“Humans versus robots” — Glauco Bigini emphasises the transition from competition to collaboration

Glauco Bigini is the chief of technology at e-Novia in Milan. Established in 2015, e-Novia is an investment firm that develops innovative high-tech products such as robotics, artificial intelligence, biomedicine, and mobility solutions in firms at early, intermediate, and advanced stages. Glauco Bigini is a long-term innovator, having worked in the technology strategy and development business for over 20 years. He is among the co-founders of e-Novia and leads the team behind the technology development of many of the e-Novia-backed deep-tech companies.

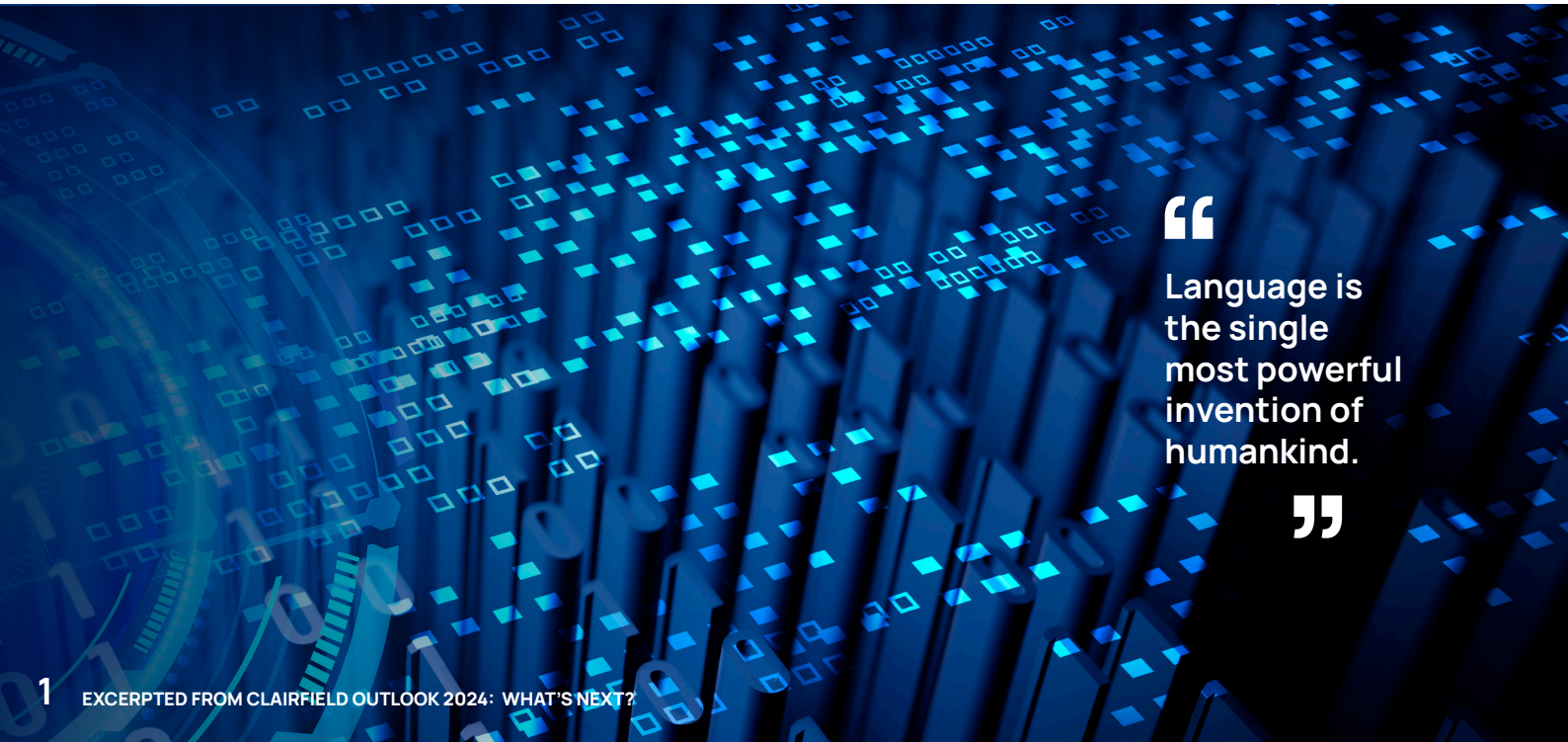
Since 2015, e-Novia has been promoting and growing innovative companies in the areas of robotics, artificial intelligence, and mobility, building upon intellectual properties developed together with research institutes and international corporates. Being at the forefront of innovation, what has surprised you most about the development of artificial intelligence?

The speed at which generative AI techniques for text and image production have become accurate and viable for mass production is certainly surprising. AI is the hottest topic of the year, and everyone is talking about it as if it was invented just yesterday. However, AI technologies have been around and widely used for years.

The theoretical basis for many AI technologies today, such as both supervised and unsupervised machine learning, deep learning, and knowledge graphs, was laid down during the nineties and became functional products at the beginning of the 21st century. In our private lives and across all industry sectors, we use AI applications many times a day, a fact that many of us are unaware of. AI techniques are integral to a vast number of applications: image recognition/tagging in social networks, document recognition, driving assistance in cars, computer vision technologies used for quality inspection or production control, fraud detection, and hyper-fast trading algorithms in the financial sectors, among others. AI technologies have subtly enhanced our capacity to interact with and manage our surroundings.

What is special about the AI tools that have entered the public consciousness lately?

The intelligence puzzle lacked a crucial piece: language. Language is the single most powerful invention of humankind. Computers, so far, lacked this vital feature. Now machine-learning algorithms and super-fast computer processors have entered the scene and revolutionised language generation, shown by Google researchers who demonstrated the reversal of recognition-focused algorithms to generate language. These algorithms go under the term of Generative AI (GenAI) and specifically, Large Language Models (LLM). In reality, the time it took for these techniques to ramp up from



> **With GenAI, we have completed the puzzle: we now have automation tools for every task.**

research studies to effective market readiness has been nothing short of flabbergasting.

What industry opportunities do you anticipate?

With GenAI, we have completed a puzzle: we now have automation tools for every task. We have automation for our sensing, motion, and vision, and now for text production. Combining these technologies gives us endless opportunities to solve problems and improve productivity. We must change our mindsets to realise that every part of a company can be made intelligent and can interact with us.

Let's look at two use cases related to process automation and machine interaction to understand better how far we can go. Workforce turnover is a major issue nowadays; to solve this major issue, we developed a solution to train an LLM with company technical documentation (product specs, procedures, operations protocols), which also provides a live connection with the real-time plant data to provide employees of any department with a conversational interface to ask for information in natural language as would happen with a real company expert. It is like being able to talk with the company as a human. Another issue we tackled using AI is the need to train and control manual workers in factories. Using AI-driven computer vision and visual/tactile feedback, we have developed (and delivered to many factories around the world) a system that oversees manual activities in plants, checks execution times, follows human movements to predict errors and provides help and suggestions to the operator, substantially improving the process output speed and quality.

What industry challenges do you anticipate?

Integrating new technology involves more than technical implementation — it encompasses a cultural shift within the company, commitment, and operational adaptation. At e-Novia, we call this concept "sustainable intelligence," which relates to the company's ability to accept and address technology from technical, economic, governance, and business structure points of view. The challenge lies in not just creating sophisticated technologies but in ensuring their sustained viability within the company's framework. Companies must move towards sustainable intelligence, ensuring technology integration isn't just a momentary trend but a long-term part of their operational fabric.

As data and analytics become increasingly critical, how is your business leveraging data-driven insights to inform decision-making and drive growth?

Data is the basis for every type of decision. It is the single most important asset every company or institution must create. Without data, no data analytics or AI is possible. We have worked on several data intelligence projects, from smart cities to vehicle fleet management and AI-driven sensing technologies, and the issue has always been getting enough data to analyse.

Many companies still need to learn or discover what data they need to collect from their plants, clients, and products. Initially, these investments might be seen as expenditures. However, the genuine expense of neglecting a comprehensive digitalisation of company assets will significantly escalate. The subsequent repercussions in recovering from this delay will prove to put companies at a great competitive disadvantage compared to competitors that have embraced digitalisation. Digitalisation means creating a digital replica of the company within the digital space, where data describe the company, its processes, and its products.

Developments in AI are moving at lightning speed. What trends do you foresee in AI over the next decade?

The next evolution of AI technologies will be a collaboration of how humans and artificial intelligence agents can work together to reach mutual goals, and the ongoing topic of internet security.

Regarding collaboration, we must make the algorithms talk to each other to improve their training and capability to react. Inter-AI communication within a complex system like a company or industry can transform into one large intelligence with self-healing or self-adjusting capabilities. Communication technology will act like the nervous system, sensing, automation, and robotics will be the motion and sensory systems, and the connected AI algorithms will be the brain. Some of the technologies we are developing for the mobility sector and smart cities already mix AI, communication, and physical technologies to make a system genuinely dynamic and programmable.

> **There is no end to human work; it is just changing.**

Regarding security, as we integrate more data in AI training, these algorithms become immense mines of company knowledge and data. The more we rely on machine interaction, the more possibilities there are for attackers to extort or steal valuable data. Along with communication, information security is set to become the major trend in AI.

How is e-Novia positioning itself to capitalise on these trends?

We are a technology strategy company; technology is our core business. We are constantly looking for new technologies to develop for our products and our clients. We are working right now on the interconnections between all these pieces of technology. There is no distinction between AI, robotics, and mobility, as all together they form the various parts of one intelligence: the brain, eyes, arms, and mouth of an intelligent solution. We see the possibility of seamlessly connecting products, customers, and production to build intelligent systems that adapt to their user, context, and situation to optimise their value.

What's next for e-Novia, your industry, and you professionally?

We live in the age of AI, which means we must deal with both the good and bad that these technologies bring. I frequently read articles stating that AI will be the death of certain professions but there is no end to human work, it is just changing. If you previously used your time writing emails or reports, you will likely spend your future time figuring out what kind of reports and emails to write — and less time actually writing them. The evolution of AI teaches us that there is always a better way to do something; this, as I like to call it, is design-thinking or engineering-thinking.

What's next for us at e-Novia and for me professionally is to put our creativity to work and reimagine a world where products, companies, and industrial systems are no longer perceived as disconnected networks of sub-components but as fully integrated thinking machines. ■

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