

Esri

How AI Is Transforming Rail Field Data Collection

Esri's Survey 123 Smart Assistant Delivers Simplicity and Speed

AI-powered tools like the Survey 123 Smart Assistant are making data collection easier, faster and more accurate for the rail sector, writes Erik Henderson, Director, Rail Industry Solutions at Esri.

In Early April, while at IMGIS in Frankfurt, I saw a demonstration of Esri's artificial intelligence (AI) tools, which have been developed to help users create, as well as analyse, the results from their [ArcGIS Survey 123](#) projects.

Survey 123 is Esri's mobile tool, designed for users to quickly create and deploy a field-based questionnaire on virtually anything they'd like to collect. What surprised me the most about the demonstration's creation process and resulting survey were both the speed with which the project was created and the comprehensiveness of the questions.

While tools like AI and machine learning (ML) are revolutionising how many people do their jobs, there's still some hesitation or scepticism around their implementation. There has always been a gap between what I would call the business user, or the railroaders, and the technologists working to create better, faster and safer tools.

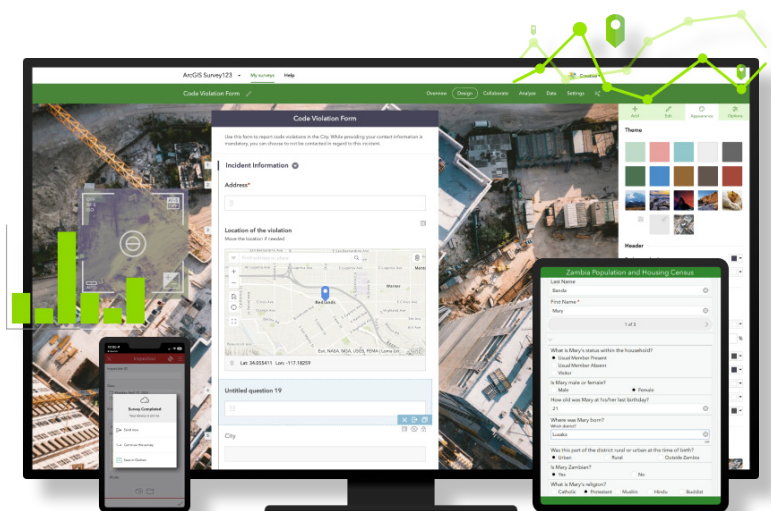
That gap falls in two areas, the first being users' ability to fully understand all of the possible solutions the market has available to them. Think about hanging a picture on the wall and all of the possible ways to do so. Now, imagine walking into a big box hardware store for the first time and only needing to hang that one picture. It can be pretty intimidating to know where

to go, who to talk to and how to evaluate all of your options.

The second gap is for the technology experts to be able to understand the potential simplicity of a business problem. Imagine you ask a world class mechanic who designs and builds race cars how to make a car go faster. The mechanic will probably start explaining the dynamics of quality fuel, and a finely tuned set of spark plugs and cylinders to power the engine, but perhaps you simply weren't sure which pedal was for accelerating and which was for the brake. With technology advancing at an exponential rate, this gap is increasing as well.

Smarter Tools, Stronger Surveys

Companies like Esri are using AI to make the implementation of technology even easier. The [Survey 123 Assistant \(Beta\)](#) is a perfect example of this. While I wouldn't consider the process of creating a survey to be





extremely advanced, there are many options a user can choose to make a survey much more complex if they wish.

In the past, a user would need to fully understand all of these forms and functions to get the most out of the tools. For a complex survey to be created, you'd need the right combination of an end user who understands what type of content they are looking for and a highly skilled technician familiar with all of the tool's functions. You may also need a business analyst documenting requirements based on how your organisation was set up to handle technology requests.

With the new Survey 123 Smart Assistant, a user can take advantage of the AI tools for a variety of gains. Here are some of the key benefits it offers:

- **Enhanced Data Accuracy**

The Smart Assistant uses AI and ML to validate and refine responses as they're entered. It can flag inconsistent or improbable answers, suggest corrections and guide users to input more accurate information based on prior data or expected patterns. A photograph of a switch taken on a mobile device in the field can prompt users for specific attributes that would only be available for a switch.

- **Time Efficiency and Workflow Optimisation**
Esri's Smart Assistant reduces the need for manual input by auto-filling answers based on historical data, user behaviour or integration with other GIS datasets. This leads to faster survey completion and less repetitive work for field staff.

- **Improved User Experience**

Whether the user is a seasoned GIS professional or a first-time railroader, the Smart Assistant simplifies survey navigation. It can explain complex fields, help avoid errors and provide real-time feedback, lowering the barrier for data collection and minimising training time.

- **Data Consistency and Standardisation**

The assistant also ensures data is collected consistently across all users and surveys. This is crucial for large organisations managing extensive datasets where discrepancies can compromise analysis and decision-making.

- **Integration with the ArcGIS Ecosystem**

Survey123 Smart Assistant works seamlessly with other [ArcGIS tools](#) such as ArcGIS Dashboards, ArcGIS Online and ArcGIS Pro, allowing for real-time visualisation, spatial analysis and reporting. The intelligent inputs improve the quality and utility of data throughout the entire GIS workflow.

AI adoption is growing rapidly and while adopting it can be intimidating at first, using it to build your surveys can help you jumpstart your team's success with Survey 123. For additional help and resources, please check out our [ArcGIS Survey 123 Overview](#) and/or our video on how to create a survey with Smart Assistant.

To stay informed of the latest GIS advancements for rail, you can also [join our mailing list](#) or contact us at railinfo@esri.com.

