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Leading-edge thecs and artificial intelligence trends 2025. Job offer and personal skills

Tendências de tecnologia de ponta e inteligência artificial 2025. Oferta de trabalho e habilidades pessoais

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Abstract

The paper discussion is about new software technologies and AI trends in 2025. The research seek trends in main International Organization and Consulting firms sites. Advancements in Artificial Intelligence (AI), Quantum Computing, and immersive technologies trends in 2025 are likely the main impacts on labor offer and skills. People must be aware of trends because opportunities varies form different economic activities and regional industry system and institutions labor offer. Some skills offer more opportunities to be employed. Although trends are clear it doesn't make any sense seek general rules to apply a job offer. A deep knowledge every Nation's labor offer and economic situation and competence skills formation define which skill must to be improved and where. What we conclude is the need of understand labor offer trend because of the speed of change and the different skills involved by new technologies trends. We suggest a way to match trends and skills.

Key-words: Innovation. Labor skills. TI and AI.

Resumo

A discussão do artigo é sobre as novas tecnologias de software e tendências de IA em 2025. A pesquisa busca tendências nos principais sites de organizações internacionais e empresas de consultoria. Os avanços na Inteligência Artificial (IA), na Computação Quântica e nas tendências de tecnologias imersivas em 2025 são provavelmente os principais impactos na oferta de trabalho e nas competências. As pessoas devem estar conscientes das tendências porque as oportunidades variam consoante as diferentes actividades económicas e os sistemas industriais regionais e as instituições que oferecem trabalho. Algumas habilidades oferecem mais oportunidades de emprego. Embora as tendências sejam claras não faz sentido

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procurar regras gerais para candidatar uma oferta de emprego. Um conhecimento profundo da oferta de trabalho e da situação económica de cada nação e a formação de competências definem quais as competências que devem ser melhoradas e onde. O que concluímos é a necessidade de compreender a tendência da oferta de trabalho devido à velocidade das mudanças e às diferentes competências envolvidas pelas novas tendências tecnológicas. Sugerimos um metodo comparativo de tendencias e habilidades.

Palavras-chave: Inovação. Habilidades trabalhistas. TI e IA.

1. Introduction

At the end of the XX century, the TI innovation trend dramatically changed all economic sectors of activities. Impact on every sector is, for example, in agriculture solutions called smart farming and precision, industry automation of processes, and online automated applications for services. There is a consensus on industrial changes discussed by the scholars as Industry 4.0 and 5.0 (WEF, 2016, Manyika, Lund, Chui, Bughin, Woetzel Batra, 2016, Kagermann, Lukas, Wahlster, 2013, Mourtzis, Doukas, 2020, Chansysouphanthong, Lee, 2020). Sometimes, these discussions misunderstood the core competencies and skills to work with and the Industrial Revolution as a Historic event (Aveni, 2023).

However, we are facing an intensive use of TI. Thus, there is a general struggle about new technologies. Europe launched in February 2025 a massive investment plan², and there are problems to regulate AI, to control Open AI, and with Chinese startup DeepSeek³. The main change, we guess, is in information uses and organization of processes, or the language of innovation or in intelligence and skills, not in goods or services, so is not about Industry Revolutions. There is not only an economy but a socio-economic impact. (Martin, 2016, Varian, Farrell, Shapiro, 2004).

The paper's research goal is to clarify and summarize 2025 TI trends, using international discussion and reports defined by consulting firms and international organizations, and forecast trend changes in job offers. People not interested in changes must equally take care of the TI innovation impacts on the traditional economy. Traditional processes sometimes do not change immediately, but in the long term, if the innovation saves costs, improves productivity, or both, the labor offer will certainly change.

The paper justified itself because not all economic policies in every Nation follow the global trends thus, there are different absorptions of workers in different markets and different policies. Today workers need to be skilled to meet offers everywhere because the international economic system also changes the location of the activities. Bauman (1998) warned us the economic power is global but the politic is regional. Thus, among other skills, knowing different languages, laws and cultural changes ability are the most important ones.

² https://digital-strategy.ec.europa.eu/en/news/eu-launches-investai-initiative-mobilise-eu200-billion-investment-artificial-intelligence#:~:text=At%20the%20Artificial%20Intelligence%20(AI,20%20billion%20for%20AI%20gigafactories and <u>https://digital-</u> strategy.ec.europa.eu/en/policies/ai-factories

³ https://theconversation.com/openai-says-deepseek-inappropriately-copied-chatgpt-but-its-facing-copyright-claims-too-248863

2. Methodology

The paper adopts a discussion research methodological procedure approach using reports and secondary data collected from Internet databases of international firms and organizations during January and February 2025.

Organizations researched for trends in 2025 (references):

- European Union (2106,2025)
- OECD (2019, 2024a, 2024b, 2024c, 2024d)
- McKinsey (2025)
- Accenture (2025,2022)
- Gartner (2025)
- Cap Gemini (2024)

The research follows these steps:

- the first step of the research was to collect reports,
- the second summarizes trends for 2025 and compares them with skills and
- the third is to explain the impacts of a job offer.

Aa a result section we will develop insights to orient skills to follow the trends.

3. Discussion

The integration of AI with other TI innovations or cutting-edge⁴ technologies is a relevant topic that can potentially lead to business performance impacts. New or cutting-edge technology and artificial intelligence are the fields of information technology focusing on technology management that learns to make decisions independently of human beings and to carry out also independent actions or take other decisions (Dwivedi et al., 2021). That is the next step of interaction between humans and machines not well-identified and obscure even if some scholars present research about a not well-identified Industry 5.0 (Mourtzis and Doukas, 2020).

Al and TI innovation impacts on the economy were included in strategic development by the most powerful economies in the world. In the recent 2024 Davos annual Economic Forum meeting were discussed four key themes among the diverse economic topics about technologies: 1) Achieving Security and Cooperation in a Fractured World, 2) Creating Growth and Jobs for a New Era, 2) Artificial Intelligence as a Driving Force for the Economy and Society, 3) A Long-Term Strategy for Climate, Nature, and Energy. Thus, themes two and three are strong economic 2025 trends involving AI and new technologies.

The landscape of technological innovation is undergoing transformative changes in 2025. The future developments are inevitably driven by advancements in Artificial Intelligence (AI), Quantum Computing, and immersive technologies. That trend is leaded by a small percentage of firms in the whole system. However, all the leading-edge innovations could be spread and embedded in many organizations even if are not changing their whole production processes. So the impact's global.

However a complete Agent AI or interaction human-machine in a corporation organization is very far and is doubtfully the goal of TI and AI use (Aveni 2023). It's more likely to have a world economy and industry with some differentiation between high-tech corporations and traditional organizations.

⁴ Cutting-edge technology or leading-edge represents the latest developments in IT, product, and software development or any new tech such new features, processes, software, or techniques. They can affect multiple industries.

3.1 Generative and New Technologies trends.

Leading international organizations have identified several key TI trends that will shape industries and societies. Reports collectively highlight a global emphasis on advancing AI and quantum technologies, safeguarding economic security, enhancing digital competitiveness, and fostering government innovation to adapt to emerging technological trends. TI 2025 trends in the European Union (EU) ⁵ (EU 2025) and the Organization for Economic Co-operation and Development (OECD) (OECD, 2024b, 2024c, 2024d) highlight several figures in technological innovation.

-Artificial Intelligence (AI) Advancements

European Union: The EU is actively investing in AI research and development. The European Commission committed to increasing EU-funded investment in AI to €1.5 billion for 2018-2020 and €1 billion per year for 2021-2027.

OECD: The OECD emphasizes the need for policies that promote responsible AI innovation, providing data and analysis to support research in this field.

-Digital Economy and Competitiveness

European Union: The EU's share of global tech revenues declined from 22% in 2013 to 18% in 2023, while the U.S. share increased from 30% to 38%. This trend underscores the need for the EU to accelerate innovation and enhance competitive-ness in the digital economy. (European Commission)

OECD: The OECD provides indicators on R&D expenditures and personnel to monitor trends in science and technology, aiding countries in optimizing their innovation policies.

-Government Innovation and Public Services

OECD: The OECD's "Global Trends in Government Innovation 2024" report analyzes nearly 800 case studies from 83 countries, identifying critical trends in government innovation reshaping public services.

The world's most-read TI and AI trends are Gartner's. Gartner and Accenture (Gartner 2025, Accenture 2025) summarize following trends for AI and new technologies 2025: 1) Agentic AI, 2) AI Governance Platforms 2) Disinformation Security 3) New Frontiers in Computing (Post-Quantum Cryptography (PQC), New Business Models in the Technology Sector, Energy-Efficient Computing) 4) Emerging Trends in Human-Computer Interaction (Spatial Computing, Multifunctional Robots, Neurological Enhancement).

Gartner forecasts that by 2028, 33% of enterprise software will incorporate Agentic AI 20% of digital storefront interactions will be conducted by AI agents 15% of day-to-day decisions will be made autonomously, fundamentally reshaping decision-making processes.

Agentic AI is transforming business decision-making, necessitating risk management in data quality, governance & employee integration. That is a significant difference from conventional AI implementations of previous generations of AI systems. These primarily focused on pattern recognition and predictive analytics. With Agentic AI a system can independently initiate actions, make decisions, and execute complex

⁵ <u>https://ec.europa.eu/programmes/erasmus-plus/project-result-content/dce32717-6cfc-4b23-b7af-e4effad68f21/Frame-work_soft_skill_Report.pdf</u>

workflows. New AI systems are projected to actively participate in organizational processes.

Agentic AI enabling it to quickly analyze complex datasets, identify patterns, and take action, enhancing decision-making processes across industries: by autonomously selecting actions for desired outcomes, improving performance over time, reducing manual modeling, and enabling scalable solutions. But the effective implementation necessitates clear guidelines on autonomy, security, and data privacy and governance adequate for the challenges.

Al in Robotic process automation with bots created with clear documentation or understanding of their functions. This decentralized approach can create vulnerabilities in data integrity and security. The reliance on organizational data for decision-making raises additional risks, particularly if the data quality is poor. A good data managing system and security features must be disposable.

Organizations seek to understand the challenge and the potential of more autonomous AI systems to stay competitive. The new autonomous AI has the task of managing associated risks and governance challenges given the rapid advancement of LLMs and autonomous systems. According to Gartner, Agentic AI will eliminate the need to interact with websites and applications.

Other Leading consulting corporations seek several key technology innovation trends to shape the business landscape (Alvarez 2024, Balocco 2024, Cap Gemini, 2024, Giron 2024, Kinetikon, 2024, Martinez 2024, McKinsey, 2024) summarized here:

-AI Governance Platforms: manage the legal, ethical, and operational aspects of AI systems to help organizations create, manage, and enforce policies that ensure responsible AI usage, providing transparency and building trust.

-Post-Quantum Cryptography (PQC): involves developing cryptographic algorithms resistant to quantum decryption, ensuring data security in the quantum era. Transitioning to PQC poses challenges, including the need to rewrite existing applications to accommodate new algorithms.

-Spatial Computing: augmented and virtual reality is set to digitally enhance the physical world, offering immersive experiences across various sectors, including gaming, education, and e-commerce. Despite the potential, challenges remain regarding the cost, usability, and data privacy concerns associated with these technologies.

-Neurological Enhancement: Technologies aimed at improving cognitive abilities by interfacing directly with brain activity are emerging.

-AI-Driven Autonomy: AI systems perform reliably and ethically to gain acceptance from employees and consumers.

-Generative AI and Applied AI: The use of AI to generate TI innovations is marking a significant trend in the technological landscape.

These trends highlighted the transformative potential of AI and related technologies in 2025, emphasizing the importance of ethical considerations, robust governance, and the need for organizations to adapt to rapidly evolving technological landscapes.

3.2 Classified intelligence and Skills, and the Learning framework.

The literature (Kigsly 2015, Luzzatto 2015, Mistsea, Grigas, Mantas 2021) defines Soft Skills as personal attributes enabling someone to interact effectively and harmoniously with others. These skills are not job-specific and are more related to the individual personality and ability to work well with others. Examples of soft skills are the following: communication, or the ability to convey information effectively and efficiently; teamwork, or Working well in a group setting to achieve common goals; adaptability, or being flexible and open to change; problem-solving, or the ability to find solutions to challenges or issues; e emotional Intelligence or understanding and managing your own emotions, as well as recognizing and influencing emotions.

These differ from Hard Skills or the teachable abilities or knowledge sets that are job-specific and often acquired through education, training programs, or on-the-job experience. Examples of hard skills are the following: technical proficiency, data analysis, foreign language proficiency, project management, and certifications.

To complete the discussion on skills needed in future, we need to define intelligence types (Gardner, 1985) and emotional intelligence (Goleman, 1995) that must be oriented to new contexts and developed with a new framework of learning. These archetypes are:

Type of Intelligence:

-Linguistic Intelligence: Sensitivity to spoken and written language, ability to learn languages, and capacity to use language to achieve goals.

-Logical-Mathematical Intelligence: Ability to analyze problems logically, carry out mathematical operations, and investigate issues scientifically.

-Musical Intelligence: Skill in performance, composition, and appreciation of musical patterns.

-Bodily-Kinesthetic Intelligence: Using the whole body or parts of the body to solve problems or create products.

-Spatial Intelligence: Capacity to think in three dimensions, including mental imagery, spatial reasoning, and the ability to visualize with the mind's eye.

-Interpersonal Intelligence: Ability to understand and interact effectively with others.

-Intrapersonal Intelligence: Capacity to understand oneself and use such knowledge to regulate one's life.

-Naturalistic Intelligence: Ability to identify, classify, and manipulate elements of the environment, objects, animals, or plants.

Finally, Emotional intelligence (EI) can be broken down into several core components or types, often categorized into the following five areas:

-Self-Awareness: The ability to recognize and understand your own emotions. Involves self-confidence and an accurate self-assessment.

-Self-Regulation: The ability to manage or redirect disruptive emotions and impulses.

Involves self-control, adaptability, trustworthiness, and conscientiousness.

-Motivation: A passion for work that goes beyond external rewards.

Involves a strong drive to achieve, optimism even in the face of failure, and commitment to personal and organizational goals.

-Empathy: The ability to understand the emotional makeup of other people.

Involves skills in treating people according to their emotional reactions, and understanding the needs and concerns of others. -Social Skills: Proficiency in managing relationships and building networks. That involves skills such as influence, communication, conflict management, leadership, and teamwork.

To meet the job offer the mix of skills and intelligence must be achieved and disposable. Then is possible to examine which skills and intelligences fit better (EU, 2016). There is a connection between the Intelligences, both typical plus the emotional, and Skills. In a recent event, OECD Skill Summit in 2024⁶, Shravan Goli, Coursera COO, said: GenAl will disrupt nearly every occupation. Advances in technical capabilities could have the most impact on activities performed by educators (for the learning framework changes), professionals (technical and regulated jobs like software engineers and medical doctors), and creatives (marketing, influencers, and leaders).

The TI impact on skills is monitored all over the world. According to USAID (2015), the top five soft skills that promise to increase the chances of workforce success for youth include social skills, higher-order thinking skills (including problem-solving, critical thinking, and decision-making), communication, self-control, and positive self-concept. These skills involved both topical and emotional intelligence. But how do people use intelligence to meet skills? Both soft and hard demand from the labor market?

OEDC (2018) defined the Learning Framework needed to achieve preparation or skill competence certifications. The education degree, and certifications, have a vital role to play. The ability to develop competencies is itself something to be learned using a sequenced process of reflection, anticipation, and action. Future-ready students need to exercise in their education and throughout life, and that requires the ability to frame a guiding purpose and identify actions to achieve a goal. In the actual context, everyone is considered a learner, not only students but also teachers, school managers, parents, and communities.

Thus, we need a personalized learning environment that supports and motivates each student, makes connections between different learning experiences and opportunities, and designs their learning projects and processes in collaboration with others. The base becomes to build a solid foundation oriented to the skills needed for the jobs wanted. The learning system must also be able to orient people's attitudes and talents to the most likely skills that match personal potential.

Students who are best prepared for the future and know their limits can have a positive impact on their surroundings because competency implies more than just the acquisition of knowledge and skills. In some way, students will need both broad and specialized knowledge. Students will need to apply their knowledge in unknown and evolving circumstances. For this, they will need broad competencies meta-cognitive skills social and emotional skills, and practical and physical skills too.

OECD (2019) identifies three basic categories of competencies for students to know: 1) creating new value (people should be able to think creatively) 2) reconciling tensions and dilemmas (people need to become adept at handling tensions, dilemmas and trade-offs, for example, balancing equity and freedom, autonomy and community, innovation and continuity, and efficiency and the democratic process, 3) taking responsibility (Equally, creativity and problem- solving require the capacity to consider the future consequences of actions, to evaluate risk and reward, and to accept accountability for the products of work.)

⁶ Skills for the future: building bridges to new opportunities 21-22 February 2024 Brussels, Belgium. https://skillssummitbelgium.be/

From these characteristic it is possible to define a roadmap to success. It means coordinating intelligence, learning, and skills to do the best performance in the new context. For example, a manager in the old industrial context needs to have Linguistic Intelligence, Logical-Mathematical Intelligence, Spatial Intelligence, and Interpersonal Intelligence. And Self-Awareness, Self-Regulation, Motivation, Empathy, Social Skills. The learning base was essentially broad, but the manager mastered a technical ability or competence or raised from the roof scaling the positions of the corporate hierarchy.

On the other side, the context with growing TI impacts a manager must become a leader and must have linguistic intelligence, logical-mathematical, spatial intelligence, self-awareness, motivation, and social skills. AI and other TI innovations could support the project's leader. A leader doesn't need any more technical skills because machines or other professionals hired have them. Even emotional is less important because efficiency and efficacy have become common evaluation and accepted methods, and AI could mitigate emotional and subjective decisions.

4. Results

We divide this section between a summary of trends and an explication of how to identify what skills and intelligence is useful.

Summary Technological Innovations to Watch in 2025. From the identified above trends we can guess the most important are:

Agentic Al

The rise of Agentic Al—Artificial Intelligence. These systems act as virtual agents, performing tasks, making decisions, and learning independently. The adoption of Agentic AI can revolutionize various sectors by enhancing efficiency, accuracy, and productivity. However, the implementation of such AI requires robust governance frameworks to ensure ethical alignment and mitigate risks associated with autonomous decision-making.

Al Governance Platforms

As AI becomes more integrated into daily business operations, the need for comprehensive AI governance platforms is growing. These platforms manage the ethical, legal, and operational aspects of AI systems, ensuring responsible use. They provide organizations with tools to create, monitor, and enforce policies that uphold transparency and trust. In 2025, the adoption of AI governance platforms will be crucial for organizations aiming to leverage AI responsibly while maintaining public confidence.

Post-Quantum Cryptography (PQC)

PQC involves creating cryptographic algorithms resistant to quantum decryption, ensuring data security in the quantum era. Transitioning to PQC will be a priority for organizations, as they need to protect sensitive information against future quantum threats. The challenge lies in rewriting existing applications to accommodate new cryptographic standards, a task that will require significant investment and expertise.

Spatial Computing

By overlaying digital information onto the physical world, these technologies offer immersive experiences in gaming, education, healthcare, and e-commerce. The

potential applications of Spatial Computing are vast, but challenges such as cost, usability, and data privacy need to be addressed to realize its full potential.

Neurological Enhancement

Advancements in Neurological Enhancement technologies are paving the way for improved cognitive abilities through direct brain-computer interfaces. These technologies hold promise for personalized education, enhanced safety in high-risk environments, and extended work capabilities for aging populations. However, ethical concerns and security challenges are critical issues that must be navigated carefully to ensure the responsible development and deployment of these innovations.

Al-Driven Autonomy

Al-Driven Autonomy is expected to revolutionize industries by enabling systems that continuously learn and act autonomously. This trend emphasizes the need for a refined trust relationship, as businesses must ensure their Al systems perform reliably and ethically. From autonomous vehicles to self-managing supply chains, the scope of Al-driven autonomy is vast, promising increased efficiency and reduced human intervention.

Generative AI and Applied AI

Generative AI and Applied AI enable the creation of new products, enhance customer service, and improve operational efficiencies. By leveraging AI's capabilities to generate content, design solutions, and optimize processes, businesses can achieve unprecedented levels of creativity and productivity.

Skills and TI job offer framework

The old job market based itself on academics and certification (hard skills). Today's work experience. We guess there are three main situations on the job market offer caused by innovation:

Job offer competition in the old economy was on hard skills (formed with years of study and practice) and defined working time during the week. Today soft skills are most useful. They can be reverted or elevated in a short time, even using online services. The working time changed from a fixed during the week to flexible H24.

Productivity and efficiency The labor factor itself is not anymore the most efficient one can achieve, but the quality, effectiveness, and cost-saving effect on the final product and processes of the worker. The increasing difference between industrial efficiency and project efficiency depends on the nature of the new economy is immaterial (information, sharing, etc.). Thus, more than the quantity of goods or services and the quality perceived is the corporation's new goal.

Quality of labor factors are soft skills and primarily the ability to interact with different people and cultures and achieve the project goal. Entrepreneurial skills are also useful. Technical competence (even in software) will be hired or shared. The organization's business core has shifted to strategy and management of immaterial capital (brand, intellectual property, software, risk, security management, etc.). Technicians will likely act as consultants in multi-service firms that offer shared services. Definitively, to have only hard skills for the market became more risky because of the technology associated with competence. The soft skills are flexible and

have a creative background. They are necessary to develop new businesses and create value.

Connections between Private and Public: Triple Helix. According to Etzkowitz and Leydesdorff (1995)⁷, the collaborative efforts of industry leaders, policymakers, and technologists or a triple Helix (Cowan, Robin, and Dominique Foray 1997, Cowan, Robin, Paul A. David, and Dominique Foray. 2000), will be crucial in shaping a sustainable and inclusive technological future and purpose solutions. However, every job will need personal evaluation and competence.

In Table 1, we resume key factors to navigate between trends, intelligence, and skills. A framework in mind is a powerful weapon to understand which path to consider when seeking new jobs and skills for the future.

TRENDS	SOFT-SKILLS	INTELLIGENCE (types and emotional)
1) Agentic Al	communication	Linguistic Intelligence
2) Al Governance Platforms	teamwork	Logical-Mathematical Intelligence
3) Disinformation Security	adaptability	Musical Intelligence
4) New Frontiers in Computing	problem-solving	Bodily-Kinesthetic Intelligence
5) Human-Computer Interaction	emotional Intelligence	Spatial Intelligence
	HARD SKILLS	Interpersonal Intelligence
	teachable abilities	Intrapersonal Intelligence
	training programs	Naturalistic Intelligence
		Self-Awareness
		Self-Regulation
		Motivation
		Empathy
		Social Skills

Table 1 - Skills Cross-over

Source: The author: Alessandro Aveni . alessandro@unb.br

As an example, we need to understand the connections between a trend (between those indicated for 2025, skills (soft and hard), and intelligence (types and emotional). Here are the links, but everyone could accept the conclusion or try the more sophisticated cross-over like the anthropocentric method. (Geslin 2017)⁸.

We start asking what skills are better to be prepared to work in the Agenti Al trend. We must have proven problem-solving skills and have followed training Al programs. But we need logical math, spatial intelligence (dominant mental imagery, spatial reasoning, and the ability to visualize with the mind's eye), self-awareness emotional to dominate the problem-solving; plus linguistic intelligence (English and

⁷ https://www.leydesdorff.net/arist09/arist09.pdf

⁸ anthropotechnic is a set of rules that we make to tame, teach, and train ourselves. See <u>https://hal.science/tel-04402440v1/file/These Antoine Henry AMU.pdf</u>

software slang), and emotional motivation to follow training. Thus, only training and logical-math intelligence or an engineering or information technology. **Table 2 - Example**



Source: The author: Alessandro Aveni . alessandro@unb.br

Agentic AI—Artificial Intelligence acts as virtual agents independently. Such AI implementation requires robust governance to ensure ethical alignment and mitigate risks associated with autonomous decision-making. A candidate must understand the AI programs deeply, have the skills and expertise needed to build and use generative AI, know what generative AI is and what its limitations are, know how to keep generative AI tools secure, and understand how to manage the full generative AI lifecycle. In any AI generative case, you understand and define data for decisions, can document all the cycles and programs, and also results. You can verify and control the agent.

The experience of problem-solving is mandatory. Thus, it is a skill you must prove working with teams and in advanced projects. That is logical, math, and spatial intelligence, but complemented by self-awareness, linguistic intelligence, and motivation to follow training. Problem-solving also means a strong capacity to solve conflicts and prepare for law and ethical concerns.

Al use must be lawful, and respect data privacy. Al use risks should be studied before and mitigated; there is a culture of responsible use with all project participants and stakeholders, and all participants should also agree that they will not use AI, The social impact of AI use should be understood. Must be proven AI is correct or ethical and not for purposes other than considered unethical.

No standard school has these curricula studies already because it seems a middle term between software engineer with excellence in maths plus law, economic and social sound preparation. However, a philosophy and ethical understanding to project ethical conflict solutions are necessary. Then, a learning framework must be customized to reach excellence in that trend application and must be completed with the intelligence seen above.

A sub-optimum result is to be included in a project team with people having part of this overall group of skills, but to be someone with hard skills, and not the leader or the project owner. However, to work with the other team member an entrepreneurship skill must be present to understand how to interact and to add value to be considered a valuable piece of the team.

The exercise starts from left to right (from trends) and could be done starting from the intelligence or skills (right to the left) someone thinks he has. But it is more complicated to figure starting from intelligence to reach trends because intelligence could be useful for everything else's job and the main match is between skills and trends. The intelligence, excluding special cases, limited the level of excellence, capacity, and ability, or someone could be more intelligent and more effective or quicker to match skills and be able to work in the trend.

A final proof that intelligence, skills, and trends meet requirements for everyone everywhere is the consideration that the leading tech corporations in the USA are today directed by American-Indian managers: Sundar Pichai of Google and Satya Nadella of Microsoft, who are leading this revolution. Parag Agarwal, CEO of Twitter, Shantanu Narayen of Adobe and Jayshree Ullal of Arista Networks, Arvind Krishna of IBM, Anjali Sud of Vimeo, and Aneel Bhusri of Workday, amongst others. They were chosen as CEOs for the value they bring to the table.

Why they are African Indians is an interesting question and could remain in the development of basic coding that Silicon Valley performed hiring Indian engineers because of the lack of American workers' hard skills. Years before Indian engineers increased their skills, studying and working in the USA and raising their job level to the top.

In the end, it is easy to conclude that only motivation or guesswork, especially based on fake information, does not help to understand how to define a career. Information technology is also a job free from indications and political influence, needs talent and application. It is also easy to affirm not everyone, even expanding to millions of applicants worldwide, will have the talent needed, but this is a consequence of innovation. People who can't work with new technologies must use intelligence, skills, and talent to work in other fields.

That line of investigation is a theme that could be useful for field research looking for statistics and imposing a null hypothesis. The comparative discussion in the present article could be a base for further works and research.

5. Concluding Remarks

The technological innovations in 2025 will reshape the economy deeply and redefine job offers and the labor market. International labor market offers will change dramatically and fast. Organizations and societies must navigate these advancements thoughtfully, ensuring ethics, governance, and adaptability to harness the full potential of these innovations. People seeking jobs must follow the market. Today, in the European Union, there are fewer safeguards than before. The welfare mechanisms can't resist the trends and need to evolve.

However, a bunch of high-tech corporations dominate the TI innovation market because they own the infrastructure and dominate the network of the information technology market that needs investments and a network with millions of customers. They belong to a few nations and will dominate the job offer market for the next years. On the other side, the education and the learning frameworks exist in whatever Nation. They are incrementing skilled people that demand jobs. People from different places of birth could work in this market with adequate skills and intelligence use. Today skills, and in particular soft skills will be more and more required to work with these corporations and their products and tools in some countries. Technical or hard skills will be also required but not as a core labor factor for top corporations. The core jobs will be able to add or create value for customers, not in managing processes or in technical processes. Thus, hard skills, especially the ones included into the 2025 trends, will be rewarded less than the others. The automation will reduce the hard skills offer.

People with no skills, or lower level skills, or who are losing competencies definitely will be shifted to lower economic circuit jobs and will lose their jobs. That means a minimal wage salary and worse work conditions, not only in developing countries. Being an Entrepreneur will be an alternative to the job market, but here, intelligence and skills are different compared to a corporation's worker.

References.

Accenture **Technology Vision 2025**. 2025 https://www.accenture.com/content/dam/accenture/final/accenture-com/document-3/Accenture-Tech-Vision-2025.pdf#zoom=40

Accenture. **Driving semiconductor growth through as-a-service models**. 2022 https://www.accenture.com/content/dam/accenture/final/a-com-migration/r3-3/pdf/pdf-131/accenture-semiconductor-growth-through-as-a-service.pdf

Agency for International Development (USAID) Child Trends. Lippman Laura H., Ryberg Renee, Carney Rachel, Moore Kristin A. Workforce connections: key "soft skills" that foster youth workforce success. Toward a consensus across fields 50. **Child Trends Publication** #2015--24. https://cms.childtrends.org/wpcontent/uploads/2015/06/2015-24WFCSoftSkills.pdf

Alvarez, G. Gartner **Top 10 Strategic Technology Trends for 2025**. 2024. Gartner. https://www.gartner.com/en/articles/top-technology-trends-2025

Aveni A. Industry 5.0 and industry 4.0 comparative definitions. **Revista Processus de Estudos de Gestão, jurídicos e Financeiros**, Vol. 14, n.46, jan.-jul., 2023 0.5281/zenodo.8045181., v.14, p.1 - 14, 2023. https://core.ac.uk/download/568037544.pdf

Balocco, V. (2024). CIO, **le 10 tendenze tecnologiche chiave di Gartner per il 2025**. ZeroUno. https://doi.org/10/24113234/tendenze-tecnologiche-2025-pp-scaled

Bauman Z.**The Human Consequences**, Cambridge-Oxford, 1998, trad. it. Dentro la globalizzazione. Le conseguenze sulle persone, Roma-Bari, 1999

CAP GEMINI. **TechnoVision: Top 5 Tech Trends to Watch in 2025.** GlobeNewswire News Room; Capgemini SE. 2024. https://www.globenewswire.com/newsrelease/2024/11/27/2987972/0/en/TechnoVision-Top-5-Tech-Trends-to-Watch-in-2025.html Chansysouphanthong, P., & Lee, J. (2020). Industry 5.0: A Human-Centered Paradigm for the Manufacturing Industry. Journal of Manufacturing Science and Engineering, 142(4), 040802.

Cowan, Robin, and Dominique Foray. "The economics of codification and the diffusion of knowledge." **Industrial and corporate change** 6.3 (1997): 595-622. 1997.

Cowan, Robin, Paul A. David, and Dominique Foray. "The explicit economics of knowledge codification and tacitness." **Industrial and corporate change** 9.2.: 211-253. 2000.

Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., et al. Artificial Intelligence (AI): Multidisci- plinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. **International Journal of Information Management**, 57, 1–47. 2021. https://doi.org/10.1016/j.ijin fomgt.2019.08.002

European Commission: Directorate-General for Research and Innovation, **Towards a European policy for technology infrastructures – Building bridges to competitiveness**, Publications Office of the European Union, 2025, https://data.europa.eu/doi/10.2777/0876395

European Commission A New Skill Agenda fro Europe. **Working together to strengthen human capital, employability and competitiveness.** COM(2016) 381 final. 2016

Etzkowitz, H., & Leydesdorff, L. (1995). The Triple Helix---University-Industry-Government Relations: A Laboratory for Knowledge-Based Economic Development. **EASST Review** 14, 14-19.

Gardner, H. Frames of Mind: A Theory of Multiple Intelligences. New York: Basic Books. 1983

Gartner **Top 10 Strategic Technology Trends for 2025**. 2025. https://www.gartner.com/doc/reprints?id=1-2HFOU8F6&ct=240430&st=sb

Geslin, Philippe. Inside Anthropotechnology: User and Culture Centered Experience. Hoboken, NJ: **John Wiley & Sons**. pp. ix. 2017 ISBN 9781786301758. Eca.europaSpecial report 08/2024

Giron, F.. Predictions 2025: Tech Leaders Chase High Performance. **Forrester**. 2024. https://www.forrester.com/blogs/predictions-2025-tech-leadership/

Goleman, D. Emotional intelligence. Bantam Books, Inc. 1995.

Kagermann, H., Lukas, W. D., & Wahlster, W. (Eds.). Industrie 4.0: Mit dem Internet der Dinge auf dem Weg zur 4. industriellen Revolution. **Springer**. 2013.

www.periodicoscapes.gov.br

Kingsley B., (November 2015). **Self Awareness and Emotional Intelligence. Speech at "Soft Skills and their role inemployability** – New perspectives in teaching, assessment and certification", workshop in Bertinoro, FC, Italy. 2015.

Kinetikon, https://www.kinetikon.com/ict-italia-situazione-attuale-trend-2025/, S K. (2024, September 2). Che cosa è "Agentic"? Comprendere il nucleo dell'autonomia nell'intelligenza artificiale. **InfoSecured.ai**. https://www.infosecured.ai/it/i/ai-definitions/what-is-agentic-ai/. 2024

Luzzatto G., (November 2015). **Final round table speech at "Soft Skills and their role in employability** – New perspectives in teaching, assessment and certification", workshop in Bertinoro, FC, Italy. 2015.

Mitsea, Eleni; Drigas, Athanasios; Mantas, Panagiotis. Soft Skills & Metacognition as Inclusion Amplifiers in the 21 st Century. International Journal of Online & Biomedical Engineering, 17.4. 2021

Manyika, J., Lund, S., Chui, M., Bughin, J., Woetzel, J., Batra, P., & Ko, R. Digital Europe: Realizing the continent's potential. **McKinsey Global Institute**. 2016.

Martinez, M.: **Top 5 high-tech trends for 2025: Embracing growth and transformation. The Future of Commerce**. 2024. https://www.the-future-of-commerce.com/2024/11/13/high-tech-trends-2025/

Mckinsey. **A look at the technology** https://www.accenture.com/itit/insights/technology/technology-trends-2025.

Mourtzis, D., & Doukas, M. Industry 5.0: The Human Factor and the Future of Manufacturing. **Engineering Management Journal**, 32(3), 100-113. 2020.

OECD Skills **Summit 2024 Joint Summary. Skills for the future: Building bridges to new opportunities.** 21-22 February 2024a, Brussels, Belgium. https://skillssummitbelgium.be/

OECD, **Agenda for Transformative Science, Technology and Innovation Policies,** OECD Science, Technology and Industry Policy Papers, OECD Publishing, Paris, 2024b. https://doi.org/10.1787/ba2aaf7b-en.

OECD, Global Trends in Government Innovation 2024: Fostering Human-Centred Public Services, OECD Public Governance Reviews, OECD Publishing, Paris, 2024c https://doi.org/10.1787/c1bc19c3-en.

OECD, Agenda for Transformative Science, Technology and Innovation Policies, OECD Science, Technology and Industry Policy Papers, OECD Publishing, Paris, 2024d. https://doi.org/10.1787/ba2aaf7b-en.

OECD. An OECD Learning Framework 2030. The Future of Education and Labor, 2019, 23-35. 2019.

https://www.oecd.org/content/dam/oecd/en/publications/reports/2018/06/the-future-of-education-and-skills_5424dd26/54ac7020-en.pdf

Varian HR, Farrell J, Shapiro C. Bibliography. In: The Economics of Information Technology: An Introduction. Raffaele Mattioli Lectures. **Cambridge University Press**; 2004:87-96. 2004.

World Economic Forum WEF. **Schwab, K. The Fourth Industrial Revolution.** World Economic Forum. 2016. https://www.weforum.org/about/the-fourth-industrial-revolution-by-klaus-schwab/