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UNRAVELING SOCIETAL DYNAMICS FROM MARCUSE TO THE DIGITAL AGE

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ABSTRACT

Purpose- This paper explores the complex interplay between technology and society, focusing on technopolitics to understand how technological advancements shape social and political dynamics. Drawing on Herbert Marcuse's critical perspectives in One-Dimensional Man, the study investigates how technopolitical forces contribute to contemporary challenges like social isolation, political polarization, and changes in public discourse. Incorporating insights from sociology, political science, psychology, and technology studies, this research provides a comprehensive look at the evolution of technopolitical structures and their effects on modern society. The paper aims to offer a deeper understanding of technopolitics along with practical insights for addressing its impacts on society.

Methodology- A diverse methodological approach, combining qualitative and quantitative analysis, case studies, and historical comparisons, has been used to capture the multi-layered nature of technopolitics and its varied implications for social structures and governance.

Findings- The research highlights that rapid technological changes have redefined human interactions, fostering social isolation and weakening traditional community ties. As technology increasingly intersects with politics, it reshapes political engagement, with digital platforms altering public discourse and transforming the nature of conflict and participation. An important finding is the evolving role of engineers, who now not only develop technological systems but also influence political processes and public opinion. The concept of a "technopolitical ecosystem" is introduced, emphasizing the close link between technology and politics and the need for a comprehensive approach to navigate these impacts. The findings underline the importance of considering technological advancements from a sociological perspective to develop policies that are both sustainable and effective.

Conclusion- This paper underscores the profound influence of technological progress on social and political structures, demonstrating how technopolitics shapes relationships and governance alike. Through a multidisciplinary lens and historical and contemporary examples, the study advocates for careful, inclusive strategies to ensure that technological advancements support social cohesion and political stability.

Keywords: Technopolitics, social impact, marcuse, technological hegemony, societal transformation
JEL Codes: O33, D72, H10

1. INTRODUCTION

Simultaneously, the interplay between the collective societal framework and the individual—referred to simply as "the individual"—has historically been ambiguous. The dynamics of individual interactions within the broader societal context remain elusive, even in contemporary discussions (Sahlins, 1972, p. 15; Tainter, 2011). To navigate these uncertainties, the notion of a "social contract" has emerged as a critical framework for understanding the origins of the complex relationship between politics and humanity. Philosophers such as Hobbes, Locke, and Rousseau have approached the concept of human nature through the lens of their respective societal contexts, with Hobbes and Locke emphasizing a static, hypothetical view, while Rousseau posited that human nature is subject to change and evolution through anthropological processes (Elahi, 2014)(Devine, 2000).

The critical theory of Herbert Marcuse states that technology does not operate in a vacuum but invariably influences the society in which it functions. Specifically, in the historical book "One-Dimensional Man", Marcuse offers a scathing critique on the advanced industrial society's use of technologies as means of engineering a passive population that is willing to conform to norms. Individuals in such societies, according to him, reach an ever increasing level of technological success, and such people become one dimensional because they use technologies as the ultimate, the only, model (Marcuse, 1964). This

stance gives rise to fundamental issues pertaining to the intersections of power which are wielded by technology and the contours of identity.

Technologies have evolved so rapidly that there is now a new way of orienting and socializing people, which has been referred to as “technopolitics.” This relates to the interplay of technology, politics and society and shows how society is structured in regard to technological progression. Nowadays, society is encountering new challenges and complexities as modern society’s evolution affects interactions between individuals and communities. It is important to understand these relations in order to tackle today’s issues as digital technologies become more and more universal.

The technological forces at play today have intensified the complexity of societal relationships, and humanity’s position under this “technological bombardment” appears increasingly entangled, shaping not only governance but also the very nature of human interaction on both individual and collective levels.As we transition into the digital age, the implications of Marcuse's critique resonate more than ever. The "Single-Person Society," a concept that emerges as a counter-narrative to Marcuse's one-dimensional man, challenges traditional perspectives on technology and individuality. In this framework, technology is viewed not merely as a tool of control but as a facilitator of individual empowerment and participatory governance (Rastovic, 1964).

After the industrial revolution, in the tumultuous decade of the 1960s, marked by student movements that reverberated across the globe, protests, resistance, and revolutionary fervor left an indelible mark on the political landscape, social structures, race relations, and national cultures. Amidst these transformative years, technological advancements gave rise to new debates. The ascent of the "New Left" alongside student activism converged with the publication of Herbert Marcuse's seminal work, "One-Dimensional Man," in 1964, solidifying its position as a potent manifesto within the zeitgeist of the "New Left" (Coomes, 2016). Marcuse scrutinizes the reduction of individuals to mere production entities within contemporary capitalist systems, highlighting the transformative impact of a one-dimensional perspective primarily focused on economic evaluation (Şan et al., 2007).

This article examines the concept of technopolitics through the lens of Herbert Marcuse’s critical theory, emphasizing the interplay between technological hegemony, individualization dynamics, and the pivotal role of interdisciplinary collaboration in shaping technopolitical paradigms. Drawing on Marcuse’s *One-Dimensional Man*, the study explores the profound impact of technology on all facets of human life and its intricate relationship with societal transformation. Marcuse critiques the reduction of individuals to mere units of production within contemporary capitalist systems, highlighting the transformative influence of an economically driven, one-dimensional perspective. By delving into the tension between “negative thinking” and “positive desires,” this analysis underscores the urgency of adopting interdisciplinary approaches to address the multifaceted challenges posed by technopolitics in an era marked by pervasive technological advancement.

2. BACKGROUNDS OF TECHNOPOLITICS

2.1. Technopolitics

Technopolitics is an interdisciplinary field dedicated to exploring the intricate interplay between technology, society, and politics. Scholars in this domain strive to elucidate the transformative effects of technological advancements on societal structures and political frameworks. At the core of technopolitics lies the governance and regulation of these innovations, which integrates research from a myriad of disciplines to address pressing issues influenced by technology. Key areas of concern include security, privacy, economics, social justice, culture, and environmental sustainability.

While technological advancements have undoubtedly enhanced convenience and efficiency in daily life, they simultaneously raise substantial concerns regarding security and privacy. For instance, digital tools, particularly the internet and social media platforms, facilitate unprecedented levels of communication and information dissemination; however, these innovations also engender vulnerabilities that can jeopardize individual privacy and societal security. Consequently, technopolitical research often addresses these multifaceted challenges, providing frameworks and recommendations for effective management strategies.

The earliest forms of social organization in human history originated from hunter-gatherer families. With the advent of agriculture, the need for organization evolved to encompass various requirements and expertise. In the initial stages, the foundations of diplomatic relations and conflicts between tribes often revolved around the theft of livestock, abduction of women, and competition for resources (Lak, 2019). During this period, political and economic power among tribes was largely determined by access to clean water, fertile land, and favorable climates, which were crucial for developing organized societies.

Basic engineering practices, such as water transportation, had significant political and economic consequences in ancient Egypt and Mesopotamia. These civilizations utilized their major rivers to implement irrigation systems, which increased agricultural productivity and sustained population growth. Consequently, a growing population led to enhanced military

power, and the fertile lands fostered loyalty to governance. The current technopolitical landscape is still exemplified by the critical role of water resources, which have historically determined societal development. Access to clean water is essential for health and productivity, yet disparities persist globally. Technological advancements, economic power, and political influence shape the availability of water, revealing the interplay between geographical factors and technological development. Policymakers must address the dual challenges of ensuring access to resources and managing environmental sustainability.

The Sumerians, a pivotal civilization in Mesopotamia, significantly influenced historical trajectories. Their religious beliefs and practices shaped various aspects of life in the Middle East, impacting governance, trade, and social interactions (Kramer, 1961). The Sumerians operated within a polytheistic framework, associating every object and event with multiple deities. This belief system allowed for a structured societal organization, where even laborers were effectively managed (Landsberger, 1943).

In contrast to historical technopolitical structures, contemporary technopolitics are increasingly shaped by advanced technological instruments. Modern mechanisms that govern behavior focus on enhancing organizational performance through various forms of expertise. Today, private companies, the public sector, and algorithms influence consumer habits and societal norms. Comprehensive societal control is achieved through social engineering approaches that impose perceived notions of the "right" and the "good." Data-driven, algorithmic frameworks create a facade of improvement and progress within society.

This strategic manipulation of behavior aligns with John Nash's game theory, which posits that the outcomes of competitive interactions depend on the established rules rather than chance (Nash, 1951). For instance, in a two-player game, the initial player's move dictates the potential for winning or losing, highlighting the importance of setting advantageous rules. This principle underlines how contemporary technocrats leverage structured systems to maintain control over societal behaviors, often presenting their data-driven initiatives as enhancements for human welfare.

Historically, the pursuit of happiness and consent has been a significant human endeavor. Philosophers such as Aristotle and Plato explored these themes, with works like Plato's "Republic" and Aristotle's "Politics" providing foundational texts on governance and societal well-being (Kolind, 2018). Aristotle's exploration of the ideal state and citizen reflects an enduring commitment to achieving the common good. In modern contexts, individuals willingly share vast amounts of personal data, forming the basis for data mining and big data analytics that drive contemporary decision-making.

The application of individual data for purposes ranging from consumer behavior to political choices exemplifies the challenges of accessing accurate information in the current era. Algorithms track habits and preferences, influencing choices in entertainment, purchasing, and political affiliation. Technopolitical dynamics harness these trends, leading to a decrease in physical interactions and increased reliance on digital communication.

Modeling societal behavior cannot be simplified to predictable mechanical processes. Society is a complex, interconnected system influenced by myriad changing parameters, making it difficult to understand behavioral relationships. Small, seemingly insignificant actions can have profound implications for societal dynamics, which can be characterized as chaotic systems. The complexity inherent in human decision-making necessitates a nuanced understanding of societal interactions.

In contrast to the common political landscape dominated by lawyers and politicians, engineers are increasingly integral to governance, particularly in countries like China, where technical expertise informs policy decisions (Kirby, 2017). The integration of engineers into leadership roles enhances the focus on technology-driven developments, fostering innovation and progress.

Ultimately, the founders of contemporary technopolitics are not without accountability. As societal dynamics evolve, the need for transparency and oversight in technopolitical processes becomes increasingly crucial. The interplay of technology and politics requires continuous examination to ensure that advancements serve the greater good rather than perpetuate inequities.

2.2. Technopolitical Ecosystems: Historical and Modern Perspectives

The first forms of social organization in human history were created by hunter-gatherer families. With the invention of agriculture, the need for organization evolved continuously to encompass different requirements and expertise up to the present day. In the early stages, the foundation of diplomatic relations and wars between tribes often revolved around the theft of livestock or crops, abduction of women, or competition for resources and status (Lak, 2019). During this period, political and economic power among tribes was determined by the availability of clean water sources, fertile land, and temperate climates. These necessities were essential for the development of highly organized societies. Basic and primitive engineering practices, such as the transport of water, which is a technical matter, had political, economic consequences in ancient Egypt and Mesopotamia. Civilizations like Egypt and Mesopotamia benefited from their great rivers by implementing

irrigation systems, which increased agricultural productivity and sustained population growth. Thus, with the growing population came increased military power, and the fertile lands resulting from water transport naturally led to loyalty to governance.

The Sumerians, one of the most significant civilizations to have emerged in Mesopotamia, where intensive interactions among societies and civilizations took place, played a crucial role throughout history. Sumerian religious beliefs and practices have had a decisive influence on all societies, religions, cultures, and various aspects of life in the Middle East, from birth to death. Many aspects of Sumerian culture can still be observed in trade, governance, war, peace, and law. Sumerian religious beliefs were centered around a polytheistic understanding of gods and cosmology. Sumerians associated every object, event, or phenomenon they encountered with thousands of gods (Kramer, 1961). Gods had an influence on daily life, trade, justice, and social and human relationships. The Sumerians, thanks to the societal engineering mechanism provided by a government centered around gods, were so well-organized that even a laborer in their organization, a man who collected reeds in their fields, could be controlled (Landsberger, 1943).

Today's founding technopolitics are enriched with technologic instruments different from Sumerians. Behind the any contemporary mechanism that controls what kind of behavior people will exhibit in increasing organizational performance that focuses on humans and encompasses different aspects of expertise in behavior control. Founding contemporary technopolitics can be a private company, the public sector, the state itself, search engines, or algorithms that control our shopping habits. Achieving comprehensive control of society by individually controlling people and directing their various habits is achieved through social engineering approaches that impose the "right" and the "good" on people. Data-driven, quantitative, rational, and freedom-enabling social media platforms create "smart" algorithms to fix "things" and improve society—or at least make us feel that way.

This is a game whose winner is determined at the beginning. This approach can be likened to John Nash's (Nash, 1951) game theory. In game theory, John Nash states that determining what is good and bad, who wins and loses depends on what the rules of the game are and who starts the game, rather than luck. Consider a two-player game. Let's say the first number is 30, and according to the rules, each player can subtract a number, which can be either 2 or 1, and the player who reaches zero wins the game. Let's also establish that the opposing player starts the game. These rules determine the winner. When the opponent subtracts 2, we subtract 1; when the opponent subtracts 1, we subtract 2. The number 30, which is a multiple of 3, will reach 0 on our turn. Thus, according to Nash, to be the constant winner of the game, it is necessary not only to play by the rules but also to set the rules in one's favor. Of course, game theory does not deal with games that involve just luck; in other words, games played with dice are beyond the scope of this theory.

John Nash, through his game theory, suggests that what is good and bad, who wins and loses, depends on what the rules of the game are and who starts the game. It is challenging to believe that luck plays a significant role in the 21st-century new world order, where the rules change almost daily. This is precisely why the founders of the new technopolitics, who claim to be decentralized, hold a significant advantage over humans or, rather, against humans. Today's technocrats, who claim that data-driven AI systems are created for "human betterment," manage to convince a large number of people to act in the desired direction and feel content.

The pursuit of happiness and consent has been a timeless human endeavor. Thinkers and philosophers as far back as the time close to the birth of Jesus, on the western coast of Anatolia, along the Mediterranean and Aegean shores, have delved into this topic. Aristotle and Plato, ancient Greek philosophers, contributed significant works in this regard. Plato's "Republic" and Aristotle's "Politics" are among the first comprehensive texts written on the functioning of the state and the happiness of society (Kolind, 2018). In his work "Politics," Aristotle, often considered one of the most influential philosophers in political thought, offers a summary of a lifetime's worth of experiences, thoughts, and observations. Aristotle delves into the nature of an ideal state, an ideal citizen, and the structure of an ideal education system (Coşğun, 2015). According to him, politics is the art of achieving human happiness and solving societal problems for the greater good. Plato, on the other hand, defines politics as the art of governing people with their consent. This is where the concepts of "happiness" and "consent" come to the forefront. In today's world, we willingly share a plethora of information, from our social media photos and personal details to our political beliefs. This act of sharing data willingly forms the basis for concepts such as data mining and big data analysis.

The utilization of individual data for specific purposes, ranging from shopping habits to political choices, lies at the heart of many contemporary issues. Technology plays a pivotal role in utilizing this data to offer shopping recommendations, suggest content based on our political views, and even attempt to understand our emotional responses. In today's world, post-truth approaches make it challenging to access accurate information. Social media algorithms track our habits, make content recommendations, and strive to make us happier. The culture of happiness and consent influences our choices in selecting TV shows, making purchases, and even determining our political affiliations. Technopolitical relationships harness these principles, guiding data with engineering practices, and leading society towards less physical interaction.

However, modeling society and the associated social relationships cannot be achieved with a simple machine prediction consisting of pendulums and strings. The values of society ensure its continuity over many interconnected or independent parameters that are constantly changing. This complexity makes modeling society and understanding behavior relationships quite challenging. Generally, considering the complexity of human and societal decision-making processes, small and seemingly insignificant actions and movements of individuals can significantly impact the entire society. Many different parameters influencing this dynamic movement complicate the understanding of the entire system. In this respect, society can be considered as a chaotic system. Chaotic systems are complex systems where sensitivity to initial conditions is crucial, and long-term predictions of system outcomes are unpredictable. The phenomenon known as the butterfly effect generally describes how small changes in the initial data of a system can lead to large and unpredictable consequences. Chaos Theory, an alternative approach developed to make sense of systems whose workings we do not fully understand, was put forward by Edward N. Lorenz, particularly in his work on modeling chaotic flow with nonlinear differential equations (Lorenz, 1963). In his work "The Essence of Chaos," Lorenz defined and explained chaos and its conditions (Lorenz & Haman, 1996). The concept he introduced into the literature as the 'Butterfly Effect' is also referred to as 'Sensitive Dependence on Initial Conditions.' According to James Gleick, the Butterfly Effect is not a coincidence but a necessity, emerging as a result of an inevitability stemming from the relationship between society's problems and its interactions with humans and nature.

Poincaré and Birkhoff examined the nonlinear, unpredictable dynamic problems of the physical world. Initially used in weather predictions, Chaos Theory has become a young and interdisciplinary academic field applied in a wide range of areas, from explaining cosmic events to understanding everyday life problems, with the discovery of similar features in many different systems (Aytaç & İlhan, 2008; Kesici, 2006). Chaos theory, which was first put forward in 1890 by Henri Poincaré, who discovered orbits that do not increase indefinitely, do not reach a certain peak, and are not periodic, was used effectively in daily life with the widespread use of computers (Bartky & Birkhoff, 1928; Poincaré, 1890).

3. MODERN TECHNOPOLITICS

The Industrial Revolution, originating in 18th century England and subsequently spreading to other European countries and North America, was significantly propelled by the invention of the steam engine by Scottish engineer James Watt (1736-1819). The advent of the steam engine transformed production processes, introducing steam as a reliable and powerful energy source independent of natural forces such as rivers, wind, and animals. However, the perceptions of development and political awareness varied among countries, influencing factors such as per capita income, an imperfect indicator of economic advancement.

This revolution led to a substantial accumulation of capital, as the quest for cheaper production methods diminished the value of labor. Capital leveraged cheap labor for mass production, fostering the development of concepts like competition and entrepreneurship. The mechanization of production altered not only people's lifestyles but also their working conditions, with factory workers facing longer hours and increased hazards due to dangerous machinery. The changes in mechanization and labor organization contributed to an increase in surplus value production. As Marx (1867) conceptualized, the generation of relative surplus value involved enhancing labor productivity, enabling workers to produce more within the same timeframe.

The aftermath of the Industrial Revolution saw capital focusing primarily on production, intensifying control over labor. These transformations unfolded within a new technopolitical ecosystem characterized by the application of scientific and technological advancements to production processes, the transition to mechanized production, and the emergence of factories that reduced the need for labor. The rapid developments in capitalist production processes prompted a transformation in technical labor, often disregarding environmental consequences. Factory operations caused pollution, adversely affecting living conditions.

Developing a technopolitical perspective for interdisciplinary solutions requires addressing historical, cultural, human, and environmental concerns, laden with cultural and engineering values. However, not all technological developments align with humanitarian progress; some may devolve into attacks on human dignity, as illustrated by certain dystopian scenarios. Although long-term international collaborations guided by technical expertise can facilitate societal development, many countries still lack the essential engineering competence, labor, and institutions to address fundamental issues. In such contexts, the pursuit of a perspective prioritizing technology and humanity often becomes enmeshed in intricate political complexities. Political entities in the West, representing socialist, social democratic, and liberal traditions, have played central roles in societal movements and struggles. Historical contexts include conflicts such as center-periphery dynamics, state-church relations, and labor-employer struggles, which continue to shape the distinct political traditions of socialism, social democracy, and liberalism.

3.1. The Technopolitical Ecosystem Created by the Industrial Revolution

The Industrial Revolution, originating in 18th century England and subsequently spreading to other European countries and North America, was significantly propelled by the invention of the steam engine by Scottish engineer James Watt (1736-1819). The advent of the steam engine transformed production processes, introducing steam as a reliable and powerful energy source independent of natural forces such as rivers, wind, and animals. However, the perceptions of development and political awareness varied among countries, influencing factors such as per capita income, an imperfect indicator of economic advancement.

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3.2. Navigating the Technopolitical Landscape: Shaping Governance and Democracy in the 21st Century

In the aftermath of World War II, Europe entered a significant period of reconstruction, during which new trends emerged. These trends emphasized the connection between the exit from Keynesianism and the development of low-income countries by high-income nations. Rather than relying solely on resource accessibility policies, a focus on enhancing individual and societal freedoms through capacity-building models gained prominence. Within this framework, Amartya Sen’s capability approach and Ronald Inglehart’s ideas on liberating values and democratization emerged as two crucial perspectives that prioritize individuals as the primary targets (Robeyns, 2005).

While classical economic development theories typically emphasize centralization, the paradigm of the 21st century advocates for personal capabilities and liberating values, asserting that individuals should be empowered to sustain the lives they deserve. In this context, the economic and political atmosphere of the 21st century can be understood as a technopolitical environment established for governance and citizen sovereignty. The emergence of artificial intelligence (AI) has introduced new dimensions to the technopolitical landscape. AI systems, particularly those utilizing machine learning and natural language processing, are increasingly embedded in governance and economic frameworks. These systems offer unprecedented capabilities in optimizing public services and enhancing policy implementation. However, they also present significant ethical dilemmas, particularly concerning accountability and the potential erosion of human oversight in critical decision-making processes (Pasquale, 2020).

Technological advancements have transformed the sharing environment since the early 21st century. The proliferation of mobile broadband connections and social media platforms, alongside new software, web platforms, and mobile applications, has accelerated processes of idea generation, discussion, decision-making, voting, media creation, and content sharing. This technopolitical ecosystem has made data generated from its components searchable and replicable. Technological progress has permeated every facet of our lives, enhancing the importance of the relationship between technology and politics over the past century.

Since the early 21st century, various technopolitical decisions related to the formation and management of digital ecosystems have emerged. Digital ecosystems, functioning as systems that communicate and operate through the internet and digital technologies, have altered how individuals interact and how workplaces operate. The rise of Industry 4.0 has integrated machines, devices, and humans, providing almost limitless information everywhere (Schwab, 2016). However, the expansion of networks complicates existing structures, and the chaotic nature of this new technopolitics makes predictability challenging.

Furthermore, data protection and privacy have become urgent issues that require technopolitical decisions concerning the formation and management of digital ecosystems. The collection and use of societal data in digital environments raise significant concerns, prompting discussions around regulations related to data protection and privacy. AI's role in digital ecosystems is profoundly tied to data analytics, where vast amounts of user data are processed to generate insights and predict trends. This raises urgent questions about privacy and the ownership of data, especially in an era where personal information is a valuable commodity. Regulatory frameworks must evolve to ensure that AI applications uphold ethical standards and protect individual freedoms, balancing innovation with the need for stringent data governance (Mendoza, 2022).

Historically, computers and the internet have been viewed as opportunities for strengthening democracy (Kurban, Peña-López, Haberer, et al., 2017). However, it has become evident that the internet reflects societal and political dynamics since its inception. While the potential of the internet to facilitate communication and organization exists, it has yet to yield sufficient democratic transformations. Currently, when combined with legal and political tools, internet-based communication methods offer limited technopolitical strategies to address democratic shortcomings. Technological advancements, technopolitical interactions, and the emerging ecosystem extend beyond mere transportation and communication. The concept of "technopolitics" must be assessed from various perspectives, encompassing urbanization, military, banking, and industrial sectors. The internet continues to represent a contested domain between the paradigms of freedom and security (M Rumold - Santa Clara L., 2015).

Since the early 21st century, technological expertise has played a role in addressing various local and global crises, leading to the emergence of communities, platforms, movements, and layers of activism. Within the representational paradigm, individuals often appear insignificant as political actors. Beyond voting, there is typically no direct connection between politicians and individuals; this disconnection can lead to a crisis of democracy when the political sphere becomes detached from the public (Chou, 2015). Larger-scale collective actions facilitate broader participation beyond traditional voting procedures, allowing individuals to engage in more extensive movements.

In Western political systems, connected individuals have become fundamental units for the networked society (van Dijk, 2006). While governments utilize the internet to reinforce traditional practices, the most significant changes within the technopolitical ecosystem are occurring from the bottom up. As empowered actors, individuals are emerging as key players in this new technopolitical era. The use of components of the technopolitical ecosystem, such as Twitter and Facebook, facilitates democratic participation. Events like WikiLeaks and the revelations by Edward Snowden exemplify individuals' capacity to question and influence political processes. Such actions allow individuals to bring sensitive information to light and aim to disrupt existing power structures.

Collective action can be defined as "facilitating individuals' contributions to collective efforts that generally seek public good" (Bennett & Segerberg, 2012). In this context, individuals contribute to the overarching narratives of main organizations that shape the spirit and themes of movements. Within the technopolitical ecosystem, the presence of individuals in collective actions and their relationships with institutional organizations exhibit similarities to "distributed leadership" (Nunes et al., 2014). The ecosystem quickly addresses the organizational and communication needs of actors, allowing political organizations to be established even with online tools and limited budgets. The technopolitical ecosystem accelerates processes of idea gathering, discussion, decision-making, and content creation, making citizen participation traceable.

The incorporation of AI in political processes has also transformed the nature of collective action and political communication. Campaign strategies now leverage predictive analytics and sentiment analysis to craft targeted messages and optimize voter engagement. While these technologies enhance political participation, they also risk exacerbating polarization and undermining democratic values. Cases involving the misuse of data in election contexts highlight the need for greater transparency and accountability in the deployment of AI-driven tools (Woolley & Howard, 2018).

Table 1: Summary of Key Themes in the Technopolitical Landscape.

Theme	Description	Implications
Historical Context	Post-World War II reconstruction in Europe; shift from resource-based policies to enhancing individual and societal freedoms.	Marked a transition in governance towards prioritizing human development, paving the way for participatory and capacity-building approaches in low-income and recovering societies.
Key Perspectives	- Amartya Sen: Capability approach emphasizing individual empowerment. - Ronald Inglehart: Focus on liberating values and democratization.	Theoretical frameworks encourage policies that prioritize human capabilities and value-driven democratization, reinforcing the importance of individual agency in governance.
Technological Advancements	Proliferation of mobile broadband, social media, and digital tools; transformation of communication and organizational practices.	Opened avenues for broader citizen engagement but also introduced challenges like misinformation and increased complexity in political systems.
AI and Governance	Use of artificial intelligence in decision-making, policy analysis, and public service delivery.	Improved efficiency and predictive governance, but raised ethical dilemmas around algorithmic bias, accountability, and transparency.
Collective Action	Emergence of new forms of political engagement beyond traditional voting; rise of grassroots movements enabled by digital technologies.	Empowered marginalized groups and facilitated rapid mobilization, leading to shifts in power dynamics and more responsive governance structures.
Privacy and Data Protection	Growing concerns around data collection and use; need for regulatory frameworks to protect citizens in digital environments.	Urgency for robust legal frameworks to safeguard privacy and data integrity, critical for maintaining public trust in digital systems.
AI in Political Processes	AI-driven tools reshaping political campaigns, voter targeting, and misinformation detection.	Enhanced personalization and efficiency in campaigns, but risks of manipulation and polarization demand regulatory oversight and ethical standards.
New Political Entities	Rise of political organizations that utilize digital platforms for decision-making and citizen engagement; examples include Podemos and Barcelona en Comú.	These organizations demonstrate how digital platforms can increase transparency, broaden participation, and challenge traditional political structures.
AI and Public Opinion	AI's role in analyzing and shaping public opinion through sentiment analysis and content recommendation algorithms.	Enabled real-time feedback for policymakers, but also raised concerns about echo chambers and the manipulation of public discourse.
Reconceptualization of Sovereignty	Need to reevaluate state sovereignty in light of global interconnections and technological changes; focus on international cooperation and governance frameworks.	States face pressures to adapt sovereignty models that balance national security with global governance in the digital age, ensuring relevance in a connected world.

The reality of this ecosystem became particularly evident during the social movements of 2011-2013 (the Arab Spring). When crowds gathered physically in urban areas, the power of social media enabled rapid global dissemination of demands. Internet-based information layers synchronized protesters' actions, while authorities monitored these processes, implementing both virtual and real measures. In recent years, digitally equipped and politically active youth have increasingly participated in political processes through these channels. New political parties in Spain, such as Podemos and Barcelona en Comú, have utilized the internet and social media to meet their communication needs (Tormey & Feenstra, 2015). Decisions within these political organizations incorporate online/offline citizen participation and enhance financial transparency through web platforms (Casero-Ripollés et al., 2014).

In response to the technopolitical ecosystem, not only nation-states but also international platforms and organizations (ranging from NGOs to multinational corporations) have begun developing new strategies for survival. This trend necessitates a reassessment of state sovereignty in the 21st century. Similar to the globalization processes that led to the emergence of

nation-states in the 19th century, a new understanding of state sovereignty requires the establishment of a legal and political framework that advances international relations.

This shift necessitates a transformation of traditional nation-state structures to accommodate the international actors of the 21st century. In this new world order, the political strategies developed must consider both the security needs of states and the expansion of international cooperation, thereby necessitating a reconceptualization of state sovereignty in the face of the digital revolution.

4. EXPLORING DIMENSIONS OF CONTEMPORARY ISOLATION: DIGITAL, SPATIAL, AND MEDIA PERSPECTIVES

The digital age, with its unprecedented connectivity, has enabled the creation of multiple virtual identities, often causing a significant disjunction between an individual's digital persona and their real-world identity. This disconnection fosters what is now commonly referred to as *digital loneliness*, a state characterized by superficial communication and a lack of meaningful emotional connections. As a dual process, digital isolation serves both as a platform for self-exploration and as a contributor to the erosion of reality, forcing individuals to navigate between self-discovery and existential disorientation.

Hegel's concept of alienation outlines a dialectical journey of self-creation and self-awareness, which Marx critiques by embedding it within the material structures of capitalism. For Marx, alienation is deeply rooted in the economic dynamics of production, contrasting with Hegel's more abstract philosophical approach. However, these perspectives are not strictly antagonistic. Instead, they complement each other, offering a holistic view of human experience that resonates profoundly in contemporary technopolitical contexts (Aydoğan, 2015). In these contexts, the dichotomy of "good" versus "bad" becomes a politically charged debate, reflecting how technological tools mediate societal norms and values. This mediation occurs within a dynamic technopolitical ecosystem, where political actors leverage technology to craft strategies that both reflect and influence societal change (Kurban, Peña-López, Internet, et al., 2017)

As the human experience evolves, so does the concept of culture. Traditionally defined as the cultivation of land and agricultural products, culture can now be expanded to encompass the myriad ways in which humans innovate, adapt, and transform their environments (Briggs & Bauman, 1992; Murdock, 1965). The rapid acceleration of change in the 21st century highlights this transformation, as humanity moves swiftly from the hunter-gatherer era through agricultural and industrial societies, culminating in today's information age. Some scholars, recognizing the magnitude of this shift, have termed the current period the *Fifth Industrial Revolution*, characterized by the integration of cyber-physical systems under the broader framework of *Society 5.0*—a concept introduced by the Japan Business Federation in 2016 to define a super-smart society that builds on previous societal paradigms (Noble et al., 2022).

However, the digital revolution has not been without its tensions. Social media platforms, initially celebrated for their democratizing potential, notably during pivotal events such as the Arab Spring, have since revealed their limitations. These platforms offered an alternative to the biases of traditional media, facilitating real-time, interactive engagement with global events. Yet, the initial optimism was soon tempered by the realization that these same platforms could be weaponized, as evidenced by the 2016 U.S. elections. Accusations of voter manipulation through social media tools highlighted the fragility of information integrity in a digital age (Sneed, 2020).

The generational divide further complicates the narrative. *Digital natives*—those who have grown up immersed in technology—approach these platforms differently from *digital immigrants*, who adopted technology later in life. This divergence is encapsulated in the metaphor of the "tweeting rabbit and the reading turtle," where the rapid pace of technological advancement often outstrips the capacity for critical reflection (Webster & Ruskin, 2012). The result is a fragmented media landscape, where the quest for immediacy undermines depth and the pursuit of novelty eclipses the value of enduring insights.

Amid these technological and social shifts, the concept of *placelessness* in technopolitics—once seen as liberating—now appears inadequate. The dynamics of data production and analysis dominate the technopolitical landscape, revealing the dual-edged nature of data: it can both unify and fragment. *Data activism* emerges as a critical force in this environment, bifurcating into two distinct forms. Proactive data activism aims to harness data for social and political empowerment, promoting equitable participation in technopolitical processes (Milan & Velden, 2016). In contrast, reactive data activism seeks to resist mass surveillance and safeguard individual privacy, often driven by grassroots movements (Milan & Gutiérrez, 2018). Within this framework, information becomes a form of power, capable of shaping narratives and redefining societal structures (Cukier & Mayer-Schoenberger, 2013).

The COVID-19 pandemic further accentuated the contours of this solitary, data-driven society. As physical interactions diminished, digital platforms became indispensable for both social engagement and economic activity. This shift compelled societies to reconsider long-standing assumptions about what constitutes public and private goods in political discourse. The pandemic underscored the urgency of developing innovative technopolitical tools that leverage data and artificial intelligence to address emerging challenges.

Ultimately, the interplay between technological advancements and social structures continues to reshape our understanding of reality. The rise of new epistemic cultures, guided by data activism, is transforming how we engage with information and evaluate its validity. In navigating this complex landscape, societies face the dual challenge of harnessing the transformative potential of technology while critically assessing its implications for human agency, social cohesion, and democratic governance. The stakes have never been higher, as the path forward will determine not only the trajectory of technological progress but also the core values that define our collective humanity.

4.1. Digital Surveillance and Power in the Single-Person Society: Spatial and Social Transformations

The concept of spatial scale is a critical tool for social scientists studying human activities on Earth. It allows for the analysis of complex processes and the interrelations between them, especially in understanding environmental and societal changes (Meentemeyer, 1989). Spatial scaling is also crucial for analyzing political phenomena, where processes operate at different levels, from local to global. Representative democracy, for instance, can be divided into social, regional, state, and international scales, all of which are shaped by hierarchical relationships with the state as a primary political actor affected by global economic interests (Hale et al., 2005)(Berber, 2003). Within the contemporary technopolitical landscape, these political scales are increasingly blurred as digital technologies allow for decentralized governance, enabling new forms of organization and political expression.

In the context of the single-person society, the state's role as a central actor is undergoing significant transformations. While historical power structures were often tightly bound by physical spaces—particularly before the Industrial Revolution—modern production transcends these boundaries, made possible by the digital realm. As a result, power dynamics become more fluid, and new forms of sovereignty emerge, where individuals can more easily organize, communicate, and even challenge traditional political structures (Sassen, 2006)(Bodemann & Yurdakul, 2006). This shift also highlights the growing influence of digital citizenship, as individuals increasingly engage in political processes through online platforms that offer participatory and decentralized opportunities.

Technological advancements have reshaped communication processes, facilitating the emergence of a new political space often referred to as "cyberspace." John Perry Barlow's "Declaration of the Independence of Cyberspace" emphasized this phenomenon, portraying cyberspace as a space beyond traditional geopolitical boundaries, where individuals are no longer subject to the same hierarchical controls. Scholars characterize this as the "third environment," an interconnected realm that combines elements of the natural and urban worlds through collective intelligence and digital interactions (Echeverría et al., 2020). This new environment fosters a more flexible, dynamic, and personalized interaction with politics and governance, where information flows freely and individuals are empowered to engage in social and political discourse.

At the social and regional levels, information technology has revolutionized both the organization of communities and the global visibility of movements. Through social media, individuals and organizations can more effectively mobilize and raise awareness on a variety of issues, challenging the relevance of traditional political institutions. The rise of slogans advocating for "governmentless management" signals a move away from conventional governance models, as citizens question whether traditional political parties remain necessary in an age of decentralized and digital activism (Mair, 2013). The increasing visibility of contentious politics on digital platforms further complicates the role of the state, which may no longer be seen as the central actor in political decision-making (Skrbis, 2008).

Despite the democratizing potential of digital spaces, there remains a latent risk of authoritarianism as states continue to centralize surveillance and control over information. The very tools that empower individuals to act autonomously also expose them to greater forms of surveillance and manipulation. In this sense, the single-person society occupies a paradoxical position in relation to power: it offers new freedoms while simultaneously subjecting individuals to more sophisticated forms of control. This duality reflects the tensions between individual sovereignty and the centralization of power in the digital age, making the governance of the single-person society a complex and potentially volatile issue.

4.2. Capitalist Loneliness and the Technopolitical Landscape

Capitalist loneliness offers a critical lens through which to examine the societal shifts brought about by capitalism, particularly in terms of how it redefines human relationships. Emerging in the late 20th century, this concept highlights the profound ways in which capitalism, through work and consumption, has altered interpersonal connections, leading to increased feelings of alienation. In capitalist societies, particularly those shaped by neoliberalism, individuals are encouraged to prioritize personal success and economic independence, often at the expense of collective solidarity and social bonds. This transformation fosters a sense of isolation, where relationships become increasingly transactional and instrumental.

In the technopolitical framework of the single-person society, this shift towards individualism is closely tied to the glorification of entrepreneurship. The idea of "freedom" in this context is often equated with self-exploitation, where individuals are encouraged to see themselves as both workers and entrepreneurs, constantly striving for success in a system that rewards individual effort. Marx critiques this notion, arguing that capitalism's emphasis on individual freedom masks its true purpose:

to maintain existing power structures through the illusion of choice and competition. As neoliberalism erodes collective identity, the worker is transformed into an entrepreneur, perpetuating a cycle of self-exploitation and reinforcing the capitalist system.

This transformation is further complicated by the role of technology, which not only mediates social interactions but also reinforces capitalist dynamics. The rise of digital technologies has led to new forms of labor, where individuals, or "prosumers," engage in the creation of content and data, thereby contributing to the economic value of platforms and advertisers. This process, however, is not without its contradictions. While the internet promises empowerment and the democratization of communication, it often reinforces existing power inequalities. The personal data generated through online interactions becomes commodified, further entrenching capitalist control and creating artificial demands for consumption.

Moreover, as traditional forms of media decline, the rise of single-person media—where individuals create and disseminate content directly through digital platforms—marks a shift in how communication takes place. This transition, while appearing to empower individuals, often serves the interests of capital by commodifying attention and engagement. The media landscape, driven by algorithms and data analytics, personalizes content to reinforce consumer behavior, creating a false sense of autonomy while shaping individual identities and desires based on market needs. In this environment, communication becomes less about collective needs and more about economic incentives, where attention itself becomes a valuable commodity.

The increasing commodification of personal data underscores the need for a critical engagement with the systems that govern digital interactions. In the single-person society, individuals may perceive themselves as free and autonomous, yet they are embedded in a complex web of surveillance and control. The illusion of freedom perpetuated by digital technologies masks the underlying power structures that shape the way individuals interact with one another and with the state. As such, the technopolitical landscape of the single-person society reflects the complexities of power, freedom, and surveillance in the digital age. The transformation of communication and social dynamics within this context highlights the intricate relationship between technology, capitalism, and societal identity, and underscores the importance of critically examining the forces that shape our digital lives.

Table 2: Summary Table: Digital Isolation, Technopolitical Dimensions, and Capitalist Loneliness

Dimension	Key Themes and Concepts	Outcomes
Digital Isolation	-Disconnect between digital identity and real identity -Emotional loneliness	Paradox of social connection and loneliness.
Capitalist Loneliness	-Impact of capitalism on human relationships -Changes in consumption and work habits	Increased loneliness due to individualization.
Technological Effects	-Interaction between politics and technology -Validity of narratives	Influence on information accuracy and governance.
Activism	-Proactive and reactive data activism	Empowerment and resistance potential.
Media and Viewer Role	-Viewer-prosumer dynamics -Information dissemination	Complexity of media consumption and value creation.
Surveillance and Control	-Control by capitalist structures -Data commodification	Socio-economic inequalities behind digital equality.
Transformation Potential	-Importance of critical engagement -Democratization of media	Need to understand the relationship between technology and social structures.

5. TECHNOLOGICAL HEGEMONY: A COMPARATIVE EXPLORATION OF MARCUSE'S ONE-DIMENSIONAL MAN AND THE CONCEPT OF THE SINGLE-PERSON SOCIETY

Marcuse's analysis in *One-Dimensional Man* offers a profound critique of the technological and bureaucratic structures that define advanced industrial societies. In these societies, technology and bureaucracy are aligned with the interests of private capital, often operating under the guise of neutrality. Marcuse argues that this "neutrality" masks the reality that these systems ultimately serve to perpetuate the dominance of capitalist interests, reducing the scope for critical thought and

alternative possibilities. His concept of technological rationality demonstrates how, in these societies, technological advancement often leads to a one-dimensional reality where individuals become passive participants in the dominant system, unable to imagine or pursue alternative futures.

In the context of the *Single-Person Society*, Marcuse's theory of technological rationality undergoes a shift. The *Single-Person Society* disrupts the traditional structures Marcuse describes by facilitating individual freedom and autonomy, offering new avenues for critical thinking and alternative perspectives. Rather than reinforcing a monolithic vision of society, this new framework allows individuals to experience distinct and unique perspectives, thereby encouraging personal agency and challenging the passive acceptance found in advanced industrial societies.

However, Marcuse's critique of class structure—particularly his observation of the unification of the bourgeoisie and proletariat—takes on a new dimension in the *Single-Person Society*. He argues that technology fosters a "rich society" that promises happiness and contentment, securing individuals' consent to the existing system. In this environment, the satisfaction of individual needs is presented as a form of freedom, yet it comes at the cost of critical engagement. As individuals embrace the technological system, they become passive agents, and dissent diminishes. This culture of consent, perpetuated by technological advancements, leaves little room for resistance, reinforcing Marcuse's concept of alienation.

Marcuse's emphasis on technology as a tool of control is critical to understanding his thesis. He suggests that technology, through its role in organizing and directing social relations, operates as a mechanism of domination, maintaining the power of the established system. The technical apparatus becomes a means of enforcing non-personal rules, creating a pervasive and often invisible form of control that extends beyond the immediate realm of production into cultural, political, and economic spheres. However, this framework does not fully account for the evolving role of technology in contemporary society, where technological advancements increasingly blur the boundaries between production and social interaction.

Today's technology is not limited to the industrial processes Marcuse primarily engages with, nor is it confined to machines that serve practical purposes. Technology has become deeply embedded in the organization and evolution of social relationships and dominant thought patterns. The rise of digital technologies, for example, has radically transformed communication and work practices, creating new forms of connection and interaction that challenge traditional power structures. While Marcuse viewed technology as a centralizing force, contemporary technological advancements—especially in the digital realm—offer individuals greater access to communication, information, and self-expression. These tools empower individuals, yet they also carry the potential for greater manipulation, as the structures of control shift and adapt in response to these new technologies.

The implementation of modern technologies raises important questions about the relationship between economic power and social change. As technology becomes more accessible and affordable, it no longer requires the vast resources once necessary to maintain and expand technical apparatuses. Marcuse's theory of technological dominance must be reconsidered in light of this shift. In today's world, the power of technology is not just determined by its capacity to control but by its ability to democratize access and reshape social structures. The proliferation of digital platforms, social media, and other technologies of communication has created new opportunities for political engagement, while also reinforcing the individualistic, consumer-driven values that characterize the *Single-Person Society*.

Habermas critiques Marcuse's view, arguing that technical reason retains its political content within social systems, suggesting that the development of technology is not neutral but intrinsically linked to social and political goals. In the context of the *Single-Person Society*, technology facilitates a culture of happiness and consent, where the focus shifts from collective action to individual satisfaction. This shift, while seemingly empowering, also deepens the paradox of societal demands. The increasing expectation for individual fulfillment in a world driven by technological advancements creates a tension between personal freedom and the rationality imposed by the system.

Ultimately, the *Single-Person Society* presents a complex landscape where technology fosters new freedoms while also deepening the rationalization of control. By offering individuals new avenues for self-expression and participation, it challenges traditional forms of governance and societal structures. Yet, it also raises critical questions about the relationship between technology, individual agency, and power, inviting a reevaluation of how technological advancements shape not only our lives but the very nature of social organization itself. This new technopolitical reality necessitates a more nuanced understanding of the roles technology plays in both enabling and constraining individual freedom.

6. RESULTS OF COMPARATIVE ANALYSIS: ONE-DIMENSIONAL MAN BY MARCUSE AND THE IMPACT OF INDIVIDUALIZED SOCIETY TECHNOPOLITICS

This section explores the evolution of the single-person society, shaped by the widespread availability and accessibility of emerging tools and technologies, particularly artificial intelligence. Digital social innovation, underpinned by information technology, facilitates more efficient and proactive social service processes. It also fosters greater individual participation in the design and management of these processes, aligning them with personal needs and goals.

The technopolitics of a single-person society, which emerges from a reconfiguration of production methods, offers a viable alternative to traditional industrial paradigms. This new technopolitical framework emphasizes three core principles: human-centricity, sustainability, and flexibility. These principles aim to improve well-being through innovative production practices and more personalized societal structures, enabling individuals to engage in more meaningful ways with the systems that impact their lives.

The social, environmental, and societal implications of this restructured technopolitical landscape are crucial for achieving authentic democracy and promoting sustainable, inclusive growth. By focusing on these dimensions, a more transparent and equitable society can be cultivated in the medium and long term. Particularly significant is the role of "digital natives" and "digital migrants," whose engagement with the new technological landscape is key to actualizing the potential of the single-person society. Their ability to deliver tailored solutions is central to enhancing human welfare in this context.

In this new societal paradigm, "smart bridges" exemplify the intersection between Society 5.0 and Industry 5.0. These initiatives promote both digital and green transformations, suggesting a comprehensive strategy to address prevalent social challenges. A key theme in this shift is the need for interdisciplinary collaboration, knowledge democracy, and the fostering of innovation within a technopolitical system that supports the individualization of society.

The successful implementation of technopolitics in the single-person society requires a multidisciplinary approach, involving educational and research institutions in this transformative process. As such, organizations and nations that champion new technopolitical strategies play a pivotal role in the broader economic and social development on a global scale. To meet the demands of an increasingly complex world, there is a need for a holistic perspective that considers not only economic growth and productivity but also knowledge creation, the emergence of new professions, and wealth generation.

A critical perspective within this analysis advocates for the recognition of the environment as a collaborative partner in innovation rather than as a resource to be exploited. It stresses that the technopolitics of a single-person society must foster social innovations that span across multiple sectors and interdisciplinary fields of study. Such innovations are not confined to technological advancements but extend to social and environmental reforms as well.

This rethinking of technopolitics also revisits Marcuse's concept of "technological domination," as presented in his seminal work, *One-Dimensional Man*. Marcuse's theory of technological dominance, first explored in his 1941 article *Some Social Implications of Modern Technology*, offers valuable insights into the current technopolitical landscape. He initially argued that National Socialism represented a mechanized economy that leveraged technological efficiency to uphold totalitarian control. In Nazi Germany, technological advancements were not merely tools of production but mechanisms of political control. Marcuse observed that technology in this context played a role in reinforcing oppressive systems by manipulating human behavior, a theme that resonates in contemporary analyses of technological power (Marcuse, 2004).

Marcuse's critique of the mechanized control exerted by technology is particularly relevant today, as we continue to grapple with global crises, including the ongoing pandemic. In a world increasingly dominated by digital technologies, politics and life intertwine in complex ways. The political environment of the 21st century is deeply shaped by these technological developments, with political discourse often blending with cultural and personal narratives. This connection between life and politics can be traced back to philosophical inquiries from figures such as Plato and Socrates, who explored the persuasive power of rhetoric in shaping political realities.

The concept of sustainable development plays a central role in this discourse, particularly in terms of how technology can be harnessed to address fundamental human needs while preserving the environment. Sustainable development goes beyond survival, requiring comprehensive policies that balance human needs with ecological preservation. The concept of "democratic social engineering" is vital in this context, ensuring that the state adopts policies that prioritize ethical considerations in technological and social development. Without such a framework, private entities may exploit technological advancements for profit, exacerbating social inequalities and environmental degradation.

In this context, the notion of engineers' role in societal development comes to the forefront. The rapid advancement of technologies, particularly those related to Industry 4.0, necessitates reforms in engineering education. Engineering schools must address the increasing specialization within the profession while also emphasizing the intersection of politics and technology. By integrating political awareness into engineering curricula, future engineers will be better equipped to contribute to societal progress through their expertise. These reforms will not only enhance the professional development of engineers but also promote their active engagement in political decision-making, thus enabling them to contribute to the sustainable and equitable development of society.

Technological innovation is rarely devoid of challenges. As new technologies emerge, so too do unforeseen consequences. Policymakers must navigate the ethical dilemmas and potential risks associated with these innovations. The concept of democratic social engineering offers a guiding framework for addressing these issues, emphasizing the role of engineers in

creating solutions that benefit society as a whole. This paradigm shift invites engineers to reconsider their role in shaping the future, not only through technological advancements but also through active participation in the political and social spheres.

In conclusion, this analysis highlights the profound relationship between technology, politics, and society in the context of the single-person society. Drawing on Marcuse's insights into technological domination and integrating them with contemporary understandings of technopolitics, the discussion underscores the need for interdisciplinary collaboration and ethical considerations in shaping the future. As we continue to navigate the challenges of an increasingly complex world, the technopolitics of a single-person society offers a promising pathway toward a more inclusive, sustainable, and democratic future.

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