ai@work

How artificial intelligence contributes to competitiveness and workforce planning

AI & Workforce planning
Business Case #2
Company: Heijmans

Company profile

Year of foundation: 1923
Headquarters:
Rosmalen, Netherlands
Size: 5844 employees
Sector: Construction

Heijmans is a major, publicly listed Dutch construction and development company that focuses on creating healthy living environments. Founded in 1923 as a paving contractor, it has grown to become one of the top three construction firms in the Netherlands. Heijmans places a strong emphasis on sustainability and innovation, working to improve the well-being of residents, consumers, and road users while considering the impact on nature and biodiversity.

Interviewee

Ronald van der Sanden

Traffic measures consultant and product owner Collision Hazard Reduction in the Work Area

Ronald van der Sanden is an experienced traffic measures consultant with almost 34 years of experience working on several projects for Heijmans. Amongst others, Ronald has worked as a project manager for large projects including the reconstruction of the Eindhoven Ring Road, Urgent Package E (Subliem), and Energieweg Nijmegen. From 2021, Ronald has established himself as Advisory Traffic Engineering Consultant, focusing on quality, training, and safety in roadworks. As a people manager, Ronald is capable of helping individuals grow in their role, benefiting the entire team. Since 2026, Ronald is focusing on his own company Nivee, coaching, educating, and training staff who work at companies that provide temporary traffic measures or are involved with them, such as provincial authorities, municipalities, or infrastructure companies.

What are your AI use cases?

Heijmans is a construction company specialising in energy, buildings, and infrastructure. My current role is within the infrastructure division, and I have been working for Heijmans for 33 years in various departments. My most recent assignment involves our materials business. This division is dedicated to improving roadwork safety, and we are leveraging artificial intelligence (AI) to achieve this goal.

Our approach involves collaboration with manufacturers and material owners, including companies such as Volvo, Scania and DAF. Together, we explore the feasibility of using AI to automatically stop machinery when a person is detected nearby. **The objective is to prevent injuries by ensuring that individuals positioned behind heavy vehicles or construction equipment are not harmed.**

This initiative began following a tragic incident approximately 18 months ago at a work zone in the Netherlands. Traditionally, we employ personnel to manage traffic safety in such zones. These individuals signal to regular traffic when trucks are approaching. Unfortunately, during adverse weather conditions - heavy rain in this case - a female traffic controller wearing a raincoat and holding an umbrella did not hear the truck's reverse warning signal. Her attention was focused on oncoming traffic, and the sound of rain on the umbrella masked the truck's audible "beep-beep" alert. Consequently, the truck reversed over her, resulting in a fatality. This incident was the catalyst for our project. More recently, three weeks ago, a similar fatal accident occurred at another company, reinforcing the urgency of our work.

To address these risks, we have implemented **a 360-degree camera system** that provides full visibility around the vehicle. However, the AI component is specifically designed to monitor the rear of the machine, where operators have limited visibility while reversing. The AI system **detects human presence and can intervene to stop the vehicle**. We have calibrated the system so that it activates when a person is within two meters of the rear of the vehicle. Additionally, the vehicle's reverse speed is limited to ten kilometres per hour to ensure safe stopping, particularly when carrying a load at the front. The system operates on three alert levels:

Green: The AI detects a person, but no action is required. The operator is informed that someone is present.
Orange: A loud warning signal is triggered both inside the vehicle and externally to alert nearby workers.
Red: The vehicle stops immediately to prevent an accident.

The AI is designed to recognise only human forms, avoiding false alarms caused by objects such as sand or equipment. Over the past year, we have rigorously tested the system under various conditions. Tests included scenarios with mannequins simulating workers in various positions - standing, kneeling, and lying down. In all cases, the system successfully halted the vehicle. Furthermore, the AI performs reliably in all weather conditions and requires minimal lighting, which is typically available in work zones.

In summary, **this technology represents a significant advancement in roadwork safety**. By integrating AI-driven detection with automated vehicle control, we aim to eliminate accidents caused by limited visibility and human error, ensuring safer working environments for all personnel.

How did you introduce AI into the workplace?

Our initial approach involved integrating AI into our materials and machinery without requiring additional manual intervention from the driver. However, the challenge was that most vehicles did not have an inherent system to stop automatically when detecting a person. To address this, we initially added **custom-built stopping mechanisms** to trucks purchased from manufacturers such as Volvo.

While this solution worked technically, it voided the **manufacturer's warranty.** To resolve this issue, we engaged directly with original equipment manufacturers (OEMs) such as Volvo, Scania, DAF and Iveco. We proposed that they incorporate these AI-driven safety features into their vehicles so that the warranty remains intact. This collaboration ensures that the safety systems are factory-installed and fully compliant.

Currently, we are working with two specialised companies - Rietveld and Brigade Electronics - that provide AI camera systems. Together, we are testing and evaluating which system performs best under real-world conditions. **Our goal is to achieve CE certification for these systems and make them a standard feature in all future equipment purchases.** This guarantees both compliance and manufacturer support.

At present, we have approximately ten active projects focused on AI integration. Each project involves assessing whether the technology can be installed on specific machinery, determining the optimal installation process, training operators, and conducting evaluations to identify necessary adjustments. Additionally, we examine whether the system can be adapted for similar or diverse types of vehicles. Each project is complex and requires careful planning and execution.

What benefits have you derived from using AI?

We aim to be among the first companies to adopt and champion this technology. At Heijmans, **we are committed to implementing AI-driven safety systems in our work zones**, and we invite all companies, regardless of their size or sector, to see what we have developed. We encourage others to adopt similar solutions because safety benefits everyone.

> "Our message is clear: everyone should use it because it enhances safety - for our employees and for yours."

Our goal is to create momentum across the industry - a "rollercoaster effect" - so that manufacturers such as Volvo and Scania recognise the growing demand and make these systems standard in their vehicles. Considering that many passenger cars, such as Tesla, already include automatic stopping features when detecting a person, why should this capability be limited to private vehicles and not extended to heavy-duty working machinery? This discrepancy is what we seek to address. At **Heijmans, we believe that all vehicles used in work zones should have this technology as a standard feature.** Importantly, we do not seek to profit from this initiative; our sole objective is to improve safety across the industry.

Has AI affected the valuation of skills in your company?

Yes, AI has transformed the skill requirements for operators substantially. Modern machinery now includes multiple screens: one for rear visibility, one for digging operations, one for GPS positioning, and an additional screen for AI monitoring.

> "Ten years ago, operating heavy equipment primarily involved steering; today, it resembles piloting."

While AI automation simplifies certain tasks, it also introduces complexity. Operators must monitor multiple screens simultaneously and interpret data in real time, requiring greater cognitive skills and situational awareness. This shift means that operators need analytical skills and technical understanding to manage advanced machinery effectively.

From the ten ongoing projects, three are currently in active deployment. Feedback from operators has been overwhelmingly positive. They report feeling safer because the AI system provides audible alerts when a person is nearby and automatically stops the vehicle if necessary. Previously, without AI, operators risked overlooking hazards. Rather than viewing the additional screen as a burden, they appreciate the enhanced safety and reduced mental stress, as the system eliminates one major source of concern.

Concluding remarks

It is unquestionably better to have this system than to operate without it. When reversing, drivers have limited visibility behind the vehicle because their attention is focused on the front and the task at hand. They frequently alternate between moving forward and backward, which increases the risk of accidents. This technology provides an additional layer of protection. While we acknowledge that no system can guarantee 100% safety - unexpected situations can always occur - we firmly believe that implementing AI-driven detection significantly reduces risk and saves lives.

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