ARTIFICIAL INTELLIGENCE FOR INTELLECTUAL PROPERTY AND TECHNOLOGY TRANSFER

POSITION PAPER

1. The importance of efficient intellectual property management to achieve a successful technology transfer practice

Within a knowledge-based society where Open Innovation is now the dominant paradigm for innovation, the concept of technology transfer has become more and more strategic. Technology Transfer is part of a wider notion of Knowledge Transfer, focusing on bringing ideas/technologies from the lab to the market, a **process which consists in turning inventions and discoveries** from public research organizations (PRO), such as universities, research hospitals or centers, **into new products or services which may benefit society at large**. Today the spillover of know-how from the lab to the market occurs in a broad variety of appearances, from traditional licensing, to joint collaborations and to co-creation exercises. The rationale behind all these channels is always the same: **creating societal impact and helping PROs establish new funding streams**.

Practitioners of technology transfer are an essential intermediary in the process to detect valuable innovations, to assist inventors and researchers with the protection of discoveries and to help knit the needed relationships to move discoveries to the market. Under the Open Innovation paradigm, the recipients of inventions and discoveries from PROS are firms of all sizes, including SMEs, start-ups and spin-offs (when created on purpose by researchers to undertake the last mile of technology development and reach the market) that **acquire innovation from external sources to gain competitive advantage**.

The Technology Transfer process is affected by many problems, that have been also singled out by European institutions. From Innovation Union to the Draghi Report there have been several occasions in which **the so called European Paradox has been observed**. Improving the ability of research institutions to transfer the research results of the market is key to regain competitiveness at European level and to tackle some of the most urgent problems of our times.

Among other factors, it is nowadays accepted that one of the reasons technology transfer is not yet delivering the expected value depends on the lack of specific capabilities of professionals serving as technology transfer officers within public

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research institutions. While specific training programs are abundantly available, **providing individuals with competences and skills proves different from building capacity in technology transfer for an institution**. Individual incentives and mobility, turn-arounds and personal attitudes should not influence the performance of an institution. **Creating capacity means giving institutions a durable and sustainable set of tools, procedures, competences and metrics that can make the difference** on the long run and be determinants of an effective Technology Transfer practice.

Also SMEs and startups are deeply affected by lack of specific capabilities to manage their intellectual assets, mostly because of very low culture of IP, lack of strategic approach and no dedicated budget [The EU Startup and Scaleup Strategy. Choose Europe to start and scale, SDW(2025) 138 final, p. 41].

2. Management of IP is management of complexity

Intellectual property management for technology transfer implies a set of very complex steps within research-intensive organizations (whether PROs, universities, startups or innovative SMEs). They can be summarized as follows.

(1) Scouting new ideas and inventions from faculty. This activity comprises the creation of internal systems and policies for IP disclosure and protection, best practices for new technologies and IP generation and their integration into the technology transfer policy of the PRO. At an operational level, it implies the implementation of procedures and rules for engaging faculty inventors in technology transfer activities and scouting for new ideas/inventions from faculty.

(2) Managing invention disclosures. This activity involves managing data collection related to new ideas and inventions, the technical evaluation of new invention disclosure (including early technical and commercial assessments), and pre-patent contractual work for creating and sharing information and intellectual property rights before patent prosecution.

(3) Training to faculty, PhDs and students. This activity is about the establishment of technology transfer related courses or coaching for researchers and students.

(4) Patent protection and management. This activity is about performing patent searches, like novelty search, validity search, infringement search and state-of-the-art search. In a second step it is about drafting a patent description and claims and the application and follow-up representation at the intellectual property office. Finally, it is about the management of the patent portfolio, including renewal/exploitation/abandonment decisions, as well as the management of the infringement of patents, i.e. patent litigation but also non-judicial proceedings like arbitration.

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(5) Other IPRs protection and management (e.g. trademarks, designs, copyrights, material transfer) This activity covers the management of trademarks, designs, copyrights, plant varieties, as well as MT and MTA cases.

(6) Technology and IPR valuation. This phase of the Technology Transfer process includes the assessment of strategic, technical and legal strengths of patents, as well as the determination of the economic value of IPR and underlying technologies and portfolios of those technologies.

(7) Proof of concept, testing and validation activities. These are activities aiming to prove concepts, testing, accelerating and validating programmes. This involves also training on business cases for a proof of concept (POC) programme.

(8) Market assessment and communication. This activity implies market analyses for university technologies, as well as the creation of strategies to improve the visibility and the value of university technologies on the market.

(9) Licensing negotiation and contracting. This activity is about searching for potentially interested technology adopters and implies contract drafting and management for IPR contracts, as well as working as licensing agent for negotiating and drafting contracts, due diligence and contract closing. Finally, the post-deal management needs contacts to licensees after the contract, collecting royalties and dealing with contract compliance.

10) Research contracts and industry consulting. This activity is about acquisition, closure and management of research and consulting contracts with industry.

(11) Start-up creation and support. This activity is the support of faculty members and students with the creation of start-ups or spin-offs. It includes legal arrangements, team building, business planning, management support and technical assistance. The basis of this activity is the implementation of a general start-up / spin-off strategy and policy within the PRO.

(12) Business planning. This activity is the support of faculty and of students in writing and testing business plans, including training and participation in business plan competitions, as well in pitching and communicating business plans and ideas.

(13) Access to finance and interactions with external investors (e.g. business angels, VCs). This activity involves finding, examining and tapping financial streams for funding of technology transfer, i.e. public and private funding. More advanced is setting up funds that work like VC funds in order to finance university technology transfer, especially spinoffs and start-ups. It implies legal experience in setting up contract work with investors, support to spinoffs and start-ups in negotiating company valuation with investors and business equity. Finally, it is the management of equity-stakes in the spin-offs and exits.

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(14) Interactions with public stakeholders and social community (e.g. local/regional/national/ international public authorities). This activity includes communication and networking with governments, administrations and other public stakeholders, as well as other stakeholders in business and society that could be interested in funding technology transfer activities, supporting the technology transfer office, and giving access to financial and non-financial resources, such as professional networks, experts, non-diluitive resources.

(15) Organisation, staffing and governance of the TTO. This activity includes creating and implementing a technology transfer strategy and practices for a TTO, followed by leading a TTO or setting it up, and creating an organisational structure. Activities related to operational management include supervising the technology transfer activities, benchmarking and assessment of the performance with indicators schemes, as well staff selection, career paths development, incentives and salary systems.

Technology transfer activities can be considered part of a complex management process, that hinges on the technology, its developmental stages, the go to market, the interaction with the intended recipient, need for resources, FTO, and many other hurdles. The idea of managing the complexity using digital technologies is not a new one, but **current products are designed to provide a quick fix**, not to improve the overall capacity of the TTO and the concerned professionals to do their job more rapidly, effectively, and rewarding.

We move from a basic observation: everyone should be at the forefront of technology transfer and be active part of the endeavor to create impact. **We only move at the speed of the slower**. If we want to achieve general improvement and impact, we have to make sure we do not leave anyone behind. As a consequence, technology transfer and intellectual property management must become first and foremost **a guided process that helps all individuals and institutions to improve their general capacity while doing their complex daily tasks**.

3. Why current solutions are unconvincing

“Make vs buy” isn't really an option for anyone. It needs a lot of competence, money and time to reach something the market already offers. Nonetheless, the market provides solutions that are not widely accepted. Anyone who has experienced commercial solutions for intellectual property management knows that **current software is rigid, expensive, intrinsically complex and designed around a notion of technology transfer that implies linear process**. Paradoxically, existing software solutions are premised on a simplistic value chain (which does not exist here) instead of complexity. They assume all activities are ordered, back-to-back, one-direction steps to be followed and the software is nothing else than a handrail that guides the user through a very well defined and immutable path. Technology

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transfer and valorization processes are never like that. As we know, complexity is the rule and a variety of activities evolve and intersect each other, some of them requiring constant check for compliance with internal and external rules and policies. Simply put, **existing commercial products require a capacity that might not necessarily exist within the technology transfer organization**.

Of course, capacity could be created and expanded through one-to-one or clustered training on-the-job activities, but the solution would not be practical, as way too expensive and difficult to scale. **The immediate alternative is to use artificial intelligence not as a quick fix, but as an enabler**.

Of course, incumbents in the IP management software industry are using AI, but not in as a disruptive way as it could be when designing from scratch a legacy-free, entirely new AI-powered product. AI currently supports existing functions, makes them easier, but basically leaves the nature of products untouched: a workflow management tool. **Integration and incrementalism wins over disruption**; none would be willing to leave the comfort zone without a vision of an entirely new product. It may sound annoying or provocative, but **the current use of AI in commercial solutions pursue a goal that is contrary to the creation of capacity**, because the dominant business models are premised on the assumption that the average user needs support, but should never become as good as an expert that does not require help.

4. The importance of the human factor. Beyond human-in-the-loop

In tackling the problem with the use of artificial intelligence, it is absolutely necessary to avoid other simplistic assumptions, such as the untold belief that everything can be automated and that professionals will be replaced by an agent or a handful of well-orchestrated agents. **We believe that technology transfer is and will remain a human-centric business**. Management of complexity cannot get rid of humans even before the most advanced AI solutions (paragraph 2 explains why).

Intellectual property management and technology transfers bear an intimate relational dimension that cannot be replaced by machines. The secret recipe is not more technology, but more capacity. AI should become one of the pillars of a renewed concept of capacity, when **individuals retain the leadership and learn-by-doing on a continued journey made of positive interactions**.

5. AI to deal with complexity and how it can support the humans

Previous actions to solve the European Paradox have been in two directions: either support enhancement of capacity through staff exchange, on-the-job training and professional courses, or give access to services. The first way aims at long lasting benefits, but it is like kung-fu: it requires long preparation for long time (at least so far). The second way gives immediate results, but it is not durable and sustainable:

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once the benefits of the action are gone, the situation remains unchanged. Both ways are expensive. The first one implies one-to-one actions which should improve the capacity of everyone, from the largest to the smallest, but doing it is time-consuming and expensive. Investments in this respect are not scalable. The second one implies there are infinite resources everyone can access at any time to 'buy' a service. Moreover, it assumes that the professionals already know what needs to be done and can activate the required services.

We introduce ValorAIze®, **a revolutionary product**, built as a native AI-powered management tool, that leverages the power of generative artificial intelligence coupled with over sixty man/year experience and dedicated reinforced learning with the most up-to-date source of technology transfer. **ValorAIze® takes a completely new direction**, that gets rid of the boundaries and legacies of the past and aims at making individuals super-powerful and putting them in control of efficient actions and solid decision-making.

6. ValorAIze®: how it works, why it is different

ValorAIze® has been created by users for the users with a principled design that builds on the idea that the tool should, first and foremost, improve the capacity of professionals in pursuing technology transfer activities and goals. Humans retain the lead and receive support whenever they need it. The link between capacity building, on-the-job learning, professional enrichment, and artificial intelligence is intimate in ValorAIze®.

The United Nations has defined Capacity Building as the process by which individuals, organisations, institutions and societies develop abilities to perform functions, solve problems and set and achieve objectives[1]. It is a long-term, continuing **change management process**, in which all stakeholders participate. It needs to be addressed at three interrelated levels: individual, institutional and societal. The UN explains that:

- At the **individual level**, capacity building involves establishing the conditions under which human resources are able to embark on a continuous process of learning and adapting to change — building on existing knowledge and skills and enhancing and using them in new directions.
- At the **institutional level**, a similar approach needs to be applied; support should focus on the modernisation of their machinery or methodology, with a priority on systems and processes.

[1] http://unpan1.un.org/intradoc/groups/public/documents/un/unpan022332.pdf

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- Finally, at the **societal level** support is required to enable communication, exchanges and learning from the feedback received from other stakeholders.

In the field of technology transfer, capacity building at the level of individual practitioners will help enhance skills and competences in order to implement technology transfer activities within a given context in a more efficient and effective way. At the institutional level, capacity building activities will help PROs and their Technology Transfer Offices (TTOs) and other actors of the technology transfer ecosystem such as companies or financial investors, improve organizational maturity for technology transfer activities. At the societal level capacity building activities empower policy makers and civil society to create the relevant environmental conditions to support effective technology transfer activities.

ValorAIze® has been created as a teammate with a lot of experience and infinite patience, that transfers on a continued basis on to users its knowledge and problem-solving capabilities, by showing users the ways in which problems can be solved, under specific conditions and given contextual boundaries.

Our agent does not imply any predefined workflow. It rather supports three levels of decision making, discriminating: (i) what is lawful and consistent with internal policies and regulations, (ii) what is possible among several courses of actions and (iii) what is convenient, under the given circumstances. The first set of decisions is conditioned on policies, statutory rules and regulations; the second is constrained by cases and best practices, the third is defined by prompts and interactions.

Compliant by design with general data protection regulation (GDPR), AI Act, and the ISO 56005:2021 rules, ValorAIze® is the best, most seasoned and most patient colleague in your office, the one who never gets sick or tired, is constantly learning, does not go on vacation and works for you 24/7. Whenever you need it, ValorAIze® is there: just ask and il will gently give you an answer and guide you towards the best solution.

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