

IT PARKS AND DIGITAL SOVEREIGNTY: BUILDING TECHNOLOGICAL INDEPENDENCE FOR DEVELOPING COUNTRIES

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ABSTRACT

Digital sovereignty — the capacity of a state and its society to understand, shape and control the digital systems on which they depend — has moved to the centre of development policy. For developing countries, the stakes are acute: dependence on foreign platforms, imported software, external data infrastructure and expatriated talent reproduces, in the digital sphere, the classic structures of economic dependency. This article examines the IT park — the state-sponsored technology zone offering fiscal privileges, infrastructure and regulatory facilitation to software and IT-service firms — as an instrument for building technological independence. Drawing on the technopole literature and on the experience of export-oriented parks from Southeast Asia and China to Belarus and Central Asia, including the rapidly growing IT Park of Uzbekistan, the article develops a three-layer framework of digital sovereignty — skills, infrastructure and market — and assesses what parks can and cannot deliver at each layer. It argues that IT parks are necessary but insufficient: they reliably build the skills layer and can anchor the infrastructure layer, but sovereignty at the market layer requires deliberate design — local linkages, education pipelines, open-source strategies, public procurement and regional cooperation — without which a park risks becoming a comfortable enclave of dependent outsourcing. Design principles for sovereignty-oriented parks are proposed.

Keywords: IT parks, digital sovereignty, technological independence, developing countries, technopoles, software exports, digital economy, Central Asia.

АННОТАЦИЯ

Цифровой суверенитет — способность государства и общества понимать, формировать и контролировать цифровые системы, от которых они зависят, — переместился в центр политики развития. Для развивающихся стран ставки особенно высоки: зависимость от иностранных платформ, импортируемого программного обеспечения, внешней инфраструктуры данных и утечки талантов воспроизводит в цифровой сфере классические структуры экономической зависимости. В статье ИТ-парк — поддерживаемая государством технологическая зона, предоставляющая налоговые льготы, инфраструктуру и регуляторное содействие компаниям в сфере ПО и ИТ-услуг, — рассматривается как инструмент строительства технологической независимости. Опираясь на литературу о технополисах и на опыт экспортно ориентированных парков от Юго-Восточной Азии и Китая до Беларуси и Центральной Азии, включая быстро растущий ИТ-парк Узбекистана, автор

разрабатывает трёхуровневую модель цифрового суверенитета — кадры, инфраструктура, рынок — и оценивает, что парки могут и чего не могут дать на каждом уровне. Делается вывод, что ИТ-парки необходимы, но недостаточны: они надёжно формируют кадровый уровень и могут закрепить инфраструктурный, но суверенитет на уровне рынка требует целенаправленного дизайна — локальных связей, образовательных конвейеров, стратегий открытого кода, государственных закупок и регионального сотрудничества, — без которого парк рискует превратиться в комфортный анклав зависимого аутсорсинга. Предлагаются принципы проектирования парков, ориентированных на суверенитет.

Ключевые слова: ИТ-парки, цифровой суверенитет, технологическая независимость, развивающиеся страны, технополисы, экспорт ПО, цифровая экономика, Центральная Азия.

INTRODUCTION

Two policy vocabularies have converged in the development debates of the past decade. The first is digital sovereignty: originally a European and great-power preoccupation, the term now names a universal concern — the capacity of a political community to understand, shape and control the digital technologies on which its economy, administration and public sphere depend.¹ The second is the IT park: the state-sponsored technology zone — fiscal privileges, dedicated infrastructure, streamlined regulation — that has become the signature instrument by which developing countries seek entry into the global digital economy. This article asks how the two are related: can IT parks, an instrument built for export promotion, serve the deeper goal of technological independence? The question matters because the instrument is spreading faster than the reflection on it: from Southeast Asia and China to Eastern Europe, the Caucasus and Central Asia — where the IT Park of Uzbekistan has become one of the region's most dynamic examples — governments are converging on remarkably similar park models while articulating increasingly ambitious sovereignty goals.

The argument is developed in five steps. Section 2 clarifies the concept of digital sovereignty and its specific stakes for developing countries. Section 3 anatomises the IT park as a policy instrument and situates it in the longer history of technopoles. Section 4 reviews the principal park experiences relevant to the developing world. Section 5 introduces a three-layer framework — skills, infrastructure, market — and assesses the park instrument against each layer, deriving design principles for sovereignty-oriented parks. Section 6 concludes.

Digital Sovereignty and the Stakes of Dependence

“Digital sovereignty” is a contested term, invoked by actors as different as regulators, platform critics and authoritarian censors; scholarship has therefore

¹Julia Pohle and Thorsten Thiel, “Digital Sovereignty,” *Internet Policy Review* 9, no. 4 (2020).

insisted on disaggregating it.² For the purposes of development policy, three senses matter. The first is capability sovereignty: possessing, within the national economy, the skills and organisations able to build, audit and maintain critical software and systems. The second is infrastructural sovereignty: territorial and legal control over the data, networks, computation and identifiers on which state and market functions run. The third is economic sovereignty: capturing, rather than exporting, the value generated by the digitalisation of one's own society. The stakes of failure on the third front have been described in the strongest terms as data colonialism — the systematic appropriation of the developing world's data resources by external platforms³ — and the empirical record confirms a stark concentration of digital value capture in a handful of economies, leaving most developing countries as suppliers of raw data and consumers of finished services.⁴

Dependence, moreover, is layered in the architecture itself: whoever controls standards, cloud regions, root infrastructure and app-store gateways exercises a quiet but effective jurisdiction over those who merely use them.⁵ For a developing country, digital sovereignty therefore cannot mean autarky — no economy, however large, produces its whole stack — but it can and must mean position: moving from the passive edge of other actors' systems toward participation in their making, on terms that retain skills, data and value at home. The question for policy is which instruments actually move a country along that path. The IT park is the instrument most governments have reached for first.

The IT Park as Policy Instrument

The IT park descends from the technopole — the planned concentration of technology-intensive production that spread worldwide in the late twentieth century as regions sought to synthesise their own Silicon Valleys.⁶ The developing-country variant has a distinctive anatomy. Its core is a special legal-fiscal regime: exemption from profit and payroll taxes for accredited resident firms, simplified currency and export procedures, and often special visa channels for foreign specialists. Around this core stand three supports: physical and digital infrastructure (campuses, connectivity, increasingly data centres); a one-stop administrative interface shielding residents from general bureaucracy; and an ecosystem apparatus — incubators, accelerators, training academies — intended to convert the zone from a tax status into a community. The model's intellectual pedigree is the developmental state: the deliberate governing of the market to create comparative advantage rather than

²Stéphane Couture and Sophie Toupin, "What Does the Notion of 'Sovereignty' Mean When Referring to the Digital?," *New Media & Society* 21, no. 10 (2019): 2305–2322.

³Nick Couldry and Ulises A. Mejias, *The Costs of Connection: How Data Is Colonizing Human Life and Appropriating It for Capitalism* (Stanford: Stanford University Press, 2019).

⁴UNCTAD, *Digital Economy Report 2021: Cross-Border Data Flows and Development* (Geneva: United Nations, 2021).

⁵Laura DeNardis, *The Global War for Internet Governance* (New Haven: Yale University Press, 2014).

⁶Manuel Castells and Peter Hall, *Technopoles of the World: The Making of Twenty-First-Century Industrial Complexes* (London: Routledge, 1994).

merely accept it,⁷ with the park as the spatial form of an embedded, promotional bureaucracy.⁸

Two features of the instrument deserve emphasis before the cases. First, the park is selective by design: it privileges one sector, and within it those firms able to meet accreditation criteria — a bet that concentrated advantage will spill over. Second, the park is export-facing by default: its fiscal logic is financed by the promise of service exports and the foreign exchange they earn. Both features are strengths for growth and, as Section 5 argues, potential weaknesses for sovereignty: selectivity can produce enclaves, and export orientation can lock a country into the dependent, lower tiers of the global value chain even as revenues rise.

Experiences: From the Multimedia Super Corridor to Central Asia

The first generation of flagship projects taught the ambitions and the pitfalls. Malaysia's Multimedia Super Corridor (from 1996) pioneered the comprehensive package — special legislation, guarantees to investors, purpose-built urbanism — and demonstrated both the mobilising power of a national digital vision and the risk that spectacular zones outrun the ecosystems meant to fill them.⁹ China's trajectory, from the Torch Program of the late 1980s through the rise of Zhongguancun, showed the opposite lesson: parks embedded in a vast domestic market and coupled to universities and state procurement became genuine engines of indigenous firms rather than mere landing strips for foreign ones.¹⁰ Between these poles lies the experience most relevant to smaller developing economies: the export-service park. Belarus's Hi-Tech Park (from 2005) turned a favourable tax regime and a strong engineering-education inheritance into a globally visible software industry, proving that even a mid-sized economy can produce world-market products and not only outsourced labour.

Central Asia has become the newest theatre of the model, and its most instructive current laboratory. Kazakhstan's Astana Hub (from 2018) combined park privileges with an international-talent strategy. Uzbekistan's IT Park (from 2019) has grown with exceptional speed: a nationwide (“extraterritorial”) accreditation model rather than a single campus, long-horizon tax exemptions, an aggressive programme of IT education and re-training, incentives for relocating foreign firms and specialists, and a rapidly multiplying resident base and export volume have made it the emblem of the country's broader digital opening. For the sovereignty question, the Central Asian cases are especially valuable precisely because they are young: their design choices — how far to couple parks to universities, domestic procurement, data

⁷Robert Wade, *Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization*, 2nd ed. (Princeton: Princeton University Press, 2004).

⁸Peter Evans, *Embedded Autonomy: States and Industrial Transformation* (Princeton: Princeton University Press, 1995).

⁹Tim Bunnell, *Malaysia, Modernity and the Multimedia Super Corridor: A Critical Geography of Intelligent Landscapes* (London: RoutledgeCurzon, 2004).

¹⁰Yu Zhou, *The Inside Story of China's High-Tech Industry: Making Silicon Valley in Beijing* (Lanham: Rowman & Littlefield, 2008).

infrastructure and regional markets — are being made now, with the earlier generation's lessons available.

Three Layers of Sovereignty: What Parks Can and Cannot Deliver

Assessment requires disaggregation, and the three senses of Section 2 supply it. At the **skills layer**, the park record is strongest. Wherever the model has been seriously implemented, it has expanded the population of working developers, raised wages enough to retain part of the talent that would otherwise emigrate, and — through academies, bootcamps and firm-level training — pulled the education system toward industry needs. Even emigration is partially recuperated: diaspora professionals return as founders, investors and mentors, converting brain drain into brain circulation when home institutions make return attractive.¹¹ Skills are the layer on which all others rest, and here the instrument works: a country with a deep bench of engineers has options that no treaty can confer.

At the **infrastructure layer**, the park can anchor sovereignty but does not automatically do so. Parks concentrate demand that justifies national data centres, exchange points and cloud capacity; accreditation rules can require local hosting of critical workloads; park campuses can house the state's own compute. But these couplings must be designed: a park whose residents build exclusively on foreign clouds adds little territorial control, whatever its export figures. The decisive choices are procurement and standards — whether the state routes its own digitalisation through park firms and domestic infrastructure — and openness: open-source strategies allow small economies to appropriate, audit and localise world-class software rather than rent it, converting global commons into national capability.¹²

At the **market layer**, the instrument is weakest and the design burden greatest. Export-service success can settle into comfortable dependence: bodyshopping and outsourcing tiers where the client owns the product, the data and the roadmap, and the park hosts — profitably — other people's value chains. Sovereignty at this layer means moving residents from services to products, from subcontracting to intellectual property, and from single-market dependence to diversified demand, including the domestic and regional markets that parks too often ignore. The levers are known from the developmental-state canon: linkage policies binding park firms to local industry and government demand, graduation requirements attached to privileges, and patient public co-investment in product firms.¹³ Regional cooperation belongs here as well: for the economies of Central Asia individually small, a coordinated regional digital market — mutual recognition of park regimes, shared data infrastructure, joint standards — multiplies the demand base on which product sovereignty can stand. The alternative — a race of neighbouring tax havens competing for the same relocating

¹¹AnnaLee Saxenian, *The New Argonauts: Regional Advantage in a Global Economy* (Cambridge, MA: Harvard University Press, 2006).

¹²Steven Weber, *The Success of Open Source* (Cambridge, MA: Harvard University Press, 2004).

¹³Evans, *Embedded Autonomy*, on the state's role in nurturing linkages between promoted sectors and the wider economy.

firms — dissipates the instrument's sovereignty potential even where it raises its revenue.¹⁴

Two structural risks cut across all three layers and deserve separate statement. The first is the fiscal race to the bottom: park regimes compete on exemptions, and exemptions are the easiest term for a neighbour to match, so that the rent of the regime is bid away while the harder, slower differentiators — education quality, institutional reliability, judicial predictability — are neglected. A privilege any state can copy is not an advantage; an ecosystem is. The second is the enclave equilibrium: a park can succeed brilliantly by its own indicators — residents, exports, employment — while the surrounding economy digitalises no faster than before, because the zone's linkages run outward to foreign clients rather than inward to domestic firms, schools and administrations. Sovereignty is a property of the whole polity, not of the zone; a park that does not leak — skills, practices, code, standards — into its host society builds a sovereign enclave inside a dependent country, which is no sovereignty at all.

From this assessment follow five design principles for sovereignty-oriented parks. (1) Couple the park to the education system by contract, not rhetoric: funded pipelines, faculty exchange, curricula co-owned with residents. (2) Make privileges promotional, not perpetual: graduate firms toward product development and IP ownership as conditions of continued status. (3) Route state digitalisation through the park: public procurement is the developing country's largest and most controllable digital market. (4) Build the data layer deliberately: local hosting requirements for critical systems, park-anchored data centres, and open-source-first policies for public software. (5) Regionalise: negotiate park-to-park recognition and shared infrastructure with neighbours before competing with them. None of these principles is exotic; each is merely the translation, into park design, of the difference between exporting labour and building position.

CONCLUSION

IT parks and digital sovereignty are related as instrument and horizon — but the relation is conditional, not automatic. The evidence assembled here supports three conclusions. First, parks are genuinely effective at the foundation: they build the skills layer of sovereignty more reliably than any alternative instrument yet tried in developing countries, and this alone justifies the model. Second, their contribution to the infrastructure and market layers depends entirely on design choices that lie outside the default export-promotion template: procurement coupling, data-layer requirements, graduation incentives, open-source strategies and regional coordination. A park without these remains what its critics fear — a well-lit enclave of dependent outsourcing, sovereign in tax status and in nothing else. Third, the current Central Asian generation of parks, with Uzbekistan's IT Park at its head, stands at precisely the fork these conclusions describe: young enough to choose the sovereignty-oriented

¹⁴UNCTAD, *Digital Economy Report 2021*, on the concentration of data value capture and the policy space of developing countries.

design, successful enough to afford it, and regionally positioned to attempt what the first generation could not — a coordinated digital space in which small economies achieve together the scale that position requires.

The wider lesson reaches beyond the instrument. Technological independence for developing countries will not be declared; it will be accumulated — in engineers trained, systems localised, products owned and markets built — and the IT park is best understood as an accumulation device: powerful when pointed at position, merely lucrative when pointed at revenue. The task for policy and for research alike is to keep the two aims distinct and the instrument pointed at the right one; for the countries now building their parks, the encouraging news of this article is that the difference lies not in resources they lack but in design choices still open to them.

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