



(RESEARCH ARTICLE)



THE ROLE OF DEVELOPMENT INSTITUTIONS (DEVELOPMENT CORPORATIONS, TECHNOLOGY PARKS, INDUSTRIAL PARKS) IN SHAPING A REGIONAL IT ECOSYSTEM

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International Journal of Science and Research Archive, 2026, 21(01), 373–377

Publication history: Received on 07 September 2026; revised on 12 October 2026; accepted on 14 October 2026

Article DOI: <https://doi.org/10.30574/ijrsra.2026.21.1.1905>

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ABSTRACT

Information technology (IT) companies and their staff are highly mobile, which makes the creation of a self-sustaining regional IT ecosystem one of the key tasks of regional policy. This study aims to assess the role of development institutions — regional development corporations, technology parks and industrial parks — in shaping such ecosystems and to identify ways of improving their performance. The study is based on a structured narrative review of peer-reviewed international literature on science and technology parks, industrial parks, regional development agencies, entrepreneurial ecosystems and the location of new information and communication technology (ICT) firms, interpreted through an ecosystem and institutional lens. The review shows that the effect of parks is uneven: they generate spillovers where they are embedded in local economies with strong human capital and business linkages, while elsewhere their contribution is modest or uncertain. Regional development agencies often perform a narrow, property-based service function that suits industrial projects better than technology start-ups. The paper proposes a framework of three functions of development institutions (infrastructure, coordination and investment, financial services) and recommends new performance indicators, an ecosystem-operator role for development corporations, closer integration with the banking sector and support for local demand. These measures can be used by regional authorities when updating IT industry development strategies.

Keywords: Development institutions; Technology parks; Industrial parks; Regional development agencies; IT ecosystem; Regional policy

1 INTRODUCTION

The digital transformation of the economy is changing what regional policy is expected to deliver. Information technology (IT) is one of the few sectors in which a region can build a competitive advantage without relying on natural resource rents or a favourable transport location. There is, however, a downside. IT companies and their staff are highly mobile: a development team can relocate at little cost to wherever salaries are higher, the professional community is denser and capital is easier to raise. As a result, most regions now face the same question — how to keep technology businesses on their territory and help them grow there.

One answer has been to rely on development institutions at the regional level: development corporations and agencies, technology parks, industrial parks, support funds and investment promotion bodies. They are expected to act as a link between government, business, universities and investors. In practice their performance varies widely from one region to another. Moreover, many of these organisations were designed for industrial policy — attracting a plant, allocating a site, connecting utilities — while the needs of the digital economy are of a different kind.

The aim of this article is to assess the role of development institutions in shaping a regional IT ecosystem and to identify ways of making them more effective. To achieve this aim, the article clarifies the place of development institutions within the structure of an ecosystem, reviews the evidence on the contribution of technology and industrial parks, and examines the activity of development corporations before proposing changes to how they operate. Section 2 describes the materials and methods, Section 3 presents and discusses the results, and Section 4 concludes.

2 MATERIALS AND METHODS

This study is a conceptual paper based on a structured narrative review of the literature. Its evidence base consists of peer-reviewed journal articles and working papers in English that address four themes: the Triple Helix and entrepreneurial ecosystem frameworks; the economic impact of science, technology and industrial parks; the design and performance of regional development agencies; and the regional determinants of new IT firm formation. Sources were identified through the RePEc/IDEAS bibliographic database, publishers' platforms and university repositories, and were included if they presented empirical evidence or an established conceptual framework directly relevant to regional development institutions. Both supportive and critical studies were deliberately retained to avoid a one-sided picture.

The selected studies were analysed qualitatively. Their findings were compared across countries and types of institutions and then grouped according to the functions that development institutions perform within an ecosystem. On this basis, the author formulated a functional framework of development institutions and a set of policy recommendations adapted to the needs of the IT sector. Because the study relies on secondary sources, its conclusions are analytical rather than statistical; the limitations of the reviewed evidence are discussed together with the results.

3 RESULTS AND DISCUSSION

3.1 Development institutions within the structure of a regional IT ecosystem

In this article, a regional IT ecosystem is understood as a set of interconnected actors — technology companies, start-ups, universities, investors, public authorities and infrastructure organisations — whose interaction produces new products, skills and jobs. Unlike a cluster, which is usually built around a sectoral specialisation and production cooperation, an ecosystem places the emphasis on horizontal ties and on the system's ability to reproduce itself. For the IT sector this distinction matters. Its key resources are people, knowledge, capital and demand rather than land or raw materials.

The most widely used framework for describing such systems remains the Triple Helix model, which treats innovation as the outcome of interaction between universities, industry and government rather than the product of any one of them [1]. A related and more recent notion is the entrepreneurial ecosystem, defined by E. Stam as a set of interdependent actors and factors coordinated in such a way that they enable productive entrepreneurship [2]. Both frameworks share an important implication: strong research capacity or generous subsidies do not by themselves produce a functioning system. Intermediaries are needed to connect human capital with finance and markets.

Development institutions are meant to play this intermediary role. Their record, however, is mixed even in countries with a long tradition of regional policy. A survey of regional development bodies in eight Western European countries by H. Halkier and M. Danson found that only about half of them met the criteria of a “model” regional development agency, and that the differences largely reflected the political setting and the policy paradigm in place when each agency was created [3]. For an IT ecosystem this weakness is particularly costly. A technology company needs premises, funding, staff and access to customers at the same time, and if each of these is handled by a separate body with its own rules, the founder spends more time on paperwork than on the product.

From the author's point of view, the functions of development institutions in an IT ecosystem can be divided into three groups. The infrastructure function (technology parks, industrial parks, data centres, shared laboratories) answers the question of where to work. The coordination and investment function (development corporations and agencies) answers the question of with whom and how: it links projects with investors, authorities and sites. The financial and service function (funds, guarantee organisations, banks) answers the question of what to pay with: grants, preferential

loans, guarantees, settlement and transaction services. A mature ecosystem emerges where the three functions work together rather than in parallel.

It is equally important that demand for each function changes as the ecosystem matures. At the early stage, when a region has only a few IT teams, the most valuable things are a professional community, affordable premises and the first orders from local enterprises. At the growth stage, talent and capital come to the fore: companies need specialists, venture and bank finance, and access to markets in other regions. A mature ecosystem sustains itself, as graduates start their own companies and successful founders become investors and mentors. A development institution that ignores these dynamics and offers the same package of measures at every stage inevitably loses effectiveness.

Russian evidence points in the same direction. S. Zemtsov and M. Kotsemir, applying data envelopment analysis to Russian regional innovation systems, found large interregional differences in efficiency, with the most efficient systems concentrated in the largest agglomerations that host leading universities and research centres, such as Moscow, Saint Petersburg and the Novosibirsk, Voronezh and Tomsk regions [4]. In other words, the regions that already have dense networks of knowledge and people convert resources into innovation more effectively, and development institutions elsewhere have to compensate for the missing links.

3.2 Technology and industrial parks as the infrastructure of an IT ecosystem

Technology parks are traditionally seen as first-order infrastructure for the IT sector. They provide office and laboratory space, co-working areas, server rooms, business incubators and acceleration programmes. Industrial parks are primarily oriented towards manufacturing, but they are relevant to IT too: they host the production of electronics, computing and telecommunications equipment, as well as data centres. With the current emphasis on technological sovereignty and import substitution, this hardware segment is becoming an increasingly important part of the regional IT ecosystem.

Despite the popularity of parks, the evidence on their impact is far from conclusive. L. Lecluyse, M. Knockaert and A. Spithoven reviewed 175 journal articles on science parks published between 1988 and 2018 and concluded that, despite decades of government support and research interest, the actual contribution of parks is still not well understood, partly because of methodological and theoretical weaknesses in the literature [5]. A sceptical position is taken by S. Wallsten, whose econometric analysis of US data led him to conclude that science parks do little to generate new jobs, new firms or inflows of venture capital, and that public subsidies to them are unlikely to pay off [6].

More encouraging results come from studies that look at which parks succeed rather than whether parks work in general. S. Zheng, W. Sun, J. Wu and M. Kahn examined 110 industrial parks near eight major Chinese cities between 1998 and 2007 and found significant spillovers beyond park boundaries: in the surrounding areas employment, productivity and wages rose, while the strongest effects were observed where park workers were more highly educated and where new park industries had clear links with existing local firms [7]. The lesson is that a park works when it is embedded in the local economy rather than built in isolation from it.

Two conclusions follow. First, a technology park is not a self-sufficient source of growth; its value depends on the human capital and business networks around it. Second, the mechanism works at scale mainly in large agglomerations. IT companies need a deep labour market, a good urban environment and proximity to customers. Where these are missing, a modern technology park building cannot replace the absent elements of the ecosystem. The problem lies not in the instrument as such but in an approach that treats the construction of the facility as an end in itself. Square metres without an active policy of attracting and retaining residents remain empty or are filled with tenants that have little to do with technology.

It is worth specifying which services IT residents actually need. Beyond offices and connectivity, these include acceleration programmes involving large corporate customers, legal support for transactions and the protection of intellectual property, help with obtaining accreditation and tax benefits, and support for software exports. For the hardware segment, other parameters come first: reserve electrical capacity, reliable communication channels and space for clean rooms and test equipment. A management company that understands these differences can turn an ordinary park into a hub of industry cooperation. One that confines itself to leasing space remains a property developer, even if it has public status.

3.3 Development corporations and ways to improve the performance of development institutions

The original mission of a regional development corporation implies a proactive stance: to shape a vision of the region's economic future, to initiate significant projects and to reconcile the interests of government, business and residents. In practice many corporations have narrowed their activity to approving and co-financing ready-made projects, advising small businesses, guiding investors through a one-stop shop and helping them find sites. This set of services suits IT projects poorly. They rarely need a land plot; what they need are customers, specialists and early-stage money.

Research on the location of IT start-ups explains why. F. Lasch, F. Robert and F. Le Roy, studying all new ICT firms created in France between 1993 and 2001, found that the strongest driver of new firm formation was co-location with incumbent ICT firms, while knowledge spillovers had some effect and the influence of agglomeration, entrepreneurial and human capital was mixed [8]. For development institutions, this means that the existing base of companies is the main asset of a regional IT ecosystem. Policy should start by strengthening and connecting the firms that are already there rather than by trying to attract outsiders with real estate.

The architecture of interaction is just as important. In the logic of the entrepreneurial ecosystem approach, government acts as a “feeder” of the ecosystem rather than its “leader”, and its main task is to create conditions under which entrepreneurs themselves build the system [2]. This is a useful corrective for development corporations, which are often tempted to manage the ecosystem from above. The difference between successful and unsuccessful regional models lies in the presence of an operator that is responsible for the ecosystem as a whole rather than for a single facility, while leaving the initiative to business.

Based on this analysis, the author proposes several directions for adjusting development institutions. First, the system of key performance indicators should change. Instead of the floor area commissioned and the volume of declared investment, institutions should be assessed by the number of active IT residents, the share of companies that survive more than three years, revenue from sales outside the region and the number of local graduates employed in the region. Second, the development corporation should take on the role of ecosystem operator — a single point of entry that links the technology park, universities, industry associations, funds and financial organisations. Halkier and Danson's finding that agency performance depends heavily on institutional design supports the idea that this role must be built in deliberately rather than expected to emerge [3].

Third, development institutions should be more closely integrated with the banking sector. Banks have distribution channels, information about cash flows and the instruments that a technology business needs from its first day: settlement services, acquiring, escrow accounts, factoring and bank guarantees. Joint products for technology park residents, embedded in the development corporation's one-stop shop, reduce a company's transaction costs and at the same time give the development institution an objective picture of the company's growth. Fourth, institutions should support demand: regional pilot sites and orders for digital solutions from local industry and municipal services often mean more to a young IT company than subsidised rent.

Finally, there is no single recipe for all regions. Leading agglomerations should focus on scaling and bringing products to external markets. Mid-level regions would benefit from seeking a specialisation, for example industrial software for the large enterprises located on their territory. For peripheral regions, it may be more effective to develop remote-work hubs and service centres than to build large technology parks that risk remaining half-empty.

Adjusting development institutions carries its own risks. The first is crowding out the market: if a development corporation begins to compete with private co-working spaces, accelerators and consultants, it suppresses the very entrepreneurial environment it is supposed to create. The second is the appearance of rent-seeking residents who come to a technology park for the tax benefits without conducting real technological activity. The third is formal reporting, where targets are met on paper without changes in substance. These risks can be reduced through open publication of results, regular independent evaluation and the participation of IT community representatives on the supervisory boards of technology parks and corporations.

4 CONCLUSION

The analysis leads to several conclusions. Development institutions can act as key intermediaries in shaping a regional IT ecosystem, but this role is still only partly realised. International evidence shows that technology and industrial parks deliver results where they are embedded in a local economy with strong human capital and business linkages, and that their effect elsewhere is modest or uncertain. Regional development corporations, for their part, tend to perform service functions rather than strategic ones and are better suited to industrial projects than to technology start-ups.

Improving the performance of development institutions depends less on expanding floor space and budgets than on changing the logic of their work: from facility to ecosystem, from reporting on square metres to indicators of company growth, and from fragmented measures to a single operator closely connected with universities, customers and the financial sector. The proposed directions may be used by regional authorities when updating strategies for the development of the IT industry. Further research could focus on a quantitative assessment of how development institutions affect the survival and growth of regional IT companies.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

Disclosure of conflict of interest

The author declares no conflict of interest.

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