

Smart Nation: Hypermediation and Sustainability in the case of Singapore

From the Dystopian Imaginary to the Smart City

TOMÁS DANIEL MESA GUZMÁN (TMESAGU01888@UNIVERSIDADEAN.EDU.CO)¹

¹EAN University, Colombia

KEYWORDS

*Technological
hypermediation
Sustainable development
Smart cities
SDGs
Singapore
Utopia
Dystopia*

ABSTRACT

In the twenty-first century, technological innovation has shaped the environments inhabited by contemporary societies, giving rise to a central question: how does technological hypermediation affect sustainable development? In this regard, this mixed-method, non-experimental documentary analysis aims to examine the impact of technological hypermediation in Singapore through the Sustainable Development Goals (SDGs), the utopian and dystopian concepts formulated by Orwell and Jameson, and official documentation from the Smart Nation initiative and the United Nations (UN). Its purpose is to determine whether technological hypermediation has a positive or negative impact on the development of cities. The findings show that Internet of Things (IoT) networks and automated transport systems contribute to energy efficiency and social inclusion, although regulatory challenges remain. By way of conclusion, the city emerges as an epicentre of progress, although it does not yet constitute an urban utopia.

Received: 28 / 04 / 2026

Accepted: 05 / 08 / 2026

1. Introduction

According to the Smart City Index published by the International Institute for Management Development (IMD) in 2025, Singapore has consistently ranked among the world's ten highest-rated smart cities over the past five years. This ranking evaluates a range of multidisciplinary dimensions that extend beyond technical considerations and encompass a broad set of variables associated with holistic urban development. On the one hand, it assesses structural dimensions such as the economy, technology, and infrastructure; on the other, it incorporates human-centred factors including quality of life, environmental sustainability, and social inclusion. In this regard, successful urban development requires cities to remain at the forefront of innovation while continuing to meet the needs of their residents. It is from this tension between automation and humanity that the central question of this study emerges: how does technological hypermediation affect sustainable development?

Over the past decade, cities around the world have increasingly embraced the smart city model as a technological response to a range of challenges affecting contemporary urban environments. In the case of Singapore, this model has a direct impact on the Sustainable Development Goals (SDGs), particularly Goal 9 (Industry, Innovation and Infrastructure) and Goal 11 (Sustainable Cities and Communities). At the same time, it is important to examine the synergies between these goals and others that address more immediate human needs, such as Goal 3 (Good Health and Well-being) and Goal 4 (Quality Education).

Within this framework, the concepts of utopia (associated with Thomas More and Fredric Jameson) and dystopia (George Orwell) provide contrasting perspectives through which technological development can be understood, both as a positive and as a negative force in the construction of social realities. By comparing these concepts with the outcomes associated with the SDGs, it becomes possible to assess whether Singapore and its Smart Nation initiative represent a forward-looking utopia or an automated dystopia. Accordingly, the principal objective of this study is to analyse the impact of technological hypermediation in Singapore through the Sustainable Development Goals (SDGs), the utopian and dystopian imaginaries articulated by Orwell and Jameson, and the official documentation of both the Smart Nation initiative and the United Nations (UN), in order to evaluate their implications for sustainable development and for the future configuration of cities.

The academic relevance of this study lies in the growing importance of smart cities and in the critical perspective from which hypermediation is examined in contemporary society. The significance of this field of inquiry is reflected in a number of studies addressing related issues, including the work of Professor Isabel Duque Franco, who explores this phenomenon in the context of Latin American cities and societies. Ultimately, this research seeks to contribute to a broader debate concerning one of the defining questions of our time: who guides societal development—human beings or the machines they create?

2. Methodology

This study adopts a mixed-method, descriptive, and non-experimental approach based on a documentary analysis research design. Data collection was carried out through a review of the relevant literature and a documentary analysis of official sources relating to Singapore and its Smart Nation initiative. This methodological framework makes it possible to examine the object of study through the triangulation of theoretical perspectives, including those of Orwell and Jameson, qualitative and quantitative evidence drawn from verified documentation, and the targets established by the Sustainable Development Goals (SDGs).

2.1. Selection Matrix

The methodological design also incorporates a literature selection matrix that identifies the analytical categories and thematic relevance of the sources included in the analysis. Table 1

presents the selected texts and documents, the inclusion criteria applied, and the principal findings in relation to the objectives of the study.

Table 1. Document analysis matrix

#	Document or source	Year	Source type	Inclusion criteria	Analytical category	Paraphrased key passage	Interpretation or finding
1	Smart Nation and Digital Government Report (SNDGO)	2023	Official	Validity, central institutional source of the Smart Nation programme	Digital governance	99% of government transactions are carried out online.	Consolidation of centralised digital governance; optimises efficiency but reduces public deliberation
2	Smart Nation Vision (Programme Office)	2024	Official	Programme founding documentation	Strategic vision	To create a nation driven by data and technology to improve the lives of all	Constructs a utopian vision of technological well-being and social cohesion
3	National AI Strategy (NAIS 2.0)	2023	Official	Update of the national AI policy	Algorithmic governance and ethics	AI Verify will promote the responsible and transparent use of artificial intelligence	Institutionalises ethical oversight in response to the risks of data capitalism
4	Green Plan 2030 (Government of Singapore)	2021	Official	Alignment with SDGs 9, 11 and 13	Environmental sustainability	Data centres must reduce their emissions by 80% by 2030	Links digital transformation with specific environmental commitments
5	IMD World Digital Competitiveness Ranking	2023	International	Substantial and verifiable data	Digital competitiveness	Singapore ranks third globally in digital competitiveness	It reinforces regional leadership and the effectiveness of the technocratic model
6	OECD Digital Government Index	2023	International	Indicators of digital maturity and participation	Inclusion and access	High digital maturity, but average levels of civic engagement	Highlights the tension between infrastructure
7	United Nations E-Government Survey	2022	International	Authoritative source on digital government	Global governance	Digital progress must be accompanied by mechanisms for transparency	Reaffirms the need for a balance between efficiency

						and accountability	and public oversight
8	Zuboff, S. (2019). The Age of Surveillance Capitalism	2019	Academica	A major work on capitalism and surveillance	Surveillance and privacy	The logic of surveillance capitalism transforms human experience into raw material for control	A basis for interpreting the dystopian dimension of the Smart Nation model
9	Barns, S. (2020) Platform Urbanism	2020	Academic	Theoretical relevance to urban planning	Platform urbanism	Platforms are reshaping the relationship between citizens, infrastructure and urban data	It allows for a comparison of Singapore with smart city trends
10	Anttiroiko, A.-V. (2023). Smart Governance for Sustainable Urban Development: Conceptual and Practical Perspectives. Sustainability,	2023	Academic	The validity and development of the concept of smart governance	Critical governance	Smart governance must integrate technological innovation and public processes to achieve sustainability	Updates the concept of Smart Governance and reinforces the discussion on technocratic centralisation in Singapore
11	World Development Report 2021 (World Bank)	2021	International	Data and sustainable development	Data governance	The use of public data must maximise the common good whilst preserving individual privacy	Provides the ethical framework for sustainable management
12	OECD. Bridging the Digital Divide	2023	International	Latest news on the digital divide		Digital inclusion policies must address digital literacy, not just connectivity	Emphasises the social dimension during technological development
13	Orwell, G. (1984).	1948	Theoretical - literary	A canonical work of dystopian thought	Dystopia and control	Who controls the past controls the future; who controls the present controls the past.	Analytical and theoretical counterpoint on control in Smart Nation
14	Moro, T. (1516). Utopia	1516	Theoretical - literary	Foundational text on the notion of an ideal society	Political and social utopia	The common good must take precedence over the individual	The ethical basis of the welfare society discourse in the

							Singapore project
15	Campanella, T. The City of the Sun	1602	Theoretical -literary	A classic work on utopian and rational social order	Utopia	Everything is rationally organised for the common good	It reinforces the analogy between planning and state efficiency

Source: Own elaboration, 2026.

3. Theoretical Framework

Before categorising Singapore, it is necessary to examine what is meant by utopia and dystopia, as the scope of these concepts extends far beyond their popular association with good and evil. In addition, sustainability itself requires separate consideration, as it has become a decisive factor in the successful development of both states and cities.

At first glance, dystopia and utopia may appear to be opposites, largely because science fiction literature and popular culture have helped to shape this collective imaginary. Formally, the two concepts are often contrasted through their respective associations with totalitarianism and freedom. Examples commonly linked to these meanings include George Orwell's *Nineteen Eighty-Four* and *Animal Farm*, Thomas More's *Utopia*, and Tommaso Campanella's *The City of the Sun*. However, in order to identify the differences and similarities between these concepts, it is necessary to examine some of their defining characteristics.

Dystopia may be understood, first and foremost, as a society governed by dictatorship, social control, and repression (Martínez Peñate, 2015). Orwell's *Nineteen Eighty-Four* provides an ideal illustration of how such a society might function, as it depicts social and power relations in a context characterised by the absence of democracy and the presence of absolute surveillance. In a dystopian reality, governmental structures exercise total control, and practices of indoctrination are employed in order to eliminate free will among the population and prevent dissent.

It is important to note, however, that there are multiple definitions of dystopia. Some authors, for example, characterise it as a society governed by totalitarianism, technology, and science (Carvajal, 2021). Such a definition may nevertheless be somewhat imprecise. More specifically, the scientific dimension of this interpretation conflicts with one of the fundamental premises of dystopia: the cultivation of popular ignorance. This can be observed in Orwell's work itself, where strict control is exercised over both the media and education at every level (Carvajal, 2021).

More specifically, it is this latter factor that makes it difficult to regard science as a foundational pillar of dystopian society. Scientific activity and research are intrinsically linked to progress, which in turn depends upon creativity. In an authoritarian society such as a dystopia, however, neither development nor creative thought has a place within the social fabric. Consequently, scientific progress cannot be considered one of the defining pillars of dystopia. At first sight, however, the concept of utopia appears to exhibit the opposite tendency.

Unlike dystopia, utopia is commonly associated with an idealised, or even "dreamed", society. According to Martínez Peñate (2015), utopia is "an imaginary society whose foundations are equality, justice, honesty, solidarity, and fraternity" (p. 4). Although the differences between the two concepts may appear self-evident, there is one decisive characteristic that distinguishes utopia from dystopia: democracy.

In addition, an important aspect of the ontology of utopia is its intrinsic relationship with human nature (Jameson, 2004). Human impulses such as greed and the desire for power directly shape both the theoretical conception and the practical construction of a utopian

society. This point deserves particular emphasis, as theoretical imagination constitutes another of the defining characteristics of utopia.

Thomas More, widely regarded as the father of utopian thought, was the first to develop systematically the imaginative dimension of utopian societies (Núñez, 1985). For this reason, the concept is often associated with communist ideology, since many of the principles underpinning such societies bear similarities to the ideas advanced by Karl Marx. Indeed, some scholars argue that “utopia as an idea, through communism as a method, gives rise to dystopia as praxis” (Núñez, 1985, p. 51). This statement highlights three crucial elements: the relationship between utopia and Marxist thought, the notion of utopia as an idea, and the synergy between utopia and dystopia. The latter two aspects warrant closer examination.

According to Zamora (2025), “the existence of utopia does not depend on its realisation as a concrete project [...] its strength lies in the imagination of that which does not yet exist, in the collective desire for what has not yet come to be” (p. 80). From this perspective, linking the utopian with the idealised suggests that the imaginative ontology of the concept is not invalidated simply because it has not been realised in practice. Furthermore, this view highlights the importance of collective agency when considering a utopian society, since the construction of such a collective imaginary must begin with the shortcomings and needs experienced by society as a whole. Consequently, and without diminishing the broader scope of the concept, utopia may be understood as arising from a shared aspiration to improve those aspects of reality that are at odds with collective well-being.

Regarding the relationship between utopia and dystopia, Ladeveze’s argument provides a useful starting point, as it suggests that one emerges from the implementation of the other. At first sight, however, it seems paradoxical to argue that two forms of society founded upon opposing principles could be causally connected. This raises a further question: how exactly are utopia and dystopia related?

As noted earlier, these two concepts may initially appear to be opposites; upon closer examination, however, a number of more complex and revealing elements emerge. A passage that captures the depth of this issue can be found in *De la utopía clásica a la distopía actual*, where Luis Núñez states:

The ideas that give rise to utopia, when transformed into reality, when they attempt to bridge the long journey that separates beautiful words from human actions, generate dystopia. For, indeed, within the semantic ties and dialectical folds that weave the fabric of the peculiar language of utopia, social happiness is not merely possible but inevitable. One need only accept as an article of faith the message imposed by collective discipline. (Núñez Ladevéze, 1985, p. 52)

From this perspective, action and thought may be associated with dystopia and utopia respectively. The complexity of this argument lies in the fact that both processes—implementation and imagination—operate within the same paradigm and yet, somewhat paradoxically, produce opposite outcomes. Utopia envisions an ideal reality in which all human needs are satisfied, technological progress advances in harmony with the social fabric, and conflict ceases to exist. However, when attempts are made to put this “perfect” vision into practice, the outcome often proves to be the opposite of what was intended: dictatorships emerge, dissent arises, and human well-being becomes distorted by self-interest.

The apparent contradiction at the heart of this relationship stems from one of the variables previously identified as central to the ontology of the concept: human nature. Although democracy is the defining feature that distinguishes utopia from dystopia, it necessarily entails a participatory dimension. For this very reason, the realisation of an idyllic, conflict-free society becomes extremely difficult—if not impossible. It is human nature itself that redirects the planned “ideal society” towards a reality shaped by totalitarianism.

An example that illustrates the imaginative dimension of social planning—its utopian moment, so to speak—can be found in the comparison drawn by Tommaso Campanella in *The City of the Sun*. The following passage is particularly revealing:

Thus, in our Republic, minds are set at ease and greed—the root of all evils—disappears, together with fraud in contracts, theft and robbery, idleness, the oppression of the poor, ignorance that affects even the most gifted minds when they shrink from the effort required for philosophical inquiry, futile concerns, needless hardships, money as the support of merchants, miserliness, pride, and all the evils arising from private property, self-interest, enmity, envy, and intrigue, as we have already shown. Since honours are assigned according to natural aptitudes, the evils produced by inheritance, election, and ambition are eliminated, as Saint Ambrose teaches when speaking of the republic of the bees. In acting thus, we follow nature, the best of teachers, just as the bees do. The system of selection employed among us is not arbitrary but natural, for those who are chosen are distinguished by their natural or moral virtues. (Campanella, 2018, p. 66).

The comparison between the kingdom of the bees and human society reveals not only characteristics that would be difficult to reconcile with an ostensibly democratic society; it in fact presents a fundamentally anti-democratic model. The assertion that “minds are set at ease” effectively eliminates the possibility of dialogue and debate, implying that differences either cease to exist or are suppressed as quickly as possible. In this sense, utopia requires a collective consciousness—or a “hive mind”—if it is to be realised without giving rise to dystopian consequences. In practice, however, such a condition is impossible to achieve.

Broadly speaking, the connection between utopia and dystopia lies in the fact that they are, in essence, two stages of the same phenomenon. On the one hand, there is the phase of imagination and planning, which seeks to address the multidimensional needs associated with human well-being. On the other, there is the implementation of this idealised vision of society, which, unlike its conceptual counterpart, must confront the real constraints and challenges posed by human nature. Does this mean that utopian projects are inevitably destined to produce dystopian outcomes? The answer is no. In recent years, a new paradigm has emerged within both the collective imagination and approaches to urban and social development, one that has proved particularly valuable in the pursuit of utopian ideals: sustainability.

According to Mesa Guzmán (2025), “sustainability is understood as a conscious mode of action that takes into account how its consequences affect—and will affect—both our environment and those who inhabit it” (p. 3). From this definition, sustainability may be seen as a bridge between utopia and dystopia, since conscious action anchors idealised visions in real-world conditions and helps prevent the pursuit of collective well-being from being undermined by individual interests.

However, sustainability is not concerned solely with the social dimension in isolation. Rather, in practice, it seeks to address four fundamental dimensions in an integrated manner, as outlined by Jeffrey Sachs in *The Age of Sustainable Development*:

The normative dimension of the sustainable development project is directed towards four defining objectives of a good society: economic prosperity; social inclusion and cohesion; environmental sustainability; and good governance by the principal actors, including governments and businesses. (Sachs, 2015, p. 17).

In this sense, any society shaped by a utopian vision in the twenty-first century must, by extension, be grounded in sustainable development practices. However, the incorporation of sustainability into the pursuit of utopian ideals does not guarantee their full realisation. Although such an approach promotes equality, solidarity, and progress, conflict and human

nature remain enduring counterweights that, regardless of the measures adopted, continue to challenge the imagined “ideal city”.

Having established the principles of sustainable action, it is necessary to define a strategic framework capable of guiding this form of development. It is for this reason that the Sustainable Development Goals (SDGs) were formulated, described as “a universal call to action to end poverty, protect the planet and ensure that by 2030 all people enjoy peace and prosperity” (UNDP, 2025). The specificity of these goals facilitates the design of initiatives and actions capable of generating a direct impact on society.

Furthermore, sustainability has reshaped what was understood in previous decades as a utopian society. Contemporary practices and technologies have broadened the range of possibilities associated with the ideal society. At the same time, they have made it more feasible to pursue such aspirations without necessarily producing dystopian outcomes, as discussed above.

Having established the theoretical foundations of this study, it is now appropriate to examine Singapore in light of the concepts developed thus far. Within this broader discussion of imagination and implementation, it becomes possible to assess whether one of the world's leading centres of innovation and development has implemented its Smart Nation initiative successfully, or whether it may instead represent a contemporary form of dystopia.

4. Results

Although Singapore's drive towards technological development is often associated with the latter half of the past decade, the foundations of this project were laid many years earlier. In 2014, the Smart Nation 1.0 initiative was officially launched with the aim of building a prosperous digital future for all. During the launch, the then Prime Minister, Lee Hsien Loong, stated that the nation's vision was to enable people to lead fulfilling lives through technological development (2014). In this way, the foundations were established for a future shaped by innovation and technological progress for both Singaporeans and their nation.

Ten years later, in October 2024, the initiative was renewed with the launch of Smart Nation 2.0 under the leadership of Prime Minister and Minister for Finance Lawrence Wong. During his address, Wong stated the following:

In Smart Nation 1.0, we focussed on building up capabilities and encouraging the use of technology. For our next phase, or Smart Nation 2.0, we aim to sharpen our focus and use technology more effectively to transform our future and shape our nation together. (Government of Singapore, 2024, para. 3)

In this sense, the current initiative seeks to deepen the use of technology even further than its predecessor. Moreover, owing to the scientific and technological advances of the past decade, Smart Nation 2.0 operates within a considerably broader sphere of action. As a result, the range of possibilities opened up by the development of this initiative appears almost limitless.

Against this backdrop, Singapore's broader objective in pursuing technological hypermediation can be understood as fostering the co-evolution of its social fabric, public administration, and economic and technological progress. To assess its impact, it is therefore useful to examine the four pillars of sustainability that serve as a bridge between utopian aspirations and their practical realisation: the economic, social, environmental, and governance dimensions. The following sections analyse each of these in turn.

4.1. Governance

Since the launch of Smart Nation 1.0, Singapore's public administration has remained at the forefront of technological innovation and implementation. One of the most significant

developments in this regard was the introduction of an artificial intelligence model specifically designed for governance. Known as the AI Governance Framework, this initiative marked a major milestone, making Singapore the first country to incorporate such technology into its administrative processes. However, this was only the beginning.

In 2022, the government introduced the AI Verify system, which was subsequently released as open-source software the following year. The purpose of these systems and frameworks is to provide citizens with a secure environment in which to interact with artificial intelligence. This objective responds to concerns regarding the transparent handling of information by emerging AI technologies. More specifically, this initiative forms part of the National AI Strategy 2.0 (NAIS 2.0), whose stated objectives include harnessing artificial intelligence for the public good (2024).

When these developments in public administration are examined through the lens of utopian and dystopian thought, several noteworthy observations emerge. First, the imaginative dimension is clearly present in the conception of the smart city, where the aspiration for a harmonious relationship between humans and technology is evident. Second, the implementation of this vision is not based on an idealised view of society; rather, it draws upon the principles of sustainability and applies them within a context shaped by real-world conditions. Finally, governmental action itself is not idealised. The NAIS 2.0 framework explicitly acknowledges the need for continuous regulatory adaptation in response to the rapid evolution of artificial intelligence systems.

Taken together, these elements suggest that the governance model underpinning Smart Nation 2.0 aligns more closely with a utopian than a dystopian vision. An AI-driven digital environment creates opportunities to enhance both institutional effectiveness and individual development. The outcomes of this technological innovation appear positive, as 99% of transactions between the state and citizens can now be completed efficiently online (Government of Singapore, 2024, p. 7).

4.2. Social

The previous section examined the relationship between individuals and public administration. The social dimension of Smart Nation 2.0, however, seeks to address the impact that technological hypermediation has on people's everyday lives. To provide a broad overview of Singapore's current approach to social development, the following statement from the Smart Nation 2.0 Report is particularly illustrative:

Everyone should have the opportunity to enrich their lives and benefit from digital technologies: whether it enables them to better communicate with friends and family, access essential services, or enjoy recreational activities. (Government of Singapore, 2024, p. 68).

The initiative seeks to foster an inclusive social fabric that addresses not only basic needs but also the multidimensional well-being of Singapore's citizens. In terms of connectivity, the figures reported in the Smart Nation 2.0 Report paint a positive picture of the initiative's reach and impact. Some of the most significant indicators are presented in Table 2:

Table 2. Digital access and connectivity (Smart Nation 2.0)

Indicator	Year	Value	Quote / excerpt used
Government services available online	2024	99%	"About 99% of our government services can be completed online"
Households with internet access	2024	99%	"99% of households are connected to the internet as of 2022, up from 88% in 2014"

Low-income households receiving support	2020 to 2024	62,000	"Over 62,000 low-income households have been supported with subsidised broadband and digital devices since 2020"
DigitalAccess@Home	2023 to 2024	16,000	"[...]. Since then, the programme has supported more than 16,000 households."
Mobile Access for Seniors	2020 to 2024	13,000	"The Mobile Access for Seniors scheme has also provided subsidised smartphones and mobile plans to over 13,000 senior citizens since its launch in 2020"
Satisfaction with government digital services	2024	83%	"High citizen and business satisfaction of 83%"

Source: Own elaboration, 2026.

However, this multidimensional conception of well-being extends far beyond the community's access to technology. The availability of digital resources is complemented by broader structural improvements. In healthcare, for example, Singapore has enhanced both care provision and health education through the use of wearable devices and smartphones capable of monitoring symptoms at an early stage and storing relevant health data (Herrera, 2019). Similarly, in the field of education, students lead a Digital Citizenship Board aimed at promoting critical thinking and fostering a reflective and participatory model of digital citizenship.

This latter aspect is fundamental to the development of a harmonious and co-evolving social fabric in a technologically mediated environment. Within the context of hypermediation, the Singaporean government seeks to strengthen connections among its citizens, not merely through digital screens but also through shared interests, reciprocity, and collective well-being (Government of Singapore, 2024). At first sight, Singapore's approach to community development appears to align closely with a model of sustainable utopian development. Nevertheless, several factors warrant closer examination, as the pervasive presence of information technologies in everyday life also gives rise to potential risks.

Technological hypermediation offers numerous benefits for the development of contemporary societies. At the same time, however, it may generate negative consequences through two closely related phenomena: dependence and misuse. Orwell's Nineteen Eighty-Four, for instance, illustrates the dangers associated with the abuse of technology. Rather than fostering social connection, technology can ultimately produce profound forms of disconnection. Should such a scenario emerge, the utopian vision would give way to a dystopian reality, undermining the sustainability of the original social project.

Furthermore, dependence on digital systems may create significant vulnerabilities in the face of cyberattacks. Singapore itself experienced a large-scale cyberattack in 2018, when medical records belonging to more than 1.5 million patients were stolen from the SingHealth system. Consequently, the interconnectedness linking individuals, organisations, and technological systems may represent the fine line separating a sustainable model of development from a dystopian outcome.

In this respect, it is worth examining organisations as key actors in the creation of connections between communities and technological systems. It is therefore appropriate to move on to the third pillar of sustainability: the economy.

4.3. Economy

A key aspect of this pillar of sustainability in the Singaporean context is the importance of the digital economy at the macroeconomic level. Thanks to its position as a leading technological hub both regionally and internationally, the Smart Nation 2.0 initiative has significantly strengthened the contribution of the digital economy, which accounted for 17.7% of Singapore's GDP in 2023 (Government of Singapore, 2024). This is a particularly significant figure, as it places the digital economy on a level comparable to major sectors such as manufacturing, one of the country's largest industries.

More specifically, national productivity has improved through the widespread adoption of new technologies across different sectors. One of the most important of these is artificial intelligence, which the National AI Strategy 2.0 (NAIS 2.0) identifies as a complement to the national workforce (2024). The intention is for AI to serve as a competitive advantage capable of attracting investment from some of the world's leading companies. At the same time, the government's objective extends beyond generating revenue through foreign organisations; it also seeks to promote the domestic creation of innovative and commercially viable products.

To this end, Smart Nation 2.0 supports the establishment of AI Centres of Excellence (CoEs) dedicated to the development of intellectual property and disruptive innovation. These centres function both as generators of new ideas and as drivers of technological projects. On the one hand, international actors are attracted by the value proposition offered by the Singaporean market; Microsoft, for example, has become one of the initiative's principal partners and a key contributor to the country's technological development (Government of Singapore, 2024). On the other hand, local small and medium-sized enterprises (SMEs) have found it easier to expand thanks to the advanced technological environment fostered by Smart Nation 2.0.

Overall, the economy appears to be one of the sectors that has benefited most from the technological hypermediation implemented in Singapore. The country's current technological capabilities have accelerated its development to such an extent that it ranked second in the IMD World Digital Competitiveness Ranking 2025. If the different dimensions of sustainability were assessed in isolation, the economic sphere would arguably represent the area closest to the realisation of the utopian aspirations underpinning the Smart Nation project. Nevertheless, it is now necessary to examine the final pillar of sustainability relevant to the implementation of this utopian vision: the environment.

4.4. Environmental

The final dimension examined in this analysis is perhaps the most ambivalent of the four: the responsible management of the environment in the context of technological hypermediation. The Singaporean government itself acknowledges that the infrastructure required to implement the Smart Nation 2.0 initiative relies heavily on resources such as energy, water, coal and land, all of which are relatively scarce in the city-state (NAIS, 2023). Consequently, the careful management of available natural resources becomes a matter of critical importance.

In order to mitigate large-scale environmental impacts, Smart Nation 2.0 supported the development in 2024 of one of the first quality standards aimed at improving energy efficiency in data centres (DCs). This framework serves as a roadmap for determining sustainable capacity limits and identifying initiatives that are most compatible with environmental preservation in a digitally hypermediated society. One of its key objectives, for example, is to increase the use of green energy sources to power data centres.

It is important to note, however, that these policies, initiatives, and projects were developed within the framework of the Digital Connectivity Blueprint, which sets out Singapore's broader strategy for digital transformation.

Table 3. Sustainability and infrastructure: *Digital Connectivity Blueprint*

Indicator	Year	Target	Reference
Data centre contribution to emissions	2023	Steering DCs towards renewable energy	"Our strategic priority is to chart the course towards green data centres that are energy-efficient and will be powered by renewable sources."
Tropical Data Centre Standard	2023	Reducing consumption and regulating the temperature of data centres	"[...] we have developed and issued the world's first Tropical DC standards ¹⁵ to drive energy-efficient data centres."
AI energy consumption	2023	Reduce the annual energy consumption required for AI model training	"Estimates show that training an AI model (termed pre-training or fine-tuning) can consume more electricity than the annual consumption of 120 households ¹ "
National 5G coverage	2022	Maintain nationwide coverage across Singapore	"Singapore is one of the first countries in the world to achieve nationwide 5G SA coverage by the end of 2022."
10 Gbps end-to-end connectivity plan	2024–2029	Increase bandwidth and connectivity speeds	"Singapore will (i) facilitate a tenfold increase in the bandwidth of our Nationwide Broadband Network (NBN)"

Source: Own elaboration, 2026.

In addition, the environmental impact of Smart Nation 2.0 extends into everyday life. Just as the initiative seeks to prevent harm to people, it also aims to protect the country's biodiversity. Through its Remote Tree Management System, artificial intelligence is used to create virtual replicas of approximately six million trees (Government of Singapore, 2024). These digital twins are monitored and managed through a digital platform that analyses variables affecting the condition of their real-world counterparts, with the aim of optimising maintenance and predicting potential tree failures or collapses.

Within this dimension, the utopian aspiration lies in developing technological infrastructures that are both carbon-neutral and equally productive. In practice, however, the environmental pillar is often in tension with the economic one, since such "ideal" solutions are typically expensive to implement. As a result, environmental considerations tend to receive lower priority in terms of development and investment, while greater emphasis is placed on other dimensions of sustainability. Yet neglecting the environment ultimately undermines the other three pillars, as it directly compromises the viability of any long-term initiative: without land, there are no people; without land, there is no government; without land, there is no progress.

5. Discussion

This study has identified a number of characteristics that associate Singapore's digital development with a utopian project implemented through the principles of sustainability.

At the same time, however, it has highlighted several potential risks that stem from the very ontology of a highly digitalised society. In this context, it is worth examining these issues more closely and posing a further question: what are the implications of building a hypermediated and hyperconnected society?

First, national digital transformation generates vast quantities of data that must be processed, analysed, and stored. While the environmental implications of this phenomenon have already been discussed, it is equally important to consider the security risks involved. In a globalised society, data flows of this magnitude represent a significant cybersecurity challenge. Indeed, S. Iswaran, Singapore's Minister for Communications in 2018, stated that the success of the country's transformation depended upon a robust digital defence strategy (Herrera, 2019).

One example of this underlying vulnerability was the 2018 cyberattack on the SingHealth group. During this incident, 1.5 million patient records were compromised, including those of the then Prime Minister. To this day, the attack is regarded as the largest cybersecurity breach in the country's history, as it threatened not only the privacy of individuals but also the sovereignty of the state itself. Furthermore, the risks associated with the large-scale accumulation of data do not arise solely from external actors; they may also emerge from within the system.

In 2020, the Singaporean government introduced a new identification system known as SingPass. This initiative incorporated facial recognition as a national identity verification mechanism, enabling citizens to use biometric data, such as facial features, to complete procedures requiring identity authentication. Singapore was a pioneer in implementing this technology; however, unrestricted governmental access to such sensitive data raises concerns about the possibility of intrusive surveillance, evoking a distinctly dystopian imaginary.

Singapore has nevertheless sought to address these potential risks through new legislation and more rigorous regulatory frameworks. One of the most recent examples is the Personal Data Protection (Amendment) Act 2020, which aims to safeguard individual privacy while regulating the use of personal data by both corporations and public authorities.

In addition, the country allocated approximately US\$120 million in its 2024 national budget to support the implementation of artificial intelligence across public services (Introl, 2025). According to Ochoa and Guaza (2025), this initiative enhances the effectiveness of developing and implementing innovative policies through a rigorous approach. From this perspective, it may be inferred that Smart Nation 2.0, and Singapore's broader smart city model, prioritise technical efficiency over public participation. Consequently, another risk associated with Singapore's digitalised society lies in the tension between individual freedom and governmental coercion.

This is reflected in the BTI Transformation Index, whose 2024 report on Singapore notes that the government has systematically tightened restrictions on mechanisms for public participation and protest. Similarly, the National Library of Congress of Chile (BCN) states that Singapore's Public Order Act grants the authorities broader powers to restrict or prohibit public gatherings. It is therefore plausible to argue that the Singaporean government exercises a significant degree of control over its citizens in order to safeguard the implementation of its digital transformation agenda. As with the previous risk, this gives rise to governance practices that bear certain similarities to forms of authoritarian control, highlighting the fine line between a utopian design and its potentially dystopian execution.

A comparison between Singapore and other Asian smart cities reveals important differences in their respective models. Seoul, for example, is also recognised internationally as a leader in technological innovation and digitalisation. Like Singapore, it manages vast amounts of data generated by companies such as Equinix and Digital Realty, making the responsible governance of information equally imperative. In response, the South Korean government launched the MyData initiative in 2019, granting citizens and businesses greater control over their personal information and thereby fostering digital trust.

In this respect, a fundamental difference between Singapore and Seoul lies in the implementation of their smart city visions. Whereas Singapore prioritises technical efficiency and structural dimensions, Seoul pursues progress through a more integrated relationship between society and technology.

Overall, this assessment of risks highlights the challenges that hypermediated societies face in terms of security, freedom, and participation. It is important to emphasise, however, that these issues do not determine the success or failure of the Smart Nation 2.0 project. Rather, they reflect the realities of a multidimensional process of national transformation. As such, these risks should be viewed as opportunities for improvement and innovation rather than as indicators of inevitable failure.

6. Conclusions

The analysis of the Smart Nation 2.0 initiative suggests that attempts to materialise a utopian vision through idealised assumptions can ultimately lead to dystopian outcomes. In this context, conception and implementation form part of the same process; however, the crucial distinction lies not in what is implemented, but in how it is implemented. It is through the four pillars of sustainability that a utopian vision can begin to take shape without necessarily drifting towards dystopia.

Singapore and the Smart Nation 2.0 project cannot be regarded as utopias in a strict sense, as underlying risks remain evident, particularly in relation to more human-centred dimensions such as freedom, security, and civic participation. Nevertheless, the project does embody a distinctly utopian vision. An examination of technological hypermediation in Singapore reveals a multidimensional approach in which structural and social dimensions are mutually reinforcing in the pursuit of collective well-being. In this respect, it is important to emphasise the transformative impact that technological innovation can have on society.

Ultimately, the extent to which technology mediates everyday life is not, in itself, the determining factor. What matters is the relationship established between people and technology. Unless humans and machines develop in a co-evolutionary relationship, progress towards an increasingly utopian future will remain out of reach.

7. Acknowledgements

This research originated within the ComTic research group at Ean University. The author would also like to express his gratitude to Professor Martha Carolina Chaparro Medina and to David Berdugo Rojas, Director of the Bachelor's Degree in Communication, for their support and confidence in the development of this project. Finally, I would like to extend my sincere thanks to the Research Management Office of Ean University for its financial and administrative support throughout the entire research process.

References

- Bertelsmann Stiftung. (2024). *BTI 2024: Informe por país – Singapur*. Bertelsmann Transformation Index. <https://bti-project.org/en/reports/country-report/SGP#pos16>
- Campanella, T. (2018). *La ciudad del sol* (A. Lázaro, Trad.). Biblioteca Virtual Universal. (Obra original publicada en 1602).
- Centro de Estudios y Documentación de la Biblioteca del Congreso Nacional de Chile. (2019). *La Nación Inteligente de Singapur*. Programa Asia Pacífico.
- Centre for Liveable Cities. (2024). *Technology and the City*. Government of Singapore. <https://knowledgehub.clc.gov.sg/publications-library/technology-and-the-city>
- Government of Singapore. (2021). *Singapore Green Plan 2030*. Ministry of Sustainability and the Environment. <https://www.greenplan.gov.sg/>
- Government of Singapore. (2023). *Digital Connectivity Blueprint: A 10-year plan to strengthen Singapore's digital infrastructure*. Ministry of Communications and Information. <https://www.mci.gov.sg/sfc/communications/connectivity-blueprint/>
- Government of Singapore. (2023). *National AI Strategy 2.0: AI for the public good, for Singapore and the world*. Smart Nation and Digital Government Group. <https://www.smartnation.gov.sg>
- Government of Singapore. (2024). *Smart Nation 2.0: A thriving digital future for all*. Ministry of Digital Development and Information.
- Government of Singapore. (2025). *Smart Nation Singapore – Official portal*. <https://www.smartnation.gov.sg/>
- Government of Singapore. (2025). *Smart Nation vision*. Smart Nation and Digital Government Office. <https://www.smartnation.gov.sg/about/our-vision/smart-nation-vision>
- Hernández Sampieri, R., Fernández Collado, C., & Baptista Lucio, P. (2014). *Metodología de la investigación* (6ª ed.). McGraw-Hill Education.
- InCorp Global. (2024). *Guía PDPA en Singapur: marco legal de protección de datos personales*. <https://www.incorp.asia/blogs/pdpa-in-singapore-guide/>
- International Institute for Management Development. (2025). *IMD Smart City Index 2025*. IMD World Competitiveness Center. <https://www.imd.org/smart-city-observatory/>
- Introl. (2024). *La revolución de la IA en Singapur: inversión de 27 mil millones para 2025*. <https://es.introl.com/blog/singapore-ai-revolution-27-billion-investment-2025#:~:text=El%20aumento%20de%20la%20financiaci%C3%B3n,IA%20para%20el%20bien%20p%C3%ABlico>
- Jameson, F. (2004). *La política de la utopía*. *New Left Review*, 25, 35–54. <https://doi.org/10.1177/030981680408400114>
- Jameson, F. (2009). *Arqueologías del futuro: El deseo llamado utopía y otras aproximaciones de ciencia ficción* (C. Piña Aldao, Trad.). Akal. (Obra original publicada en 2005).
- López Keller, E. (1991). *Distopía. Otro final de la utopía*. *Revista Española de Investigaciones Sociológicas*, 55, 7–23. <https://doi.org/10.2307/40183809>
- Martínez Peñate, O. (2015). *George Orwell y Tomás Moro: entre la distopía y la utopía*. Editorial Nuevo Enfoque. https://www.researchgate.net/publication/280740209_George_Orwell_y_Tomas_Moro_entre_la_Distopia_y_la_Utopia
- Mesa Guzmán, T. D. (2025). *4.000 años de historia a un click de distancia [4.000 years of history one click away]*. *European Public & Social Innovation Review*, 10, 1–12. <https://doi.org/10.31637/epsir-2025-1104>
- Moro, T. (2014). *Utopía* (A. Valcárcel, Trad.). Alianza Editorial. (Obra original publicada en 1516).

- Naciones Unidas. (2015). Transformar nuestro mundo: la Agenda 2030 para el Desarrollo Sostenible. Organización de las Naciones Unidas. <https://sdgs.un.org/es/2030agenda>
- Naciones Unidas. (2024). Informe de los Objetivos de Desarrollo Sostenible 2024. Organización de las Naciones Unidas. <https://unstats.un.org/sdgs/report/2024/>
- Núñez Ladevéze, L. (1985). De la utopía clásica a la distopía actual. Revista de Estudios Políticos (Nueva Época, 44), 47–80. Centro de Estudios Políticos y Constitucionales. <https://dialnet.unirioja.es/servlet/articulo?codigo=26825>
- Ochoa, L. (2025). *Condiciones y desafíos del entorno de innovación digital en Asia: gobernanza algorítmica, ecosistemas y vigilancia*. Universidad Nacional Autónoma de México. <https://repositorio.unam.mx/ochoa-2025-innovacion-digital-asia>
- Orwell, G. (2003). 1984. Penguin Books. (Obra original publicada en 1949).
- Programa de las Naciones Unidas para el Desarrollo (PNUD). (2025). Objetivos de Desarrollo Sostenible (ODS). <https://www.undp.org/es/sustainable-development-goals>
- Sachs, J. (2015). La era del desarrollo sostenible. Grupo Planeta.
- Smart Nation and Digital Government Office. (2018). Smart Nation: The Way Forward. Prime Minister's Office, Singapore.
- Smart Nation Singapore. (2017). *Smart Nation Singapore*. Holland Innovation Network, Embassy of the Kingdom of the Netherlands in Singapore.
- World Bank. (2023). Digital development in Singapore: Policy lessons for smart cities. World Bank Group. <https://www.worldbank.org/>
- Zamora Sauma, R. (2025). Ahí está la idea. La justicia como utopía. Revista de Filosofía, Universidad de Costa Rica, 64(169), 79–88. <https://revistas.ucr.ac.cr/index.php/filosofi>