



Knowledge Transfer Strategy in a Regional University: The Case of UTN, Costa Rica 2025

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Abstract

This paper outlines the institutional knowledge transfer strategy of the National Technical University (UTN) of Costa Rica, a young public university with a clear regional and social mission. Developed by the Vice-Rectorate for Research and Knowledge Transfer, the strategy reflects a participatory process aimed at strengthening the university's capacity to engage with external socio-productive sectors. Grounded in innovation systems theory and guided by open science principles, the strategy is built around five pillars, including governance, capacity building, external engagement, innovation culture, and evaluation. A 2025 institutional survey informed its design, revealing both existing strengths and key gaps—such as limited knowledge of intellectual property frameworks, weak incentive structures, and low levels of commercial transfer.

Keywords: university; innovation; knowledge transfer; technology.

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1. INTRODUCTION

In recent years, knowledge transfer has become an essential part of how universities contribute to society. No longer confined to teaching and research alone, higher education institutions are increasingly expected to engage with the world around them—building bridges across disciplines, sectors, and communities. This role is especially meaningful in places where universities are not just centers of knowledge, but also active players in promoting inclusive development and social progress. The National Technical University (UTN) of Costa Rica was founded with a deep territorial and social mission: to respond to regional needs and to expand access to education and technology in a fair and meaningful way. Within this vision, developing a strategy for knowledge transfer is not merely about ticking boxes; it is about making a commitment to ensure that what happens inside classrooms and labs does not stay there but reaches beyond the university walls to make a real difference. This paper tells the story of that effort: how UTN built its strategy through a collaborative and reflective process, grounded in dialogue with both its own community and external partners. It's a strategy rooted in Costa Rica's unique context, shaped by national policy goals, and inspired by international conversations on the future of innovation and education.

2. THEORETICAL FRAMEWORK

2.1. Innovation and the knowledge-based economy as a starting point

Innovation, knowledge, and connection to various sectors have long been studied in an integrated manner. Key conceptual frameworks include the Sabato Triangle (Sábato & Botana, 1970) and the Triple Helix model (Etzkowitz, 1996). These frameworks emphasize the importance of interactions among universities, industry, and government to foster stability and strengthen the innovation system. They align with more complex models that seek to explain the innovation process, such as the one proposed by Kline and Rosenberg (1986).

The Sabato Triangle and Triple Helix approaches are complemented by more recent and systemic models,

such as the concept of National Innovation Systems (INS). This theoretical development goes beyond merely describing the existing capacities for innovation. Instead, it explores the interactions among the many actors within this complex system (Lundvall, 1992). These actors are typically grouped into two broad categories: knowledge producers and knowledge users. Crucially, they operate within an institutional framework that either facilitates or hinders innovation by shaping these relationships.

Within this framework, universities play a central role as key actors in the knowledge infrastructure (Campos et al., 2023). According to Chesbrough (2003), National Innovation Systems and a shift toward more collaborative knowledge transfer models between academia and socio-productive sectors have sparked the emergence of new trends. These trends encourage business strategies in which firms actively engage with research groups or scientific communities. This dynamic is captured under a new conceptual approach: *open innovation* (Chesbrough, 2003).

This perspective is particularly relevant in certain fields. For instance, as Pisano (2006) notes, biotechnology—an area that demands significant capital investment—has advanced largely due to strong educational–private sector partnerships.

At this point, it is worth pausing to clarify the relationship between innovation, technology transfer, and knowledge-based economies. Innovation is a broad concept, but there is widespread agreement that it represents one phase in the broader knowledge cycle. In essence, it occurs when an invention is brought to market, generating added value in the form of goods and services (Drucker, 1985; Schumpeter, 1934; Rogers, 2003; Tidd & Bessant, 2013; OECD, 2005).

2.2. Technology transfer and knowledge exchange

According to López, Mejía y Schmal (2006), in its broadest sense, *technology transfer* refers to the dissemination or movement of a technology or product from its original creation—the *initial invention*—into a different context, often economic or social. This



definition implies that technology transfer originates either in the market or society itself and can take many forms, such as patents, licensing agreements, or contractual arrangements.

Technology transfer encompasses a range of activities aimed at enabling the adoption of new techniques or knowledge. These may include dissemination, demonstrations, training sessions, and other efforts that lead to innovation or the effective appropriation of knowledge. Often, such transfers involve a formal agreement, some form of payment for usage rights, or financial returns for the original inventor or knowledge producer (López et al., 2006).

A key challenge for those responsible for managing technology transfer lies in identifying and measuring knowledge as it moves from basic scientific research into applied technology or experimental development. This challenge becomes especially critical when defining and managing institutional policies within universities or public R&D centers, as they seek to capitalize on the knowledge and innovations developed within their institutions (Codner et al., 2012).

In Latin America, many universities generate substantial knowledge with real potential for industrial application. However, the local appropriation of that knowledge remains limited. In this regard, and with a view to promoting innovation through effective knowledge transfer, Upstill and Symington (2002) propose three basic modes of university-to-business technology transfer:

Non-commercial or open transfer, which includes academic seminars, workshops, public courses, professional training, and published research.

Commercial transfer, encompassing commissioned research, consulting services, licensing agreements, patents, intellectual property sales, and paid technical services (Wright et al., 2004; Lockett et al., 2005).

Business creation and spin-offs, referring to the formation of new companies—either direct or indirect spin-offs—or technology-based enterprises specifically designed to commercialize university-generated technologies (Upstill & Symington, 2002).

This last approach—creating new ventures—is increasingly seen as a vital mechanism for transferring technology (Mustar et al., 2008; Wright et al., 2004). Today, universities are deeply embedded in networks of economic and community actors, engaging in multiple forms of interaction. This leads to a broader understanding of transfer types. For example, López et al. (2006), Siegel et al. (2004), Leydesdorff & Etzkowitz (1998), Henderson et al. (1998), and Cohen et al. (2002) distinguish between different models of transfer.

One of them is the linear model, also referred to as the *traditional model*, which conceptualizes technology transfer as a sequential process flowing from the university to industry in a step-by-step fashion.

In contrast, the dynamic model, as proposed by Siegel et al. (2004), rethinks this approach. It acknowledges the blend of formal and informal mechanisms

involved in transferring knowledge. Under this model, universities that actively encourage faculty participation tend to produce more patents and licenses. To support this approach, they often allocate more resources to their Technology Transfer Offices (TTOs), intensifying efforts to market their innovations.

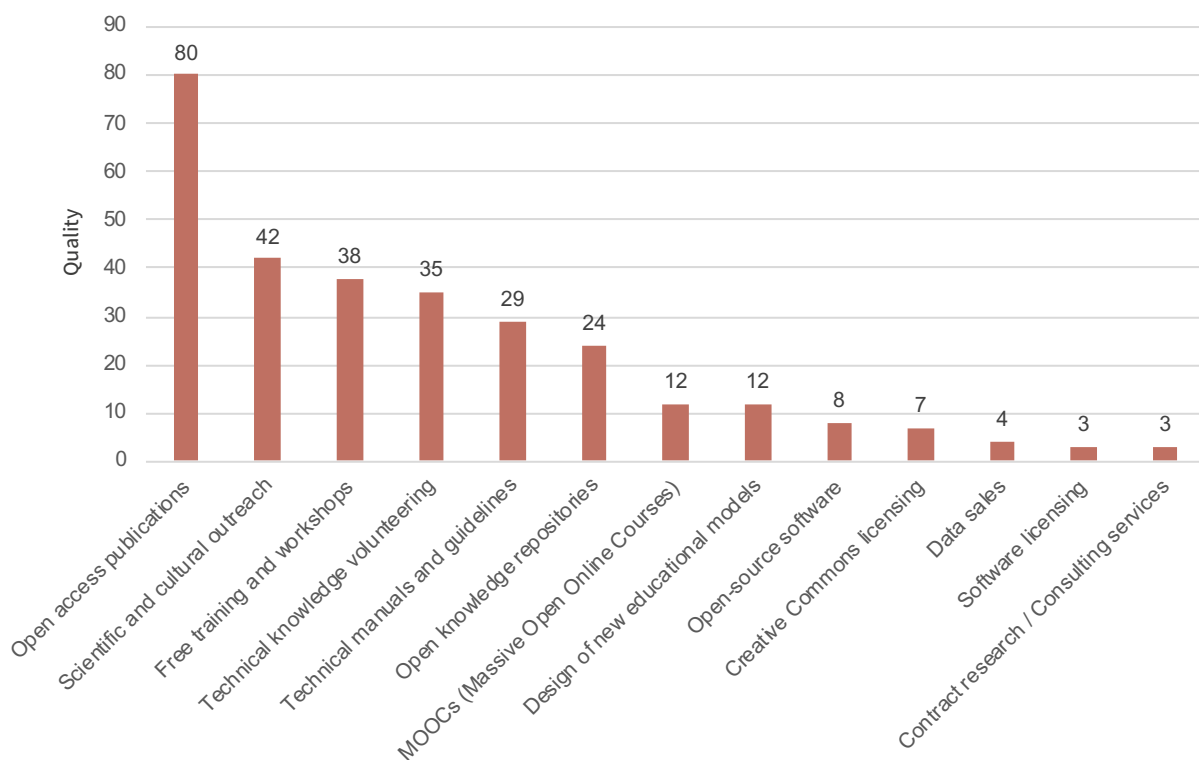
Collaboration between universities and industry can be powerful, but it is not always smooth. These sectors often operate with different mindsets—businesses move fast and focus on market needs, whereas universities work on longer research timelines and emphasize open knowledge. This mismatch can lead to tension around issues like intellectual property, licensing, and how to share results. In response to such challenges, alternative models like the “Catch-Up” approach have gained attention, especially in countries aiming to close the innovation gap. Rather than starting from scratch, this model focuses on absorbing and adapting existing technologies—a strategy that has helped nations like South Korea and Japan drive rapid development by learning from others and tailoring innovations to their own needs.

3. CONTEXT OF THE DESCRIBED RESEARCH/ PRACTICE

At the National Technical University (UTN) of Costa Rica, a survey was carried out among staff members identified by the Vice-Rector’s Office for Research and Knowledge Transfer as being potentially involved in knowledge transfer—whether through commercial, non-commercial, or entrepreneurial activities. The effort aimed to include all regional campuses and provide a broad institutional perspective. With a 52% response rate, the survey offered valuable insights into the state of knowledge transfer at UTN, highlighting current practices, perceptions, and institutional challenges as seen by those actively engaged.

Building on this diagnostic process, several strategic pillars of the institutional framework were defined and further developed through participatory work sessions. The strategy was enriched not only by internal collaboration but also by the incorporation of good practices from other public universities and the contributions of the NEXO sub-commission of CONARE,

Figure 1. *Number of knowledge transfer mechanisms*

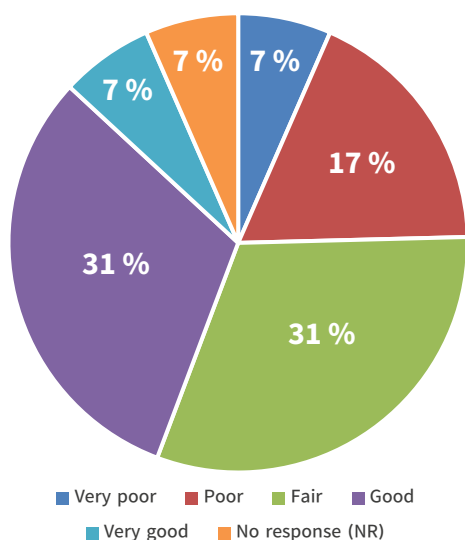


fostering an approach aligned with national coordination and shared learning across institutions.

4. MAIN RESULTS/REFLECTIONS

According to the results of the survey, 84% of respondents at the Technical University reported engaging in knowledge transfer activities. There is a clear predominance of non-commercial modalities of transfer, such as open-access publications, scientific and cultural outreach, and free workshops (see Figure 1). In contrast, commercial modalities—such as licensing and patents—remain underdeveloped. Only 7% of respondents rated the visibility of their works as “very good”, while 31% considered it “good” and another 31% described it as “fair” (see Figure 2).

Figure 2. *Perceived effectiveness of knowledge transfer activity dissemination*



In terms of external linkages, the majority (54 mentions) indicated that primary partnerships for knowledge transfer were with external academic institutions. Communities were cited 52 times, followed by central government institutions (43 mentions), and private companies (38 mentions). Fewer respondents reported linkages with professional associations, local governments, entrepreneurs, and other stakeholders. Regarding intellectual property (IP) frameworks, only

19% of those surveyed reported being familiar with national and international regulations in this area.

When asked about the main barriers to knowledge transfer within the university, the most frequently cited challenge (96 mentions) was the lack of institutional incentives. Other significant barriers included limited training in IP-related matters (71 mentions), the absence of an institutional structure or technical support (68 mentions), regulatory constraints (24 mentions), lack of advisory services (18), and weak entrepreneurial capacity (9 mentions).

Drawing from the diagnostic process, five core pillars were defined to shape UTN’s knowledge transfer strategy, in line with its regional mandate. The first pillar focuses on governance and institutional structure, establishing a clear framework led by the Vice-Rector’s Office for Research and Knowledge Transfer (VIT) and a team of legal and technical experts. This structure supports intellectual property protection, inventor rights, and transparent agreements, aiming to ensure that all transfer activities are coherent, mission-driven, and socially responsive.

The second pillar addresses one of the most evident gaps identified in the diagnostic: a limited level of training and awareness regarding knowledge transfer and intellectual property. In response, dedicated training programs were developed and implemented, targeting various groups within the university community. These initiatives aim to build internal capacity, promote a better understanding of the legal and strategic dimensions of knowledge transfer, and foster a culture of protection and responsible use of intellectual property across the institution.

The third pillar centers on a recognition and incentive scheme, which had also been identified as one of the key institutional weaknesses. This component proposes various support mechanisms, ranging from seed funding for prototype development to institutional awards, mentoring opportunities, and participation in the financial benefits arising from licenses or technological assets.

The fourth pillar focuses on building stronger links with external socio-productive sectors. As part of this

effort, dissemination is also framed as an essential dimension—not only to strengthen partnerships, but also to increase the visibility of ongoing actions. The strategy, therefore, includes initiatives aimed at showcasing knowledge transfer efforts, creating spaces for co-creation, promoting scientific and technological outreach, and fostering a culture of innovation across all campuses. Visibility, in this sense, is not merely about highlighting achievements—it is about inspiring new vocations and reinforcing a shared sense of purpose.

Finally, no strategy can be sustained without monitoring and evaluation. A set of indicators has been defined to assess progress—not only in terms of the number of technologies transferred, but also in relation to their social or economic impact. Here, monitoring is conceived not as a mechanism of control, but as a way of learning, adjusting, and demonstrating the public value of the university. Evaluation, in this case, is an act of care: a commitment to ensuring that knowledge truly reaches those who need it.

5. CONCLUSION

The development of UTN's institutional strategy for knowledge transfer reveals a university that is not only aware of its regional mission, but also committed to translating that mission into tangible, responsive action. Rather than replicating external models, the strategy draws from its own diagnosis, its people, and its context to shape an approach that feels both grounded and aspirational.

The findings of the internal survey show a strong commitment from academic staff to engage in knowledge transfer—primarily through non-commercial modalities such as open publications, workshops, and community outreach. This reflects a university culture that values accessibility and public service. However, the same findings also highlight persistent structural challenges: limited awareness of intellectual property frameworks, a lack of institutional incentives, and scarce visibility for research outputs. These are not minor issues—they affect the university's capacity to connect its knowledge production with real-world needs and opportunities.

The five strategic pillars proposed—ranging from governance and capacity-building to external engagement and monitoring—offer a comprehensive, realistic roadmap. But more than that, they reflect a desire to strengthen the institutional ecosystem where knowledge flows not as a product, but as a shared process. The inclusion of incentives, the commitment to training, and the recognition of dissemination and evaluation as core dimensions all speak to a strategy that understands knowledge transfer as a long-term investment in trust, relevance, and collective capacity.

Ultimately, this experience affirms that knowledge transfer is not a mechanical function—it is a human one. It depends on relationships, understanding, and the ability of institutions to create spaces where innovation is not only possible, but welcome. The UTN's approach is an invitation to rethink how universities can accompany society—not only through technological outputs, but through values, engagement, and responsibility.

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