to ERP-ABC, YOU received a 2015 sustainability report that outlined some adverse environmental issues in some rural areas in New Al-Minia City. At the time, the company's sustainability teams were unable to resolve these issues and avoid the risks surrounding them due to a lack of activity-based sustainability cost information. Now, through ERP-ABC technologies, the company has the ability to reduce this business risk due to the measurability and readability of the cost drivers associated with its sustainability activity. This has avoided uncertainty about cost information related to the company's sustainability activities and investments in the smart city space. Another senior ABC accountant agreed, saying:

> With activity-based [ERP-ABC] analyses, YOU's investment in sustainability activities has jumped by about 13.8% in the smart city space. ABC provides cost movement details for each sustainability activity a company undertakes. ABC-based cultural sustainability reports have helped the company reduce business

risk and cost-information uncertainty related to smart city projects. This activity-based reporting has been a sustainable innovation not only to increase the city's investment in urban activities but also to meet the social and cultural expectations of citizens. This is done by providing sustainability activities and smart services to the public at the lowest possible cost.

With these emerging reports, in line with Hofstede's [15] cultural value of long-term orientation, YOU's organisational culture has become a long-term focus in national smart city projects and goals. The financial manager explained that with smart city cost sustainability reporting, ABC is viewed as a long-term cultural sustainability reporting tool. Before ABC, YOU's sustainability activities were focused on short-term cultural orientations in cities. This resulted in significant failures in urban projects. Through ERP-ABC and subsequent cost-based sustainability reporting reforms in SOEs, the company's sustainability activities have focused more on future public benefits and social expectations. During side discussions, another senior ABC manager agreed and added:

> ERP-ABC is not just an activity-based cost sustainability reporting system through which a company can evaluate the actual costs of sustainability activities at a smart city level. The ABC application's smart city cultural value also extends to providing decision-makers with valid estimates of the city's future sustainability costs. This helps key city and company members not only in participatory decision-making but also in sustainable cost management for the city.

This sustainable cost management, provided by the ABC implementation, is seen as an organisational culture mechanism for achieving employee happiness and well-being within the case company in line with Hofstede's [15] cultural value of indulgence. At YOU, a senior ABC accountant explained that with ERP-ABC, the company has given employees "bonuses" to encourage them to comply with this smart city cost reporting system as a new cultural sustainability practice. ABC has also given employees the opportunity to receive "training", an essential criterion for their promotions within the company. As the board director explained, choosing ERP-ABC satisfies executive members' desires and makes them happier compared to the old computerised sustainability costing system. Another ABC accountant added:

> With ERP-ABC, cost-based sustainability reporting is less difficult to comply with the multicultural values of smart cities. ABC accountants feel more comfortable with the sustainable ERP-ABC network than with the old standalone cost accounting system. There is no internal culture conflict around ERP-ABC implementation. This may be a strong cultural and political driver within the company for ABC's successful implementation of smart city cost sustainability.

Accordingly, as a smart city SOE, YOU's ABC system implementation has been influenced by the multicultural values and principles of national smart city projects. Within SOEs in particular, the ABC system is seen as a cost-based cultural sustainability reporting system. As analysed above, this led to a case of cultural dynamics between national/macro smart city values and the internal/micro implementation of sustainability reporting systems, structures, and practices within smart city SOEs as in the present case of YOU's ABC. This culturally and politically oriented system has brought multiple city and organisational members into a single procedural protocol for cost management and participatory decision making. Therefore, ABC is seen as an emerging field in smart city cost sustainability.

4.2. Compliance with Cost-Based Cultural Sustainability Reporting in Smart City Decision Making

Besides the above cultural role of the ABC system, the following is also an important political role, which is to comply with the presentation of multiple sustainability cost activities for participatory decision making, leading to Hofstede's [15] recursive dynamics at various organisational and city levels. At YOU, the financial manager explains that besides the cultural values mentioned above, there is another government compliance

with "certain" cost activities that the ABC system reports on the sustainability of smart cities. The ABC reporting reflects not only the smart city sustainability cost incurred by the company but also the difference in cost compared to previous periods, the so-called "cost movement". As explained by ABC's senior accountant, cost movement reporting is the state/city government compliance for SOEs (e.g., YOU) to assess not only the actual cost but also the long-term cost management of city sustainability activities. Apart from the ERP-ABC technical functionalities, public healthcare is the most important activity in the company's sustainability costing of smart cities. This cost activity of the ABC system reflects the company's contribution to the city's public healthcare sustainability. To clarify, the board director explains that in smart cities, the company measures its cost contribution to the public healthcare sustainability activity through its active participation in cultural campaigns nationwide, including Egypt's campaign to be free of C virus by 2030, the fight against COVID-19, medical convoys, and blood donation campaigns. During side discussions, the board director gave an example:

> . . . For example, YOU offered an antiviral product to public hospitals across cities for free and donated thousands of pharmaceutical products to manage COVID-19 patients in each city. The company has also participated in sending medical convoys to rural and low-income areas of urban cities and in blood donation campaigns in cooperation with city councils and the ministry of health and population.

Smart city human development is another ABC system sustainability cost activity within the case company. The ABC accountant explains that this sustainability cost activity reflects the company's contribution within each smart city to employee training and promotion, professional development, student training and empowerment, and technical education schools. YOU has established a human development centre in every smart city across Egypt. The political and cultural purpose is to provide the citizens of each city with appropriate training courses and workshops. During board meetings, another ABC accountant agreed and added:

> A number of educational programmes are offered to city employees, university students, and school students. These focus on developing their technical and professional skills through which they can gain a better understanding of the job market in their city.

Another smart city sustainability cost activity is the company's contribution to the learning and development activity. YOU's sustainable governance manager explained that besides the human development centre mentioned above, the company has set up another learning and development centre in each city funded by some non-governmental organisations. This sustainability (cost) centre provides city-level companies with high-level professional development programmes. It also extends to provide the city's companies and businessmen with appropriate advisory services. During side discussions, another ABC senior manager added that this centre strives to develop professional knowledge and skills among practitioners at the smart city level. Since launching the company's citywide professional development programme in 2020, more than 10,000 people from various cities and businesses have attended, and their professional certifications have been a step toward promotions in their companies. The financial manager supported this, saying:

> The learning and development programme, which is seen as a sustainability cost activity in smart cities, is ISO9001 certified. Compared to other programmes in cities, it covers a wide range of skills and experiences, from mechanical engineering and metallurgical sciences to human resources and marketing. This helps educate citizens in the many disciplines required in the modern smart city workplace.

Within the aforementioned cultural sustainability reporting, the ABC system has also embodied the smart city research sustainability cost activity. YOU's financial manager ex-

plained during board meetings that the cost content of the company's cultural sustainability reports also reflects YOU's efforts and the costs incurred to develop technology-mediated scientific research in each city. The company has established an advanced research centre in each city responsible for conducting financial market research. This research relates not only to the city's sustainable products and services but also to the information requirements of the city's stakeholders in the financial markets. This helps YOU to identify opportunities and challenges in the financial market and the best practices it adopts to deal with them. An ABC senior accountant added:

> The political and cultural purpose of establishing advanced research centres in smart cities is not limited to determining citizens' requirements for smart products and services but also to improving transparency and governance in city-wide financial markets. These, compared to other centres, help survey each city for unknown social and environmental problems and take swift action to solve them.

ABC reports have also included the smart cities' infrastructure sustainability cost activity. The cost sustainability manager explained that through the country's SDGs, YOU has been involved in implementing many construction and housing activities at the smart city level. This has been not only to gain government legitimacy and societal trust but also to ensure a decent life and well-being for citizens. The ABC senior manager added during side discussions that YOU's support in building smart city infrastructure ranges from fundraising initiatives for local charities to working alongside the city government on sustainable public utility services to provide a decent standard of living for low-income families and citizens. The financial manager also added during board meetings:

> YOU has been mandated by the government to install advanced cross-city electricity distribution and water supply networks, mostly running on an ERP system, at a cost of more than $50 million . . . funded by the European Union.

More so, smart city environmental sustainability is another cost activity generated by the ABC system within the cultural sustainability reporting mentioned above. At YOU, the sustainable governance manager explained that YOU's activity-based sustainability reporting also reflects its cost contribution to preserving the smart city environment from harmful pollutants. The case company applies multiple sustainability criteria to maintain the smart city environment. These include the reduction in air pollutants from boilers and forklifts as well as the disposal of effluents through industrial drainage, hazardous solid waste, and non-hazardous waste. For example, hazardous waste, such as complete products and raw materials that do not meet specifications, is identified and collected by the company at waste collection sites in the city. Then, it is transported by a company vehicle licensed by the ministry of health and population to the hazardous waste disposal centre in the same city. Then, it is shredded inside a mincer and repacked in red bags in preparation for transportation to the authorised disposal company, called "city cleaner", which is responsible for collecting this hazardous waste in sealed drums. Another example of environmental sustainability costing was provided by the financial manager during side discussions:

> Our sustainability costing treatment of non-hazardous waste at the city level is different from that of hazardous waste. Non-hazardous waste is collected and sorted in preparation for transportation by the same designated vehicle to the main collection point in the city. Then, our company transports daily non-hazardous waste from this main point to be disposed of by common waste disposal ways such as pledge and safe packaging . . . All of these [and above] are ABC cost activities and functional elements of smart city cultural sustainability reporting.

From the above, cost-based cultural sustainability reporting has played a political role in shaping participatory smart city decisions within SOEs. At YOU, the senior accountant explained that ABC reporting has played multiple roles (cultural and political) in smart city

sustainability, particularly with regard to the cost incurred by the company in implementing smart city activities, as mentioned above. For example, the 2020 sustainability cost reporting (from a cultural and political lens) revealed harmful gas emissions from some production plants in some living areas, which caused massive damage to the environment around their citizens. The company decided to install advanced fume-collection systems, which formed a cost element within ABC's environmental sustainability cost centre, in melting and ladle furnaces to capture harmful substances in the gas emissions. The gases are now processed and cleaned in smart cities before they are emitted as steam. The remaining waste is concentrated and disposed of safely. During board meetings, the financial manager agreed and added:

> ABC-based cultural and political sustainability reporting has played a powerful role in participatory decision-making at various city and organisational levels. Through detailed sustainability costing activities, both levels can jointly assess and manage YOU's sustainability cost performance across smart cities and make appropriate decisions for required sustainability activities. These participatory decisions are those related to smart service pricing, employee training, periodic bonuses, and promotions within the company.

After all, the ABC system has played multiple roles in achieving smart city cost sustainability. As analysed above, and in line with Hofstede [15], while the cultural role was represented by internalising the national cultural values of the smart city within the ERP-ABC implementation framework, the political role was represented by SOE compliance with cost-based cultural sustainability reporting in participatory city decision making. This not only reflected the cultural dynamics between national-level smart city values and the implementation of sustainability costing systems within SOEs, but these dynamics have also seen the multiple cultural values of the smart city embodied in the ABC system. More so, these smart city dynamics reflected the micro–macro/recursive dynamics through the strong influence of culturally and politically oriented sustainability cost reporting on participatory decision making at different levels of organisations and cities. Figure 1 summarises the above-analysed political and cultural lenses of Hofstede [15] in SOEs' smart city sustainability cost reporting.
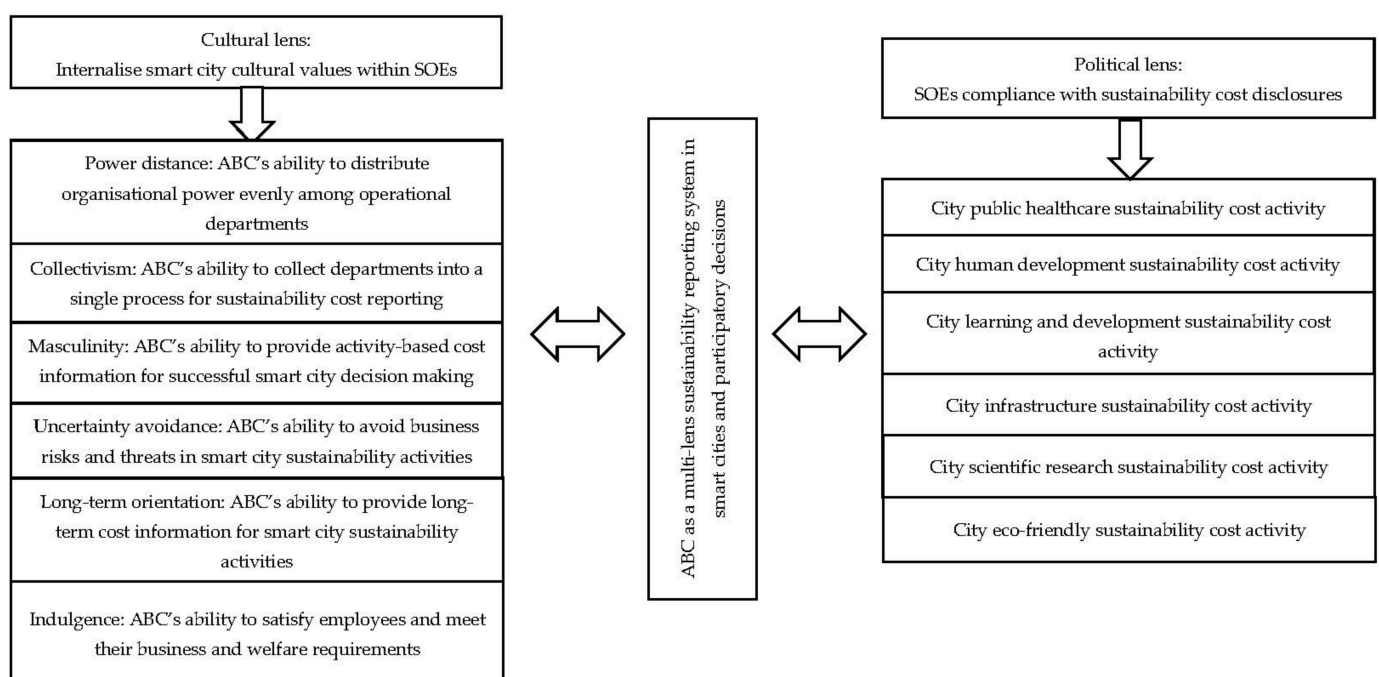

Figure 1. Hofstede [15] political and cultural lenses in SOEs' smart city sustainability cost reporting.

5. Discussion

The above findings reveal some theoretical and empirical implications for the existing literature on how management accounting tools, such as ABC, can be used to achieve smart city sustainability. As analysed above, in the Egyptian context of emerging smart cities, ABC is no longer a traditional method or system for cost allocation within organisations. Its management role and accounting lenses have expanded into a hybrid sustainability reporting model for smart city cost management. This may agree with Grossi et al. [16] and Secinaro et al. [3], who see smart city sustainability initiatives as a "hybrid reporting model" of management, governance, and accountability. In this new hybrid sense, and also in line with Hofstede [15], ABC is seen as a "multi-lens" system of sustainability reporting that simultaneously combines smart city cultural values and political/government compliance within SOEs. This agrees with Secinaro et al. [4] and Vilajosana et al. [5] who advocate the idea of "hybridisation" in smart city organisational systems, which leads to "collaboration" between different levels of organisations and cities to evaluate the city's sustainability performance. Through this smart collaboration, ABC becomes a dialogical platform for sustainability cost performance reporting through which different SOEs and city governments can remove barriers (which may have been strained) for smart city cost management. This is consistent with Ferraris et al. [1], who support the "openness" of public governments and SOEs in smart cities by removing barriers to sustainable innovation and entrepreneurship. As a result, triggering participation is not only a key sustainability feature in smart city frameworks but also in the hybrid, multi-lens implementation of the ABC system within SOEs. The ABC implementation, as analysed above in line with Hofstede [15], captured the simultaneous involvement of political effectiveness, public administration satisfaction, and a sense of belonging, which Lebrument et al. [2] identified as "drivers" of citizens' intention.

The present case findings also reveal compliance with ABC-based sustainability reporting in smart cities. With national SDGs, the state government has forced smart city SOEs (e.g., YOU) to report on their sustainability costing activities for smart city projects. Since complying with smart city sustainability cost reporting, as analysed above, the case company has provided various state/city government bodies with activity-based sustainability reporting. This reporting of a political and cultural nature is seen as a sustainability costing system in smart city governance. This reporting is an ERP-ABC system tool, which reflects Hofstede's [15] multiple political cultural values of the smart city. Different from a very short list of previous studies e.g., [6,7], this reporting has not only detailed smart city sustainability cost activities but also analysed the cost-per-activity movement. Compliance with cost-based sustainability reporting has transformed the ABC application from a simple method of cost allocation as in previous studies to a new way of smart city thinking, represented by cost-based cultural sustainability reporting. This is in line with Grossi et al. [16], who discuss smart city projects and their role in changing traditional public management thinking into sustainability cost management innovations for smart city governance. Although the present finding agrees with Cohen and Karatzimas [8] on the importance of sustainability reporting for smart city organisations, they disclosed the conventional formats that their organisations published on their websites as smart city reporting. Their findings, which resulted from content analyses of some organisations' financial and non-financial reports in smart cities, showed that these reports do not embed technological, political, and cultural advancements and are limited to integrated popular reportings. As analysed above, with government compliance for sustainability cost reporting, smart city SOEs have implemented advanced ERP-ABC technologies as a politically and culturally sensitive sustainability cost reporting system in smart cities.

The ABC implementation has then brought multiple cultural values of smart cities within urban development SOEs. Due to the dynamic nature of this costing system, multiple cultural sustainability values at the national level have been embodied in the case smart city company as an SOE. As above, among other things, these are exemplified in the ability of the ABC system to achieve an internal distribution of organisational power between

different departments, to bring different operating company and city structures into a single processual cost management network, and the ability to provide decision-makers with reliable cost activities to avoid sustainability risks and manage long-term costs in smart cities/governance. These cultural values of smart cities within the ABC system in smart city SOEs are consistent with Hofstede's [15] political cultural values. The ABC application is seen as a multicultural sustainability costing tool through which the social and political expectations of city stakeholders can be met, especially in relation to activity-based sustainability cost disclosures. This is in line with Zanellato and Tiron-Tudor [17], who support the importance of considering Hofstede's [15] multiple political and cultural values while implementing sustainability reporting within SOEs in the European context of non-financial reporting regulatory compliance. This is also in line with Viana Jr et al. [18], who support the political role of Hofstede's [15] multiple cultural values in earnings management within organisations in developed and emerging nations. In line with this, as analysed above and also shown by Toli and Murtagh [25], the practical meaning of urban sustainability has been altered in the emerging context of smart cities. With sustainability costing compliance as in Egypt's 2030 urban development strategy [14], the sustainability of smart cities has come to include not only economic, social, and environmental aspects [10] but also cultural and political aspects, as shown by ABC.

In these cultural and political dynamics, ABC-based sustainability reporting has become a smart city governance tool within urban development SOEs. This differs from Alsaid [9] considering the relationship between accounting and smart cities, with a particular focus on the Egyptian city council. The findings reveal the political (rather than cultural) role of performance measurement in smart city governance and accountability. Similarly, Alsaid [10] examined the role of management accounting in smart city dynamics. With no cultural role analysis, the findings only reveal the political role of the management accounting system in these multi-level dynamics. As above, the present case findings reveal the importance of analysing cultural values along with political/government compliance in the implementation of ABC-powered sustainability reporting systems within smart city SOEs. Although Buallay et al. [26] addressed multidimensional performance measures of sustainability reporting in smart cities, their quantitative analyses did not analyse cultural and political values in smart city reporting compliance as in the present qualitative case study. Using the top 20 smart cities worldwide, their sustainability reports have disclosed traditional performance metrics (operational, financial, and market), with many variations in their impact on firms' performance in smart cities. As analysed above, with ERP-ABC, smart city sustainability cost reports have added another set of multiple sustainability activities and their associated costs. These are seen as a politico-cultural tool through which SOEs can assess and manage the cost movement of their sustainability activities in smart cities. With this tool, state and city governments can jointly assess SOEs' contributions (e.g., YOU) to the political and cultural sustainability of smart cities and make participatory urban decisions (e.g., pricing). By adding to common (economic, social, and environmental sustainability) analytical aspects in a very short list of literature in this emerging field, ERP-ABC features additional (cultural and political) aspects in smart city organisations. This may agree with Grossi et al. [16], who argue for the role that organisational sustainability and accountability practices play as an emerging "politico-cultural" tool in smart cities.

Accordingly, ABC-enabled sustainability reporting has played a powerful role in achieving smart city recursive dynamics. As analysed above, the findings reveal the role that activity-based sustainability cost reporting plays in shaping participatory smart city decisions not only within SOEs but also at the state/city government level. This is in agreement with Cohen and Karatzimas [8], who point out the importance of smart city reports in decision-making processes at the city level. In contrast to the present study, their findings show that city organisations and networks do not provide smart reporting, and their reports are conventionally developed. In the present study, as above, the (Egyptian) case findings reveal that activity-based sustainability cost reporting embeds technological advancements through the ERP application. This is in line with Alsaid [10], who advocates for the role

that ERP technologies play in the accounting dynamics of smart cities, represented by a multi-level management accounting system. With advanced ERP-ABC technologies, sustainability activities' cost reports are seen as a dialogic political and cultural accounting tool in smart city governance. ERP-enabled sustainability cost reporting has connected various company and city government levels, improving transparency and legitimacy in smart city decision making. This media tool of a political cultural nature has opened a two-level communication channel, defined by Hofstede [15] as "reflexive deliberations", for sustainable city governance and accountability. This differs from Alsaid [9,10] and Buallay et al. [26], who refer to standalone sustainability reporting practices in the dynamic context of smart cities, which has led to differences in the quality and quantity of sustainability disclosures in smart cities' reporting.

6. Conclusions

This study explores the political and cultural values of a cost-based sustainability reporting system, better known as ABC, in the emerging context of smart cities. As indicated earlier, given the very short list of management accounting literature on smart city sustainability, the overarching research question is: How does the ABC system play multiple roles within urban organisations in the sustainability of smart cities? This main question is divided into two inter-related sub-questions. The first is: How does the ABC application become a multicultural smart city accounting tool within urban organisations? The second sub-question is: How does political/government compliance with cost-based cultural sustainability reporting play a powerful role in shaping participatory smart city decisions? Using a qualitative case study from an Egyptian smart city SOE, which touched on a natural setting and practice, the present study has extended the application of Hofstede's [15] political cultural values to a very short list of previous literature for a better understanding of the purported dynamics between accounting and smart cities, represented by ABC-based sustainability reporting of a political and cultural nature.

As above, the present case findings reveal the emergence of multiculturalism in the ABC application within SOEs as a political and cultural sustainability reporting system in smart cities. This differs from the literature which dealt with the economic, social, and environmental aspects of smart cities, with little attention paid to the cultural and political aspects of activity-based sustainability costing. The findings also reveal government/political compliance with so-called cost-based cultural sustainability reporting in shaping participatory decision-making processes. This also differs from the previous literature, which has focused on non-compliance (European and Western) contexts. Moreover, compared to other case studies, cost-based political cultural sustainability reporting, enabled by advanced ERP-ABC networks, has established the recursive collaboration and consultation dynamics between various company and city members which helped in making city decisions and formulating sustainability policies, especially with regard to smart city sustainability costs, which are characterised by long-term management. From the foregoing, the present findings fuel the existing literature with a new set of practical and social implications. Practically, ABC may help state/city governments shape smart city cost management decisions and sustainability policies by which cost transparency and legitimacy in smart city financial markets can be significantly improved. In social terms, ABC-based sustainability reporting may also help different levels of SOEs and city governments to jointly assess the sustainability cost movement of smart city activities and then acts as a measurable, manageable, and reliable decision-making tool for citizen well-being and employee satisfaction.

As in any case study, there are some limitations for possible future research on the cultural and political roles of ABC-based sustainability reporting in smart cities. The present study has presented Hofstede's [15] political cultural model in this emerging field of sustainability cost reporting in smart cities. Possible future research may fuel this emerging field with additional theoretical lenses using other interdisciplinary frameworks. Additionally, this study was designed based on a qualitative single-case study from an

Egyptian smart city SOE, which is characterised by multiple cultural values and compliance with an activity-based sustainability costing protocol. Future research could be extended to public and private sector organisations, which do not comply with the political and cultural values of the smart city in implementing management accounting systems (including sustainability costing systems). Furthermore, for security and political reasons, this study encountered difficulties in conducting empirical interviews at the city government level. Future research may conduct these interviews at the macro-smart city government level, potentially enhancing existing knowledge of sustainability cost reporting through additional ABC lenses.

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