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Letter from the CEO

> **Our goal is to share knowledge in Artificial Intelligence to build a shared future.**

Dear friends, how long has it been since you held a paper magazine in your hands? Now you have opened the first issue of the annual collection of articles and research on practical software development based on Artificial Intelligence. As you know, AI continues to have a significant impact on countries in the Middle East. According to global research by McKinsey[1], the AI market will continue to grow until **2030**, and companies will increase their investments and research in this area.

Throughout the pages of the magazine, you will find articles and research from Usetech staff, as well as leading AI experts and analysts. You will learn how to apply AI in the oil and gas industry and how to build an AI benchmark structure in an organization. You will be able to familiarize yourself with AI predictions and trends for **2025** and learn how AI will change the landscape of the Middle East. Amazing AI use cases await you: we have collected unique and seemingly unbelievable solutions for you.

As a bonus, we offer all readers the opportunity to take the "Is Your Business Ready for Digitization?" quiz. The test questions will allow you to assess your company's readiness for digitalization, and our team is ready to help you with a free consultation.

This magazine reflects the work of a large team of experts, analysts, architects, technical writers, and other professionals who are passionate about what they do. The material presented here is exclusive opinion based on years of expertise and experience. And the essence of any expertise is research, accumulation, and dissemination of knowledge, that's why articles by Usetech experts can be found on the world's best platforms and conferences, as well as in the pages of this magazine.

Do you agree that sometimes it is so nice to put aside your gadget and just flip through a real paper magazine? I hope you will discover something new in the stream of continuous AI development.

Sincerely,
Maxim Kuznetsov, CEO of Usetech

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What Will
Change
In Artificial
Intelligence
In 2025
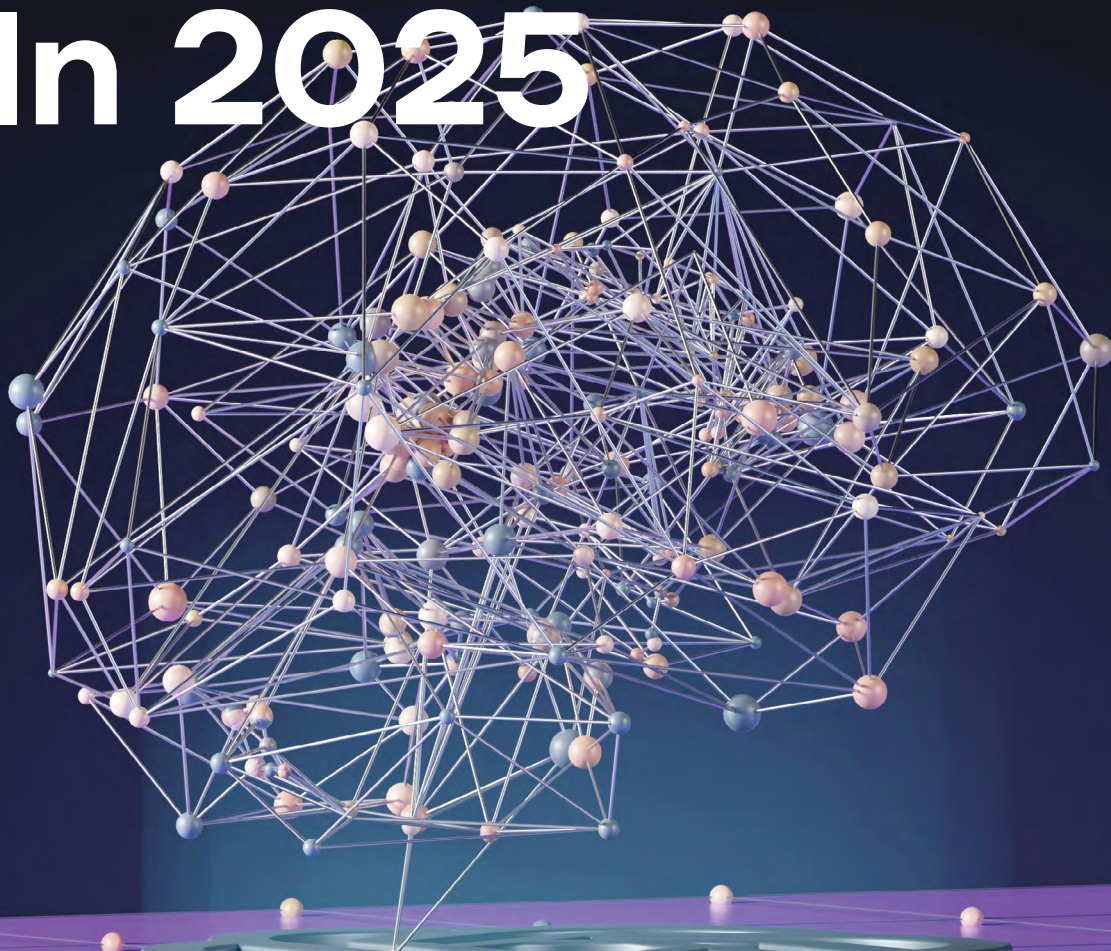
Experts' Views On Global AI Trends In 2025

I t's no secret that Artificial Intelligence (AI) is revolutionizing many industries around the world: from manufacturing to agriculture, from oil and gas to energy, from medicine to education, not to mention business and marketing.

Analyst firms predict that the global AI market **will grow exponentially from 2025 to 2030**. Just imagine: from **$136.55** billion in **2022** to **$1,597.1 billion in 2030**[2], at a compound annual growth rate (CAGR) of **37.3%**.

What is driving this growth? Of course, the development of AI itself and its technologies, significant investments by leading companies, increasing knowledge about AI and improving the skills of specialists. In addition, it is impossible not to notice the active implementation of AI in various industries, which we could not have imagined a few years ago!

We conducted a survey among AI experts and entrepreneurs and asked them to highlight AI trends for 2025:

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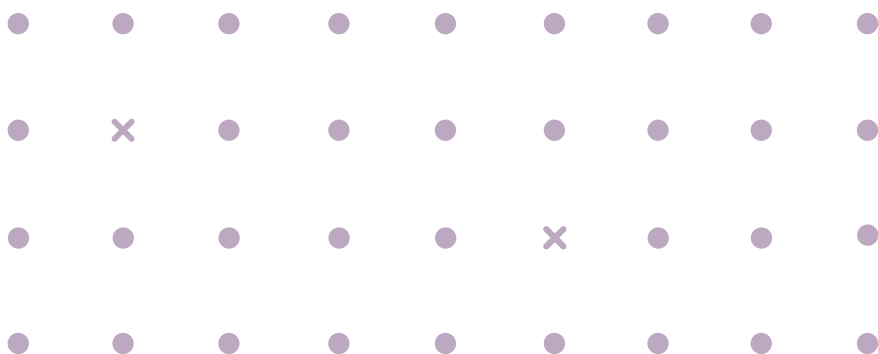
Kevin Shahnazari

Founder and CEO, FinlyWealth:

AI in **2025** will be transformative, with global AI market size projected to reach **$190.61** billion. Natural language processing will advance dramatically, enabling AI to understand and communicate in human-like ways across over **100** languages. AI will increasingly augment human decision-making rather than replace it entirely.

In the financial services industry, AI adoption will skyrocket. By **2025**, **95%** of customer interactions in banking will be AI-powered. AI algorithms will process vast amounts of financial data in milliseconds, providing hyper-personalized recommendations and risk assessments. This shift will revolutionize credit scoring, fraud detection, and investment strategies.

The United States and China will remain at the forefront of AI investment, allocating over **$50** billion annually by **2025**. However, the Middle East will emerge as significant players, particularly the UAE and Saudi Arabia. The UAE's AI strategy aims to boost GDP by **35%** through AI integration by **2031**.

In the Middle East, AI development will focus on smart city initiatives, healthcare, and oil and gas optimization. Dubai's goal of becoming the world's first AI-powered government by **2031** will drive rapid adoption across sectors. Saudi Arabia's **$500** billion NEOM project will be a testing ground for cutting-edge AI applications.

Current limitations in AI, such as bias in datasets and lack of explainability, will persist but improve. By **2025**, **70%** of organizations will have implemented AI ethics guidelines. The EU's comprehensive AI regulations, set to be fully enforced by **2025**, will likely inspire similar frameworks globally, including in the Middle East.

Angel Vossough

CEO at BetterAI:

" The next five years are poised to be transformative for AI, computer vision, and related technologies. We can expect these technologies to become more integrated into our daily lives, offering hyper-personalization and efficiency. AIwill continue to enhance decision-making processes across many sectors, from healthcare to finance, by providing deeper insights and automating more complex tasks.

Computer vision, in particular, is likely to revolutionize areas such as autonomous driving, augmented reality, smart houses, and smart cities by enhancing how machines understand and interact with the physical world. Additionally, advancements in NLP will enable more natural and intuitive interactions with technology, further blurring the lines between human and machine communication. These developments will drive innovation, create new opportunities, and address challenges in ways we are just beginning to imagine.

How Will AI Evolve In The Middle East?

According to McKinsey, Artificial Intelligence (AI) could bring up to **$150 billion** to Middle Eastern countries, equivalent to at least **9%** of the GCC's combined GDP.

Many companies are adopting AI and AI-based solutions at varying rates. It depends on the resources of the company itself and its willingness to embrace such changes. But it's worth noting that retail companies are investing the most in AI.

To help companies, the Government of the United Arab Emirates (UAE) is implementing an Artificial Intelligence strategy[3] to position the UAE as a global leader and develop the country's own AI ecosystem. UAE sets a clear vision through its AI Strategy, to become one of the world leaders in A.I. by **2031**.

The strategy focuses on nine sectors where Artificial Intelligence is expected to have the greatest impact: transportation, healthcare, space, renewable energy, water, technology, education, environment, and traffic.

We interviewed some experts who shared their views on the development of AI in the Middle East.

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David Ly

CEO and Founder of Iveda:

" The Middle East has been relying on foreign companies to bring AI technology into the region, as there are not any home-grown tech companies specializing in AI. Working closely with government organizations in the MENA region, Iveda has seen an increasing demand in developing countries for AI solutions for transportation – specifically for the safer and more efficient movement of people – as well as to enhance infrastructure and improve security. As for more developed cities like Dubai and Riyadh, they're looking for AI for enhanced predictive modeling and automations, seeking foreign customers through tech transfer in order to train local talent.

Ryan Carmichael

Co-Founder and CEO of Kanari AI:

" AI initiatives have become a priority for many of the GCC countries, particularly in the last year, with the more companies offering AI solutions across industries and finally offering Arabic centric solutions. Government initiatives are and will continue to drive AI adoption.

Finally, there are growing options, Arabic focused AI technologies that actually work. Previously, due to the limited access of training data and the more than **20** Arabic dialects, there were only a few AI technologies that were accurate enough for useful applications. Cloud based solutions also limit adoption due to strict government security and privacy protocols.

Hassan Sawaf

CEO and Founder of aiXplain:

" Leaders in the Middle East understand the need for greater democratization of AI and a focus on Arabic AI tools. A recent PwC report noted that AI could channel around **$320B** into the region by **2030**, with Saudi Arabia and the UAE driving investment and innovation.

This provides a snapshot into a broader strategy to diversify economies and reduce oil-dependency, but also is seen as a necessary move to make sure the region isn't left behind technologically.

We expect the greatest demand to be within enterprises across sectors such as healthcare, supply chain, and legal. Additionally, local governments and education are other sectors we see great initial potential. All of these require a great deal of **1:1** personal interaction where human resources are limited and would benefit from a scalable co-pilot/assistant.

Despite Arabic being one of the most spoken languages in the world, AI research and commercialization is being driven by English-language, US-driven models, meaning the Middle East is in danger of being left behind. Conversely, the AI sector is in danger of missing out on a huge market, with culturally and linguistically different needs.

For example, a model or AI agent trained in English cannot be expected to respond accurately in Arabic, a language that has roughly **25** different dialects. In order to enable AI agents that are best-suited to Arabic, we need more multilingual AI assets to support them.

Continued innovation from AI models like ALLaM and Jais will help bridge this gap and provide more data and models to build Arabic-specific solutions on.

AI in numbers

Did you know that...

$320
billion AI could bring to the MENA region's economy by **2030** (Source: PwC[4])

35%
the regional AI market will grow at a compound annual growth rate from **2025** to **2030** (Source: iot business magazine[5])

64%
of businesses expect AI to increase productivity (Source: Forbes[6])

$15
billion by **2030** is to reach by the UAE AI market(Source: iot business magazine[7])

Over 75%
of consumers are concerned about misinformation from AI (Source: Forbes[8])

Banking and retail industries accounted for the largest investment in AI in **2023**. Investment in the financial industry is projected to grow from **2024** to **2027** (Source: Statista[9])

4   5   6

7   8   9
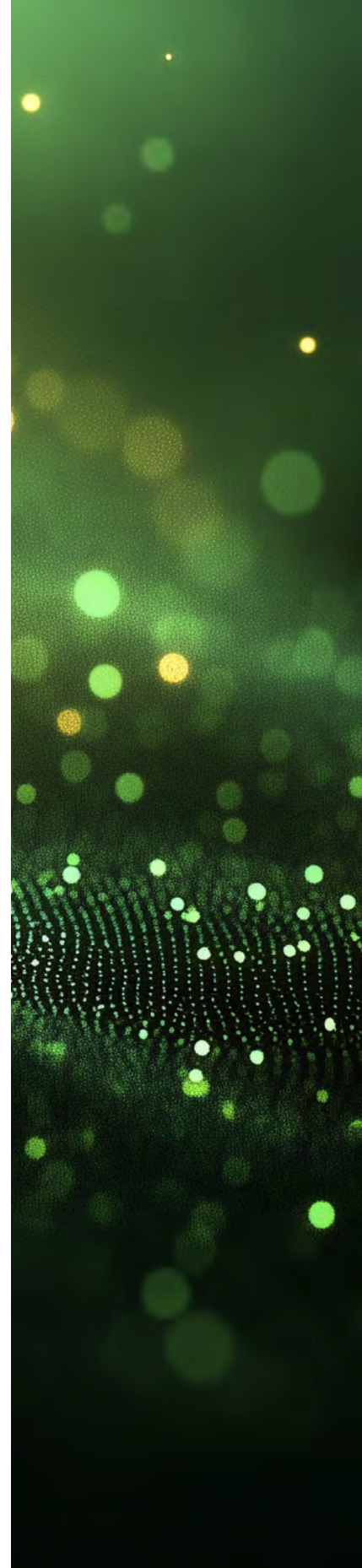
A new realities of Artificial Intelligence

▪ Products and services using Artificial Intelligence make me nervous

▪ Products and services using Artificial Intelligence make me excited

Nervous
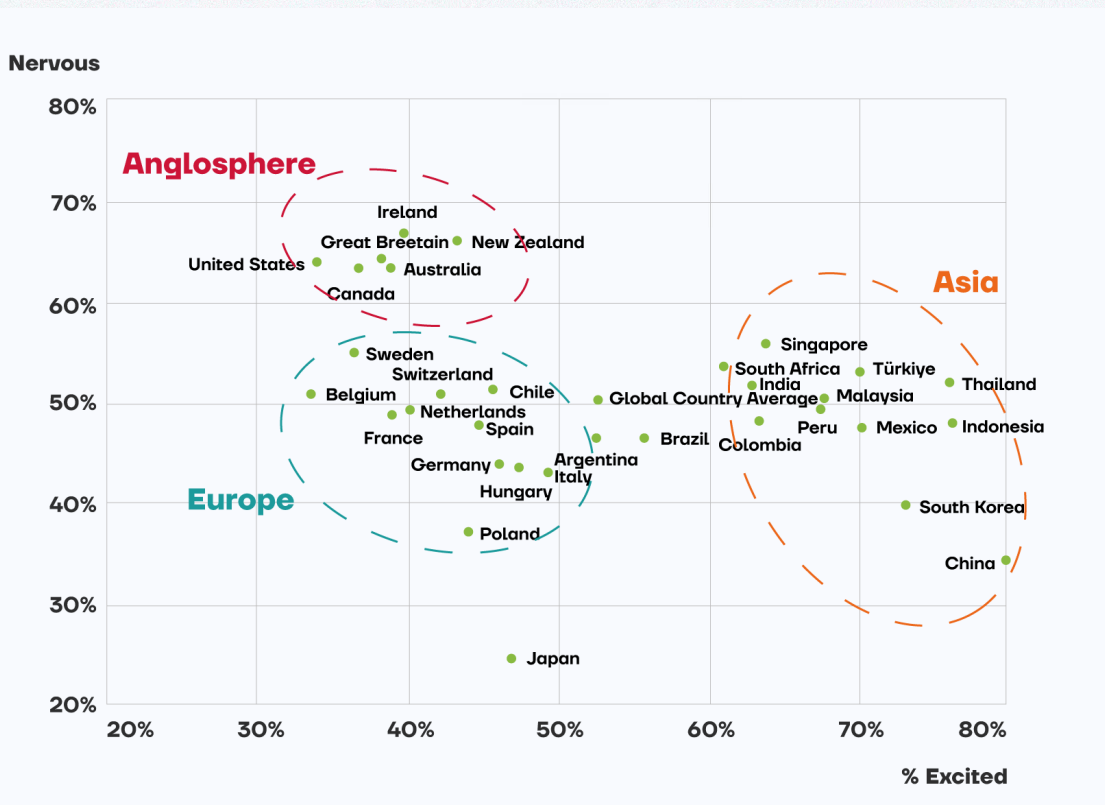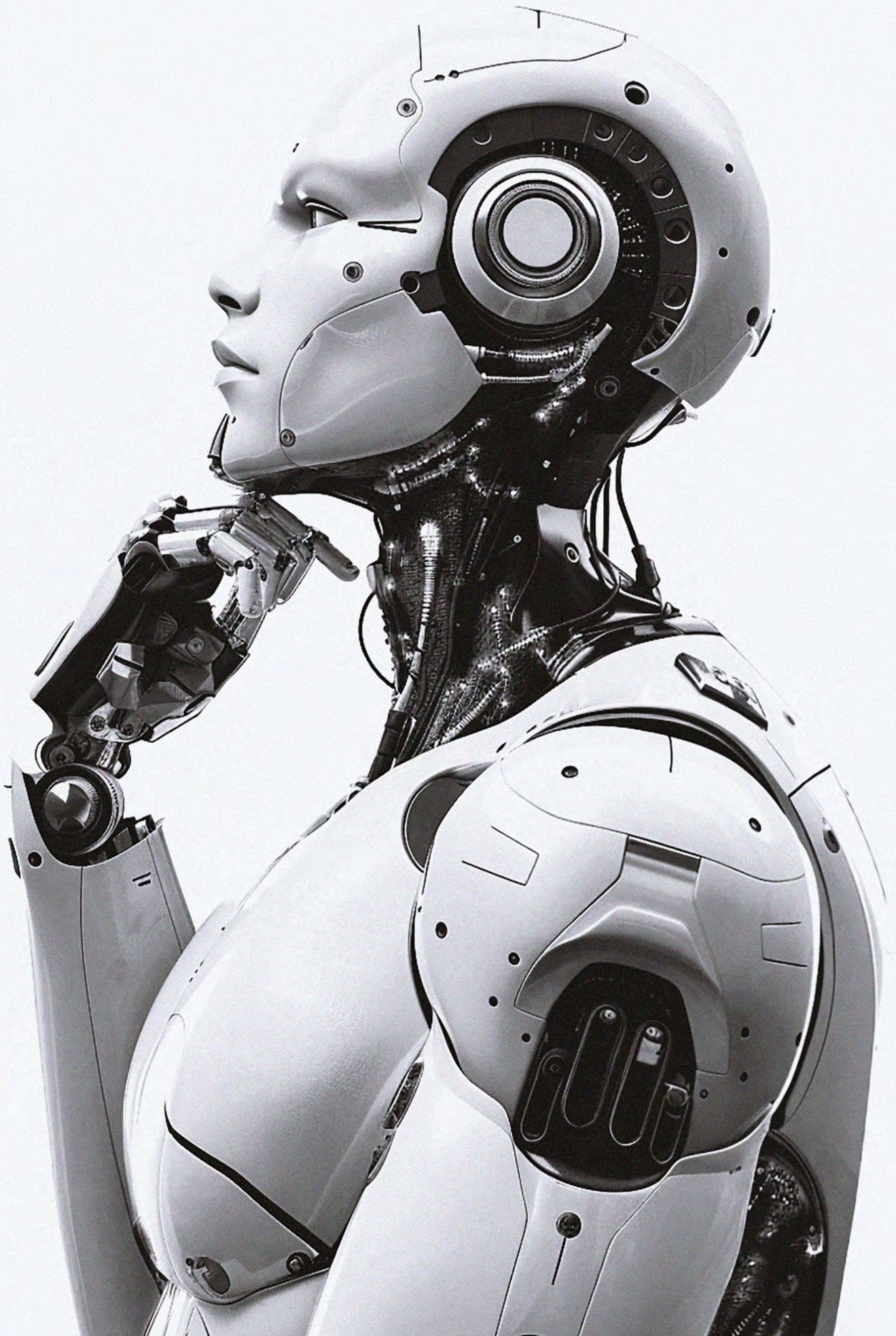
Ilya Smirnov

Head of AI / ML Department at Usetech

Author of the following three articles is Ilya Smirnov, Head of AI / ML Department at Usetech. Visiting lecturer at the Massachusetts Institute of Technology. He has written more than 50 scientific publications, speaker at international conferences and technology podcasts. Author of patented technology for trajectory analysis of vector 3D seismic fields.
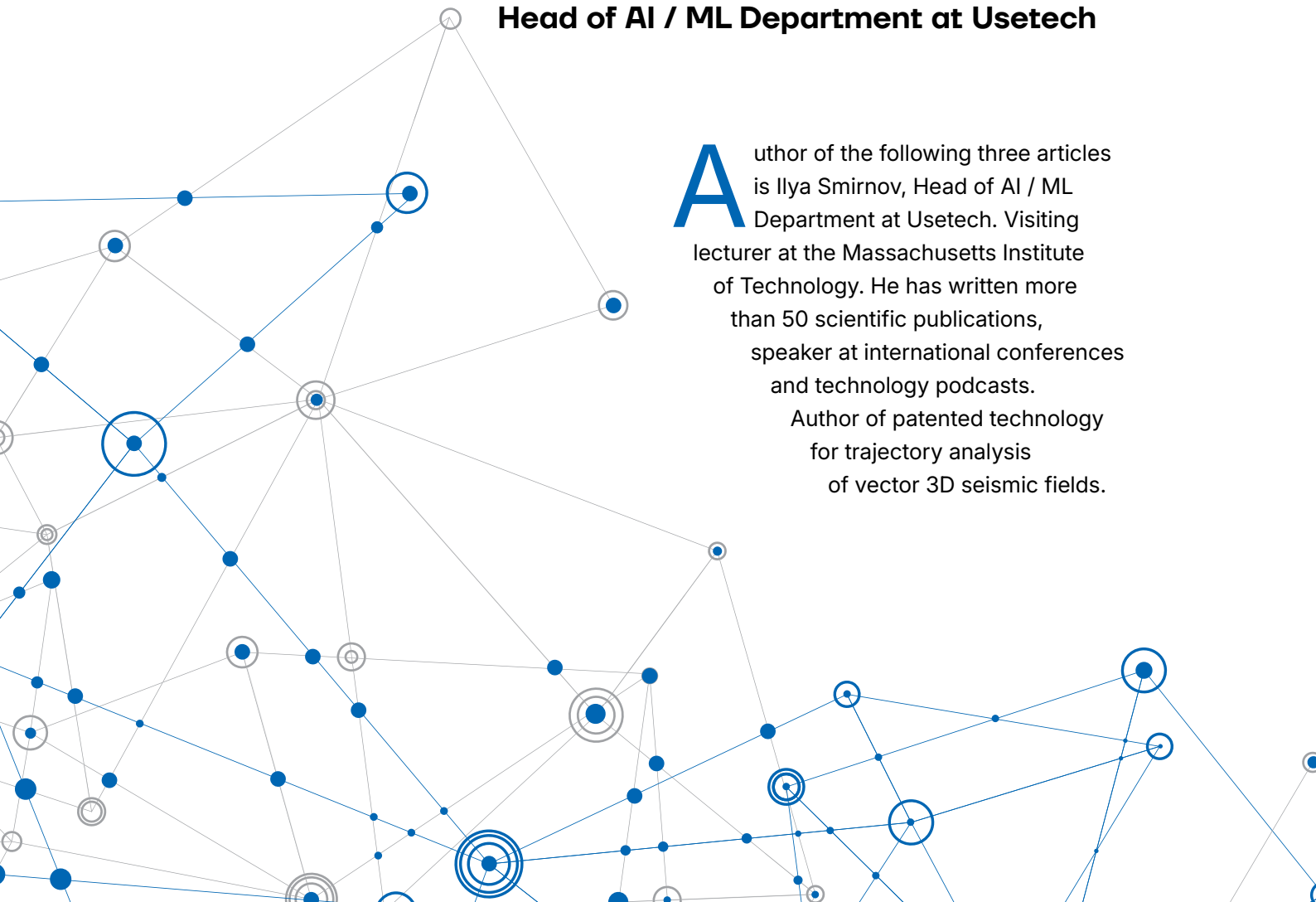
How can businesses create a benchmark AI framework

Basing on my experience, I can say that today Artificial Intelligence (AI) is fairly widely used to solve important practical issues, but so far this is just fragmentary implementation and use. That is, it's used locally as part of a business optimization process in some areas. For example, my team and I developed various AI-based models for energy consumption control at oil fractionation plants, but not as part of the entire technological process, but only its minor part. We also implemented projects to search for hydrocarbons and ore deposits, but without considering their effective production.

In terms of computer vision, we have solved many problems in recent years. For example, tasks on recognizing granules on a conveyor belt to reduce mill downtime and remotely monitoring the power lines condition. Other practical aspects of AI implementation were related to the automatic selection and design of a contract template depending on the type of contractor for a client who has more than 1,000 contractors, or the algorithm for developing a dynamic evacuation plan in case of fire smoke or gas leaks in a building, and modeling the expansion of gas contamination exhausted by moving objects.

The range of projects is quite extensive, and they can be divided into 3 groups according to integration processes:

- The projects involving necessary integration of information flows;

- The projects involving data from several systems, which can be integrated in different ways, for example, through API or data bus;

- The projects requiring significant rebuilding of the IT infrastructure, developing the data management strategy and implementing modern approaches to data management and storage such as DWH, Hadoop, and Data Lake.

Most often, we implement the third type of projects. On the one hand, AI workloads impose new requirements on computing and network resources compared to traditional applications and systems. On the other hand, the fragmented AI application faced with insurmountable obstacles, both in terms of business practices and technological limitations. The fragmented approach to developing appropriate AI models results in fact that architects develop only solution needed for individual AI projects of their teams, rather than bigger enterprise IT landscape. As the result, disparate systems make it difficult for companies to implement AI best practices and limit the technology performance. These structural barriers make technological changes less effective.
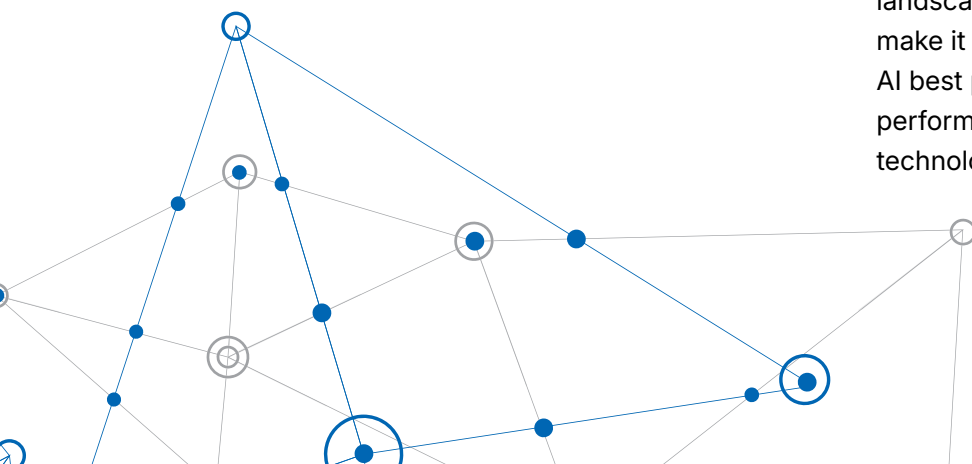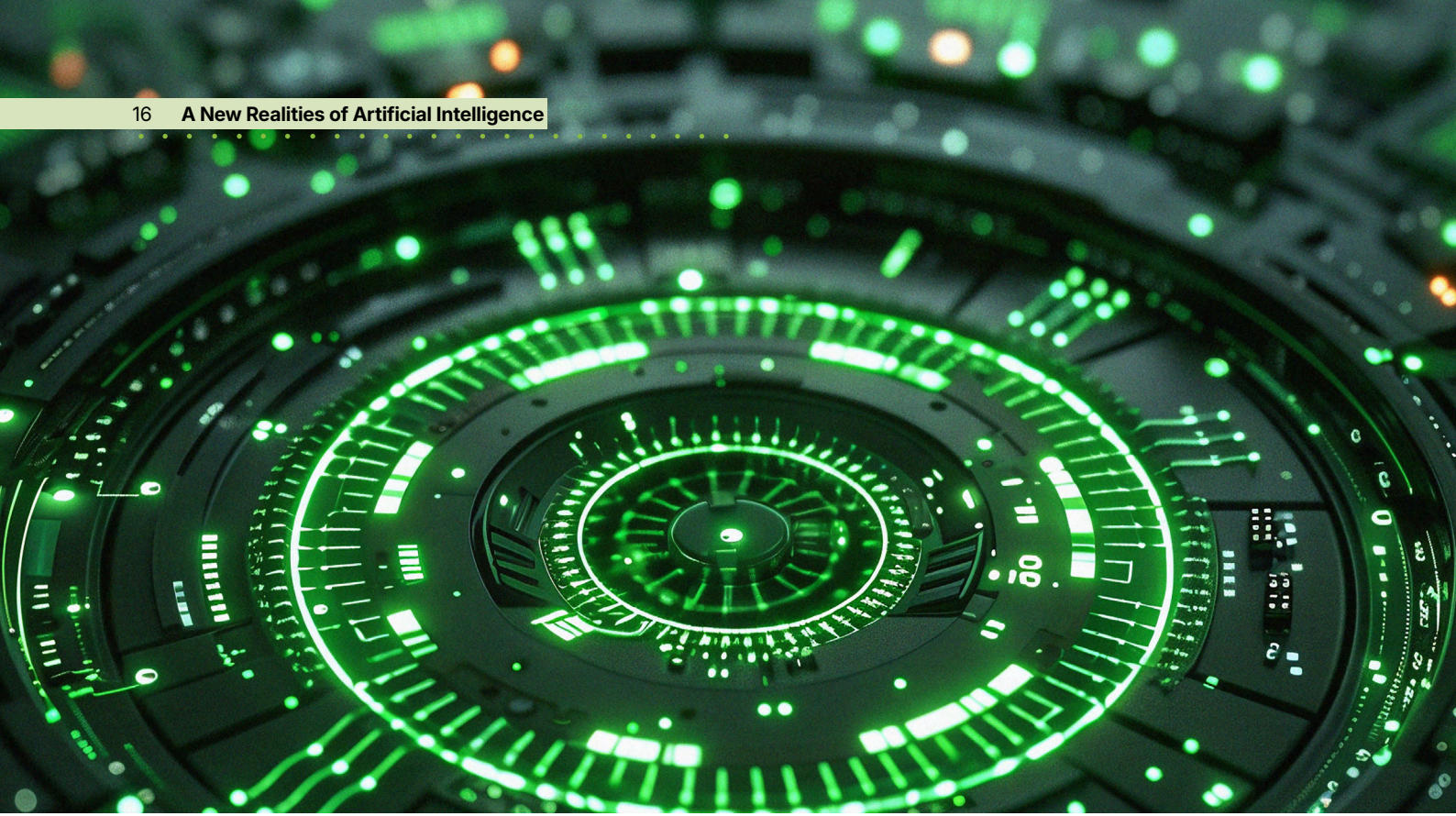
Problems associated with the implementation of AI in different areas of a single business process

Implementation of own AI projects
in various **areas of an integrated business process**

Area 1	Area 2	Area 3
AI project 1	AI project 2	AI project 3
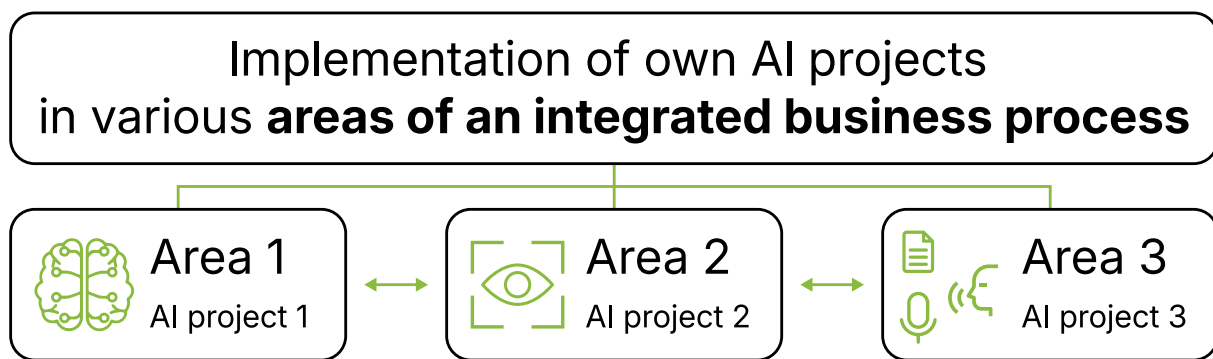
Barriers and problems of such implementation

Excess computation resources consumption (overconsumption)	The need to develop integration layers among AI models of various projects	Difficulty in models operation monitoring within an integrated business process
Increased requirements to server resources	Difficulty in a unified cybersecurity policy implementation	High dependence on solutions suppliers in each area, including as related to updates, bug fixing, Gtc.

This approach does not guarantee that the developed AI solution will actually be adaptive to possible changes in the business process. So, the companies have to invest in new AI models that take advantage of all business data, rather than maintaining multiple stand-alone models.

The AI reference architecture, which enables complex and flexible AI introduction, combines a multilevel approach and module AI development to eliminate any dependencies on underlying technologies and ensure that all AI stakeholders can participate in the development process.

AI architecture should consist of five modules, each can be developed independently having its own users, interface, technologies, services, and deployment scenarios. The implementation of each module is related to the company's technology stack. This allows to implement the best solutions, not depending on a single technology or vendor.

AI Infrastructure Reference Model: What does it consist of?

Knowledge base of implemented AI models

This module includes a unified view of all AI artifacts: descriptions of cases, frameworks, models, source data and other artifacts. This level is primarily designed to communicate successfully implemented AI solutions to all stakeholders, including end users, testers, data scientists, operations teams, infrastructure teams, and IT managers.

AI services and classifier of implemented AI models by types of processed data stored in the knowledge base (speech, text, computer vision, tabular data)

This module uses a single API and model classifier to enable access to AI service for users. Microservice architecture allows each API to provide a limited and well-defined function. This module also makes it possible to use one AI model in multiple applications.

Environment for developing new AI models and customizing existing ones (managing full life cycle of AI models)

This module includes tools and development platforms to standardize the AI lifecycle. It collects AI artifacts (versions and metadata) in models for reuse. This level allows data scientists to use machine learning development tools to create and deploy models across the company. In addition, it helps to check the performance of models and configure the policies of the AI solution.

Server and network infrastructure for data storage, training, and execution of AI models

This module optimizes infrastructure for multiple vendors providing sufficient computing power for model training. These models are developed by cross-functional

teams, so they are relevant to departments of the enterprise. This level manages data storage, hosts applications (local and cloud), trains AI models, and executes models.

Center for management and monitoring of implemented AI models

This service ensures consistency and optimization of AI systems across all business functions, collects AI metrics, and compares them with key business performance indicators. This level allows business to evaluate the effectiveness of the model and take actions if the AI model is overtrained or does not reach the expected goals.

Conclusion

The role of Artificial Intelligence in business is increasing due to AI's ability to reduce costs and improve operational efficiency. In the digital transformation era, using the best available technologies is no longer a matter of competitive advantage, but a matter of survival and keeping the enterprise up to date. Artificial Intelligence can not only increase human productivity, but also completely automate many business processes.

Even though these are just predictions, enterprises shall begin to rethink how people and machines interact in the digital transformation era now to avoid duplicating costs and developing local AI solutions in any part of business process that may have significant development barriers.

Federated learning as an implementation of trusted AI

**This article was first published
in the AIFOD Proceedings.[11]**

I n the modern medical field, access to large amounts of data is a key factor for developing accurate and effective disease prediction methods. However, maintaining the confidentiality of medical information and compliance with legal regulations become obstacles to data exchange between medical institutions and research centers.

(11)

Federated learning is a promising approach that allows you to use data from various sources without transferring them, while maintaining patient confidentiality and safety, which opens up new opportunities for creating more effective models and algorithms for analyzing medical data. By training models on the devices of the sources themselves and subsequent concatenation of the weights, the risk of information leakage can be reduced, while maintaining a high level of accuracy and generalizing ability of the models. A visualization of how federated learning works is shown in Figure 1.

In the field of Machine Learning, especially in the context of federated learning, ensuring the security of data and models is becoming a key issue. With the development of technology and the availability of data, their cost increases, which attracts the attention of cybercriminals and intruders. Attacks on federated learning systems pose a serious threat to the confidentiality, integrity of data and trust in the field of Machine Learning, especially in the context of federated learning, ensuring the security of data and models becomes a key issue. With the development of technology and the availability of data, their cost increases, which attracts the attention of cybercriminals and intruders. Attacks on federated learning systems pose a serious threat to confidentiality, data integrity, and trust in model results. Therefore, ensuring protection within the framework of federal education is an urgent and important task.
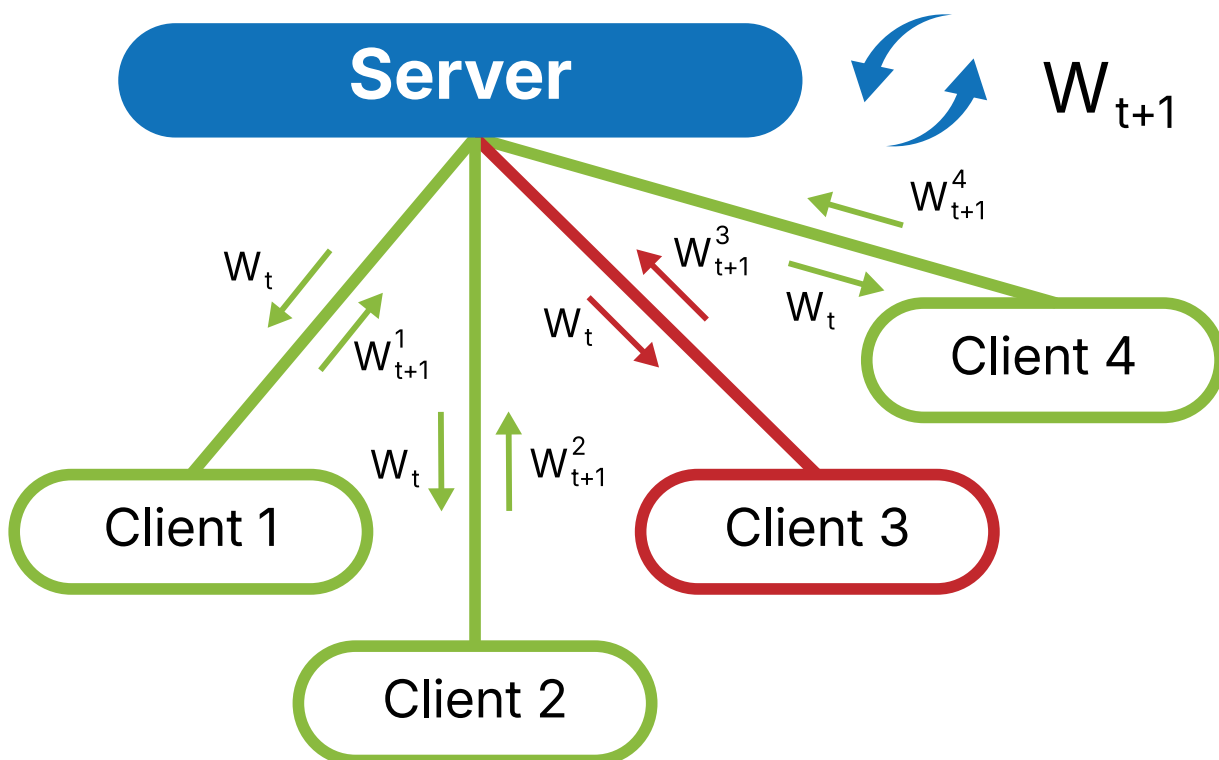

Figure 1: Visualization of Federated Learning

Federated learning is used in various fields where there is a need to train models on distributed data while maintaining confidentiality. Possible applications:

Healthcare

Electronic Medical Records (EMR) are the main data source for Machine Learning in medicine. The limited data of one hospital can lead to a bias in forecasts. Federated training allows data exchange between organizations without disclosing confidential patient data.

Transportation

With the growth of sensors in automotive networks, a lot of data is being collected to train Machine Learning models. However, current autonomous driving solutions are limited to offline learning due to environmental dynamics. Federated training allows you to train cars online in different locations, ensuring accurate marking of objects.

Economics

Federal education in economics, especially in the banking sector, is used to assess the risk of issuing loans. Organizations can use it to create a Machine Learning model for risk management.

Natural Language Processing (NLP)

Accurate models require a lot of data collected from mobile devices, but transferring audio recordings to a processing center is considered a violation of a person's personal space in some states.

Our company has developed a platform for federated learning for medical centers. Our experience of training decentralized models has shown that the accuracy of decentralized trained models differs by no more than 1-2% from centralized ones. At the same time, in some cases, it is possible to obtain a model that is more accurate than with centralized training. We see that this approach has a future in creating models that use data that is prohibited from transferring.

We are also working on the implementation of machine unlearning algorithms. To realize the Right to be forgotten, a person's right to demand, under certain conditions, to delete of their personal data from public access.

Simply deleting data is not enough, since Machine Learning models are often able to 'remember' old data. Speaking of memory in Machine Learning models, it means that in most cases they implicitly represent a compressed (with some losses) version of the data on which they were trained (as an example of this behavior, we can give a linear autoencoder, the encoder of which, as a result of training, is a matrix of eigenvectors of data, which used in the principal component method).

Difficulties in removing information from Machine Learning models are caused by the fact that there is often no direct explicit connection between model parameters and data, so the task of selectively deleting data is not trivial.

One of the most obvious solutions in this case is to retrain the model from scratch

on the remaining data, but it's impractical from the point of view of optimal algorithm execution, taking into account the time and resources spent, since modern machine learning models consist of tens of billions of parameters.

In order to solve this problem, a new paradigm has been invented, which is called "Machine unlearning". Ideally, the machine unlearning mechanism should ensure that data is deleted from the model without the need to retrain it.

There are a number of reasons why users may request the deletion of their data. The attacks that Machine Learning models have been subjected to have been described above. Below is a grouping of the reasons that cause the need for machine unlearning. The reasons are divided into the following groups:

Security

Protection against adversarial attacks. Minor changes in the data for human perception are enough to confuse the model and force, for example, to predict incorrect answers with a high degree of confidence. This phenomenon can be especially dangerous for models working with medical data,

where the accuracy of the forecast can cost a human life. Machine unlearning in this context is used when detecting corrupted data for their selective deletion, thereby improving the performance of the model.

Privacy

Machine unlearning allows you to delete information stored about specific data in the model to prevent various attacks, thereby preserving human rights to the confidentiality of their personal data.

Relevance

Various recommendation systems may offer users incorrect products based on their old preferences or erroneous search queries. Machine unlearning is used to remove irrelevant information, allowing different systems to keep up with user preferences.

Accuracy – during training, machine learning models can acquire so-called incorrect shifts, attributes insignificant for the result to it. Machine unlearning algorithms are often used to eliminate such in accuracies. When deleting specific parts of the training dataset, you may encounter certain difficulties:

Stochasticity of training

it is impossible to determine the effect
of each individual point on the model, given
the stochasticity of learning algorithms. For
example, most learning algorithms involve
feeding data into the model in batches,
which include several elements from
the dataset, instead of one specific one.

Gradual learning algorithm – training occurs
gradually, which means that the behavior
of the model on specific elements of the
dataset affects the behavior of subsequent
points, so you can't just delete data from
the model without hitting other data.

Catastrophic unlearning

Often after applying the unlearning algo-
rithm, you may encounter a severe dete-
rioration in the performance of the model
on the remaining data.

We have considered two implementations
of trusted Artificial Intelligence: federated
learning and machine unlearning. It is worth
noting that many modern data processing
models can be trained using a federated
approach. This approach allows us to avoid
transferring personal, secret, or other sensi-
tive company data to an external processing
center.

Ways To Use AI In Software Development

Whether you have tried ChatGPT or use automated AI tools every day, the monumental rise in the adoption of Artificial Intelligence systems in all aspects of our lives is absolutely obvious. According to Grand View Study, the global Artificial Intelligence market is expected to grow by **37.3%** from **2023** till **2030**[12]. Of all areas, AI in software development will be the most progressive and attractive for investments.

There is no denying that AI has already found its place in software development and has great prospects for the future. That's why it is so important for IT market leaders to identify competitors as related to AI adoption in order to remain commercially viable. In this article, we are going to highlight opportunities and offers in the area of AI adoption in software development.

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Will AI replace software developers?
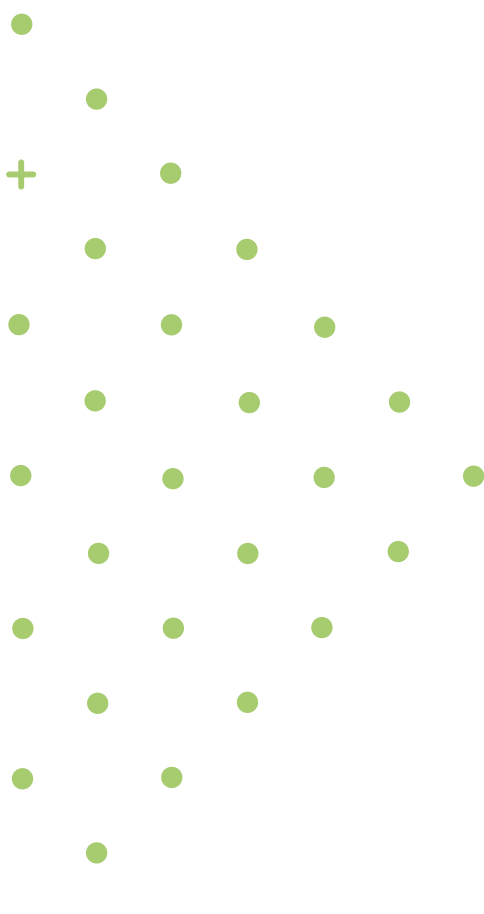
We can say for sure: AI will not replace software developers in the immediate future. Even with customization, specific use cases and wishful thinking, AI has too many limitations. Nonetheless, AI will change software developers working practices, as **70%** of developers admit that they routinely employ AI tools, which give them advantage in tasks completion and increase their performance. It is important to realize that AI will not replace all software developers and engineers. AI will only help developers achieve more and have much time to perform tasks that are more complicated than the applied algorithm code implementation.

How will AI influence developer's experience?

AI for software development is already changing methods of software testing, debugging and documenting by expert teams. Developers use AI as a mediator in communicating with colleagues, analysts, customers, and clients. In particular, AI can speed up new features addition, bugs fixing and support requests.

All these changes can already be observed in the following development aspects:

- AI already helps analysts decompose large tasks and establish code and product acceptance requirements and criteria. Analysts can take this information into account, as decomposing performed by AI, is highly likely to correspond to community standards and approaches used in model learning.

- AI in design. In our opinion, this is one of the issues almost solved in practice. AI already helps with basic user interface design for MVP. This allows teams implementing the prototype to save on front-end development, since as a rule there is no need for design at that stage, and to leave complex interactive design elements for designers and front-end developers. Once AI has created the basis for app pages, designers can turn to user interface logic and mechanics.

- AI helps ensure the continuity of the development process. The development teams can use AI to write large amounts of code, but AI can also be employed to generate test coverage for a given piece of code. Thus, AI speeds up the development on the whole and increases the process continuity.

What areas definitely require generative AI?

Recurring, recurring and recurring tasks: AI is able to perform routine tasks with clearly defined requirements. This job is also important and allows developers to concentrate on more complex non-standard issues, which cannot be managed by AI.

- The first code prototypes: a software developer can quickly get the first draft prototype using AI. When developers are not sure where to start from, or they face challenges in task decomposition, the AI-generated code provides one of the skeleton options for further development.

- Minor updates of existing code: AI is perfect for minor code changes and updates. The main thing here is not to try too hard and state the request correctly, since there is a risk that you receive the brand-new code, and a minor update turns into full-scale development. However, developers can use AI to find bugs, improve previously written software and enter adjustments according to specific criteria.

- Analysis of plans and search for the best development path: AI provides an opportunity to analyze road maps and coordinate plans and development speed. This significant advantage is implemented in teams of 10 experts and more. AI tracks projects performance, improves predictions and finds the best way for tasks completion and assignment.
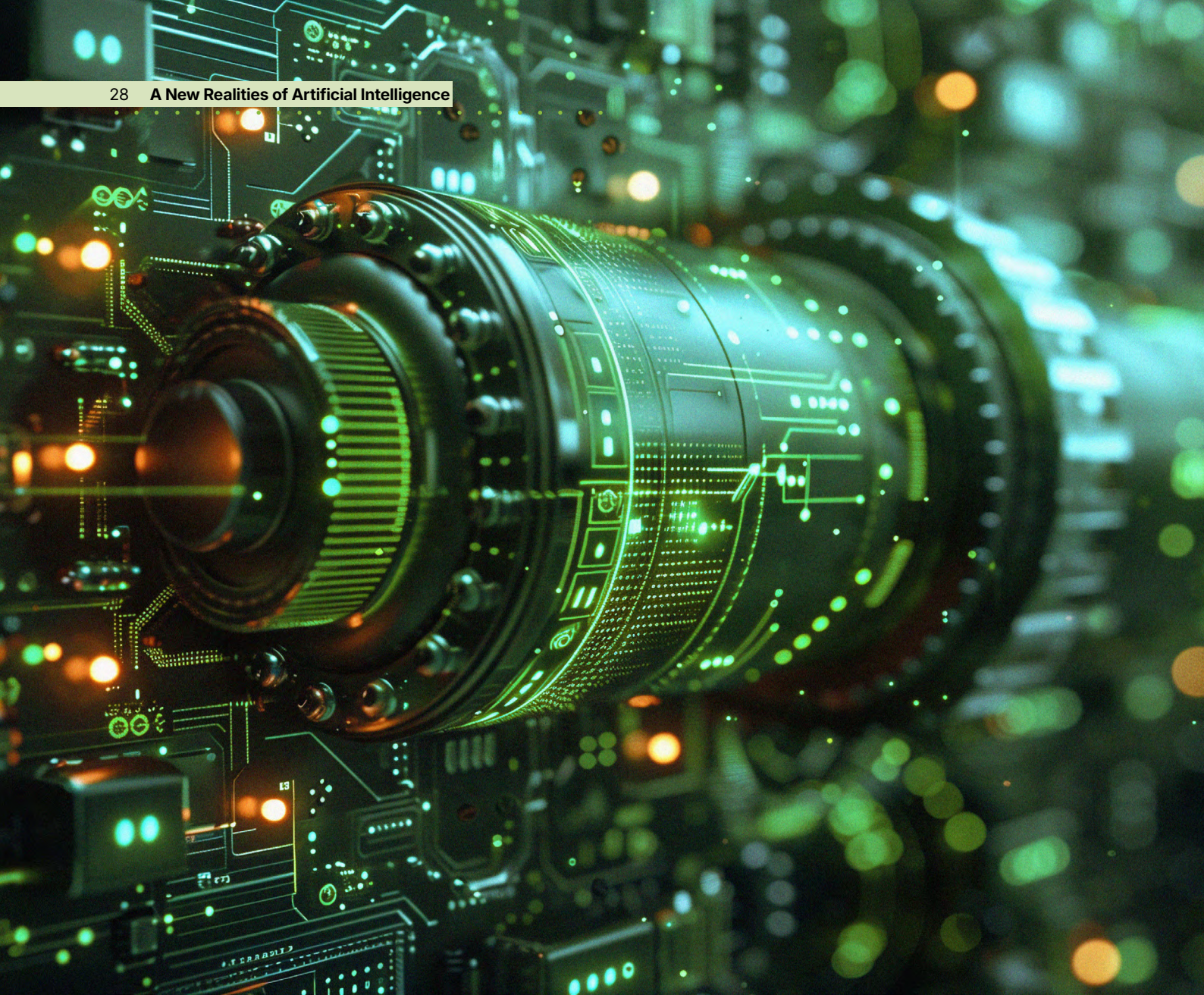
Despite all benefits of AI, developers are ahead of it in many processes.

So you still need a development team:

- Comperformance requirements. For this, among other things, such development standards, as PEP8, etc., are elaborated. This makes it possible to teach AI systems, and then generate code using the same standards.

- AI works best in a narrowly defined area. It can create the code which solves specific tasks, but such solutions will not be perfectly aligned with the overall product. We need a developer, who would be able to align all developed software in terms of style and function.

How to use AI in software development?

Knowing when and how to use AI is critical for making the most of available tools. Let us review the best options and practices to use AI in software development.
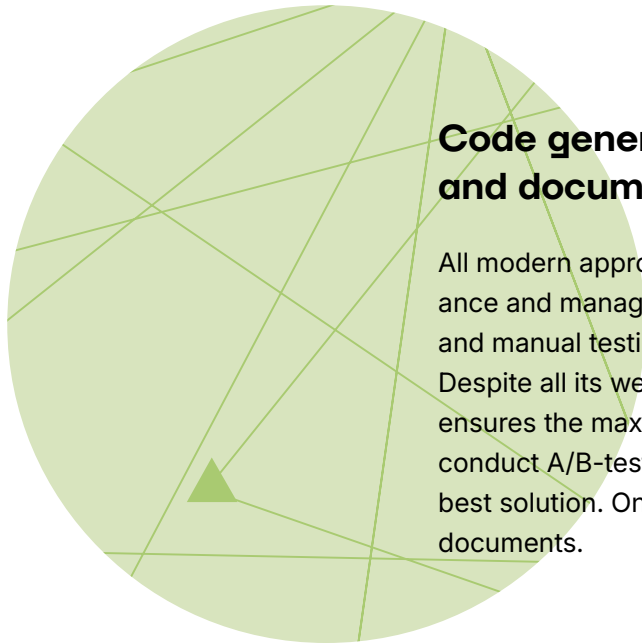
Code generalization and documents drafting

All modern approaches to development require quality assurance and management, which is expressed in automatic and manual testing. AI can automate the testing process. Despite all its weaknesses, AI combined with manual tests ensures the maximum code testing coverage. AI can also conduct A/B-testing of two software versions to identify the best solution. Once testing is complete, AI can draw up the documents.

Specific coding processes optimization

Automated tools can improve coding and speed-up projects implementation. Unlike common code generation, such tools are able to:

- Suggest new code lines, recognizing the code of the task being implemented;

- Introduce small corrections in real time, e.g., as related to syntax; automatically add line-end strokes, closing brackets, etc.;

- Supplement branching operators with all required commands. Thanks to these tools, developers can concentrate on the creative aspect of coding.

Such approach also allows them to try other code blocks combinations and other ways to solve tasks, while AI will generate code blocks for them.

Debugging

Automated debugging routines are one of the most wide-spread artificial intelligence tools in software development. Developers can identify problems manually, but AI is able to improve the process due to revealing and eliminating bugs in the blink of an eye. Some tools are even able to predict future bugs based on your data.

AI can not always identify complex errors, but in simple testing it saves many hours spent for debugging.

It is worth mentioning, that systems for project planning and resource allocation are already being developed:

- Successful projects involve thorough planning and assessment, as well as budget compliance. AI can analyze previous projects, collect data on resources allocated, and recommend the assessment for similar new projects. Such assessments help the company make a decision on the advisability of participation in a project with existing resources.

- Once resources are allocated, AI helps predict the results. Namely, automated project tracking platforms use these data to manage:

  - Project timing and stages;

  - Budget and resource planning;

  - Scope of project;

  - Workflows.
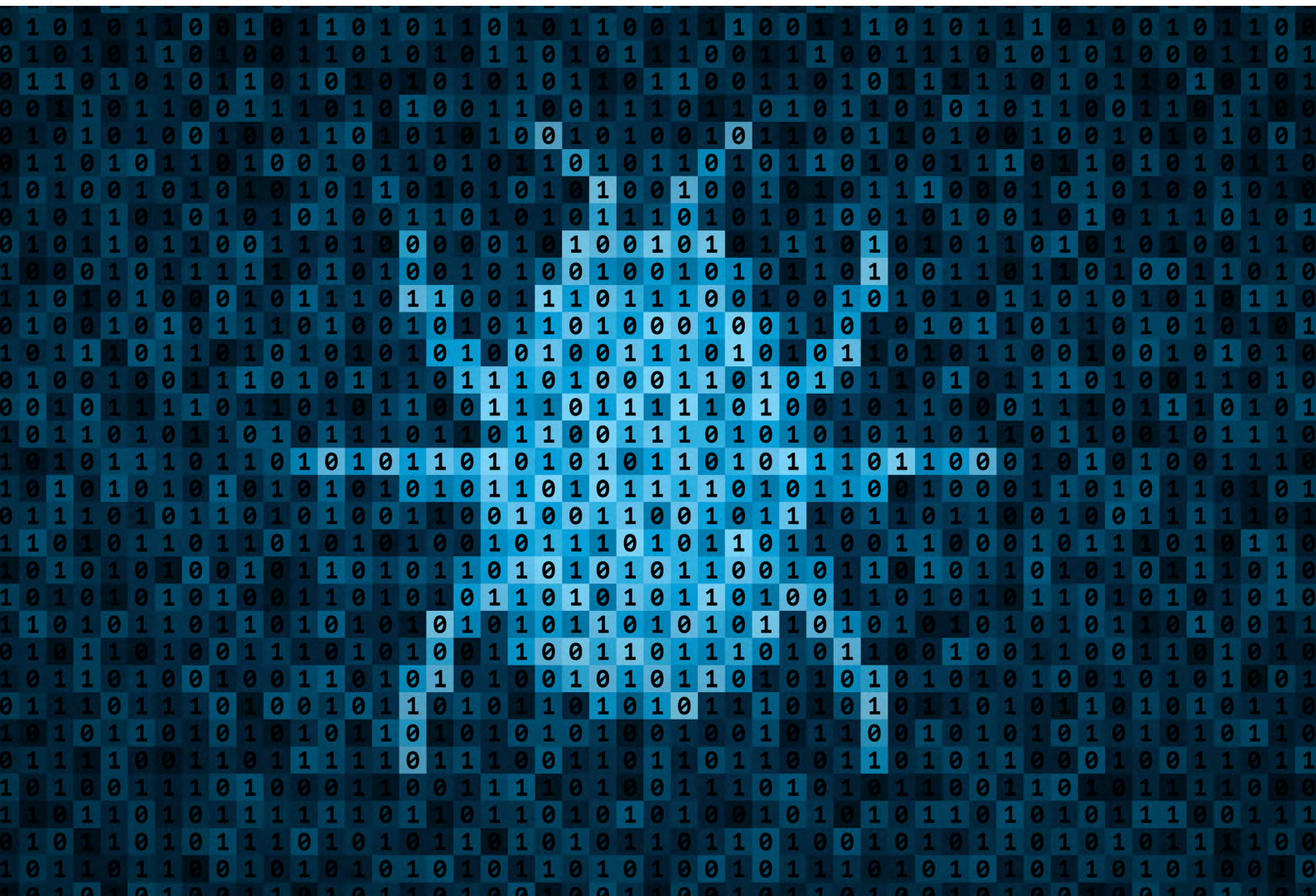
Mitigation of entry barriers for non-developers

Software development requires deep expertise, that's why there are skill gaps and barriers for such team members as testers, analysts, and project manager. Generation of code with AI allows less experienced team members to employ a tool, which can be useful to check new ideas and approaches to solve a major business task. It is also important, that this additional tool allows developers to perform more complex tasks and improve their skills.

Conclusion

It is safe to say that AI represents the present and the future of mankind. AI is already successfully integrating both into our personal and professional lives. This, in turn, means a growing amount of work for AI developers. Sooner rather than later, we will start to successfully adopt AI-assistants to develop AI-assistants. The circle is closing. Get the popcorn!
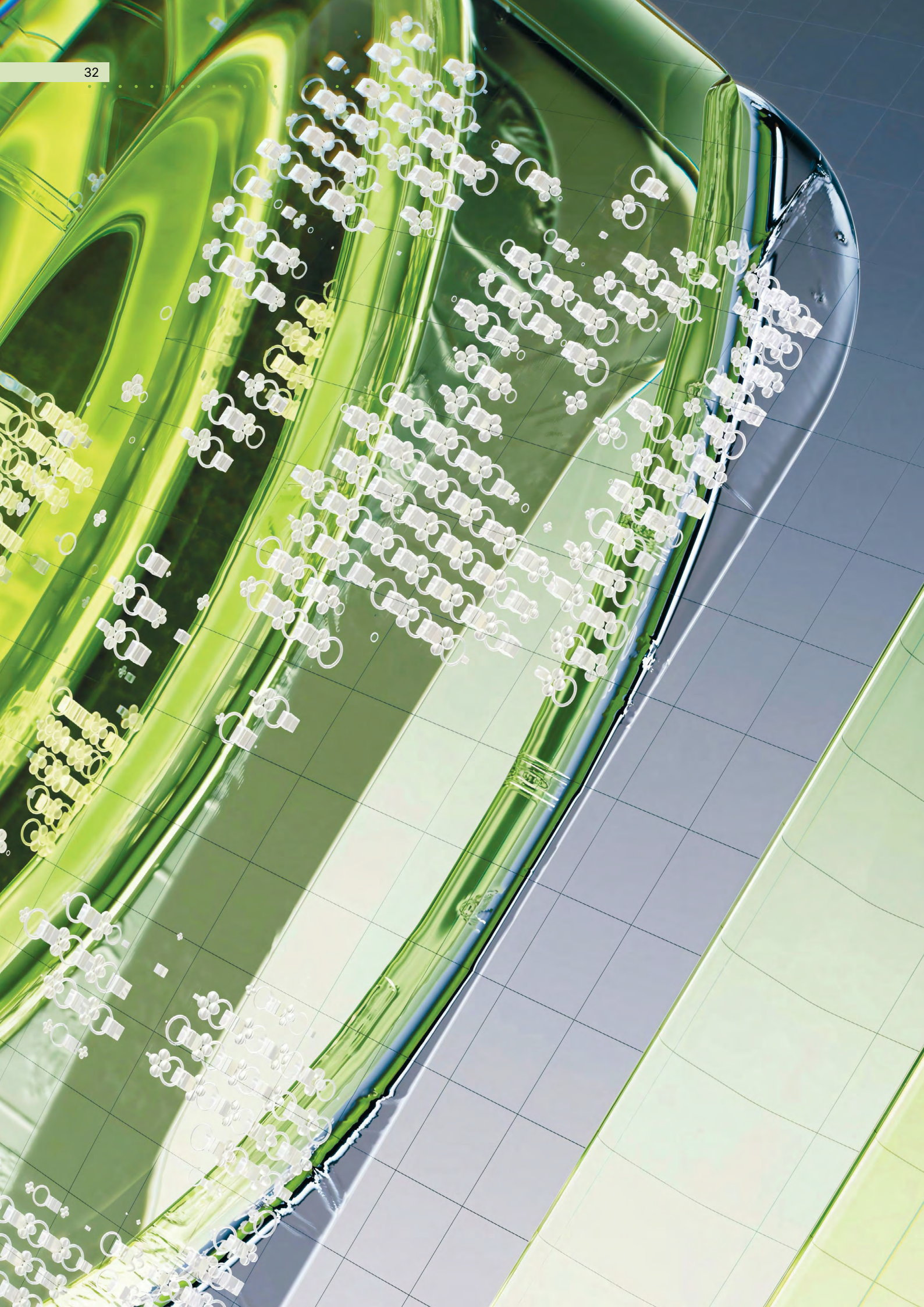
Business Involvement In AI: Real Cases

Learn more about the application of advanced technologies with examples of AI implementations in the oil and gas, manufacturing, and agriculture industries.

Our Competencies In The Oil & Gas Industry

Ilya Smirnov

Head of AI / ML Department at Usetech

" We don't shy away from our know-how, we're not afraid of competition, and we're ready to share our proven cases. We are constantly involved in interesting projects on the edge of the fantastic. Fantastic because just a few years ago it would have seemed impossible to meet these business requirements. It is impossible to predict behavioral scenarios and so on, but we are already solving global problems on a global scale.

Introduction

The oil and gas industry continues to grow rapidly, attracting more and more investment from companies. The Middle East has dominated the oil market since the **1950s** and shows no signs of slowing down. On the contrary, the impact of new technologies is increasing every year, and companies are discovering more ways to make their projects happen.

For example, AI, which we talk about a lot in today's issue, is already being used in the oil and gas industry for complex analysis and workflow optimization. AI is helping to speed up processes that used to take a lot of time. As more companies become comfortable using AI in the oil and gas industry, they will strengthen their position and outperform the competition.

We would like to share with you some of the Usetech team's cases in the manufacturing sector. If you are interested in any of the solutions, contact us via email

▶ **contact@usetech.com**
or via phone
▶ +48 571 349 433 (Yuliya)

Let our team know you heard about the case study through the magazine and book a meeting.

Simulation Of Hydrocarbon Accumulation Search

Seismic exploration is used not only to find structures that may contain hydrocarbons, but also to select the optimal location for exploration wells drilling. The only reliable way to find out whether a trap contains industrial gas quantities is to drill a well. On average, only one out of three drilled wells turns out to be a field.

The main problems of production:

Seismic exploration is an expensive method of exploration. The cost of seismic exploration depends on many factors, such as the size of the area to be surveyed, the complexity of the geological conditions, the need for specialized equipment, etc.

Difficulty in interpreting results: Seismic exploration can produce ambiguous results that require careful analysis and interpretation. This is due to the complexity of geological structures and the presence of various factors that affect wave propagation. The Earth's crust is made up of different layers, each with its own unique properties, which can also make data interpretation difficult.

Environmental risks: Conducting seismic surveys can disrupt the ecological balance in the area being surveyed. Noise and vibration can scare away animals and disrupt their natural processes such as migration, breeding and foraging. In addition, the movement of machinery and installation of equipment can result in the destruction of vegetation.

Project description

The solution is based on a droplet-bubble model of the field. The application of machine learning technologies makes it possible to discriminate spontaneous hydrocarbon oscillations at depths of up to 7 km from the surface microseismic noise.

As a result, the project generates a map of parameter anomalies corresponding to projections of field contours on the surface. The method allows the anomalies to be separated into gas and oil anomalies.

The project involves the migration of measured data to identify multilayer reservoirs. The migration results in a 3D model of the hydrocarbon reservoir, which allows the estimation of reserves. The developed approach makes it possible to identify hydrocarbon reservoirs, estimate reserves and make recommendations for the positioning of new wells.

Results:

The developed 3D model determines hydrocarbon accumulation, allows the user to assess reserves, and provides recommendations for new wells location:

- Improved field development efficiency

- Reduced drilling of empty wells and drilling cost savings

- Integrated modeling and operational asset management

- Improved accuracy of results and reduced probability of interpretation errors

- Predict geologic structures and identify the most promising locations for hydrocarbon exploration

- Minimize human error in seismic acquisition

- Up to **7 km** depth of hydrocarbon vibration detection

- More than **85%** direct prediction accuracy

Using Machine Vision To Monitor Compliance With Industrial Safety Regulations

One of the main goals of the company is to strive for zero injuries. It is difficult to achieve this result in manufacturing plants, as it requires paying attention to every detail and responding immediately to incidents if safety requirements are not met.

The main problems faced by manufacturing:

Injuries at work: the problem of injuries at work is a topical issue for many industries. It results in economic losses, loss of productivity, as well as illness and even death. To solve this problem, it is necessary to take comprehensive measures aimed at preventing injuries and ensuring the safety of workers.

Fines and compensation: there are penalties for companies for violating industrial safety requirements. If a violation has resulted in an accident or an immediate threat to human life and health, the fines for companies are significant. Companies need to be proactive and prevent incidents.

The need for continuous monitoring: while working, people can unwittingly become violators because they are distracted by, for example, unusual noises, coworkers, or their own thoughts. Thus, it is necessary to ensure continuous monitoring of actions and compliance with certain rules in the danger zone. It is very difficult to do this with human visual control.

A solution based on machine vision technology:

The solution for continuous monitoring is based on machine vision technology which detects not only wearing of PPE but also equipment, human access to a certain area, monitoring of illegal activities of employees in certain areas. The video from the cameras is transmitted to the system, where it is processed with the help of a trained neural network. If an incident is detected, the system notifies of the violation. This allows real-time monitoring of safety compliance and prevention of occupational injuries.

Results:

- Rapid detection of anomalies and other hazardous situations

- Automatic notification and rapid incident response

- Improved workplace discipline and safety culture

- Reduced costs by reducing fines, insurance payments and compensation

- Increased labor productivity

- Improved company image, no negative news stories

- **100%** automated control

- **10** times reduction of industrial safety violations

Forecasting Of Optimal Consumption Of Energy

Raw materials extracted from oil wells are no longer used in their pure form anywhere. First, oil refineries perform oil fractional distillation — first primary one, then secondary one — using high temperatures.

Project description

Based on the analysis, consumption parameters and quality characteristics of energy have been determined, the forecasting model of energy consumption (error < 2%), optimal resource consumption and plant operating modes' detection has been developed.

Results:

The developed forecasting engine determines how much gas needs to be burned for raw materials refining. The service makes it possible to reduce fuel consumption and improve products quality:

- Reduction of energy consumption

- Improvement of products quality

- Automation of equipment operation

- Optimization planning of gas consumption

Our Competencies In The Manufacturing Industry

Introduction

The digitalization of industrial enterprises is a consistent and gradual process. There is no need to rush to implement everything and everywhere. In our experience over the years, the main ingredients of a successful AI project are awareness, assessment of the applicability of Artificial Intelligence and budget control. Digitalization is not about implementing technology everywhere; it is more about thinking processes within the enterprise.

The application of AI in manufacturing has a wide range of use cases, such as: supply chain optimization, quality control, process optimization. For manufacturing, the implementation of machine learning represents a strategic step towards modernization and maintaining leadership in a highly competitive environment.

Several main components of a successful project can be emphasized:

- High-quality digitized historical and current data as the basis for all mathematical models;

- An expert design and implementation team with a wealth of industry knowledge;

- Support from the production side, "ambassadors" of AI projects at the enterprise;

- Economic feasibility of implementing Artificial Intelligence-based technologies.

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Vibromonitoring: Balancing Technology

Vibromonitoring — is a method of equipment technical condition monitoring based on vibration data mathematical analysis.

One of the most important ways to increase the efficiency and reliability of equipment is constant monitoring of its technical condition. Diagnostics is an integral part of repairs, allowing the user to identify equipment defects and analyze causes of its failure.

Problematics

Excessive repair costs

Scheduled repairs are conducted to reduce equipment failures and maintain its good working condition. At the same time, scheduled repairs involve both faulty and non-faulty parts replacement.

Equipment downtime because of failure

Unpredictable failures lead to unforeseen equipment downtime and financial losses. Moreover, each emergency stop breaks the manufacturing process and causes extra risks and financial losses.

Large assortment of operating equipment

Operating a wide variety of equipment is not critical, but leads to some problems, which may cause financial losses, i.e., difficulties related to repairs and maintenance planning, inventory management, etc.

Benefits Of Implementation

- Actual equipment condition monitoring

- Maintenance costs optimization

- Increase in consistency of operation

- Repairs scheduling on the basis of actual equipment condition analysis

- Repair interval extension due to unreasonable scheduled repairs elimination

- Increase in efficiency of equipment and production

Vibromonitoring:
The Way To Identify Defects

Three-dimensional vibration measurement

Our method is based on three-dimensional vibration measurement at a surface point. This innovative method allows us to draw a detailed three-dimensional phase pattern, which would be substantially changed by any defect.

Reducing the number of iterations leads to a decrease in balancing weights and the total weight of the system to be balanced. The initial consideration of vector imbalance of components makes it possible to perform balancing with no additional adjustments.

Real-time vector measurement

Through real-time vibration vector measurement at a particular material surface point, our method ensures more informative data representation as compared to traditional techniques. This is due to the lack of phase dispersion among measurement channels or axes, which increases the informative value.

System energy assessment

Three-dimensional vector measurement allows us to assess the vibrational system energy in order to reduce total energy after one-dimensional balancing.

This includes solving the problem of real three-dimensional vector imbalance and axial vibration.

Three-dimensional vibration measurement

Our method is versatile, it is suitable for dynamic balancing of all rotor types and allows us to perform balancing of a flexible rotor with 1–3 modes using the same number of iterations as for a rigid one. Such efficiency is achieved due to precise assessment and less non-matching vibrations on X and Y axes.

Vibrodiagnostics fordefects identification

One of the most important ways to increase the efficiency and reliability of turbine systems is constant monitoring of their technical condition.

Diagnostics is an integral part of repairs, allowing the user to identify equipment defects and analyze causes of its failure.

The solution is based on the technology of three-dimensional vibrations recording at a surface point. The feature of the technology is the lack of phase and time delays among the axes (4D = 3D + time / synchronization).

The analysis of the turbine trajectory vibration pattern is carried out, and any abnormalities, defects and cracks are revealed. This allows the user to conduct three-dimensional balancing of large turbines, eliminate imbalance and establish the vibration plane.

The assessment of ore grain-size distribution was carried out manually through visual inspection, there was a high probability of human error. To solve the problem, the computer vision system for ore recognition on a conveyor belt has been developed.

Detection Of Ore Grain-Size Distribution

Project description

Photostream analysis, ore segmentation, size calculation, and decomposition of sticky granules are performed.

Results:

The computer vision system makes it possible to reduce mill downtime and equipment breakdowns, and provides optimal mill rotation management.

- Increase in performance

- Reduction of equipment failure risk

- Reduction of production cost

- Reduction of human errors

- Up to **10%** reduction in energy consumption

- Over **98%** accuracy in recognizing oversized stones

Detection Of Ore Grain-Size Distribution — Core Analysis

Core analysis is a key stage in the study of geological rocks. It provides information on the structure and composition of rocks, their age, formation conditions, hydrocarbon presence and other characteristics. The results of core analysis are used for geologic mapping, well drilling planning, estimation of mineral reserves and other purposes.

Major challenges facing production:

Time and resource costs: core analysis is a labor-intensive process that requires time and resources. Core sample collection, processing, and analysis processes need to be optimized. On average, analyzing a single sample can take anywhere from a few days to a few weeks. For complex geochemical studies, the process can take months.

Complexity and interpretation of results: Interpretation of core analysis results can be a complex task requiring highly skilled professionals. Incorrect interpretation can lead to erroneous drilling or development decisions.

Errors and inaccuracies in description: the problem with describing rocks manually is that the process can be laborious and time-consuming. The geologist must visually examine the rock sample and describe its color, texture, structure, and other characteristics. This requires care, experience, and expertise. In addition, manual description can lead to errors or subjectivity in estimates.

Machine vision technology based solution:

A solution based on machine vision technology is used to recognize core, a rock sample extracted from a well during drilling. This automates the core analysis process and speeds up the results. A machine vision-based algorithm detects rock columns and determines the geologic rock class based on a set of characteristics. This automated approach speeds up the processing of one box of core up to 10 times. Another advantage of the method when embedded in the system is the automatic determination of depths corresponding to each column. The system also provides the ability to automatically synchronize the recognized core with seismic and electrical survey data.

Results:

- Increased accuracy in determining core quality and parameters

- Reduction of core analysis time

- Savings on laboratory core analysis and reduced contractor costs

- Reduced payback period for site license and drilling costs

- Identification of prospective areas in the reservoir

- Minimize human error in core evaluation and interpretation of results

- Up to 10 times faster processing of one core box
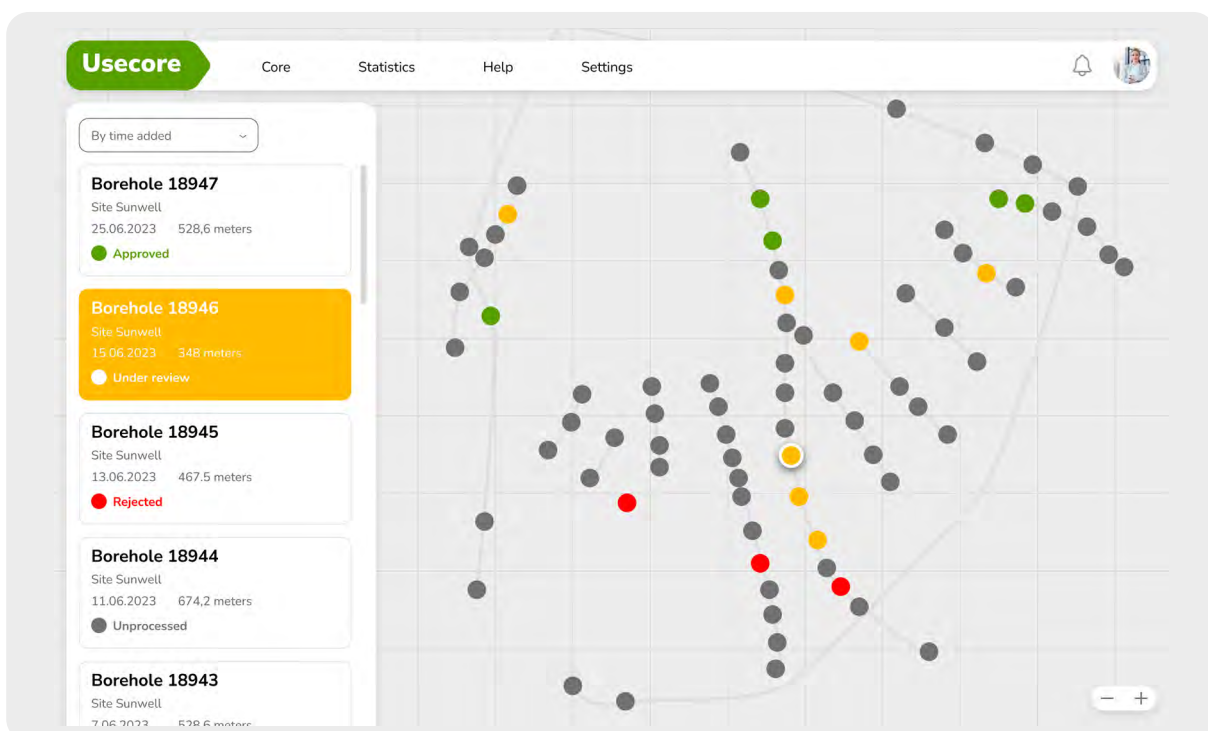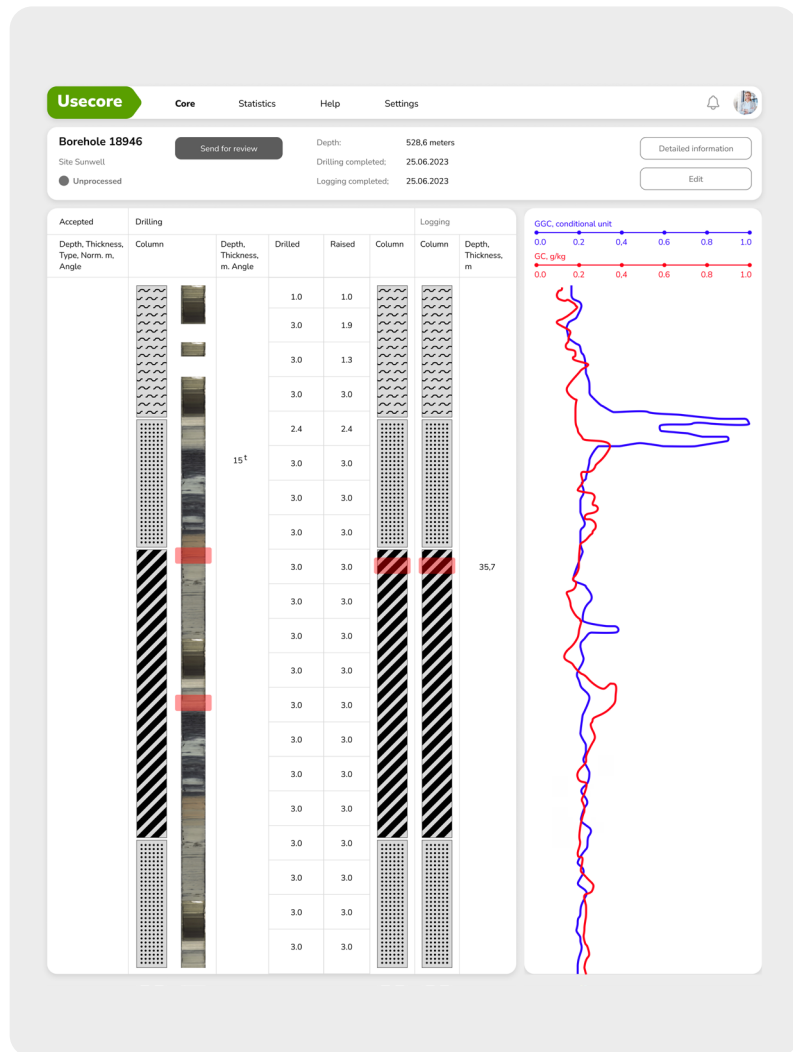
Controlling The Technological Process Of Baking Products With The Help Of Computer Vision

Machine Learning and Computer Vision are already an integral part of businesses in all industries, and the food manufacturing industry is no exception. In this industry, digital technologies play a major role in ensuring food safety and quality control, minimizing food waste, optimizing production processes, etc. The use of Machine Learning based technologies continues to grow and is expected to expand further in the coming years.

Why is this important for the company?

When baking products, it is essential to ensure that the result is consistent and meets consumer demands. A company that values its reputation and customers cannot afford to market products of inadequate quality. The risk of receiving low-quality finished products is a direct loss for the company. In addition, these technologies help relieve production personnel from time-consuming routine work.

What were the requirements for the system?

The computer vision system required mobility, autonomy, reliability, and accuracy. It was also important to comply with the principle of scalability and fault tolerance.

What is the developed solution?

The developed system consists of a camera and software that recognizes and monitors the quality of baked goods by color in real time.

What results have been achieved with the implementation of the system?

Firstly, we have reduced the workload of our staff: now an automated task performs the baked goods control for them. It is important to note that this has not led to a reduction in workplaces, but rather to relieve employees of routine tasks. The introduction of the computer vision system provided 100% automated control of the degree of product readiness. In addition, the reject rate of finished products has decreased, and the quality of finished products has improved.

# Our Competencies In The Agricultural Industry

Introduction

The agriculture industry is being transformed every day by massive digitalization and technological advancements. Digitalization is having a profound impact on the agricultural sector, helping businesses to automate work processes and optimize them. New technologies help to work more efficiently with data: to collect and analyze data in large quantities, to process the information, and as a result to gain valuable insights for their enterprise and its development.

According to the UAE Agriculture Market Report[13] (Mordor Intelligence), the UAE Agriculture Market size is estimated at USD 3.31 billion in 2024, and is expected to reach USD 4.09 billion by 2029, growing at a CAGR of 4.30% during the forecast period (2024-2029).

As the market is showing high growth potential, it will be right to invest in new technologies to build off the competitors.

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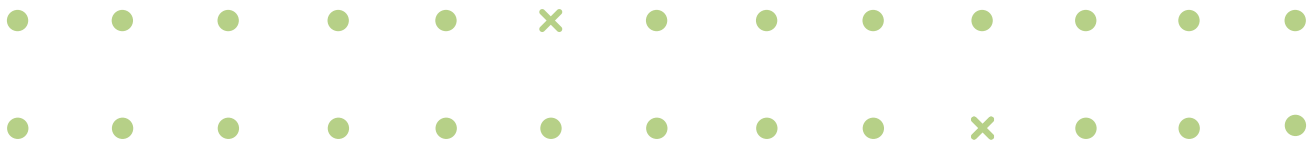
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Let our team know you heard about the case study through the magazine and book a meeting.

Revolutionizing Plant Disease Detection With Image Analysis

Client Overview:

A large-scale agricultural enterprise focused on optimizing crop yield and maintaining sustainable farming practices.

Description:

The agricultural company aims to deliver innovative solutions to improve crop health monitoring and management. They sought to implement a sys-tem capable of accurately diagnosing common plant diseases through image analysis, enabling farmers to take timely and effective action to protect their crops.

Situation:

The client needed an advanced diagnostic tool to help farmers identify and manage plant diseases quickly and accurately. Traditional methods of disease detection were often slow, labor-intensive, and prone to human error. The client required a system that could provide reliable disease identification to enhance crop management and reduce losses.

Challenges:

- Accurate Disease Identification: The system needed to distinguish between multiple plant diseases with high accuracy.

- Efficiency: The solution had to deliver quick results to enable prompt intervention.

- Scalability: The system needed to handle large volumes of data and be applicable to various crops and diseases.

- Easy Interface: Farmers and agricultural workers needed a system that was easy to use and interpret.

Action:

System Development and Implementation:

1. Image Acquisition and Preprocessing:

- Collected a large dataset of plant leaf images affected by various diseases, including leaf rust, powdery mildew, septoria, stem rust, yellow rust, and multiple diseases.

- Implemented image preprocessing techniques to enhance the quality and features of the images for better analysis.

2. Machine Learning Model Development:

- Developed a machine learning model trained on the prepro-cessed image dataset to identify and classify the specific plant diseases.

- Employed advanced algorithms to ensure the model's accuracy exceeded 93%.

3. System Integration:

- Integrated the machine learning model into a user-friendly software platform accessible to farmers and agricultural workers also developing of mobile apps.

- Ensured the system could analyze images quickly and provide instant diagnostic results.

4. Testing and Validation:

Conducted extensive testing and validation to ensure the system's accuracy and reliability across different crops and environmental conditions.

Results:

- High Accuracy: The developed system achieved an accuracy of more than 93% in identifying and classifying plant diseases.

- Efficiency: Provided quick diagnostic results, enabling farmers to take immediate action to protect their crops.

- Scalability: The system was scalable and adaptable to various crops and diseases, making it a versatile tool for different agricultural settings.

- Easy Interface: Farmers and agricultural workers found the system easy to use, with clear and actionable diagnostic results.

Engagement Impact:

- The implementation of the image analysis system for plant disease detection significantly enhanced the client's ability to provide valuable diagnostic tools to farmers. By achieving a high accuracy rate and delivering quick, reliable results, the system helped farmers identify and manage plant diseases more effectively. This led to:

- Reduced Crop Losses: Early and accurate disease detection allowed for timely interventions, reducing the overall crop losses by 20%, which translated to a savings of approximately $500,000 annually for the farmers using the system.

- Improved Crop Health: Consistent and precise monitoring improved overall crop health and yield, leading to a 15% increase in crop production.

- Increased Farmer Satisfaction: Farmers reported higher satisfaction due to the system's ease of use and reliable performance, with 90% of users expressing positive feedback.

Overall, the system transformed disease management practices in agriculture, providing a robust solution that benefited both the client and the end-users, leading to a healthier and more productive agricultural sector.
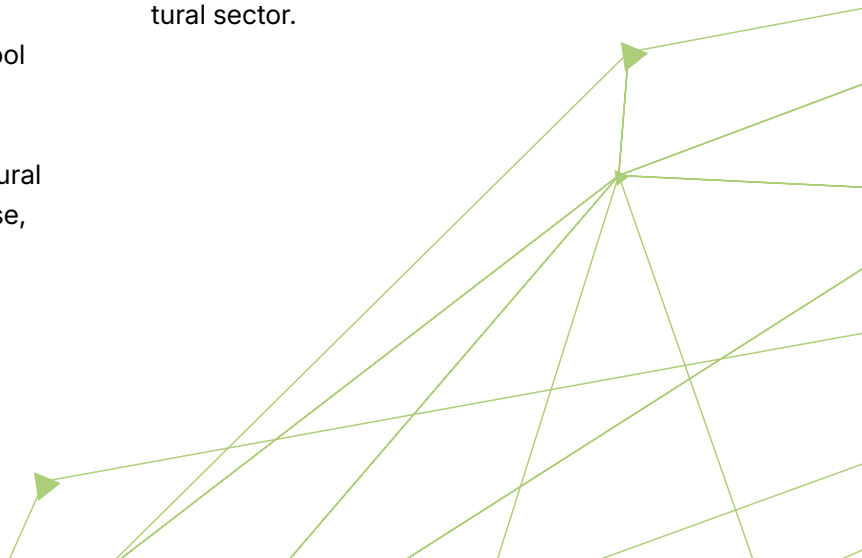
Optimizing Vertical Farming With AI And Led Technology

Client Overview:

An innovative agricultural company specializing in the vertical cultivation of vegetable crops.

Location:

North America

Description:

The client sought to implement modern technology for vertical cultivation of vegetable crops using artificial light (LEDs) and artificial soil to significantly reduce the cost of growing vegetable crops. The goal was to create a highly controlled environment that could simulate optimal climatic conditions for various crops, thereby enhancing yield and quality while reducing resource consumption.

Situation:

Traditional farming methods often face challenges such as limited arable land, dependency on weather conditions, and high resource consumption. The client recognized the potential of vertical farming to overcome these challenges by using artificial lighting, heating, ventilation, and climate control technologies to create ideal growing conditions for vegetable crops year-round.

Challenges:

- High Initial Investment: Establishing vertical farming facilities with advanced technologies required significant upfront costs.

- Optimizing Climatic Conditions: Identifying and maintaining the optimal climatic parameters for different crops was crucial to maximizing yield and quality.

- Resource Management: Efficiently managing resources such as energy and water to minimize costs while ensuring optimal growing conditions.

- Integration of AI Systems: Developing and integrating AI systems to monitor and adjust the greenhouse parameters in real-time.

Action:

Implementation of Modern Technologies:
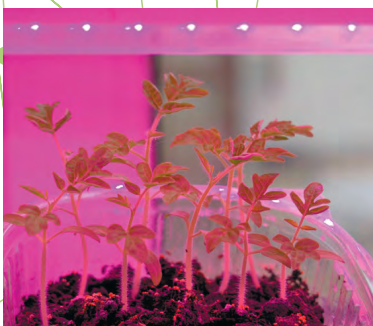

1. Artificial Lighting and Soil:

- Installed state-of-the-art LED lighting systems to provide precise light wavelengths required for the growth of various vegetable crops by client.

2. Climate Control Systems:

- Implemented advanced greenhouse technologies to control lighting, heating, ventilation, humidity, and pressure, enabling the simulation of various microclimates.

- Used AI technologies to select and simulate optimal climatic parameters for each crop.

3. AI Integration:

- Developed AI systems capable of continuously monitoring greenhouse parameters and making real-time adjustments to maintain optimal growing conditions.

- Ensured AI systems could evaluate the optimal ratio of costs and output quality, providing commands to optimize resource usage (energy and water).

Results:

- Cost Reduction: Achieved a 25% reduction in overall growing costs through the efficient use of artificial lighting and optimized resource management.

- Increased Yield and Quality: Enhanced crop yield by 30% and improved the quality of vegetable crops by maintaining ideal growing conditions.

- Resource Efficiency: Reduced energy consumption by 20% and water usage by 35% through precise climate control and resource management.

- Scalability: Successfully scaled the vertical farming operations to accommodate various vegetable crops, demonstrating the feasibility of the technology for large-scale production.

- Sustainability: Minimized environmental impact by reducing dependency on natural resources and utilizing sustainable farming practices.

Engagement Impact:

The implementation of modern technology for vertical cultivation significantly transformed the client's farming operations. The integration of artificial lighting, climate control, and AI technologies resulted in substantial cost savings and improved crop yield and quality. The client experienced:

- Increased Profitability: The cost reductions and yield improvements led to a 40% increase in profitability.

- Market Leadership: Positioned the client as a leader in innovative agricultural practices, attracting new business opportunities and partnerships.

- Sustainable Growth: Established a model for sustainable agriculture that can be replicated in various regions, promoting the adoption of vertical farming technologies.

Overall, the project showcased the potential of modern technology to revolutionize vegetable crop production, providing a sustainable and cost-effective solution to meet the growing demand for high-quality produce.

Innovative AI Projects You Never Thought Of

The most interesting and incredible AI cases and global practices. You didn't even know it was possible!

Interview With Brian Prince, Founder & CEO Of TopAITools[14]

We are welcome Brian Prince, CEO of TopAITools and consulting CMO at XCoins, champions AI innovation leveraging his vast tech and marketing expertise.

His ventures, including Hotel Hotline and Best of the Web, underline his success in digital marketing and online platform development, positioning him as a thought leader in AI's evolving landscape.
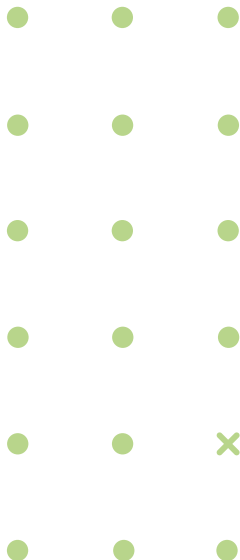
Hello Brian! We are happy to offer you an opportunity like an interview to tell a wider audience more about you and your experience. Did you see (or envisioned) the field of AI actively evolving when you first started working with it?

I first started getting familiar with AI software during my involvement as CMO of Xcoins, a sizable crypto exchange platform. I used AI to help optimize marketing emails, PPC ad copy, language translations, social media content, SEO strategy, Facebook ads, AI-generated custom images and, above all else, strategy planning and project management.

It was during that time I realized the tremendous potential AI has to streamline workflows for small business owners, enhance creativity, and free our time to work on big-picture strategy, core competencies, and other tasks that still require the human touch.

(14)

Could you point out what's in store for AI in the next 5 years?

I think we're going to see the tools we already have just getting better and better.

The next phase after generative AI might well be interactive AI, where the tools are communicating with each other to complete a task.

Rather than providing detailed, step-by-step, very clear prompts, we might be able to give AI a specific end goal, and it will figure out how to get there. Of course, we'll need lots of regulation surrounding those capabilities to ensure an AI doesn't "go rogue," so to speak.

After that, or simultaneously, we'll start to see "Artificial General Intelligence (AGI) or "superintelligent" AI – LLMs that give the appearance, at least, of independent thought. OpenAI has already launched a new "Safety and Security Committee" to begin protecting against any threats, superintelligent AI may pose.

In what areas do you think the use of AI is not applicable?

Right now, it's clear there are many tasks AI still cannot do as well as human workers. While it's fun to play around with AI graphics, we're creating marketing materials, not fine art. I do feel a new genre of both visual art and music is emerging from creatives incorporating AI into their projects.

AI has yet to match our team of copy-writers and content writers when it comes to creating engaging and informative material. It's great for strategy, ideas, and tweaking though! It's like that smart friend who can help you find the perfect line when you're stuck.

AI also can't build relationships, and that's crucial in today's world in so many fields.

Now let's talk a little bit about you so that our readers get to know you better. What makes you happy every day?

I love this question! Beyond the obvious of spending time with my family, I love collaborating with my team on creative endeavors and constantly brainstorming ways we can improve the site. I find that rewarding. I have an insatiable curiosity for innovation. And, as a serial technology entrepreneur, I love a new challenge.

What advice do you have for aspiring AI professionals?

As in any business or field, don't be afraid to be the one who is innovating. Of course, it's not always necessary to reinvent the wheel, but when you can come up with a truly unique concept, idea, or leap forward, do it!

Also, keep your transferable skills in mind. AI is a completely new and emerging field. What talents, skills, and experience do you have from the past that you can bring to this career?

Read the full interview on our blog:
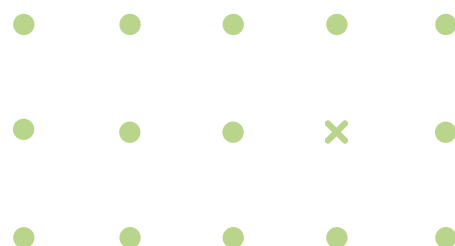
Interview With Angel Vossough, CEO Of Better AI[15]

Angel Vossough, CEO and Co-Founder of Better AI, leads the creation of innovative AI solutions like "VinoVoss".

VinoVoss is a semantic search and recommendation system, creating a virtual wine sommelier.

Hello Angel! You have an impressive background, and first, our readers and I would like to know more about how you started your career and got into this field?

My journey in technology began with a passion for applied math and coding. This interest led me to pursue my Bachelor's degrees in Mathematics and Computer Engineering and then a Master's in Software Engineering. After this, I worked at Cisco for over a decade as a network engineer. I became fascinated by the power of statistics and the potential of big data. My role involved analyzing vast amounts of data to monitor network performance and detect anomalies, which was both challenging and incredibly rewarding.

As one of the only women on my team, I was also tasked with recruiting and supporting other women in technical roles. This experience revealed not only the complexities of integrating a demanding tech-career

with personal life stages, but also the significant drop-off of talented women in tech after starting families. Watching my high-achieving female friends struggle to balance their careers and personal lives further fueled my desire to create solutions that could help women navigate these challenges better.

I know that you are using AI, computer vision, NLP and other technologies to create "VinoVoss" (an AI-powered virtual wine sommelier), a transformative semantic wine search and recommendation engine that is revolutionizing the relationship between wine and digital platforms. Could you tell us more about this solution?

In creating VinoVoss, we are using the latest AI technology to enhance the wine selection experience. As mentioned, we use natural language processing (NLP), and computer vision to understand and interpret user inputs and queries. Unlike traditional search engines, VinoVoss is a semantic search engine, which is capable of understanding user queries and provides a better user experience for both wine enthusiasts and people new to wine.

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For instance, if a user describes their ideal wine experience using subjective terms like "I am looking for a fruity and bold red wine that goes well with grilled steak for my friend's 50th birthday", VinoVoss can interpret the query and understand the user intent to recommend the best wine available in our database. The goal is to make wine discovery more intuitive by bridging the gap between user expectations and the complex world of wine.

Why did you decide to use AI in an industry like wine? How did you get the idea?

The idea for VinoVoss came from a personal struggle when selecting wine. Wine selection can be an intimidating experience at a restaurant or wine shop, since the process is often loaded with jargon and subjective descriptors. I became curious about the complexity underlying the wine selection process. When I went back to school to earn my second Master's degree in Data Science at UC Berkeley, I decided to focus my capstone project on wine search and recommendation

using natural language processing (NLP). This was an exciting challenge for applying AI to the traditional industry of wine. Our academic research evolved into BetterAI's new product, VinoVoss.

By integrating AI, computer vision, and NLP, VinoVoss aims to simplify and enhance the wine selection process and provide tailored, intelligent recommendations.

Could you demonstrate how your tool works?

Here is our landing page for searching wines. The user can enter a search query using their own language with their current level of knowledge. This means that VinoVoss can assist both wine enthusiasts using specific wine terms, as well as beginners. VinoVoss is additionally trained to understand peripheral, non-wine content in the user's query, such as descriptions of the occasion, event mood, weather – anything that the user wishes to include.

Here is an example of a user search:
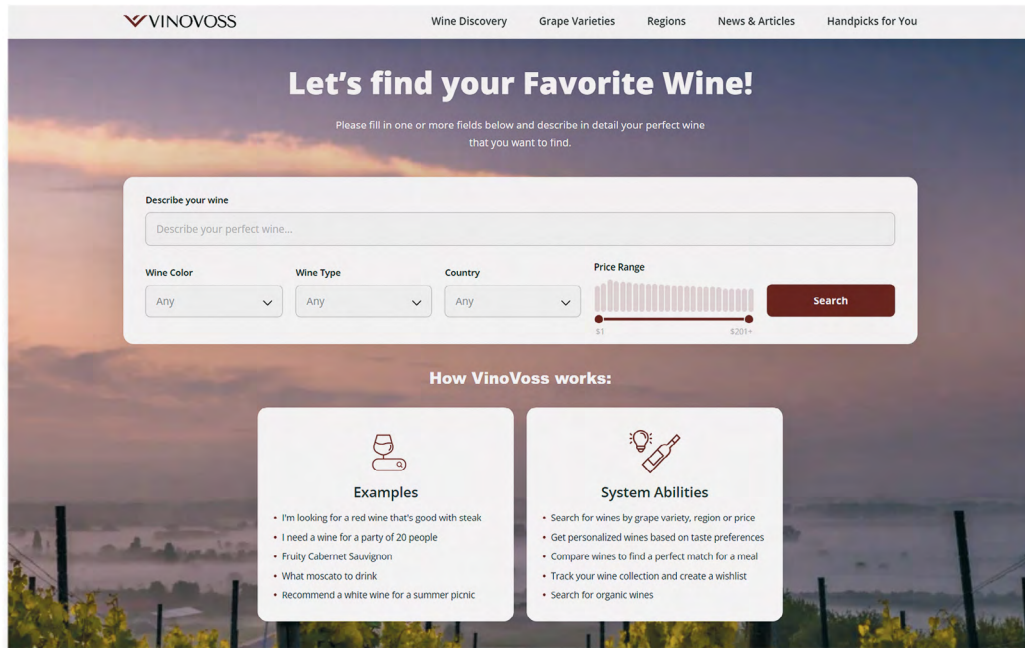
As you see in the page results below, the system found and applied relevant filters based on the user's query.
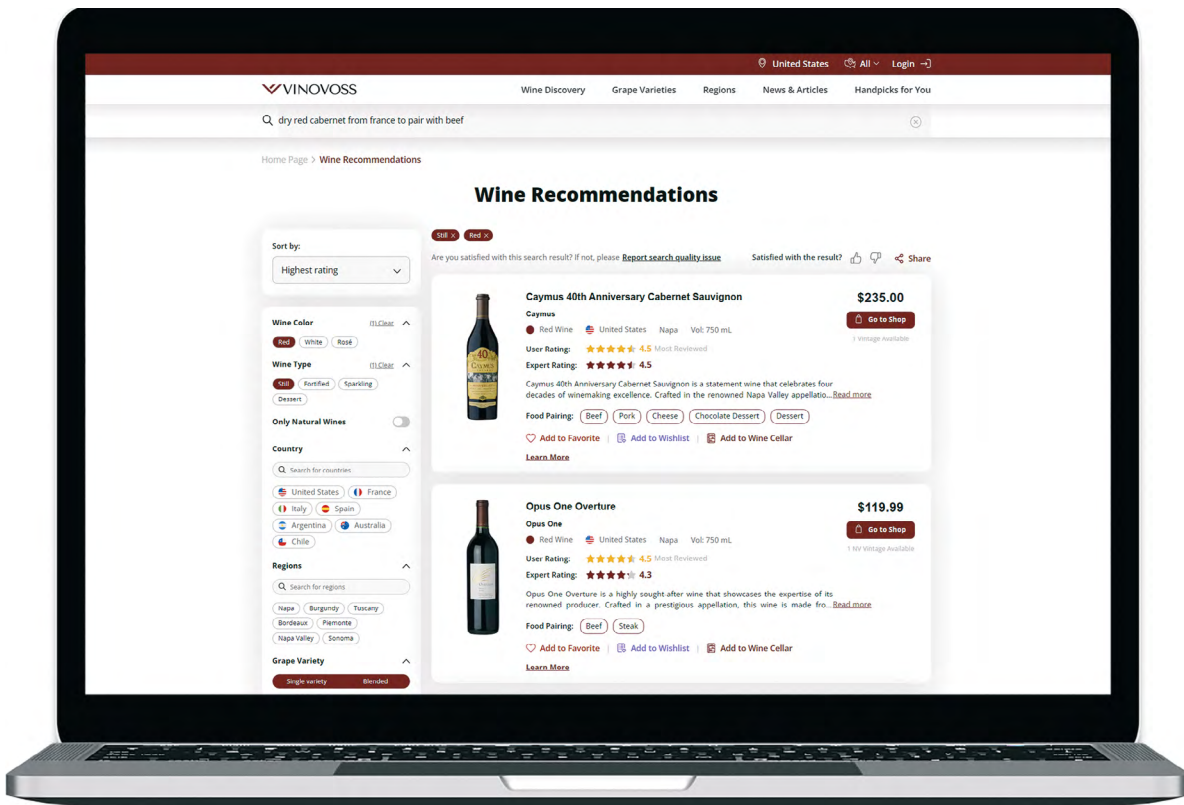
What do you think AI, computer vision and other technologies will do in the next 5 years?

The next five years are poised to be transformative for AI, computer vision, and related technologies. We can expect these technologies to become more integrated into our daily lives, offering hyper-personalization and efficiency. AI will continue to enhance decision-making processes across many sectors, from healthcare to finance, by providing deeper insights and automating more complex tasks.

Computer vision, in particular, is likely to revolutionize areas such as autonomous driving, augmented reality, smart houses, and smart cities by enhancing how machines understand and interact with the physical world. Additionally, advancements in NLP will enable more natural and intuitive interactions with technology, further blurring the lines between human and machine communication. These developments will drive innovation, create new opportunities, and address challenges in ways we are just beginning to imagine.

Read the full interview on our blog:

Quiz: is your company ready for digitization?

Digitization of industrial enterprises is a gradual and gradual process. There is no need to implement everything and everywhere. In our long experience, the main components
of a successful AI project are based on the "three pillars" — awareness, assessment of the applicability of Artificial Intelligence and budget control.

Digitization is not about the widespread introduction of technology, it is more about thinking processes within the enterprise. Do we need Artificial Intelligence here? What kind of result do we want to get? It is worth answering these questions at once and sticking to the digitization vector from the point of view
of the real need to implement AI projects.

The application of AI in manufacturing has a wide range
of use cases, such as: supply chain optimization, quality control, process optimization. For manufacturing, the implementation of machine learning represents a strategic step towards modernization and maintaining leadership in a highly competitive environment.

Several main components of a successful project can be emphasized:

- High-quality digitized historical and current data as the basis for all mathematical models;

- An expert design and implementation team with a wealth of industry knowledge;

- Support from the production side, "ambassadors" of AI projects at the enterprise;

- Economic feasibility of implementing technologies based on Artificial Intelligence.

We believe that the wave of popularity around Artificial Intelligence has already passed. AI is being implemented not because it is fashionable, but because they see the real economic benefits of using the technology.

Digital transformation is the process of fundamentally rethinking and reorganizing business models, internal and external processes, and the customer experience. Find out what your company's level of digitization is in just two minutes.

Answer a few questions and find out!

Data digitization opens up a new world of innovation and competitive advantage. Assess your data's readiness for the new digital reality:

☐ Historically, records are kept on paper — 1 point

☐ Some data is in spreadsheets — 2 points

☐ All data is electronically digitized — 3 points

☐ Data is captured by sensors, stored in a lake or vault — 4 points

Digital transformation is not just about data, it is also about changing organizational culture. People are the most important factor in the success of digital transformation. Assess the level of readiness for digital transformation on the manufacturing side:

☐ Employees are opposed, believe digital is a threat to jobs — 1 point

☐ Weak involvement of production, conservative approach — 2 points

☐ Fear of change, but willing to help IT — 3 points

☐ Employees are actively involved in shaping the transformation strategy — 4 points

A digital transformation strategy begins with an audit of existing production processes, systems, and technologies. Assess the current level of digital maturity and technology capabilities:

☐ No understanding of the basic concepts of process management, description in the form of disparate parts in various documents of the organization — 1 point

☐ A process catalog has been created, first digital products exist — 2 points

☐ More than 30% of processes are automated, fragmentary monitoring of indicators and efficiency is performed — 3 points

☐ Routine processes are fully automated, decision-making processes are fully based on data collected in real time — 4 points

Without clear vision and understanding of strategy, there is no chance of a successful digital transformation for an organization of any size. Assess the readiness of your organization's evolution strategy:

- ☐ No strategy and don't want one — 0 point

- ☐ No strategy, we are researching the market for innovative digital solutions — 1 point

- ☐ No strategy, we audit internal processes, identify pain points — 2 points

- ☐ There is a development vector, but there is no final version of the strategy — 3 points

- ☐ The strategy is clearly defined, the stage of digitalization is formed, priority areas are defined, potential impact is calculated — 4 points.

Send the number of points to us at **contact@usetech.com**, and get the result from us. Include "QUIZ: IS YOUR COMPANY READY FOR DIGITIZATION?" in the subject line, along with your contact information: name, company, position, and phone.

Thank you for participating in this quiz!

About Usetech

Usetech is an international company providing **AI** and beyond solutions for **manufacturing**, **oil and gas**, **agricultural** and other industries. Usetech team has expertise in advanced technologies such as **Data Science**, **Data Lake, DWH, Digital Twins, IoT**, which is confirmed by numerous cases.

Being in the market for over **18 years**, we know how difficult it is to find a company that can create an effective solution. Practicing an **individual approach** to each client, our team analyzes your business needs to offer a **unique product** to solve the necessary problems. Our unique expertise in **new technologies**, experienced team, and customer communication skills have helped us succeed for years.

Discover our solutions

Artificial Intelligence Solutions (AI, ML, CV, NLP)

Artificial Intelligence (AI) has long been popular and continues to evolve, helping companies to break new ground. Usetech has high expertise in developing AI solutions in various fields such as Oil & Gas, Agriculture, Culture, Logistic, Steel, Industry, Manufacturing, Fintech and others.

Data Science Solutions

In today's data-driven world, Data Science is critical for companies looking to gain a competitive edge in the marketplace. Usetech provides several types of services for your business, and you can choose what suits you.

Digital Twins

Our services include 3D visualization of technical and business processes, production processes simulation, mathematical modeling for enterprise operations optimization, and imitation, and simulation of real events and situations.

Enterprise Management Systems (MES, EAM, BPM, LIMS, ERP)

Usetech helps you automate your business processes and increase the productivity of your business. We use relevant and really effective technologies that help you.

Software Development Solutions

Relying on a personalized approach, we create a truly unique solution that differentiates you from your competitors and takes into account your requirements.

Data Management (DWH, Data Lake, Data Fabric)

Usetech has a high level of expertise in data warehouses design and creation, introduction of Data Lake for collection, storage, and processing of a large amount of manufacturing information (Big Data), business intelligence systems introduction, data consolidation systems and enterprise data buses (ESB, Streaming, ETL) for information systems integration

Internet of Things (IoT)

Usetech creates IoT mobile applications, web, and desktop versions development, smart-systems development, telemedicine,

collection of data from various devices and their processing, systems of notification on technical issues based on installed sensors.

Business Intelligence (Reporting, Analytics, Dashboards)

Understanding the importance of BI in everyday life, we help you work with and apply data for the benefit of your business.

1C

We are experienced in using 1C and will help you automate your business processes.

UX/UI

We know how important an attractive interface is for the first contact with a potential customer, so we'll help you create a platform that's simple and easy to use.

Innovative products developed by our team

Teal HR

Teal HR is an employee motivation and loyalty platform with automated dashboards and survey capabilities. You can easily increase employee engagement using Teal HR.
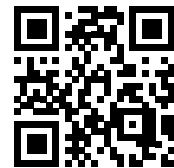
USE BUS

USEBUS is an enterprise bus for integrating any information systems and data. USEBUS helps increase the flexibility and scalability of your IT landscape without replacing legacy systems.

OCTOPUS

OCTOPUS is an automatic balancer of computing resources of virtual data center infrastructure. With the help of Artificial Intelligence technologies, OCTOPUS provides an optimal mode of data center system resource consumption, freeing up non-purposefully reserved system resource that can be used to ensure business-critical operation of data center production resource. OCTOPUS allows you to optimize business processes and ensure optimal operation mode.

Our awards

Winner
of The UAE
Business Awards
MEA Markets

Winner
The Middle East
Technology Excellence
Awards

Gold
Award Winner
of the IT
World Award

Silver
Award Winner
of The Globee
Business Awards

Top 4
Big Data Analytics
Companies
in the UAE
by TopDevelopers

Top 7
AI Companies
for Deep Learning
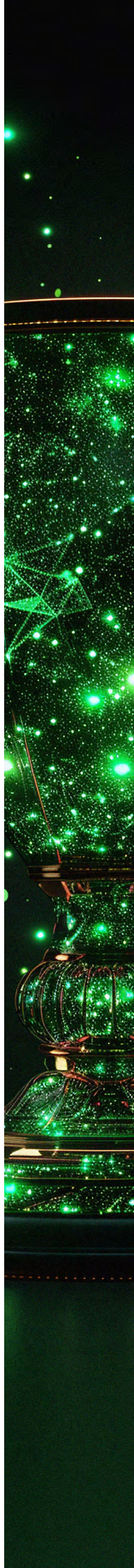in the UAE
by TopDevelopers

Top 6
IoT Companies
in the United Arab
Emirates by AppFutura

Top 3
Companies in the United
Arab Emirates that provide
Operations & process
improvement Services
by TechBehemots

Instead of a conclusion

We would like to thank all those who participated in the preparation of this magazine. There is no denying the revolutionary development of Artificial Intelligence and its impact on many areas of our lives. Cooperation between humans and AI will help to make a broad step in the development of business and technology, and we hope that the materials of this magazine will open new horizons for you.

We also invite you to become part of the community contributing to the dissemination of information about AI. Become an author for the Usetech blog and share your expertise for a wide audience!

The Usetech Blog is a place where authors can talk about technology in plain language, and industry leaders can share their predictions or elaborate on their stories.

We write about technology, development, Artificial Intelligence and its impact on various human industries, and publish interviews with leaders in the technology sector.

If you would like to become a contributing writer and make a meaningful contribution to the techcommunity, contact the editor at j.voloshchenko@usetech.ae (Julia).

Bonus:

During GITEX, we surveyed experts and attendees about the future of AI. You can read the survey in November by requesting it on our website.

See you at GITEX 2025!

USE TECH // INNOVATIVE SOLUTIONS
FOR YOUR BUSINESS