T-KIBS in the New Digital Era: Web-based Evidence from Italy

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Scholars are investigating the role that innovation intermediaries play in supporting the digital transition and in the development of innovative regional ecosystems (Rossi et al., 2021; Howells, 2023). Based on the body of literature that has preceded the digital transition, these organizations are supposed to be capable of playing multiple roles, including supporting the diffusion of existing innovations within different economic systems; supporting the creation of new technologies; and supporting policymakers in setting policy (Howells, 2006). Since the variety of intermediaries is wide - just as wide is the range of activities they can perform - in this article we choose to focus on a particular type of innovation intermediary, which can play a peculiar role in supporting firms: technological knowledge-intensive business services (t-KIBS).

Introduced in 1995 by Miles, the acronym KIBS indicated organizations that i) "result in the creation, accumulation or dissemination of knowledge", ii) "rely heavily upon professional knowledge" and iii) "are concerned fundamentally with technology and innovation" (Miles et al. 1995). In general terms, KIBS are described as capital-intensive and know-how-intensive organizations devoted to producing and collecting knowledge, not for private consumption (Strambach 2001) but with the intended or unintended purpose of transferring and disseminating it across a pool of final users. Despite being often treated as a homogeneous group of organizations, a great variety of organizations falls under the KIBS umbrella. A relevant distinction is provided by Miles (et al., 1995) who identified two main sub-groups: professional services (p-KIBS), namely "traditional" business services that are intensive users of new technologies (e.g. business and management service, legal accounting and activities); and technological services (t-KIBS) who are developers of new technologies and focus mainly ICT and other technical activities (Miles et al. 1995; Doloreux and Shearmur 2012). This distinction reflects the different attitudes toward technological innovations of these two sub-groups (Freel 2006) but also the different educational requirements, occupational structure, and skill base (Consoli and Elche-Hortelano 2010).

Numerous studies have acknowledged the significant role of t-KIBS in the development of new digital technologies (Sharma et al. 2023). T-KIBS have emerged as key drivers of the digital transition due to their expertise in leveraging digital technologies (Corrocher and Cusmano 2014; Paiola et al., 2018). As producers of innovative digital products, they contribute to the development and advancement of the technological landscape (Rodriguez et al., 2017). Through their role as facilitators and adapters, KIBS assist businesses in implementing and customizing digital solutions to meet specific organizational needs (Ciriaci et al., 2015; Hervas-Oliver, 2019, 2021; Amancio et al. 2022; Larrea et al., 2022). Furthermore, KIBS offer a range of services that support the adoption and utilization of these technologies (Howells, 2006).

Adopting a systemic perspective, some authors have found that t-KIBS play a role in the development of innovation ecosystems at regional scale (Corrocher and Cusmano 2014; Vaillant et al., 2021).

Capello et al (2022) find that these organisations are strongly present in regions where digital transformations are more advanced. However, despite these contributions, we still know little about how these organizations behave, and what distinguishes t-KIBS involved in new digital technologies from others. In this paper, we will particularly delve into the analysis of what characteristics (technological, spatial, strategic) distinguish t-KIBS and to what extent they are able to stimulate the emergence of innovation ecosystems at regional level.

This study does not focus only on the symbiotic relationship between KIBS and the local manufacturing sector, but it delves into technological KIBS and the territorial determinants that influence their diffusion. In the context of Italy, it targets technology-based knowledge-intensive business services specializing in the provision of information and communication technologies. By analysing information obtained from their websites, this study identifies the t-KIBS involved in the new digital transformations (digital t-KIBS and maps their geographical diffusion. Then, the provision of digital technologies is modelled as the result of a mix of firm-level (e.g., firm size or company profile) and territorial-level (e.g., urbanization economies) determinants. The former looks at the internal characteristics that might affect the decision and the capacity to provide these technologies.
The latter reflects established literature on the main determinants that regulate the geographical diffusion of business services that is mainly affected by urbanization economies and by demand coming from sectors (Meliciani and Savona 2015; Di Giacinto et al., 2020) and on the impact that localization choices have on KIBS innovativeness (Brunow et al., 2020). Having this in mind, this chapter seeks to answer the following questions:

• What are the firm-level and territorial-level determinants that affect the provision of new digital technology and related services by t-KIBS?

• Whether and to what extent do these determinants depend on the technology that they provide?

Results suggest that overall, the involvement in the provision of new digital technologies is strongly affected by the co-location with manufacturing companies that demand these technologies. However, this finding does not hold for all the technologies as some of them rely more on urban advantages. This suggests that in new digital technologies the spatial dimension continues to be important, but in different ways depending on the specific technological context. In the case of relatively ready-to-use technologies, whose focus is on interaction with the manufacturing customer (e.g., 3D manufacturing), intermediaries are very much anchored in territorial proximity with the latter. In contrast, cross-cutting technologies such as cloud or IoT, are developed in different contexts, where the urban system dimension, centred around the university and services, plays an important role.

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