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Crane Engineering Service in the Age of Industry 5.0

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Partner	: ZEUKO, S.A.
Author	: Maialen Elordi/Estibalitz Sierra

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Crane Engineering service in the Age of Industry 5.0

The industrial crane sector is currently facing several key challenges. Digitalization and automation are critical trends, with companies seeking to integrate technologies such as IoT and remote monitoring to optimize performance and reduce operating costs. Additionally, sustainability is a growing priority, driving the demand for more efficient and eco-friendly cranes. Safety remains fundamental, with stricter regulations and the need to improve worker protection.

Another challenge is the shortage of skilled labour to operate and maintain advanced equipment. Companies must also adapt to the modernization of the existing crane fleet, upgrading older equipment to align with new efficiency and safety standards without disrupting industrial operations.

These challenges presented by the sector are strongly aligned with the Industry 5.0 principles (human centricity, sustainability and resiliency).

Regarding resiliency, the communication with clients for feedback on resilience is limited. Furthermore, there is a lack of risk assessment and the implementation of contingency plans, hindering a quick and effective response to adverse situations, compromising agility in decision-making.

With this in mind, the implementation of simulations based on artificial intelligence and big data, analysis of complex networks, collaborative evaluation through crowdsourcing platforms, and the use of digital twins provides a comprehensive approach to risk management within organisations. These strategies not only enable the forecasting of critical events and the customisation of contingency plans, but also identify vulnerable points and hidden risks, foster a culture of collective safety, and facilitate the testing of solutions in controlled environments. Together, these tools enhance organisational resilience, optimising preparedness for crises and minimising costs and risks.

Focusing on the evaluation of sustainability, it is complex due to the nature of the sector and its business model. By operating in third-party facilities, much of the environmental impact generated is not directly controlled, making it difficult to measure and hold the business itself accountable.

Continuous customer feedback drives innovation and improves sustainability throughout the value chain. Suppliers are facing increasing pressure to meet sustainability criteria, driven by the demand from conscious consumers and stricter regulations. This includes responsible practices in material sourcing, emission reduction, and efficient resource management. By adopting sustainable standards, suppliers not only enhance their reputation but also ensure competitiveness in a market that values environmental and social responsibility.

Focusing on **human centricity**, which is the main topic of Industry 5.0 in this sector, **Industry** 5.0 emphasizes the centrality of the person within industrial processes, recognizing the importance of human development alongside technological innovation. However, implementing a human-cantered approach in this sector faces several obstacles and potential risks, particularly related to employee development and training.

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A key challenge in implementing this approach is the limited involvement of senior management in employee development. While the industry moves towards automation and the use of advanced technologies, leadership is often not sufficiently engaged in the training and skill enhancement process of their staff. This creates a disconnect between the company's strategic vision and the growth of its human resources, who are essential for the success of industry 5.0.

Additionally, companies often lack a specialized profile capable of properly managing employee development and training. To promote a culture of Human Centricity, a figure is needed that combines leadership skills, technological knowledge, and talent management competencies. This profile should be able to align technological needs with the well-being and personal growth of employees, creating a balance between the two. However, the absence of this role limits companies' ability to effectively implement people-centered strategies.

Although there are no intrinsic risks to implementing Human Centricity from an operational or technological perspective, the lack of an appropriate profile to manage human resource development represents a threat to the expected outcomes. Without a trained leader or manager in this field, companies may not maximize their staff's potential or fully leverage the emerging technologies of Industry 5.0. The absence of this profile could lead to employees who do not adapt quickly to technological changes or feel sufficiently supported in their professional development, which in the long term could negatively impact the company's competitiveness.

Assessing sustainability in this context is challenging due to the specific characteristics of the sector and its business model. Since the company operates in third-party facilities, much of the environmental impact generated is outside its direct control. This complicates accurate impact measurement and makes it difficult to assign responsibilities. In addition, the lack of access to comprehensive data on operations at such facilities can lead to uncertainty in the assessment of environmental indicators. This complexity makes it necessary to adopt collaborative approaches with partners and suppliers to implement sustainability best practices. The company must have innovative ways to influence its value chain, fostering transparency and more responsible management of environmental resources.

In conclusion the main principle of Industry 5.0 for this sector is the centrality of the human being, which is fundamental to its success, but it faces significant obstacles. The lack of involvement from senior management in the development and training of employees creates a disconnect between the strategic vision and the growth of the team. Additionally, the absence of specialized profiles capable of effectively managing talent development and aligning technological needs with employee well-being is a critical risk. Without trained leaders to implement Human Centricity, companies may not maximize their staff's potential or optimize emerging technologies. In the long term, this disconnect could affect competitiveness, as employees would not feel supported or prepared for technological challenges. Sustainability is also difficult to assess due to impacts generated by third parties.

To address the challenges posed by this situation, the following guidelines can be considered:

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1. **Commitment from Senior Management**
- **Development of a Leadership Culture:** Senior management must understand that investing in employee development is crucial for the success of Industry 5.0. It is necessary to promote a culture where continuous improvement and employee well-being are priorities.
- **Involving Leaders in the Change Process:** Training in Human Centricity should start from the highest levels of the company, ensuring that leaders understand and promote this vision.

2. **Development and Retention of Specialized Talent**
- **Training and Upskilling Programs:** Implement training programs tailored to the technological and human needs of the workplace. These should focus on digital skills as well as soft skills like team management and organizational well-being.

3. **Strategic Partnerships**
- **Collaboration with Third Parties:** Sustainability may be influenced by external partners, so it is vital to establish clear criteria for social and environmental responsibility with suppliers and collaborators.

4. **Technology for Well-Being**
- **Implementing Technology to Enhance Employee Experience:** Use technologies like artificial intelligence and automation to eliminate repetitive tasks and improve the work environment, allowing employees to focus on more creative and strategic tasks.

5. **Culture of Inclusion and Participation**
- **Encouraging Active Employee Participation:** Allow employees to engage in decision-making, especially concerning the implementation of new technologies and how they affect their well-being.
- **Creating Spaces for Dialogue:** Establish open communication channels between employees and senior management to facilitate feedback on human-cantered initiatives.

6. **Measurement and Adjustment**
- **Establishing KPIs in Human Centricity:** Define performance indicators that measure the success of implementing a people-cantered strategy, adjusting plans based on results.

These guidelines would enable the company not only to overcome current obstacles but also to strategically position itself for the future, ensuring that technological growth is balanced with human well-being and sustainability.

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