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Technological advances keep emerging and evolving. This happens every day and it is far to only be trends, since they have an impact on the way we work, learn, and interact. We call them emerging technologies and are currently taking digital transformation to the next level.

Years 2023-2024 are particularly representative in this initial acceleration. Technological innovations from last year and a half have stirred up our common practice—and will keep doing so in the future. To become familiar with them, it is key to begin at home.

This second bulletin of the Technological Observatory includes interviews to five professors of Universidad de Lima, who identify the most significant emerging technologies within their areas of expertise during the aforementioned period sharing their knowledge and different experiences. We have conducted interviews in the Faculty of Business and Economics and the Graduate School. Invited professors are familiar with the potential and risks of these new technologies. They will talk about their favorite tools—those they use and encourage students to do so too but with caution.

FACULTY OF BUSINESS AND ECONOMICS



Alfredo San Martín

Professor since 2015, with proven track record at the University. He has taught courses in both Faculty of Communication and Faculty of Business and Economics. Furthermore, he serves as coordinator for all courses of the Business Innovation Department.

REVOLUTION OF CHATGPT IN THE BUSINESS WORLD

During 2023-2024, applications such as ChatGPT have had an impact on different professional areas. These AI tools, together with others such as Gemini (Google) and Claude (Anthropic), have simplified complex tasks and access to technology. However, the rapid technological change poses ethical and privacy challenges that demand attention and balance for both security and data protection. For the new professionals, curiosity, adaptability, and willingness to learn and experience with these emerging technologies are paramount to keep updated and be competitive in an ever-changing work environment.

TECHNOLOGIES FOR THE FIELD AND DESCRIPTION

Since its launch, ChatGPT has stirred up the technological world. It has transformed our perception and application of the AI. This breakthrough has triggered a fierce competition between companies for developing new and thrilling applications based on technology—similarly to the Internet's arrival.



\$OpenA1

⁻oto: Diego Thomazini / Shutterstock.com

language processing (NLP) developed by OpenAI. It understands and generates texts autonomously through AI. This technology allows accurate and creative responses, as well as assistance in different contexts, so a wide array of data is harnessed to improve—constantly—its communication skills.

ChatGPT

From interacting with virtual assistants to generating contents for social media, it transforms the way we relate to technology permanently (Morales-Chan, 2023). According to an article of Harvard Business Review (2024), users employ this technology for practical applications such as content creation and editing, technical assistance and problem-solving, personal and professional support, learning, hobbies and education, as well as for research, analysis, and decision-making.

FUNCTIONS







ADVANTAGES

- Ability to understand the context and user preferences. Generation of highly-customized content tailored to the individual needs of each user.
- Automation of repetitive tasks, simplification of processes and significant improvement of productivity for both companies and users.
- Management of a large number of simultaneous interactions and effective scalability, which is key for companies handling plenty of queries or users (Cortés-Osorio, 2023).
- Response time reduction and increased customer satisfaction (Huang et al., 2020).

- Inaccurate or biased responses in cases where a more detailed analysis or specific context is needed.
- Lack of emotional intelligence to understand and respond appropriately to subtle nuances in communication. This can affect user experience negatively.
- Vulnerability to cyberattacks and spreading misinformation if not managed properly (Morcela, 2023).
- Contribution to spreading misinformation and tampering public opinions (Bender et al., 2021).

DISADVANTAGES





Professor San Martín said that society is under transformation, especially in the field of artificial intelligence. Although it is common to associate AI with ChatGPT, there are in fact many fields under development, which move forward towards a common goal. ChatGPT stands out for its ability to understand and respond to human language, which is quite promising in terms of HMI. On the other hand, robotics is constantly evolving towards creating humanoid robots (e.g.: BMW, Tesla and Sony). Generally speaking, we are at critical moment, when all areas are ready to embrace these new technologies.



Pedro Ayala

PhD candidate in market intelligence from Universidad Nacional Mayor de San Marcos. He holds a Master's Degree in Business Administration from ESAN Graduate School of Business. Industrial Engineer by training from Universidad de Lima. Professor of the International Business Undergraduate Program, where he teaches International Market Intelligence. Since 2010, he has been working as professor, teaching industrial engineering, administration, and international business.

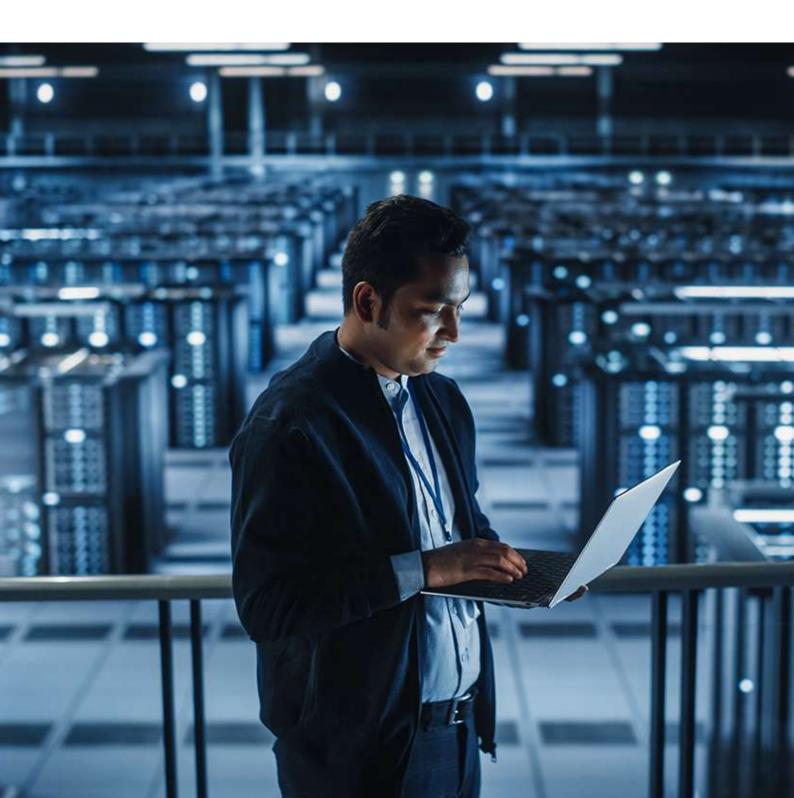
REVOLUTION IN TEACHING MARKET INTELLIGENCE WITH AI AND POWER BI

During 2023-2024, AI has been a key emerging technology that has influenced significantly different professional areas. The Market Intelligence course uses AI to a great extent in order to process large volumes of data and generate key indicators to identify market opportunities. Thanks to the incorporation of tools such as Power BI—a Microsoft platform improved with Copilot since last November—users can quickly suggest formulas and process data more efficiently. This is complemented by OpenAl, which is another important platform in this field. In the courses, students learn how to handle multiple databases, developing skills that will be later apply in real business environments to optimize product exports and minimize risks. Ethics and privacy are vital when handling third-party data, since we have to prioritize the responsible use of information. Moreover, these tools allow students to develop effective export strategies and improve their analytical capacity.



TECHNOLOGIES FOR THE FIELD AND DESCRIPTION

Artificial intelligence is at its peak, providing information that will help to the analysis as long as data has been validated. Exportemos.pe from PromPerú provides assistance to junior and experienced exporters to identify potential products and access new markets. Tools such as Power BI or Tableau allow us to process high volumes of data to make quick and effective business decisions. For example, the trend analysis in social media, such as the increased interests in gourmet coffee in Germany, has skyrocketed Peruvian coffee exports. This new AI approach is pivotal to adapt to an increasingly competitive business world.



Power Bl

It is a collection of software services, apps, and connectors that work together to turn your unrelated sources of data into coherent, visually immersive, and interactive insights.

Power BI lets you easily connect to your data sources, visualize and discover what's important, and share that with anyone or everyone you want (Microsoft, 2024).

FUNCTIONS

Generate reports and interactive panels with

data fusion from different sources to obtain dynamic and appealing visualizations.

Facilitate data exploration by handling graphics and tables in order to identify patterns and relations.



Integrate with other Microsoft tools for data analysis and visualization.

Facilitate collaboration between teams by enabling shared access to generated reports.**

Handle volumes of data and combine multiple sources in order to have a coherent visualization.



ADVANTAGES

- Interactive and appealing data visualization.
- Optimal integration with Microsoft Excel. This is quite beneficial because many companies use Excel spreadsheets for data analysis. This Excel data can be easily exported and connected to Power BI panels.
- Data development through the combination of multiple sources in a single report.
- Advanced security and compliance features, which ensures the protection of sensitive data and regulatory compliance.
- Advanced customization of visualization panels, in order to adapt to the specific needs of each user or team within the organization (Sasthra Analytics, 2020).

- Subscription for advanced features, which can be expensive. Choosing a plan depends on the budget and goals that wish to be met with this tool (Cámara de Comercio Exterior, s. f.).
- Complex high-volume data management. This means that when addressing an extensive information source, the tool can have a slow performance (Flores, 2022).
- Less fluid integration with third-party platforms. It even uses additional connectors or intermediate solutions to import data effectively (Sasthra Analytics, 2020).

DISADVANTAGES



FEATURED TOPIC

Professor Ayala pointed out that harnessing new trends and technologies—such as market intelligence—is paramount for young minds who are paving their professional path. Since there are no enough specialization opportunities in Peru, many students are forced to look for information overseas. It is critical to overcome fear to new things and understand how to seize these tools in order to boost relevant information. On the other hand, processing large amounts of data to obtain significant indicators requires both interpretation and critical thinking. Furthermore, in market intelligence—as in project assessment—is vital to know how to make decisions based on results obtained.

GRADUATE SCHOOL



Rocío Vera

Industrial Engineer from Universidad de Lima. She holds an MBA and has doctoral studies from SAE Barcelona. She is also an industrial engineering professor.

IMPACT OF ARTIFICIAL INTELLIGENCE

During 2023-2024, generative artificial intelligence (GenAI) has influenced Vera's professional scope. Professor Vera integrated this to her professional practice, which streamlined product creation and processes. She considers GenAI and quantum computing quite relevant because they offer quick and efficient solutions. But she also points out that key skills include business vision, critical thinking, and ethical and technical decision-making. Professor Vera anticipates a future where professional differentiation is marked by the ability to create value based on technologies. Moreover, she recognizes copyright and privacy challenges, which can be addressed through robust contracts and team training.

TECHNOLOGIES FOR THE FIELD AND DESCRIPTION

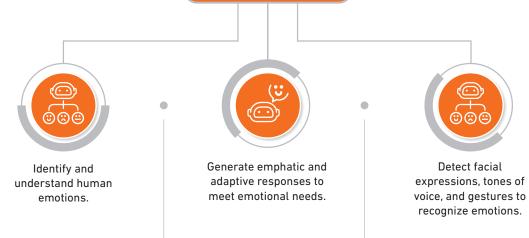
Artificial intelligence is quite useful, especially when creating products and prototypes. When combined with digital twins—which recreate the functioning of a product in a more realistic way—it reduces significantly the time for its development and market launch. Furthermore, existing barriers are considerably reduced in this process.

Emotion AI (EAI)

EAI specializes in developing systems to recognize and manage human emotions through algorithms and computational models, in order to interpret data (e.g.: tone of voice or facial expressions).

This field has many applications, from improving customer service to promoting mental health—where emotional interaction plays a critical role. The objective is to improve the ability of machines to interact with people in a more natural and thoughtful way, and encourage more emphatic and customized exchanges.

FUNCTIONS





ADVANTAGES

- Skills to identify and understand human emotions, which allows a more natural and empathic human-machine interaction (HMI) and improves user experience in areas such as customer service and education.
- Mental health improvement through emotional support and identification of stress or anxiety signs in users, which is quite useful in medical and therapeutic care.

- Invasion of user privacy when collecting and analyzing sensitive emotional data.
- Inaccurate or even inappropriate responses due to biased interpretation of human emotions, which can negatively affect user experience.
- Reduced empathy and interpersonal understanding due to the excessive technological dependency, which can have important social and ethical implications.

DISADVANTAGES





Professor Vera said that, over the past few years, AI integration with other tools such as computer vision and Internet of Things (IoT), has propelled significant progress when controlling production processes. Moreover, computing arises as a disruptive element that allows the quick exploration of new solution scenarios. Specific examples, such as the application in the LA port, showcase how these technologies reduce supply chains and streamline processes remarkably.



Renzo Jeremías

Senior executive in business transformation, with proven track record in companies such as IBM and Alicorp. He focuses on creating and capturing value through strategies that comprise processes, advanced analytics, data, change management, and technology. Jeremías currently leads a boutique consultancy firm, where he applies all his experience to help clients from different sectors to achieve business success.

INCREASED PRODUCTIVITY AND ADVANCED DATA ANALYTICS

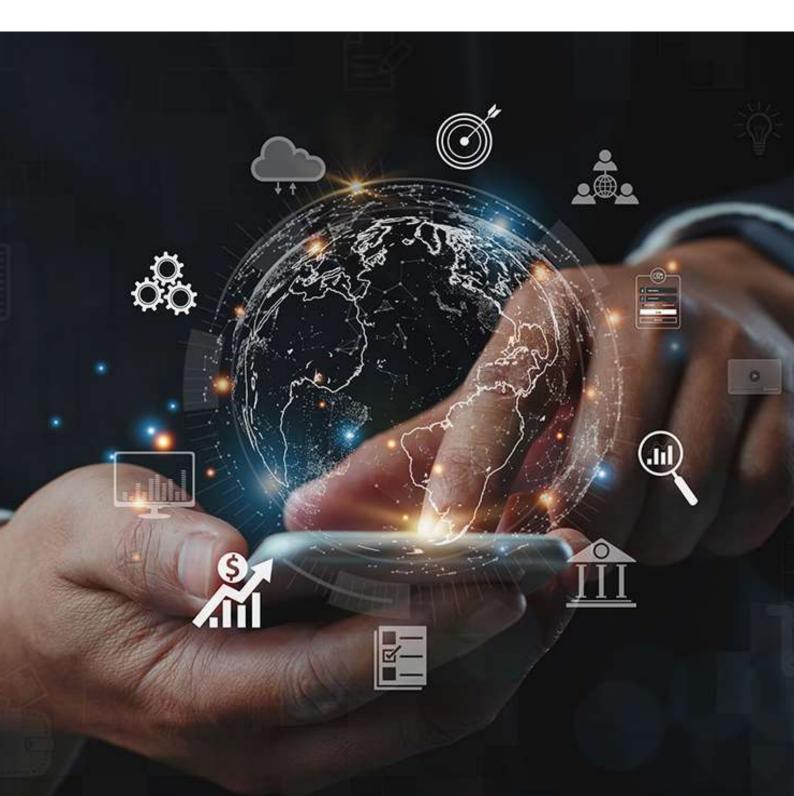
In 2023-2024, GenAl has had an impact on Professor Jeremías' professional scope. This technology increases productivity in daily tasks, which is key to redirect efforts towards tasks that add more value and transform businesses. He considers that technologies, such as Microsoft Copilot, increase productivity in working environments. However, some of the main challenges are resistance to change and the need to adapt business mentality. On the other hand, to address ethical and privacy challenges, he focuses on corporate governance practices and promotes inclusion and diversity. Professor Jeremías advises new professionals to build technical skills, soft skills, and business knowledge, while they keep embracing humbleness and teamwork in a globalized world.

He also mentions that, in the industrial field, digital twins have allowed customers to replicate and anticipate operation scenarios through the simulation of variables such as environment, macroeconomic variables, and supply and demand, which improves manufacturing efficiency. On the other hand, GenAI is on the rise rapidly, with practical applications in marketing that can extract accurate insights in hours based on focus groups and market data. This reduces hours of work substantially. These innovations—still evolving—are accepted because they provide almost immediate results.



TECHNOLOGIES FOR THE FIELD AND DESCRIPTION

Professor Jeremías said that every year new important technologies arise, but in Latin America only two stand out for its application in mass consumption. The first one is using Digital Twins in manufacturing and logistics, which employs artificial intelligence and machine learning to simulate scenarios and improve decisions. The second is GenAI that—although under development—showcases promising results. It is also expected to generate applications in operational, back office and commercial areas in the next few years.



3:05

Microsoft Copilot

It is a productivity AI-powered tool that combines the power of large language models (LLMs) with your data in the Microsoft Graph and the Microsoft 365 apps.

Microsoft 365 Copilot provides real-time intelligent assistance, enabling users to enhance their creativity, productivity, and skills (Microsoft, 2024).

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FUNCTIONS

Help to respond emails, answer telephone calls, and browse files.

Compatibility with popular Microsoft 365 applications such as Word, Excel, PowerPoint, Outlook, Teams and more.***

Facilitate collaboration and communication between teams with suggested responses, meeting organization, and calendar management in Microsoft Teams and Outlook.







- Significant improvement in productivity by helping users to write faster and more efficiently.
- Use of artificial intelligence to generate accurate contextual suggestions, which allows to create contents with more fluency and quality (Takale et al., 2024).
- Accessibility for users with writing or language impairments to express more clearly and effectively.
- Contribution to content quality by giving suggestions based on a vast linguistic and contextual knowledge (Kytö, 2024).

- Potential risk to compromise classified information, especially in corporate and learning environments (Ray, 2023).
- Limited development of core writing skills, particularly between students and professionals (Hiwa et al., 2024).
- Inconsistent and even inaccurate texts.
- Inadequate adaptation to the user specific context or intended communication purpose (Semeraro et al., 2024).



DISADVANTAGES



FEATURED TOPIC

Professor Jeremías mentioned that listed companies are currently adopting corporate governance practices and focusing on compliance—not only to comply with financial audits, but also to generate transparency and follow ethical principles. This group of companies also showcases a greater willingness to adopt disruptive technology, which is reflected in larger budgets to address regulatory compliance. In parallel, there is an increasing attention towards inclusion and diversity, which has been evidenced recently through the lack of representation in technologies, such as Gemini. Moreover, it is mandatory to develop a common sense among organizations in order to address ethical and moral challenges. It is also advised the allocation of specific responsibilities and active search of solutions.



Luis Espinoza

Industrial Engineer from Pontificia Universidad Católica del Perú. He holds an MBA from ESAN Graduate School of Business. Specialization in teaching data analytics. Renowned professor and professional in this field and in innovation management. Finally, he has taught data analytics to students from the Master's Program in Innovation Management.

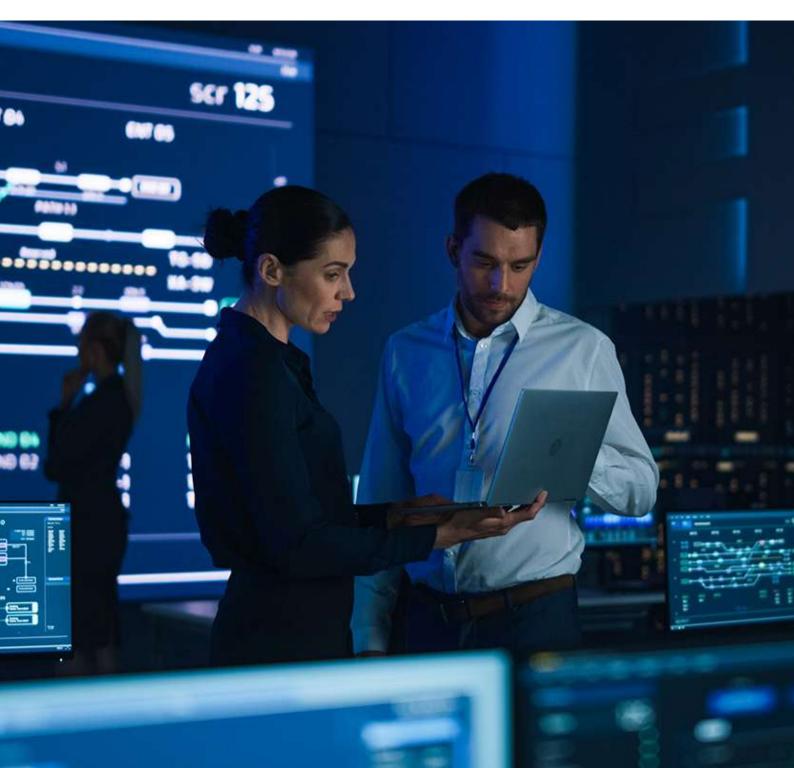
HARNESSING EMERGING TECHNOLOGIES EFFICIENTLY

During 2023-2024, different emerging technologies have influenced the field of energy and related areas such as aviation and data center management. In Espinoza's professional scope, this type of technologies is integrated to streamline processes such as automation of administrative file analysis and improvement of operational efficiency by using artificial intelligence and data management. Key skills to seize these innovations include reading comprehension, writing skills, domain knowledge, and common sense. In the future, these technologies are decisive to improve analysis efficiency and capacity. Although success will depend on the skills of each individual to adapt to changes and use these tools effectively.



TECHNOLOGIES FOR THE FIELD AND DESCRIPTION

Professor Espinoza mentioned that he is working in an artificial intelligence project to help administrative courts to manage claims on energy utilities. This project comprises many phases, from digitization of documents to identification of relevant information. Al is expected to be used to make the case resolution process more efficient. Moreover, it is worth mentioning that initial implementation can be quite challenging. The project has a practical approach, and it enables continuous improvements as tools keep evolving. Although challenging, this project has the advantage of keeping abreast with the latest technology and rapidly adapting to changes in the field.



Optical Character Recognition (OCR)

It allows the conversion of documents, such as scanned PDFs, images taken with digital cameras or printed files, into a machine-readable format. Using image processing algorithms and machine learning, it identifies and extracts text seen in pictures for its edition and digital storage. OCR has evolved and it is now capable of managing a wide array of fonts and languages (Jiménez, 2018). On the other hand, Google Cloud offers two types of OCR: OCR for documents and OCR for images and videos. While they share a foundational technology, Document AI is a document understanding platform optimized for document processing. Its Custom Extractor is powered by GenAI that processes both generic and domain-specific documents with higher accuracy and faster, without the need to choose a specialized processor. Cloud Vision is commonly used to detect text, handwriting and a wide range of objects from images and videos (Google Cloud, s. f.).

FUNCTIONS





ADVANTAGES

- Increased efficiency and productivity when automating data entry and eliminating the need of manual transcriptions.
- More access to information by granting access to high volumes of data that are searchable and editable electronically, which is useful in business and learning environments.
- Preservation and protection of historical and ancient documents by its digitization to avoid physical deterioration (He, 2020).

- Inaccuracy issues that generate errors in recognition and conversion of text, especially when handling documents with poor image quality, unusual fonts, or simply damaged.
- Expensive in terms of required software and hardware, which is a barrier to small companies or institutions with limited budget.
- Compromising data protection if not adequately managed in the digitization phase of classified documents.

DISADVANTAGES



FEATURED TOPIC

Professor Espinoza highlighted that mastering new technologies is like learning English in the current professional context. In the same way that English opens up job opportunities, the technological knowledge is pivotal. From mastering basic tools such as Word, Excel and PowerPoint to understanding macros and dynamic data, each professional should familiarize with these tools to maximize their development. However, it is quintessential to remember that these are only tools—the important thing is common sense and understand your business. Furthermore, professionals must keep an eye on new emerging technologies and how they can seize them to improve customer experience and keep updated in a rapidly changing business environment.

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