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PARADOX OF SKILL IN THE TRANSFER OF INNOVATION: HARD WORK OR(AND) LUCK?

Abstract. *This article provides an authors' view on the phenomenon of the paradox of skill in the transfer of technologies (innovations). The impact of Mauboussin's success equation on sports, economy, education and science is analyzed. The authors proposed that the paradox of skill may be used to improve the efficiency of innovation transfer. The algorithm for evaluating the level of readiness of a product for implementation on different scales from the point of view of the concept of the paradox of skill is given. Suppose we have the same skill level as our competitors, and the luck factor is problematic. In that case, we must first provide a deeper analysis of the level of product readiness to improve skills and minimize failure through forecasting and risk assessment. The proposed algorithm allows the maximal evaluate the skill at each stage of the analysis of the product's readiness level according to different classification scales. It reduces the risks of loss of skill according to Mauboussin's approach. In addition, this algorithm determines the possibility of using artificial intelligence and neural networks to increase success in technology transfer.*

Keywords: *paradox of skill, technology transfer, readiness level, (M)RL model.*

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ПАРАДОКС МАЙСТЕРНОСТІ У ПЕРЕДАЧІ ІННОВАЦІЙ: НАПОЛЕГЛИВА ПРАЦЯ ЧИ(І) ВДАЧА?

Анотація. *У статті представлено авторський погляд на феномен парадоксу майстерності при передачі технологій (інновацій). Проаналізовано вплив рівняння успіху Мобуссіна на спорт, економіку, освіту та науку. Автори припускають, що парадокс майстерності може бути використаний для підвищення ефективності трансферу інновацій.*

Наведено алгоритм оцінки рівня готовності продукту до впровадження в різних масштабах з точки зору концепції парадоксу майстерності. Припустимо, що ми маємо такий самий рівень майстерності, як і наші конкуренти, а фактор везіння є проблематичним. У такому випадку ми повинні спочатку провести більш глибокий аналіз рівня готовності продукту, щоб поліпшити навички і мінімізувати невдачі за допомогою прогнозування та оцінки ризиків. Запропонований алгоритм дозволяє максимально оцінити навички на кожному етапі аналізу рівня готовності продукту за різними класифікаційними шкалами. Це зменшує ризики втрати майстерності відповідно до підходу Мобуссіна. Крім того, цей алгоритм визначає можливість використання штучного інтелекту та нейронних мереж для підвищення успішності трансферу технологій.

Ключові слова: *парадокс навичок, трансфер технологій, рівень готовності, модель (M)RL.*

Introduction. Technology transfer is a complex process that depends on the transfer object's life cycle stage and the environment. If the transfer mastery depends on the internal environment (the stage of the product life cycle), then there are risk and luck factors in the external environment. However, it is possible to increase the potential success and reduce the risks by increasing the skill at the stage of product development. The task of assessing internal factors and the level of product readiness for implementation from the point of view of disruptive parameters is an actual task.

Analysis of recent research and publications. The "paradox of skill" is a phenomenon that has garnered attention in various fields, particularly in sports and management, where the relationship between skill level and performance outcomes is examined [1]. This phenomenon also has implications across various fields, including science and academia, where the relationship between skill, performance, and outcomes can be complex and counterintuitive. This paradox suggests that as the skill level of competitors increases, the role of luck becomes more pronounced in determining the outcomes of competitions.

Before discussing technology transfer, it is important to "feel" the paradox of skill in different industries. This explanation will provide additional information about the nature of the paradox and the subtleties of the relationship between skill and luck in various applications.

In sports, the paradox of skill is often articulated through the observation that elite athletes, despite their high levels of skill, experience outcomes significantly influenced by chance. Authors [2] highlight that in highly competitive environments, the best players often exhibit similar skill levels, leading to outcomes predominantly determined by luck rather than skill alone. This assertion is supported by authors [3], who further elaborate that as players' skills converge, the variability in performance outcomes increases, thereby elevating the impact of luck. This phenomenon can be particularly observed in team sports, where unpredictable factors, such as referee decisions or unforeseen events during the game, can sway the performance of teams with similarly skilled players. The implications of the paradox of skill extend beyond sports into organizational contexts, where similar dynamics can be observed. Smith et al. [4] discuss how leaders in organizations face paradoxical challenges that require them to balance competing demands effectively. This balancing act can mirror the paradox of skill, where organizations with highly skilled employees may still face unpredictable market conditions that can undermine their competitive advantages. Gopakumar and Gupta [5] emphasize the need for leaders to develop paradoxical leadership skills to navigate these tensions, suggesting that the ability to manage skill and luck is crucial for organizational success.

Moreover, the paradox of skill has been explored in the context of psychological responses to performance pressures. Day et al. [6] note that heightened focus on specific skills can lead to anxiety and fear of failure, which may ironically hinder performance. This fact aligns with the findings of Peña [7], who investigates how anticipatory anxiety can paradoxically enhance performance through imagery techniques. Such psychological dynamics illustrate that mental states can significantly influence outcomes even in skill-intensive environments, further complicating the relationship between skill and performance. The literature also suggests that the paradox of skill can inform strategies for training and development. Toner and Moran [8] argue that expert performers must develop a heightened awareness of their bodily movements, challenging traditional views that advocate for a more automatic execution of skills. This notion resonates with the idea that understanding the interplay between skill and mental processes can improve performance outcomes, even in unpredictable elements. In conclusion, the paradox of skill presents a complex interplay between skill, luck, and psychological factors across various domains. As organizations and athletes strive for excellence, acknowledging the limitations of skill alone and the role of chance can lead to more effective strategies for performance enhancement and leadership development.

The findings from relevant studies that explore the paradox of skill in the context of scientific research and education are shown below. One of the key areas where the paradox of skill manifests is in the recruitment and retention of talent in academia. Łuczaj [9] discusses the paradoxical nature of academic migration to Poland, where internationally mobile academics often criticize policies promoting internationalization. This criticism highlights a disconnect between the skills and qualifications of these academics and the institutional frameworks that govern their careers. The paradox arises when highly skilled individuals are constrained by policies that do not effectively recognize or leverage their expertise, leading to a misalignment between skill and opportunity. In science education, the paradox of skill is evident in the challenges educators face in fostering effective learning environments. Balducci [10] notes that while there is a growing emphasis on gender equality in education, the widening gender differences in science skills present a paradox. This discrepancy suggests that despite advancements in educational policies, underlying biases and structural issues continue to hinder equitable skill development in science. Such findings underscore the complexity of skill acquisition and the factors that can impede progress, even in environments designed to promote equality. Moreover, translating scientific knowledge into practical applications often encounters paradoxical challenges. Fernández-Esquinas et al. [11] highlight the difficulties in university-industry interactions, particularly in peripheral innovation systems. The authors argue that despite the presence of skilled researchers, translating scientific results into marketable innovations remains problematic. This situation exemplifies the paradox of skill, where high levels of expertise do not necessarily correlate with successful outcomes in applied settings, thus necessitating a reevaluation of how skills are utilized within the innovation ecosystem. The paradox of skill also extends to the teaching and assessment of scientific competencies. Gishen et al. [12] emphasize the importance of soft skills in medical education, such as communication and professionalism. They argue that while these skills are critical for effective practice, they are often undervalued in traditional assessment models, prioritizing complex science knowledge. This misalignment creates a paradox where students may excel in technical skills but struggle in essential interpersonal competencies, ultimately affecting their performance in real-world scenarios. Furthermore, the complexities of scientific writing illustrate the paradox of skill in academia. Merkle [13] points out that while writing is a fundamental skill for scientists, it is often not adequately taught within science education programs. This oversight leads to a paradox where students are expected to produce high-quality scientific writing without the necessary instruction, resulting in a gap between their skills and expectations. In conclusion, the paradox of skill in science and academia reveals a multifaceted interplay between skill development, institutional frameworks, and practical applications. As organizations and educational institutions strive to cultivate talent and foster innovation, recognizing and addressing the paradoxes inherent in skill utilization is crucial for achieving desired outcomes. The literature suggests that a more nuanced understanding of these dynamics can inform strategies for improving educational practices and enhancing the translation of scientific knowledge into impactful applications.

This concept has significant implications for technology transfer, where the expected benefits from transferring advanced technologies may not materialize as anticipated due to the dynamics of skill distribution and competition. Below, the paradox of skill within the context of technology transfer is explored, examining its implications for economic growth, innovation, and competitive advantage.

The aim of the article. This article aims to develop an algorithm for risk assessment and an attempt to "counteract" failure through the prediction and application of artificial intelligence due to the minimization of potential random factors when changing the level of product readiness for implementation.

Results and discussion. The paradox of skill, as articulated in Mauboussin's equation, posits that success in various domains, including technology transfer, is contingent upon both skill and luck. This relationship raises critical questions about the efficacy of technology transfer processes, particularly in how skills are developed and utilized within organizations. While skill is essential, the unpredictable nature of luck can significantly influence outcomes, creating a paradoxical situation where high skill does not always guarantee success.

Technology transfer is fundamentally a process involving the transfer of knowledge, technology, and practices from one entity to another, often requiring a nuanced understanding of the transferring organization's capabilities and the receiving entity's absorptive capacity [14,15]. The effectiveness of technology transfer can be influenced by the skills of the individuals involved and the structural and relational dynamics within technology networks [16,17]. For instance, Agbim emphasizes that successful technology transfer relies on the cooperation of actors within a technology network, which can enhance the performance of the transferred technology [14]. This highlights the importance of individual skills and the collective capabilities of organizations engaged in technology transfer.

However, the paradox of skill becomes evident when considering that even highly skilled individuals or organizations may encounter failures due to unforeseen circumstances or external factors – essentially the role of luck. Artyukhov et al. articulate that success is a function of both skill and luck, suggesting that even with high levels of skill, outcomes can be unpredictable [18]. This duality is echoed in the context of technology transfer, where the ability to absorb and implement new technologies can be hampered by factors outside the control of skilled personnel, such as market conditions or regulatory environments [19].

Moreover, the interplay between skill and luck can manifest in various ways across different contexts. For example, authors [20] discuss how the breadth of experience can lead to legitimacy issues in entrepreneurship, suggesting that while diverse skills are beneficial, they may also create challenges in establishing credibility. This notion can be applied to technology transfer, where organizations with a broad skill set may struggle to gain recognition or support in specific technological domains, thus complicating the transfer process.

Additionally, the "learning curve" concept is pertinent to understanding the paradox of skill in technology transfer. Steenhuis and Bruijn note that the time required to become proficient with transferred technology can vary significantly, influenced by both the skill level of the individuals involved and the inherent uncertainties of the technology itself [21]. This variability underscores organizations' need to cultivate skills and develop strategies that account for the unpredictable nature of technology transfer outcomes.

Assessment of skill during technology transfer can be carried out at various stages of product readiness for implementation. Also, it should be done according to different classification features, which are given below.

1. Technology Readiness Level (TRL) [22] or Manufacturing Readiness Level (MRL-1) [23] depending on the product's features.
2. Innovation Readiness Level (IRL) [24].
3. System Readiness Level (SRL) [25].
4. Intellectual Property Readiness Level (IPRL) [26].
5. Market Readiness Level (MRL-2) [27].
6. Adoption Readiness Level (ARL) [28].

Another option that can be considered as working is to reduce the degree of risk and increase the degree of luck. At first glance, this approach correlates with the last point of the classification of levels of development readiness for implementation, which is given above.

However, before using this option, you should refer to the work [29]:

"Risk and luck are two fundamental concepts that play a crucial role in shaping the outcomes of our actions and decisions. Risk refers to the potential for facing loss or negative consequences due to a particular action. It's about the possibility of an unfavourable outcome when we dare to reach for something of value.

Luck, on the other hand, is the chance occurrence of events in our favour without our intentional action or calculation. It's the unpredictable and uncontrollable force that can change the course of events in unexpected ways…

…Risk and luck are two sides of the same coin, influencing the outcomes of our decisions and actions in ways that are often complex and interwoven. Both concepts are characterized by unpredictability and have significant impacts on decision-making, albeit in different manners. They share the commonality of affecting outcomes beyond our immediate control, making them critical factors in both personal and professional contexts.

Similarities:

• Unpredictability: Both risk and luck introduce a degree of uncertainty into any decision-making process. While we can often anticipate and plan for risk to some extent, its outcomes, much like those of luck, can still be unpredictable.

• Impact on Decision-Making: The potential for risk or the hope of luck can influence our choices. Whether investing in the stock market, pursuing a new career, or even in daily decisions, the way we weigh potential outcomes can be swayed by our perceptions of risk and the possibility of fortuitous events.

Differences:

• Measurability and Management: Risk, unlike luck, can often be measured and managed. Through analysis, we can estimate the likelihood and potential impact of risks, allowing for strategies to mitigate them. Luck, by contrast, is inherently random and beyond our control. We cannot manage its occurrence or influence its outcome through analysis or planning.

• Origin: Risk is typically associated with a specific decision or action taken, meaning it has a traceable origin. Luck does not necessarily follow from our actions and can occur independently of them.

Spotting Bias Towards Risk or Reliance on Luck:

• Individuals more biased towards risk-taking often engage in thorough analysis and calculation before making decisions. They might have contingency plans in place, reflecting a belief in controlling outcomes through strategy.

• Those relying more on luck might make decisions with less deliberation or with an optimistic belief in favourable outcomes, regardless of the odds or existing data…".

Thus, despite the close nature of these two concepts, there is no need to confuse them. A better option is to include ARL in the decision-making matrix to increase the skill's influence.

Suppose we are at the same skill level as our competitors, and the luck factor is problematic to consider. In that case, we must first provide a deeper analysis of the level of product readiness to improve skills and minimize failure through forecasting and risk assessment.

Based on the above-listed classification signs of product readiness for implementation, an algorithm for increasing skill influence is proposed (Figure 1).

Figure 1 presents a structured model for evaluating product readiness parameters and addresses the paradox of skill assessment by integrating various evaluation methodologies and metrics. It bridges readiness assessment with advanced technologies (like AI) and traditional evaluation methods, eventually targeting market applicability.

1. Product readiness parameters.

This is the starting point, representing the set of parameters used to evaluate the readiness of a product or system. It feeds into specific readiness levels, represented by different categories of metrics.

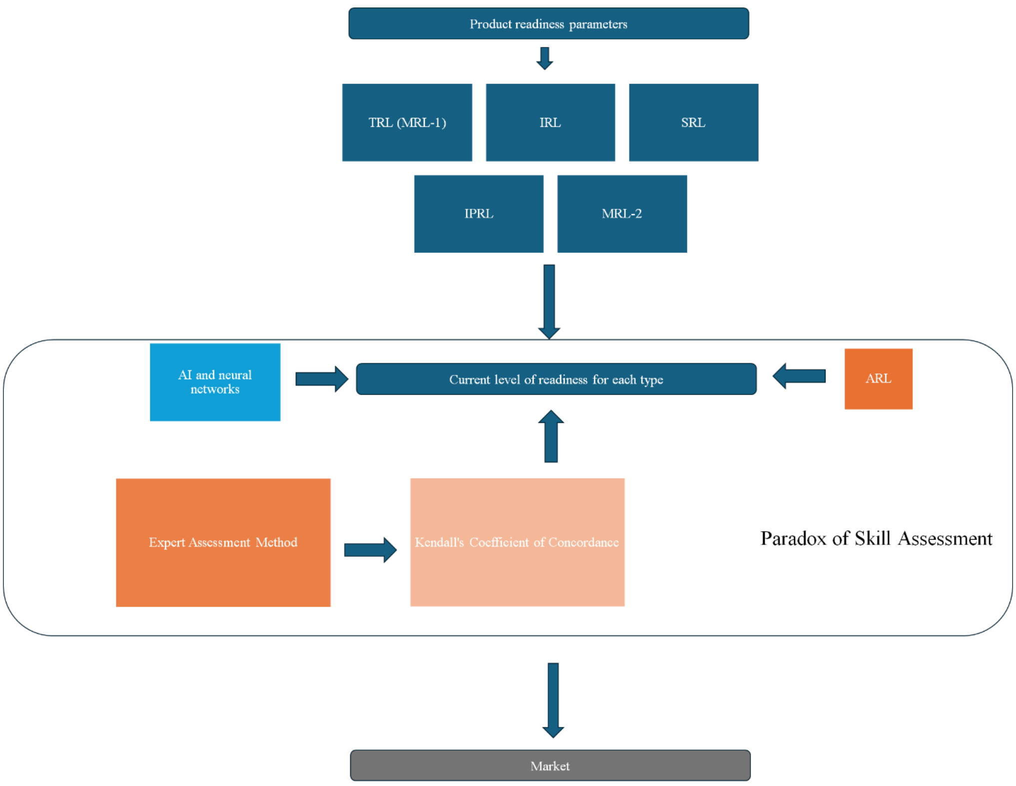

Figure 1. Algorithm for increasing the degree of skill influence in the process of technology transfer

2. Determining current readiness.

The readiness levels feed into a central process labeled the “Current level of readiness for each type”. This stage determines the status of the product across the various readiness categories.

3. Readiness assessment.

• AI and neural networks:

– These advanced computational methods are utilized to analyze and predict the paradox of skill and level of luck (as shown, for example, in the game industry [30]). They provide a data-driven approach to readiness assessment.

• Expert assessment method:

– a traditional evaluation method involving human experts, which focuses on subjective analysis based on expertise;

– this feeds into Kendall's coefficient of concordance, a statistical measure used to evaluate the agreement among experts, ensuring reliability and consensus in readiness evaluation;

– ARL represents a synthesized metric or a final readiness level derived from the other readiness assessments.

4. Feedback Loops.

Readiness evaluation involves iterative feedback, allowing adjustments based on insights gained from both AI-driven analysis and expert consensus. This iterative nature reflects the paradox of skill assessment, as multiple perspectives are reconciled to ensure an accurate readiness level.

5. Market Integration.

The current level of readiness for each type ultimately feeds into the market, implying that readiness assessment is oriented toward market applicability and deployment. This linkage ensures that the assessment process is theoretical and aligned with practical implementation and commercialization needs.

Key concepts of the algorithm.

1. Integration of traditional and advanced methods.

Figure 1 highlights a hybrid approach that combines advanced technologies (AI and neural networks) with traditional expert-based evaluations.

Using Kendall's coefficient of concordance ensures that the subjectivity of expert assessments is balanced with statistical rigor.

2. Iterative and multi-level analysis.

Multiple readiness metrics (TRL, IRL, SRL, IPRL, MRL) provide a comprehensive evaluation framework, ensuring that no aspect of readiness is overlooked.

The feedback loops accommodate continuous improvement, aligning the product with market expectations.

3. Focus on the “paradox of skill assessment”:

This term suggests a tension between subjective expertise and objective technological methods in readiness evaluation.

The model resolves this paradox by integrating both approaches into a coherent framework.

Conclusions and prospects for further research. The paradox of skill in technology transfer highlights the complex interplay between skill and luck, suggesting that while skill development is crucial, organizations must also navigate the uncertainties accompanying technology transfer processes. The literature reveals that successful technology transfer is not solely dependent on the skills of individuals but is also shaped by external factors and the dynamics of technology networks. Thus, a comprehensive understanding of technology transfer must consider skills development and luck's unpredictable nature.

The proposed algorithm allows the evaluation of the skill at each stage of the analysis of the product's readiness level according to different classification scales. It reduces the risks of loss of skill according to Mauboussin's approach. In addition, this algorithm determines the possibility of using artificial intelligence and neural networks to increase the level of success in technology transfer.

The task of further research is to study the possibilities of artificial intelligence and neural networks as tools for increasing the level of success in technology transfer.

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References:

1. Mauboussin, M.J. (2012) Success Equation. Untangling Skill and Luck in Business, Sports, and Investing. Harvard Business Review Press, 2012. – 320 p.

2. Gilbert, D. & Wells, M. (2019). Ludometrics: luck, and how to measure it. J*ournal of Quantitative Analysis in Sports,* 15(3), 225–237. DOI: https://doi.org/10.1515/jqas-2018-0103

3. Csurilla, G., Boros, Z., Fűrész, D., Gyimesi, A., Raab, M., & Sterbenz, T. (2023). How much is winning a matter of luck? a comparison of 3 × 3 and 5v5 basketball. *International Journal of Environmental Research and Public Health*, 20(4), 2911. DOI: https://doi.org/10.3390/ijerph20042911

4. Smith, W., Besharov, M., Wessels, A., & Chertok, M. (2012). A paradoxical leadership model for social entrepreneurs: challenges, leadership skills, and pedagogical tools for managing social and commercial demands. *Academy of Management Learning and Education*, 11(3), 463–478. DOI: https://doi.org/10.5465/amle.2011.0021

5. Gopakumar, K., & Gupta, V. (2023). Combining profit and purpose: paradoxical leadership skills and social–business tensions during the formation and sustenance of a social enterprise. *Nonprofit Management and Leadership*, 34(3), 489–522. DOI: https://doi.org/10.1002/nml.21580

6. Day, M., Thatcher, J., Greenlees, I., & Woods, B. (2006). The causes of and psychological responses to lost move syndrome in national level trampolinists. *Journal of Applied Sport Psychology,* 18(2), 151–166. DOI: https://doi.org/10.1080/10413200600653782

7. Peña, D. (2009). The beneficial effects of anticipating anxiety-related symptoms: an investigation of paradoxical-success imagery in the laboratory. *Journal of Imagery Research in Sport and Physical Activity*, 4(1). DOI: https://doi.org/10.2202/1932-0191.1037

8. Toner, J. and Moran, A. (2015). Enhancing performance proficiency at the expert level: considering the role of 'somaesthetic awareness'. *Psychology of Sport and Exercise,* 16, 110–117. DOI: https://doi.org/10.1016/j.psychsport.2014.07.006

9. Łuczaj, K. (2022). Academic migration to Poland: policies and paradoxes. *Science Technology and Society*, 28(1), 88–107. DOI: https://doi.org/10.1177/09717218221075144

10. Balducci, M. (2023). Linking gender differences with gender equality: a systematic-narrative literature review of basic skills and personality. *Frontiers in Psychology,* 14. DOI: https://doi.org/10.3389/fpsyg.2023.1105234

11. Fernández-Esquinas, M., Pinto, H., Yruela, M., & Pereira, T. (2016). Tracing the flows of knowledge transfer: latent dimensions and determinants of university–industry interactions in peripheral innovation systems. *Technological Forecasting and Social Change*, 113, 266–279. DOI: https://doi.org/10.1016/j.techfore.2015.07.013

12. Gishen, F., Dacre, J., Horn, C., & Peters, D. (2020). Educating future doctors for uncertainty and complexity. *The Clinical Teacher,* 17(6), 726–728. DOI: https://doi.org/10.1111/tct.13165

13. Merkle, B. (2019). Writing science: transforming students' science writing by tapping into writing instruction scholarship and best practices. *Bulletin of the Ecological Society of America,* 100(1). DOI: https://doi.org/10.1002/bes2.1487

14. Agbim, K. (2018). Technology transfer and technology transfer performance: the role of technology network of manufacturing entrepreneurships. *Open Journal of Economics and Commerce,* 1(1), 28–38. DOI: https://doi.org/10.22259/2638-549x.0101004

15. Park, S. & Lee, Y. (2011). Perspectives on technology transfer strategies of Korean companies in point of resource and capability based view. *Journal of Technology Management & Innovation,* 6(1), 161–184. DOI: https://doi.org/10.4067/s0718-27242011000100013

16. Bozeman, B., Rimes, H., & Youtie, J. (2015). The evolving state-of-the-art in technology transfer research: revisiting the contingent effectiveness model. *Research Policy*, 44(1), 34–49. DOI: https://doi.org/10.1016/j.respol.2014.06.008

17. Hong, J. (2016). Framework for cultivating the technology transfer based on the analysis of technology transfer network. DOI: https://doi.org/10.14257/astl.2016.126.08

18. Artyukhov, A., Gavurová, B., Volk, I., Bilan, S., Lyeonov, S., & Mudarri, T. (2023). External assessment of medical education quality: indicative model development considering paradox of skill. *Frontiers in Public Health*, 11. DOI: https://doi.org/10.3389/fpubh.2023.1184861

19. Waroonkun, T. and Stewart, R. (2007). Modeling the international technology transfer process in construction projects: evidence from Thailand. *The Journal of Technology Transfer,* 33(6), 667–687. DOI: https://doi.org/10.1007/s10961-007-9043-1

20. Kacperczyk, A. and Younkin, P. (2017). The paradox of breadth: the tension between experience and legitimacy in the transition to entrepreneurship. *Administrative Science Quarterly*, 62(4), 731–764. DOI: https://doi.org/10.1177/0001839217700352

21. Steenhuis, H. and Bruijn, E. (2010). Technology transfer and learning. T*echnology Analysis and Strategic Management*, 14(1), 57–66. DOI: https://doi.org/10.1080/09537320220125883

22. Artyukhov, A., Bilan, S., Volk, I., Lyeonov, & Serafimova, D. (2023). SPACE-RL Innovation Transfer Model "Science-Business". *European Journal of Interdisciplinary Studies*, 15, 1–15. DOI: http://doi.org/10.24818/ejis.2023.01

23. Manufacturing readiness level. Available at: https://en.wikipedia.org/wiki/Manufacturing_readiness_level

24. Ozcan, S., Stornelli, A. & Simms, C. (2024). A Product Innovation Readiness Level Framework. *IEEE Transactions on Engineering Management*, 71, 9920–9937. DOI: https://doi.org/10.1109/TEM.2023.3312595

25. Yasseri, S., & Bahai, H. (2018). System Readiness Level Estimation of Oil and Gas Production Systems. *International Journal of Coastal, Offshore and Environmental Engineering,* 3(2), 31–44. DOI: https://doi.org/10.29252/ijcoe.2.2.31

26. IPR Readiness Level – IPRL. Available at: https://kthinnovationreadinesslevel.com/wp-content/uploads/sites/9/2021/02/IPR-Readiness-Level_E.pdf

27. Understanding market readiness level: From idea to IP. Available at: https://iuk-business-connect.org.uk/perspectives/understanding-market-readiness-level/

28. Adoption Readiness Levels (ARL) Framework. Available at: https://www.energy.gov/technologytransitions/adoption-readiness-levels-arl-framework

29. Balancing Acts: Exploring Risk and Luck Through Lens of Gender and Decision-Making. Available at: https://dadsinbusiness.co.uk/blog/risk-and-luck/

30. The science of luck: Can luck be measured or predicted in gambling? Available at: https://thesun.ng/the-science-of-luck-can-luck-be-measured-or-predicted-in-gambling/

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