

THE TRANSFER OF TECHNOLOGY FROM THE ORGANIZATIONAL VIEWPOINT

Editorial comment

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"Technology transfer has been the vanguard of progress and an inexhaustible fountain for productivity, empowerment, and convenience" (Mings, 1998). Since then, no consensus definition has been presented due to the complexity of the topic that requires time to evolve. (Bengoa et al., 2021). Considering the excellence in business management the process of technology transfer is certainly composed by advantages and disadvantages regardless its great importance on innovation management (Lager & Hassan-Beck, 2021).

From a broader perspective, research streams and important topics were identified by Bengoa et al. (2021) such as (a) technology transfer in university (academic entrepreneurship, intellectual property, new ventures, technology transfer offices, and university–industry relationship), (b) international technology transfer, (c) intra-firm technology transfer, (d) absorptive capacity, and (e) public innovation policies (Bengoa et al., 2021). Considering the various agents involved in technology transfer (transferors and transferees) and its bidirectional process, the authors highlighted that limited attention has been paid to detecting the difficulties and efforts in an effective university–industry relationship from the perspective of firms (Bengoa et al., 2021).

Yet, due to the institutionalization of the technology transfer process in the university context, a wide array of organizational components dedicated to support this process has emerged (Good et al., 2019). Therefore, drawing upon a holistic view, this editorial point out organizational perspectives that support the ecosystem of commercialization of university technological research, hereafter referred to as technology transfer to bring a relevant framework for analyzing the different organizational components that encompass the related challenges.

We assume this organizational perspective also considering that a recent literature points to the emergence of new modes for the facilitation of academic entrepreneurship, such as university-based entrepreneurial ecosystems and accelerators (Balven et al., 2018; Schaeffer & Matt, 2016; Siegel & Wright, 2015) which do rely on an organizational purpose, stablished activities, structure of organization and people to support the process of developing and transferring technologies.

Organizational purpose reflects the first perspective of this holistic view meaning the main reason for firms' existence or their conception of the desired ends. From the purpose, firms define the activities, the second perspective, which consist of the different tasks performed to fulfil the purpose. Supporting the performance of these activities, firms design an ownership structure, the third perspective, that formally indicates how activities and tasks are divided between individuals and groups of individuals commonly considered to have a significant impact on technology transfer performance. The fourth perspective, people and organizational culture typically considered to be the shared social knowledge including the values, norms and rules, which in turn can shape individuals behavior (Colquitt et al., 2008; Good et al., 2019; Nadler et al., 1997; Scott, 1992).

To cover the different stages of commercialization of technologies and more likely successful outcomes, indeed, technology transfer offices is characterized as an organizational purpose in the literature tend to focus either on licensing technology or forming a firm around a technology (Bozeman et al., 2015; Schaeffer & Matt, 2016). While, science parks (Díez-Vial & Montoro-Sánchez, 2016), incubators (Bergek & Norrman, 2008), and university venture funds (Pierrakis & Saridakis, 2019) are purposes more concerned with ensuring that the firm formed around successfully university technologies to build commercial products. Together these organizational purposes are likely to provide a complete coverage of the distinct stages of technology transfer process into an ecosystem.

The extent activities in technology transfer led firms at early-stage development (e.g., support for research and intellectual property rights) to later stages (e.g., property management, business support, or network development). However, one activity that appear as a common sense is the substantial extent in internal and external networking with the purpose of supporting the commercialization of technology. According to Good et al. (2019), these boundaries that span network activities may be redundant or complementary and may prevent or foster competitive service providers rather than partners in the effective commercialization of university technology.

Regarding the elements of structure, the literature presents overlaps in its components being common in terms of ownership, governance, and physical location. The unity in terms of ownership prevails the university. As standalone structures are quite common, firms prefer to own the others to evolve in technology transfer instead of new emerging structures such as enterprise labs and garages, or offices of engagement (Pauwels et al., 2016; Wright et al., 2017). Further, university' size and location are major differences identified in the literature as structure issues.

People and organizational culture elements are important shortcomings in the literature. Some capabilities frequently appear in the research such as capability to understand complex technologies, experience in intellectual property rights, understanding of the academic environment and how technological research is conducted (Jefferson et al., 2017). However, composition of, and evolution in, the teams of technology transfer and their role distribution and identity are critical aspects highlights as absent. Entrepreneurial culture, Intra- and inter-individual micro-processes, the role of leaders in the evolution of the ecosystem to support technology transfer are new avenues for academic research presented by Good et al. (2019).

Overall, little is known about the effect of technology transfer from industry's side and even less from the perspective of small and medium-sized enterprises (SMEs) which relatively more adept at absorbing knowledge from external sources, such as universities comparing to large firms (Feldman et al., 2002). Cultural and informational barriers between universities and firms, especially for smaller may be additional impediments for technology transfer (Bengoa et al., 2021; Good et al., 2019) and deserve more attention from researchers.

Furthermore, the impact of academic entrepreneurship beyond the activities of licensing, patenting, or creating new ventures, for example, more informal activities and initiatives that may require new structures or management systems to implement them should be part of the new generation of publications (Bengoa et al., 2021). In the future, the challenges associated with information security in society should also impact advances in this research field, since cyber-attacks arise through connectivity with direct implications for technology and knowledge transfer.

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