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GOVTECH PORTOVIEJO 2050MUNICIPAL POLICY FOR GOVTECH COLLABORATIVE ECOSYSTEM

Cantonal Directorate of Development Planning

INDEX

1.Executive Summary

In the context of growing governmental digitalization, Latin American cities face the challenge of adopting innovative approaches to respond to 21st-century citizen demands. In this scenario, the GovTech (Government Technology) concept presents itself as a transformative paradigm that redefines the relationship between the public sector, citizenry, and innovation ecosystem, promoting a collaborative culture that involves startups, technology companies, academic institutions, entrepreneurs, and citizens as co-creators of solutions.

International indicators show that Ecuador has a favorable environment in terms of access to digital skills, representing a solid foundation for developing innovative initiatives. However, the entrepreneurial ecosystem faces administrative and structural challenges that limit agility for initiating and consolidating technological projects. This reality makes it essential to implement policies that reduce entry barriers and strengthen support for entrepreneurs, especially in early stages, to foster a dynamic fabric of startups and GovTech solutions in the country. This landscape is influenced by Industry 4.0, which integrates technologies such as artificial intelligence (AI), internet of things (IoT), big data, blockchain, and robotics. Despite advances, digital gaps persist: in Manabí, internet access reaches about 70% in urban areas versus 38% in rural areas.

The Autonomous Decentralized Municipal Government of Portoviejo canton, aligned with Vision Portoviejo 2050, will promote the Municipal Policy for GovTech Collaboration Ecosystem - Portoviejo 2050 to position the city as an urban laboratory of innovation. Its initiative, the CETI GovTech Challenge, will seek to integrate youth, startups, companies, and academia in co-creating technological solutions that will respond to strategic urban challenges, such as intelligent mobility, sustainable production, and energy efficiency.

Including diversification of the local economy through youth talent, generation of qualified employment, improvement in public service delivery, consolidation of public-private-academic partnerships, and strengthening of municipal digital governance. GAD Portoviejo will assume the commitment to channel budget, facilitate access to financing, and guarantee the sustainability of the GovTech ecosystem as a pillar for an innovative, inclusive, and resilient city toward 2050.

2. Legal Framework

2.1. Constitution of the Republic of Ecuador

- **Article 16:** All persons, individually or collectively, have the right to: *"Universal access to information and communication technologies".*
- **Article 227:** *"Public administration constitutes a service to the community governed by principles of effectiveness, efficiency, quality, hierarchy, deconcentration, coordination, participation, planning, transparency, and evaluation"*.
- **Article 100:** *"At all levels of government, participation instances will be formed integrated by elected authorities, representatives of the dependent regime, and representatives of society from the territorial scope of each government level, functioning regularly to strengthen participatory democracy, with consultation, deliberation, and public management monitoring processes"*
- **Art. 388:** *"The State guarantees the promotion of scientific development and technological research, their dissemination and application, as well as the rescue and development of ancestral knowledge, to respond to the country's productive and social needs, and to strengthen sovereignty and good living. The State will formulate policies to foster innovation and technological transfer, and will allocate necessary resources for it."*

2.2. Organic Code of Territorial Organization, Autonomy and Decentralization (COOTAD)

- **Article 44:** *"Decentralized autonomous municipal governments are legal entities under public law, with political, administrative, and financial autonomy"*.
- **Article 54, literal m):** *"Foster association of popular and solidarity economy actors, micro, small and medium local productive units and entrepreneurships to generate employment and improve population living conditions"*.
- **Article 57, literal a):** *"Formulate, approve, evaluate and administer the development and territorial planning plan and local public policies"*.

2.3. Organic Law for Digital and Audiovisual Transformation

- **Article 1:** of the Organic Law of Digital and Audiovisual Transformation establishes among its general objectives:

"d. Simplification and adoption of digital means and technologies in public service delivery and management of all types of administrative procedures (before any government level), judicial or private; promoting their use and appropriation in productive sectors, academia and society, strengthening innovation, development and research for such adoption and focused on enhancing the country's digital economy development".

Also, it considers within its specific objects:

"d. Encourage the use and optimization of necessary resources to achieve digital transformation".

- **Article 2:** of the Organic Law of Digital and Audiovisual Transformation regarding the Law's Axes indicates that these are:

a. Digital infrastructure: Connectivity and Telecommunications Services, Information Systems;

b. Digital Culture and Inclusion: Digital Education, Digital Health;

c. Digital Economy: Digital Transformation of productive structure, Electronic Commerce;

d. Emerging technologies for sustainable development: Promotion of new technologies in industries, Promotion of new technologies for the environment, Smart and Sustainable Cities;

e. Digital Government: Procedure simplification, Citizen participation through electronic means, ICT Government, Digital Identity;

f. Interoperability and data treatment: Interoperability Services, Personal data, Open data; and,

g. Digital Security and trust: Information security

2.4. Organic Law of Transparency and Access to Public Information (LOTAIP)

- **Art. 5:** *"Any person may freely access information generated, administered or in possession of public institutions, except for exceptions established by law. Public institutions guarantee timely, truthful and complete delivery of requested information."*

2.5. Organic Law of Entrepreneurship and Innovation (2020)

- **Article 3:** *"Entrepreneurship is recognized and promoted as an engine of economic and social development"*.
- **Article 4:** *"Startups are recognized as private legal entities for profit, of innovative and scalable nature"*.

2.6. Agenda 2030 - Sustainable Development Goals

- **SDG 9:** *"Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation"*.
- **SDG 17:** *"Strengthen means of execution and revitalize the Global Partnership for Sustainable Development"*.

2.7. Ibero-American Charter of Open Government (CLAD, 2016)

"The set of mechanisms and strategies that contribute to public governance and good government, based on the pillars of transparency, citizen participation, accountability, collaboration and innovation, centering and including citizens in the decision-making process, as well as in the formulation and implementation of public policies, to strengthen democracy, legitimacy of public action and collective welfare."

3.Key Definitions

- **Digital transformation:** comprehensive process of integrating digital technologies in all areas of public management, which is not limited to digitizing procedures, but implies redesigning processes, services and management models to generate greater public value.
- **Industry 4.0**: fourth industrial revolution characterized by the use of advanced technologies such as artificial intelligence, internet of things, big data, blockchain, 3D printing and robotics to optimize processes and create new productive models.
- **Open innovation**: collaboration model in which public entities invite external actors (startups, companies, universities, civil society) to co-create solutions to specific problems.
- **GovTech:** set of technological solutions developed mainly by startups and emerging companies that seek to solve public sector challenges, improving efficiency, transparency and quality of governmental services.
- **Startup:** emerging company with high growth potential, scalable model and focus on innovation, seeking to generate novel and impactful solutions, frequently leveraged by technology.
- **Public challenge:** specific challenge identified by a public institution that requires innovative solutions to be resolved, and is susceptible to being addressed through open calls and collaborative innovation processes.
- **Innovation ecosystem:** network of actors, resources and conditions that allow development, scaling and sustainability of innovative solutions in a territory.
- **Internet of Things (IoT):** refers to the network of physical devices, vehicles, appliances and other objects that are integrated with sensors, software and network connectivity to enable them to collect and exchange data.

4. Contextual Framework and Theoretical Foundation

4.1. Conceptualization of Public Policies in the Digital Era

Public policies constitute fundamental instruments of governmental management that define an articulated set of decisions, strategic objectives, methodologies and deliberate actions adopted by the State at its different government levels. These are developed in systematic coordination with various actors of the social, economic, academic and technological ecosystem, with the specific purpose of addressing priority needs, solving complex problems or taking advantage of strategic opportunities that generate positive and measurable impact on collective welfare and sustainable territorial development.

Their formulation process is rigorously based on the current constitutional and legal framework, incorporating participatory diagnostic methodologies, empirical evidence analysis, evaluation of international best practices and broad citizen participation processes. This comprehensive methodology ensures that implemented actions are technically sound, socially inclusive, environmentally sustainable, financially viable and consistently oriented toward tangible results that effectively contribute to improving population quality of life and strengthening territorial competitiveness.

Strategic Context: Vision Portoviejo 2050

The CETI Challenge GovTech Municipal Public Policy - Portoviejo 2050 will be strategically articulated within the conceptual and operational framework of the canton's vision "Portoviejo 2050". This prospective vision will project the comprehensive transformation of the canton toward a territory leading in sustainable development, characterized by its capacity for technological innovation, economic diversity, effective adaptation to climate change and implementation of a successful and replicable model of digital public management that will generate substantial and sustained improvements in the quality of life of all its inhabitants.

To materialize this ambitious but achievable development vision, digital transformation will be consolidated as a transversal and strategic axis, capable of comprehensively modernizing public management processes, significantly boosting business and territorial competitiveness, diversifying the local economic matrix, strengthening citizen participation mechanisms, and establishing the foundations for inclusive, sustainable and resilient economic development.

The Fourth Industrial Revolution

The policy explicitly recognizes that the Fourth Industrial Revolution represents a paradigmatic change that urgently demands systematic development of advanced digital competencies and

strategic and efficient use of Information and Communication Technologies (ICT) as an essential means of economic production, fundamental tool of inclusive social development and critical instrument of institutional strengthening and State modernization.

Global Economic Impact

The accelerated global digital transformation is profoundly redefining traditional productive models, revolutionizing public management systems and transforming forms of social and economic interaction. According to the *Global Digital Economy Report 2025*, the digital economy represents approximately 15% of world Gross Domestic Product, equivalent to USD 16 trillion over a total global GDP estimated at USD 108 trillion for 2024, according to International Data Corporation (IDC, 2025) projections.

This exponential growth is sustained by the convergence and massive adoption of fourth-generation disruptive technologies, including: artificial intelligence (AI) and machine learning, internet of things (IoT) and smart cities, advanced robotics and automation, big data and predictive analytics, blockchain and distributed ledger technologies, cloud and edge computing, augmented and virtual reality, and advanced cybersecurity. These technologies significantly optimize productive processes, substantially improve quality and efficiency of public and private services, and generate completely new and disruptive business models.

4.2. Opportunities and Challenges in Latin America

Digital Transformation

In the Latin American context, the Economic Commission for Latin America and the Caribbean (ECLAC) identifies that the region has an unprecedented historical opportunity to strategically utilize the talent and transformative energy of youth, especially "digital natives," as main catalysts for adopting emerging digital tools to overcome three structural traps that have historically limited their development.

Latin American youth, especially those between 15 and 29 years old, represent 25% of the regional population and constitute the most connected, technologically competent and entrepreneurial generation in history. This generation possesses unique competitive advantages: intuitive mastery of digital technologies, accelerated learning capacity, innovative mindset, adaptability to change, and a fresh vision to solve complex problems through creative technological solutions.

Digital transformation, implemented comprehensively and participatively, offers a concrete and viable path to significantly strengthen regional competitiveness, accelerate technological and social innovation processes, substantially improve population quality of life, and establish foundations for inclusive and sustainable development. However, this necessarily requires systematic and coordinated strategic collaboration between national and subnational governments, innovative

private sector, organized civil society, academic and research institutions, and international cooperation organizations.

Leadership in Artificial Intelligence

In terms of specific technological development, artificial intelligence has definitively transitioned from being a futuristic and experimental concept to becoming a real, tangible and measurable engine of economic and social development in the Latin American region. According to specialized analysis by Ekos Negocios (2024), Brazil exercises regional leadership with 154 companies specialized in AI development, followed by Chile with 40 companies and Mexico with 32 active companies in the sector.

Ecuador currently figures with 3 formally established companies in this strategic sector, reflecting an ecosystem still incipient but showing signs of growing interest and significant potential to adopt, adapt and develop indigenous AI solutions. These initiatives are especially concentrated in areas of governmental digital modernization, innovation in financial and technological services, logistic and supply chain optimization, and development of specific sectoral applications.

4.3. Global Projections and Opportunities for Ecuador

Technology-Driven Emerging Economies

Strategic projections developed by PricewaterhouseCoopers (PwC) in its influential report "*The World in 2050*" consistently indicate that emerging economies that manage to successfully implement comprehensive strategies based on technological innovation and digital capacity development could significantly increase their relative participation in world GDP toward mid-21st century.

Ecuador, strategically aligned with its national development vision toward 2050, has a concrete and viable historical opportunity to integrate the digital economy as a fundamental and structuring pillar to effectively diversify its traditional productive matrix, reduce dependence on primary sectors, and substantially improve its positioning and competitiveness in global markets.

Digital Entrepreneurship Ecosystem

In the specific field of technological entrepreneurship, the Global Startup Ecosystem Index 2024 registers notable progress for Ecuador, ascending 13 positions in the global startup ecosystem ranking, particularly highlighting Quito and Guayaquil as dynamic poles for developing technology-based innovative entrepreneurships.

However, significant structural challenges persist that require priority attention, including: critical lack of specialized financing for technology-based entrepreneurships, scarce effective articulation between different actors of the entrepreneurial ecosystem, regulatory and administrative barriers

for technological entrepreneurships, limited availability of specialized human talent, and insufficient supporting technological infrastructure.

4.4. National Framework: Ecuador Digital Policy 2025-2030

Articulation with National Agenda

In direct and operational coherence with the Public Policy for Digital Transformation of Ecuador 2025-2030, developed and implemented by the Ministry of Telecommunications and Information Society (MINTEL), Ecuador seeks to strategically position itself as a regional reference in technological innovation, digital competitiveness and knowledge-based sustainable development.

This national strategy materializes through coordinated promotion of a comprehensive National Digital Agenda that systematically articulates capacities and resources of central government and decentralized autonomous governments, innovative private enterprise, academic and research institutions, and active citizen participation in inclusive digital transformation processes.

National Strategic Priorities

National policy prioritizes four fundamental strategic axes:

- **Closing the digital gap:** Universalization of high-speed internet access, especially in rural and peri-urban areas
- **Strengthening technological capacities:** Systematic development of digital competencies in population, productive sector and public administration
- **Digital government development:** Implementation of efficient, transparent and citizen-centered digital public services
- **Innovation and entrepreneurship:** Promotion of technological innovation and digital entrepreneurship ecosystems

4.5. Strategic Investments in Digital Infrastructure

Private Investment Commitments

As an integral part of Ecuador Digital Policy implementation, significant strategic announcements stand out such as that made by Claro (América Móvil), which has committed an investment of USD 500 million in telecommunications infrastructure over the next three years. This investment will be specifically destined to: modernization and expansion of fixed and mobile telephony infrastructure, massive deployment of fiber optic to the home, installation of new generation antennas, and improvement of quality and coverage of digital services.

4.6. Digital Economy: Impact and Limitations

Contribution to Global GDP

The Digital Economy Report published by the United Nations Conference on Trade and Development (UNCTAD) establishes that the digital economy currently contributes between 4.5% and 15.5% of world GDP, constituting a fundamental and irreplaceable engine of contemporary and future economic growth.

Regional and National Gaps

In Latin America, however, significant structural limitations persist in telecommunications infrastructure and connectivity, as well as pronounced access gaps between rural and urban areas. In Ecuador specifically, this difference reaches critical levels: 38% connectivity in rural areas versus 70% in urban areas, evidencing the magnitude of the territorial digital inclusion challenge.

The country currently occupies 98th place out of 141 economies in the Global Competitiveness Index of the World Economic Forum, reflecting the strategic urgency of implementing comprehensive public policies to close these structural gaps and accelerate the country's technological modernization.

4.7. Provincial and Local Ecosystem: Manabí and Portoviejo

Provincial Context

In the specific context of Manabí province, there is an entrepreneurial ecosystem in development and consolidation phase, although limited by structural factors such as: lack of robust and high-capacity technological infrastructure, low effective articulation between innovation ecosystem actors, critical scarcity of financing mechanisms for innovation projects, limited availability of human talent specialized in emerging technologies, and regulatory barriers for technological entrepreneurships.

Strategic Advances in Portoviejo

Portoviejo canton has demonstrated relevant and recognized advances in the field of innovation and technology, including significant achievements such as:

- **International recognition:** Outstanding participation in Smart City LATAM Awards 2025 and winner of the *Smart Municipality* recognition in the Latin American Award for Economic and Social Development of Municipalities 2025
- **Digital educational infrastructure:** Systematic installation of high-speed internet in rural and urban schools
- **Technological equipment:** Massive delivery of educational tablets to students and teachers

- **Specialized training:** Implementation of training programs in emerging technologies such as 3D printing, artificial intelligence and educational robotics
- **Strategic center:** Establishment and operation of the Center for Entrepreneurship, Technology and Innovation (CETI) as a strategic node of the local innovation ecosystem and for becoming the first municipal incubator of technology-based entrepreneurships in Portoviejo.

Impact Consolidation

Although CETI effectively acts as a strategic node of the local innovation ecosystem, its specific impact in terms of qualified job generation, territorial economic diversification and strengthening of local technological capacities is still in consolidation process and requires comprehensive public policies that enhance its effectiveness and expand its territorial and sectoral reach.

4.8. Implemented Technological Innovations

Emerging Technologies in Urban and Rural Management

The pioneering adoption of technologies such as LoRaWAN (Long Range Wide Area Network) for urban and rural internet of things in Portoviejo city and implementation of intelligent early warning systems for floods evidence concrete and replicable technical achievements that position Portoviejo as a reference in implementing smart urban-rural technologies.

Need for Comprehensive Policies

However, these technological advances necessarily require comprehensive and coordinated public policies that address fundamental structural challenges such as: intelligent and sustainable urban planning, strengthening territorial resilience to natural disasters and climate change, articulation of technological systems with municipal management processes, and development of institutional capacities for emerging technology management.

5. The CETI Challenge: Pioneer Model of Youth GovTech

CETI Foundation and Consolidation

The Center for Entrepreneurship, Technology and Innovation (CETI) was established as "a strategic initiative of the Autonomous Decentralized Municipal Government of Portoviejo Canton, conceived to position the city as a benchmark for technological innovation and entrepreneurship within the framework of the Fourth Industrial Revolution or Industry 4.0" (Center for Entrepreneurship, Technology and Innovation, 2025, p. 1).

CETI has its "origins in 2019 through the 'Portoviejo IN' project, responding to the need to guide ourselves as a Smart City" (Center for Entrepreneurship, Technology and Innovation, 2025, p. 5). Its general objective is to "create an innovation ecosystem in Portoviejo canton through human talent development, incubation and acceleration of entrepreneurships focused on disruptive technologies" (Center for Entrepreneurship, Technology and Innovation, 2025, p. 3).

Building upon this consolidated foundation of training and infrastructure, CETI has evolved toward new challenges, including its institutionalization process as a municipal incubator and the development of initiatives such as the CETI GovTech Challenge, leveraging trained talent to channel youth innovation toward addressing public management challenges.

Youth-Centered GovTech Methodological Design

The **CETI Challenge GovTech** represents a pioneering model of open public innovation that applies GovTech methodologies specifically designed to channel the transformative potential of Portoviejo youth in co-creating solutions to complex governmental challenges. This emblematic initiative uses international GovTech best practices adapted to the local youth context: participatory design thinking with generational focus, hackathons specialized in public management problems, youth governmental innovation laboratories, intergenerational government-youth co-creation processes, agile methodologies for public software development, and rapid validation systems with real users.

Priority Areas of Youth GovTech Innovation

CETI Challenge youth participants focus their GovTech innovation efforts on five strategic areas where municipal administration requires urgent technological solutions:

- **GovTech for intelligent urban mobility:** Development of governmental platforms for public transport optimization, intelligent traffic light systems, official applications for traffic management, and dashboards for mobility officials.

- **GovTech for sustainable production:** Governmental traceability systems for agricultural products, support platforms for local producers, applications for sanitary inspections, and municipal agricultural information systems.
- **GovTech for energy efficiency:** Platforms for monitoring energy consumption in public buildings, public lighting optimization systems, municipal sustainability dashboards, and applications for energy resource management.
- **GovTech for waste management:** Intelligent garbage collection systems, municipal recycling management platforms, applications for cleaning operators, and environmental monitoring systems.
- **GovTech for citizen participation:** Official public consultation platforms, transparency and accountability systems, applications for citizen reports, and governmental digital engagement tools.

GovTech Impact on Youth Talent Development

The CETI Challenge generates multiple specific impacts in training youth specialized in public innovation:

- **Technical competencies in GovTech:** Programming for public sector, design of digital governmental services, public data analysis, governmental cybersecurity, and public systems architecture
- **Public sector understanding:** Municipal administration functioning, public contracting processes, regulatory frameworks, and institutional dynamics
- **Public innovation skills:** Agile methodologies applied to government, design thinking for public services, governmental project management, and social impact evaluation
- **Specialized GovTech network:** Connection with innovative public officials, GovTech sector entrepreneurs, investors specialized in governmental technology, and other youth leaders in public innovation at national and international levels
- **Professional opportunities in GovTech:** Access to employment in digital public sector, possibility of creating startups specialized in governmental solutions, consulting in public digital transformation, and leadership in State modernization projects

5.2. Youth Technological Entrepreneurship Support Ecosystem

Specialized Infrastructure for Youth

The CETI Challenge ecosystem has physical and digital infrastructure specifically designed to maximize youth innovative potential:

- **Youth innovation laboratories:** Spaces equipped with cutting-edge technology for rapid prototyping, 3D printing, robotics, and software development

- **Youth coworking spaces:** Collaborative areas designed to foster creativity, youth networking, and team project development
- **Specialized technology classrooms:** Equipment for training in programming, digital design, data analysis, and other technical competencies
- **Digital collaboration platforms:** Online systems for project management, virtual mentorships, and connection with the global community of young innovators

Training and Capacity Building Programs

Systematic capacity development programs specifically designed for youth are implemented:

- **Intensive bootcamps:** 2-4 week programs in emerging technologies such as AI, blockchain, mobile development, and data analysis
- **Technological entrepreneurship courses:** Training in business models, market validation, pitch deck, and financing search
- **Design thinking workshops:** User-centered innovation methodologies to solve complex problems
- **International certifications:** Access to globally recognized certifications in specific technologies
- **Technology exchanges:** Learning opportunities with international innovation ecosystems

Specialized Mentorship Network

The program establishes a robust mentorship network that includes:

- **Local technical mentors:** Experienced technology professionals based in Manabí
- **Business mentors:** Successful entrepreneurs who guide in business and market aspects
- **International mentors:** Virtual connection with experts from Silicon Valley, Tel Aviv, Medellín, and other global ecosystems
- **Peer mentoring:** Peer mentorship system where more experienced youth support those starting

6. Fundamental Guiding Principles

The policy is based on three fundamental principles that guide all public intervention:

- **Open and collaborative innovation**: will establish a co-creation paradigm where government, private sector, academia and citizenry will converge to develop contextualized technological solutions. This principle will recognize that youth, as digital natives, will possess unique perspectives to identify local problems and will propose disruptive solutions, implementing through municipal hackathons, citizen innovation laboratories and intergenerational mentorship programs.
- **Systemic interoperability**: will guarantee that public and private systems and platforms will operate under common integration standards, creating a digital ecosystem. This interoperability will facilitate that young entrepreneurs will develop applications and services that will connect fluidly with governmental infrastructure.
- **Equitable digital inclusion**: will ensure that all population groups, particularly youth in socioeconomic vulnerability situations, will access opportunities for participation in the digital economy. This principle will materialize through digital literacy programs, connectivity subsidies, community technology access centers and scholarships for STEAM skills training.

Scope and Institutional Management Model

The policy will be applied transversally to all GAD Portoviejo dependencies, establishing strategic articulations with national government, universities, local and international private sector, and civil society organizations. Implementation will adopt an adaptive management model based on results-based government that emphasizes systematic measurement of tangible impacts on youth and citizen quality of life, including real-time control dashboards, participatory quarterly evaluations and strategic adjustments based on empirical evidence.

The model contemplates an advanced interoperability technological architecture that allows fluid connection between municipal systems, facilitating entrepreneurs to develop solutions that transcend administrative jurisdictions. Permanent digital citizen participation channels allow young citizens to actively participate in design, implementation and evaluation of public policies through digital platforms, online consultations and urban innovation laboratories; public-private innovation partnerships establish contractual frameworks that allow strategic collaborations with technology companies and international organizations, guaranteeing knowledge transfer between public and private sectors.

7. Strategic General Objective

Create strategic diversifications that, through a comprehensive GovTech collaboration ecosystem, modernize public management, promote youth-led innovation, strengthen territorial competitiveness and generate sustainable social impact, through democratization of technological access and technology-based entrepreneurship in Portoviejo.

Operational Specific Objectives

- Implement a GovTech ecosystem of public-private collaboration that articulates governmental, business, academic and community sectors in developing technological solutions for the city.
- Design and implement public challenge mechanisms that promote participation of entrepreneurs and young innovators in solving urban and municipal management challenges.
- Consolidate public-private partnerships for learning processes, knowledge exchange and technology transfer that strengthen local capacities.
- Establish a GovTech solution generation HUB with active academia participation, fostering applied research and co-creation of projects that promote territorial digital transformation.

8.Comprehensive Strategic Programs

The Smart Government program will promote comprehensive modernization of municipal management through an integrated municipal management system with specialized modules, a unique citizen services platform with native mobile application, implementation of artificial intelligence for routine process automation, a digital document management system with blockchain to guarantee traceability, an executive dashboard with real-time management indicators and chatbots with virtual assistants for 24/7 citizen service.

CETI will represent a comprehensive human capital development program that will include intensive programming bootcamps for 2,000 youth annually, university diplomas in digital transformation and electronic government, international certifications in emerging technologies, an exchange program with international technology hubs, a municipal academy of public innovation for officials and a senior technology mentors network that will accompany young entrepreneurs.

Organizational Structure and Strategic Roles

GAD Portoviejo will exercise strategic political leadership through local policies and public communication of digital transformation, negotiation of strategic alliances with national and international governments, institutional representation in smart city networks and direct supervision of strategic objective compliance.

The Economic Development Directorate will catalyze the ecosystem through active promotion of youth technological entrepreneurship, management of relationships with international investors and accelerators, development of technology investment attraction policies, coordination of local startup internationalization programs and articulation with chambers of commerce and technological business guilds.

Academia will contribute with training and knowledge transfer through curricular design of specialized programs in emerging technologies, applied research in local urban problems, technology transfer from university laboratories to companies, teacher training in innovative digital pedagogies and academic evaluation of digital transformation policy impact.

The private sector will participate through development and implementation of scalable technological solutions for municipal challenges, investment in complementary technological infrastructure, creation of highly qualified jobs for local youth, transfer of international best practices and articulation of regional technological value chains.

Young citizenry will assume a leading role in co-creation and validation through active participation in urban problem identification, co-design of contextually relevant technological solutions, testing

and validation of municipal digital applications and services, continuous feedback on public policy effectiveness and leadership in social and technological innovation processes.

Generations GovTech Committee

This high-level multisectoral advisory body is represented by all involved sectors, with outstanding participation of youth leaders between 18 and 30 years elected through public call. Its strategic planning functions include proposing high-impact strategic projects for youth development, prioritizing technological investments according to identified territorial needs, designing internationalization strategies for the local GovTech ecosystem and evaluating global technological trends and their local applicability.

In terms of evaluation and monitoring, the committee quarterly reviews strategic indicator progress, evaluates effectiveness of implemented programs through participatory methodologies, identifies lessons learned and replicable good practices, and recommends adaptive adjustments based on empirical evidence and contextual changes.

Comprehensive Monitoring and Evaluation System

Monitoring will be carried out through the Portoviejo GovTech Intelligent Indicators System, a digital platform that will integrate real-time data from multiple sources and generate automatic reports for different audiences. Evaluation will be conducted with a mixed methodology that will combine quantitative analysis of indicators and participatory qualitative evaluation.

Strategic impact indicators will cover five fundamental dimensions. In youth entrepreneurship, the number of technology startups that will be created and scaled by youth under 35 years will be measured, highly qualified jobs that will be generated in the local technology sector, volume of private investment that will be attracted by GovTech entrepreneurships, business survival rate of municipally incubated startups and billing level that local technology companies will reach.

The governmental digitalization dimension will contemplate the percentage of municipal services that will be completely digitalized and mobile accessible, average time for citizen procedure resolution that will be progressively reduced, citizen satisfaction index with digital public services, decrease in operational costs through process digitalization and number of digital transactions that will take place monthly.

For human capital development, the digital competencies index that young population will reach will be considered, number of technical and professional certifications that will be obtained annually, employability rate of youth that will be trained in municipal programs, participation of young women in technology programs and level of young talent retention in the cantonal territory.

Infrastructure and connectivity will be evaluated through the percentage of high-speed internet coverage that will be achieved in the canton, average connection speed in urban and rural sectors, number of free public access points that will be functioning, technological infrastructure quality index according to international standards and level of 5G technology adoption by citizens and companies.

Finally, transparency and participation will be measured through the number of public datasets that will be available on the open data portal, frequency of municipal data access and download by developers, citizen participation in digital consultation processes, number of citizen applications that will be developed using municipal data and governmental transparency index that will be achieved according to independent organization measurements.

Evaluation Methodology and Sustainability

Evaluation will be conducted annually with a participatory component that will include public accountability sessions with massive citizen participation, citizen perception surveys on digital transformation impact, focus groups with direct program beneficiary youth, external evaluations that will be conducted by universities and specialized organizations, and public reports that will present recommendations for the following period.

Feedback and adjustment mechanisms will contemplate a public dashboard updated monthly with main indicators, quarterly progress reports that will be distributed to all ecosystem actors, an early warning system that will identify significant deviations from goals, an adaptive adjustment protocol that will allow strategic modifications based on evidence and an international peer network that will facilitate benchmarking and best practice exchange.

The policy will contemplate a diversified financing model that will combine municipal resources, provincial and national co-financing, private investment, international cooperation and innovative financing mechanisms such as social impact bonds and civic crowdfunding. The estimated budget for the 2025-2029 period will amount to 45 million dollars, distributed in 40% for infrastructure investment, 30% for training and entrepreneurship programs, 20% for digital platform operation and 10% for evaluation and innovation.

Scalability will be guaranteed through development of replicable methodologies, process documentation, creation of a sister cities network in digital transformation and establishment of partnerships with international urban development organizations. This public policy will represent a strategic bet to position Portoviejo as a model of inclusive digital transformation in Latin America, where youth will not only be beneficiaries but active protagonists of public innovation and sustainable territorial development.

Intelligent Public Transportation Monitoring

Public Challenge #1

GovTech Portoviejo 2050
Municipal Policy for GovTech Collaborative Ecosystem

Challenge 1: Intelligent Public Transportation Monitoring

Challenge:

Implement an intelligent system that allows citizens to know the real-time location of transport units, plan routes and receive arrival alerts, reducing waiting times and improving user experience.

Solution:

Web platform and mobile application that, through QR codes located at bus stops, shows real-time location, plans routes and offers notifications. Use of GPS modules with LoRaWAN technology for low-cost, long-range data transmission.

Management model:

Collaborative execution between the Mobility Directorate, transport cooperatives and startups selected in the CETI Challenge. Implementation in two phases: pilot on one route and expansion to the remaining 154 buses.

Intelligent Vertical Hydroponic Cultivation

Public Challenge #2

GovTech Portoviejo 2050
Municipal Policy for GovTech Collaborative Ecosystem

Challenge 2: Intelligent Vertical Hydroponic Cultivation

Challenge:

Design and implement an intelligent vertical hydroponic cultivation system that optimizes water use, allows production in reduced spaces and improves fresh food availability.

Solution:

Modular structures with recycled PVC and reused pallets, coconut husk substrate and IoT sensors (pH, temperature, humidity, water level) connected to an ESP32 microcontroller for remote monitoring and alerts. Production of short-cycle vegetables without soil use or constant irrigation.

Management model:

Project promoted by community associations, local entrepreneurs and CETI as incubator. Implementation in homes, schools and public spaces with training and interactive manuals. Replicability in urban and rural areas.

CETI CHALLENGE

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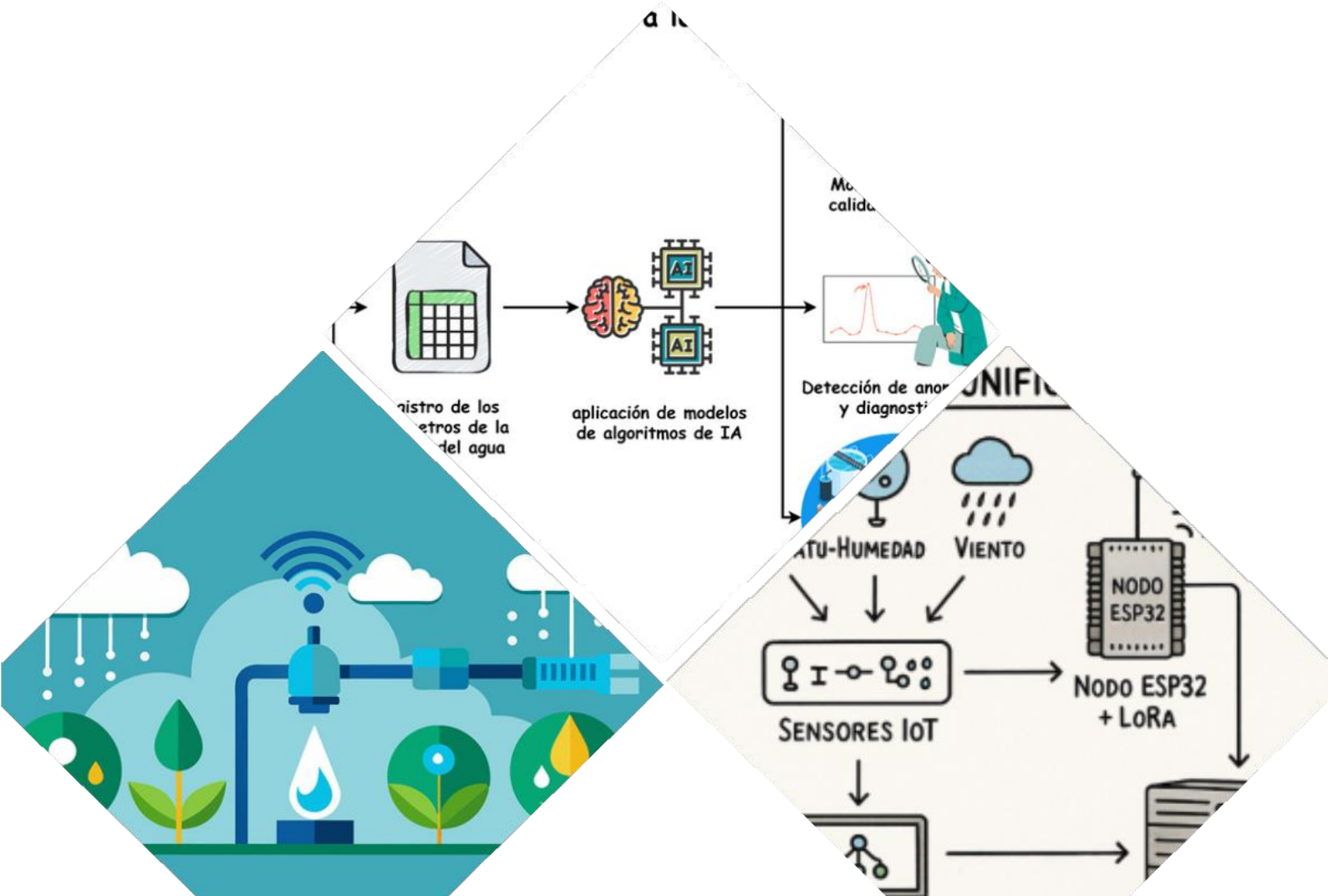
Unified Environmental Monitoring Platform

Public Challenge #3

GovTech Portoviejo 2050
Municipal Policy for GovTech Collaborative Ecosystem



Challenge 3: Unified Environmental Monitoring Platform

Challenge:

Have a real-time environmental data collection and analysis system to prevent disasters, improve air quality and reduce vulnerability to climate events.

Solution:

Distributed network of IoT sensors (temperature, humidity, pressure, UV radiation, precipitation, noise, air quality) connected via LoRaWAN to a municipal data platform "Portoviejo Previene" with analytics and artificial intelligence for early warnings.

Management model:

Coordination between Risk Management and Environmental Sustainability Directorate, technology companies and universities. Installation at strategic urban and rural points. Integration with municipal app for citizen access to data and alerts.

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