

# Greene 4.0 Innovation Contest Regulation

These regulations establish the rules for the recruitment and participation of solution providers in the Greene 4.0 Innovation Programme, co-financed by the Interreg Central Europe Programme.





#### § 1. Definitions

For the purpose of these regulations, the following definitions apply:

- 1. Technology Readiness Level (TRL) a scale used to assess the maturity of a technology, ranging from basic research (TRL 1) to full deployment in an operational environment (TRL 9), as defined by the European Commission.
- 2. B2GreenHub platform an interactive platform, available at b2greenhub.eu, which aims to facilitate contact between manufacturing companies and green and digital technology providers and accelerate the transformation of European industry towards sustainability.
- 3. Small and medium enterprises (SMEs) enterprises which employ fewer than 250 persons and/or which have an annual turnover not exceeding 50 million euro, and/or an annual balance sheet total not exceeding 43 million euro.
- 4. Associated partners (ASPs) key stakeholders of the project, whose involvement can improve the planning and development of project outputs and results. They can help to sustain and mainstream project results and generate multiplier and leverage effects.
- 5. Innovation Expert Panel an impartial panel of experts to evaluate the proposals submitted by participants. Its members include: one representative from Pomurje Technology Park organization, one representative from Krakow Technology Park organization, one representative from ASP's, one member from the External Advisory Board, one private equity representative.
- 6. Solution a technology, method of work organization, software, service or concept, the implementation of which directly benefits the manufacturing enterprise.

## § 2. General provisions

- 1. The Greene Innovation Contest (hereinafter referred to as the "Program") supports small and medium-sized enterprises (SMEs), startups and individuals offering innovative solutions in industrial digital transformation and the green economy.
- 2. The Program aims to facilitate cooperation with manufacturing companies seeking modern technological solutions in these fields.
- 3. The Program is organized by a consortium collaborating under the Greene 4.0 project (CE0100198), funded by the Interreg Central Europe Program (hereinafter referred to as "Organizer"). The consortium includes:
  - a. Pomurje Technology Park
  - b. Bautzen Innovation Centre
  - c. University of Applied Sciences FH Kufstein Tirol
  - d. University of Ljubljana
  - e. Univerzita Jana Evangelisty Purkyně v Ústí nad Labem
  - f. Innovation Centre of Usti Region (registered association)
  - g. Intellimech Consortium
  - h. Krakow Technology Park Ltd.
  - i. MGFÜ Közhasznú Nonprofit Ltd.
- 4. The Program runs from 01.07.2025 to 31.10.2025 and all stages are conducted entirely online.



## § 3. Eligibility criteria

- 1. Entities eligible to participate in the Program (hereinafter referred to as "Participants") must:
  - a) be classified as a startup, SME, university, or an individual.
  - b) offer solutions applicable in at least one of the following sectors:
    - Electronics
    - Food and beverage
    - Pharmaceutical and chemical
    - Metal
    - Plastics and rubber
    - Machinery and equipment
    - Building materials and furniture
  - c) offer solutions in the fields of digital transformation or the green economy, suitable for implementation in manufacturing. Solutions can be offered that address the following areas:
    - Green & sustainable materials
    - Waste reduction & recycling technologies
    - Energy efficient technologies
    - Renewable energy technologies
    - Data analytics & artificial intelligence
    - Automation & robotics
    - Digitalisation & connectivity

A list of preferred solutions is attached as Appendix no. 4.

- d) be registered in one of the following countries: Austria, Czech Republic, Germany, Hungary, Italy, Poland or Slovenia; in the case of individuals, citizenship is decisive.
- e) not have close personal relationships (e.g., family members or those with equivalent ties) or financial ties to consortium members that could create a conflict of interest.
- f) hold full intellectual property rights to the proposed technological solutions.
- g) submit a complete application form by 31.05.2025.
- 2. The technology readiness level (TRL) of the proposed solution must be at least 2 till 6.

## § 4. Application process

- 1. To apply, Participants must complete the MS Forms form, available at the link <a href="https://tiny.pl/spwy1n2z">https://tiny.pl/spwy1n2z</a> by 31.05.2025. A properly completed form must include the Participant's consent to personal data processing by the organizer and confirmation of full intellectual property rights to the solution.
- 2. The Organizer may request additional documentation to confirm the information provided. Participants must submit these documents within 3 working days; failure to comply may result in exclusion from the Program.
- 3. Participants are responsible for all costs related to their participation. Each Participant is required to designate at least one representative to participate in the Program.
- 4. Participants must ensure that all information submitted in their application is accurate and up-to-date. Providing incorrect or misleading information in the application may result in immediate disqualification from the contest.
- 5. Selected solutions will be published on B2GreenHub platform.



6. The number of participants is limited. The two entities from each region with the highest number of points will be admitted to the Program.

## § 5. Evaluation procedure

- 1. Applications will be evaluated by representatives of members of the consortium and Innovation Expert Panel in two stages:
  - a) Stage 1 Initial Assessment (evaluated by representatives of the consortium)
  - b) Stage 2 Final Assessment (evaluated by Innovation Expert Panel)
- 3. At the stage 1 (initial assessment), applications will be evaluated according to the criteria described in Appendix No. 2 to the Regulations. An application can receive a maximum of 12 points at this stage.
- 4. Participants whose applications score 5 or more points in Stage 1 will move on to Stage 2.
- 6. At the stage 2 (final assessment) applications will be evaluated according to the criteria described in Appendix No. 3 to the Regulations. The final evaluation is performed by Innovation Expert Panel. Each Panel member completes an evaluation form (Appendix No. 3) with a scoring system. The maximum number of points a participant can receive from a single panel member is 45 points.
- 7. The final score in stage 2 is calculated by averaging individual panel scores. The result of the operation is given to one decimal place.
- 8. Result from stage 2 is added to the points awarded to the application at stage 1. The maximum possible score is 57 points.
- 9. The two entities from each region with the highest number of points will be admitted to the Program
- 10. All decisions by the Innovation Expert Panel are final and non-appealable.

## § 5. Granting support

- 1. In the Greene 4.0 Innovation Program, applicants whose product, service, or process solutions can potentially be applied to the identified needs, challenges, or supply chain of the Technology Recipient may participate.
- 2. The aim of the Greene 4.0. Innovation Program is to identify solution providers and their products that will most effectively contribute to initiating or expanding collaboration between them and Solution seekers in the field of digitalization and green transformation.

The goal of the Greene 4.0. Innovation Program is to pilot and test 7 solutions within 7 sectors:

- 1st on national level
- 2nd on EU level

The description outlines the structure for the Greene 4.0 Innovation Program with three key stages:

- 1. Proof of Concept Programme: focusing on validating and testing early-stage ideas to assess their feasibility
- 2. Minimal Viable Product (MVP) Programme: aimed at developing a working prototype to demonstrate core functionalities and gather user feedback
- 3. Investment and Market Readiness Programme: designed to prepare innovations for market entry and attract potential investors by enhancing business models and scalability



- 3. Forms of support for companies and/or individuals selected in the competition may include, but are not limited to:
  - access to matchmaking services;
  - consulting services;
  - access to the ecosystem of companies;
  - participation in workshops designed for start-ups;
  - mentoring;
  - testing;
  - · networking.

## § 6. Data protection

- 1. The co-administrators of personal data are the partners of the Greene 4.0 project:
  - a) Pomurje Technology Park
  - b) Bautzen Innovation Centre
  - c) University of Applied Sciences FH Kufstein Tirol
  - d) University of Ljubljana
  - e) Univerzita Jana Evangelisty Purkyně v Ústí nad Labem
  - f) Innovation Centre of Usti Region (registered association)
  - g) Intellimech Consortium
  - h) Krakow Technology Park Ltd.
  - i) MGFÜ Közhasznú Nonprofit Ltd.
- 2. The co-administrators have designated the contact point at the Krakow Technology Park headquarters: ul. Podole 60, 30-394 Krakow, Poland, e-mail address: biuro@kpt.krakow.pl.
- 3. The co-administrators have designated the Data Protection Officer (DPO) at Kraków Technology Park for data protection collaboration, whom you can contact via email: iod@kpt.krakow.pl.
- 4. The personal data of contest participants will be processed for the following purposes:
  - a) to conclude and perform the contract by accepting the provisions of these regulations (legal basis: Article 6(1)(b), (f) GDPR),
  - to establish necessary contact, inform participants about the course of the contest and its results, as well as carry out informational and promotional activities related to the contest (legal basis: Article 6(1)(f) GDPR),
  - c) to fulfill tax, accounting, archival, and other legal obligations of the administrator (legal basis: Article 6(1)(c) GDPR),
  - d) to send marketing information related to the activities of the co-administrators including based on the consent given (legal basis: Article 6(1)(a) GDPR),
  - e) to publish participants' images in connection with promotional and informational activities regarding the contest (legal basis: Article 6(1)(a) GDPR).
- 5. Providing personal data is voluntary, but necessary to participate in the contest.
- 6. The recipients of personal data will only be entities authorized under applicable law.
- 7. Personal data may be transferred to entities processing it on behalf of the administrator, such as IT service providers, entities providing legal and advisory services these entities process the data solely under an agreement with one of the co-administrators.
- 8. Personal data will be processed for the duration of the contest and then:
  - a) for archival, tax, and accounting purposes for a period of 5 years after the completion of the collaboration,



- b) for the purposes of establishing or pursuing claims or defending against claims for a period of 3 years and in case of ongoing proceedings, until the final resolution and until the expiration of claims,
- c) until consent is withdrawn in the case of marketing messages.
- 9. In connection with the processing of personal data, you have the right to:
  - a) access the content of your personal data,
  - b) obtain a copy of your personal data,
  - c) rectify your personal data,
  - d) request the deletion or restriction of the processing of your personal data,
  - e) object to the processing of your personal data,
  - f) withdraw consent at any time,

in the cases and under the conditions specified in the GDPR. The above rights can be exercised by contacting the co-administrators or the Data Protection Officer.

- 10. You have the right to lodge a complaint with the President of the Personal Data Protection Office if it is justified that your personal data is being processed by the co-administrators in violation of the GDPR.
- 11. Your personal data will not be processed in the form of profiling.

### § 7. Final provisions

- 1. By submitting an application, Participants agree to all terms and conditions set forth in these Regulations. The Organizer reserves the right to amend the Regulations, cancel the contest, or end the Program early.
- 2. The Organizer and members of the Panel are not liable for any damages resulting from the disclosure of information about the submitted solution to third parties. For matters not covered by these Regulations, the Organizer's decisions are binding. The Organizer holds the right to interpret these Regulations.
- 3. In all matters not covered by the above regulations, the decision belongs to the Organizer.

## **List of Annexes**

Appendix No. 1 - Application form

Appendix No. 2 - Initial criteria for evaluating applications

Appendix No. 3 - Evaluation Form for final assessment

Appendix No. 4 - Areas of green and digital technologies covered by the Greene 4.0 Innovation program





# Appendix No. 1 - Application form

# Section 1: Applicant information

Please provide accurate details about the individual or entity submitting the application.
1. Applicant name:
2. Organization name:
3. Organization type: [] Start-up [] SME [] University [] Individual
4. Position of contact person (e.g., CEO, Manager, Specialist):
5. Full address - street, city, postal code, country:
6. E-mail:
7. Phone number:
8. Webpage:
Section 2: Proposed innovation details
This section focuses on collecting detailed information about your proposed solution. Indicate whether your innovation is categorized as "Green Technology" or "Digital Technology" and provide a clear description of its purpose and potential impact.
9. Category: [ ] Green Technology [ ] Digital Technology
10. Sector the solution is designed for:
[] electronics
[] food and beverage
[] pharmaceutical and chemical
[] metal
[ ] plastics and rubber
[ ] machinery and equipment
[] building materials and furniture
11. Field of application:
[] Green and sustainable materials
[] Waste reduction and recycling technologies
[ ] Energy-efficient technologies
[] Renewable energy technologies
[] Data analytics and artificial intelligence
[ ] Automation and robotics
[ ] Digitalization and connectivity
12. Technology Readiness Level (Select TRL):
[] 2 - technology concept formulated
[] 3 - experimental proof of concept





[] 4 - technology validated in lab
[] 5 - technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)
[] 6 - technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)
13. What concrete technological challenge does your solution address? Please reply using a maximum of 1200 characters:
14. What new technology, application, or business model does this solution include? Please reply using a maximum of 1200 characters.
15. Describe the benefits to businesses, such as increased revenue, productivity, or new market opportunities. Please reply using a maximum of 1200 characters:
16. How does this solution contribute to the green/digital transition? Please reply using a maximum of 1200 characters:
17. Are you ready to implement the solution outside of your country?
[] Yes
[] No
18. Please indicate which of the listed countries you are considering:
[] Slovenia
[] Germany
[] Czech Republic
[] Hungary
[] Italy
[] Austria
[] Poland
19. Has this innovation been implemented? Implementation status: Has this innovation been implemented? (Yes/No)
20 Please provide an example of a successful implementation, including location. Please reply using a maximum of 1200 characters.
21 Target audience/market for the solution





22. How easily can this solution be integrated into existing manufacturing processes and systems? Can it be customized to specific manufacturing requirements? Please reply using a maximum of 1200 characters.
23. Please add case studies or testimonials. Please reply using a maximum of 1200 characters.
24. Please add link to video about solution or technical documentation (optional).
Section 3: ROI and cost considerations
Insert insights into return on investment and associated costs.
25. Return on Investment (ROI) for manufacturing companies - please provide a sample ROI calculation based on a typical implementation scenario
26. Key Performance indicators - please reply using a maximum of 1200 characters.
27. Estimated implementation costs - provide costs in Euros and describe the scope of a typical implementation; specify how implementation costs change with scale. Please reply using a maximum of 1200 characters.
28. Ongoing Maintenance Expenses:
Section 4: Additional information
Optional information for further engagement.
29. Additional information about the solution, at your discretion.
Section 5: Consent for Data Processing and Intellectual Property Rights Declaration
30. Acknowledgement of the Greene 4.0 Innovation Contest rules
[] I hereby declare that I have read and understood the Greene 4.0 Innovation Contest Regulation and accept all of its terms and conditions.
31. Confirmation of the veracity of data and ownership of intellectual property rights
[] I confirm all the information contained in the form is true and the person filling out the form takes full responsibility for it.





32. I consent to the processing of my personal data by Krakow Technology Park Ltd. for the
purpose of receiving marketing information about the company's activities, including support
offers, information about industry and technology events, and projects carried out by KPT, to
the email address I have provided. I acknowledge that consent is voluntary and can be
withdrawn at any time.

[]	Yes
[]	No

In accordance with Article 6(1)(a) of the GDPR, I consent to the placement and distribution by co-administrators of personal data of photos and audiovisual materials containing my image, including publication on social media. I also acknowledge that my image will be used exclusively for promotional and informational purposes related to the Administrator's activities. Consent is voluntary and can be withdrawn at any time

[]	Yes
٢1	No

# Appendix No. 2 - Initial criteria for evaluating applications

No.	Criterion name	Criterion description	Scoring legend	Number of points
	Type of organization The organisation is		Yes/No	
1		classified as a startup, SME, university, or an individual	0 - no	
			1-yes	
2	Location	Located in Partners countries	Yes/No	
			0 - no	
			1-yes	
3	Maturity of the		yes/No	
	solution of the solution according to the TRL scale is a minimum	0 - no		
		of 2 and maximum TRL 6.	1 - yes	
4	Fit to the at least	offer solutions applicable in	Yes/No	
	one of the sector	at least one of the following sectors:	0 - no	
		<ul> <li>Electronics</li> </ul>	1 - yes	
		<ul> <li>Food and</li> <li>Beverage</li> </ul>		
		Pharmaceutical and Chemical		
		• Metal		
		<ul> <li>Plastics and Rubber</li> </ul>		
		<ul> <li>Machinery and Equipment</li> </ul>		





		Building Materials     and Furniture		
5.	Fit to the at least one of the field of application	Field of application:  Green and sustainable materials  Waste reduction and recycling technologies  Energy-efficient technologies  Renewable energy technologies  Data analytics and artificial intelligence  Automation and robotics  Digitalization and connectivity	Yes/No 0 - no 1 - yes	
6	Innovation of the solution	Innovation of the solution stands out from currently available solutions	<ul> <li>0 - solution offers no new, innovative ideas</li> <li>1 - solution offers few new ideas and features that will distinguish it from the competition</li> <li>2 - product offers numerous new, unique ideas that will significantly distinguish it from the competition</li> </ul>	
7	Benefits received by business	Value of the solution to the business, positive impact on production capacity, productivity, revenue growth	0 - the solution does not bring tangible benefits to the business  1 - the solution brings moderate benefits in one or more areas  2 - the solution brings significant benefits in one or more areas	
8	Ease of implementation	Ease of deployment of the solution, ability to integrate with existing solutions and processes, adaptability to user needs, existing implementations	0 - the solution is characterized by very low flexibility and ability to implement; high implementation costs, low expected return on investment     1 - solution is characterized by moderate flexibility AND implementation capability; medium expected return on investment     2 - solution is characterized by high implementation capability, high expected return on investment     3 - solution is characterized by high implementation capability, high expected growth from investment, solution has already been successfully implemented	





# Appendix No. 3 - Evaluation form for final assessment

Section 1: General Information	
Applicant organization Name:	
Reviewer Name:	
Section 2: Evaluation Criteria	
Rate each criterion on a scale from 1 (Poor) to 5 (Excellent). Provide comment	s as necessary.
1. Innovation originality and uniqueness:	
Score:	
Comments:	_
2. Alignment with green transition goals:	
Score:	
Comments:	_
3. Feasibility of implementation:	
Score:	
Comments:	_
4. Scalability and potential for broader adoption:	
Score:	
Comments:	
5. Impact demonstrated in use cases or testimonials:	
Score:	
Comments:	_
6. Business impact (e.g., profitability, market expansion):	
Score:	
Comments:	-
7. Clarity of target market and audience:	
Score:	
Comments:	-
8. Cost-Effectiveness:	
Score:	
Comments:	

9. Estimated ROI or key performance indicators:





Score:
Comments:
Section 3: Summary and Recommendation
Provide an overall evaluation and recommendations for the submission.
Overall Score:/45
1. Strengths:
2. Weaknesses:
Recommendation:



Appendix No. 4 - Areas of green and digital technologies covered by the Greene 4.0 Innovation program

#### 1. Green and sustainable materials

- Expansion of recycled and renewable material use across production and packaging
  including recycled wood, metals (e.g. aluminium, copper, steel), bio-based plastics,
  and industrial by-products to reduce reliance on virgin resources and minimize
  environmental impact.
- Adoption of sustainable material innovations in product design such as lightweight composites, modular structures, lignin-based adhesives, and materials facilitating remanufacturing, reuse, and recyclability.
- Development and substitution of eco-friendly packaging solutions including compostable bioplastics, cellulose-based films, and green chemistry alternatives to replace single-use plastics and reduce packaging-related emissions.
- Collaboration with certified suppliers and material traceability systems to ensure sourcing transparency and compliance with environmental standards, especially for green steel and other low-carbon materials.

## 2. Waste reduction and sustainable technologies

- Development of technologies for circular use of materials, including reuse, remanufacturing, and recycling encompassing solutions for diverse waste streams such as wood, paper, food, textiles, polymers (including composites and thermosets), and post-consumer or industrial containers, with emphasis on high-value recovery and material reintegration.
- Advancement of selective recycling and recovery methods for complex and critical materials including grinding, sorting, and recognition technologies, as well as certified systems for safe re-entry into the market—particularly for CRMs, drug packaging, and durable plastics.
- Optimization of production processes to reduce waste generation at source targeting decreased material loss across sectors such as manufacturing, construction, and food and beverage, supported by process innovation and energy efficiency improvements.
- Implementation of waste valorization practices and secondary raw material utilization promoting the conversion of by-products and residues (e.g., wood scraps, paper dust) into new inputs like pellets, panels, or acoustic materials, instead of incineration or disposal.
- Upskilling and knowledge dissemination on sustainable waste management solutions addressing competence gaps through training, awareness programs, and capacitybuilding to support implementation of circular strategies and reduction of resource consumption.



## 3. Energy efficient technologies

- Optimization of industrial processes to reduce energy consumption across production, storage, and thermal systems including process redesign, modernization of equipment, and targeted improvements for high-temperature and energy-intensive operations.
- Integration of smart energy management systems and real-time monitoring tools leveraging ERP/MES platforms, sensors, and analytics to track and optimize energy use dynamically and improve operational efficiency.
- Implementation of automation, predictive maintenance, and digital twins to identify
  energy-saving opportunities supporting proactive interventions, minimizing
  downtime, and improving system-wide energy performance.
- Deployment of energy-efficient heating, cooling, and auxiliary systems tailored to sector-specific needs involving solutions like intelligent thermal regulation, low-energy HVAC, and high-efficiency combustion alternatives.
- Alignment with regulatory requirements through customized energy optimization strategies ensuring compliance while enhancing competitiveness and sustainability in evolving energy policy environments.

## 4. Renewable energy technologies

- Integration of renewable energy sources into industrial processes and infrastructure including electrification, hydrogen-based systems, solar thermal applications, and biogas production from organic waste, with emphasis on technical feasibility, cost-efficiency, and process compatibility.
- Development of materials, components, and systems tailored to renewable energy applications supporting the growth of the sector through innovations in structural materials, electronics, and services designed to enhance energy generation, storage, and utilization.
- Valorization of waste streams for on-site renewable energy production enabling the conversion of wood residues, spoiled food, and industrial by-products into usable energy carriers such as biofuels, heat, or electricity.
- Optimization of industrial energy use in alignment with renewable energy availability including smart scheduling, adaptive process control, and machinery upgrades that respond to renewable energy supply fluctuations and support cost-effective load balancing.
- Implementation of carbon-negative and low-emission technologies based on renewable energy covering carbon capture, substitution of natural gas in thermal processes, and other strategies for reducing lifecycle emissions while maintaining operational efficiency.
- Improvement of market access and financial viability for renewable energy solutions addressing the need for stable funding mechanisms, competitive pricing, and reliable



supply infrastructure to support the widespread adoption of renewables in the manufacturing sector.

## 5. Data analytics and artificial intelligence

- Deployment of AI and analytics tools to improve operational efficiency, resource use, and process control supporting smarter, data-driven management of production, logistics, and energy systems, with emphasis on waste reduction, performance optimization, and continuous improvement.
- Integration of predictive and prescriptive analytics for maintenance, quality, and capacity planning enabling real-time insights into machinery conditions, production forecasts, and customer demand to enhance uptime, accuracy, and responsiveness.
- Development of cross-functional systems for end-to-end traceability and compliance ensuring consistency, transparency, and optimization in highly regulated or complex environments through unified data platforms and automated monitoring.
- Implementation of intelligent decision-support systems across the value chain facilitating better forecasting, defect detection, reuse strategies, and workflow automation from procurement to delivery.
- Interoperability and automation of digital ecosystems for scalable insights integrating ERP, MES, IoT, and AI systems to generate unified, actionable intelligence that drives efficiency across organizational levels.

### 6. Automation and robotics

- Integration of advanced robotics and automation to improve productivity, precision, and process efficiency including the automation of manufacturing steps, logistics, inspection, and sorting to reduce manual workload, mitigate labor shortages, and enhance consistency.
- Application of AI in robotics for intelligent control, quality assurance, and system programming supporting self-optimizing production lines, smart defect detection, and collaborative robotics (cobots) for flexible and adaptive task execution.
- Digitalization of industrial and organizational workflows through automated systems covering the automation of administrative, operational, and support functions to improve coordination, reduce errors, and accelerate throughput.
- Deployment of automation solutions for maintenance, monitoring, and infrastructure diagnostics enabling predictive maintenance, remote diagnostics, and early detection of structural or operational issues in industrial and built environments.
- Development of traceability and control systems for dynamic environments including construction, warehousing, and logistics settings where real-time tracking and automation help optimize resource allocation and reduce waste.

## 7. Digitalisation and connectivity

• Comprehensive digitalization of production, monitoring, and quality control systems including integration of MES, ERP, and computer-aided platforms to enable real-time



control, traceability, and performance optimization across the manufacturing process.

- Implementation of intelligent digital tools for knowledge management, customer engagement, and operational decision-making leveraging AI, generative algorithms, and automated systems to preserve company expertise, enhance customer experience, and support data-driven strategies.
- Modernization of digital infrastructure and interoperability between systems replacing legacy tools (e.g., spreadsheets) with scalable digital solutions, enabling seamless data flow, remote operations, and advanced performance tracking.
- Development and adoption of product traceability systems and digital documentation including digital product passports, logistics tracking tools, and document workflow optimization to improve transparency, compliance, and delivery efficiency.
- Promotion of digital training environments and workforce upskilling supporting employee development and adaptability through online learning platforms, simulation tools, and interactive training integrated with operational systems.