Turning data into action: how AI can transform reconstruction after disaster

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SUMMARY

1. Introduction/Context

After a natural – or other – disaster, fast and reliable damage assessment of buildings and urban areas is essential for an effective reconstruction. Traditional manual inspections often lead to significant delays, making people wait before they can safely return to their homes, working place and normal lives.

2. Problem statement

Surveyors and engineers spend a lot of time collecting, classifying, and organizing post-disaster data. Coordination between professionals and public administrations is often difficult because information is spread across different databases, paper forms, and system that do not communicate with each other. This lack of connection slows down decision during emergencies and reconstruction.

3. Proposed approach

This work presents a practical idea to make post-disaster assessments faster and more organized. The goal is to collect, connect, and share information in a single, coordinated system. By linking local building data, cadastral maps, and GIS layers, technicians can have an immediate picture of the affected area. The use of digital tools, including artificial intelligence, can support professionals in classifying the level of damage and in managing all the related documentation. The focus is not only on new technologies, but on creating a clear workflow that saves time, reduces mistakes, and improves collaborations among technicians and public

offices.

4. Methodology

The proposed method starts from what surveyors and technicians already do after an emergency: visiting sites, documenting damage, and preparing reconstruction files. The innovation lies in how this information is organized and shared. Data collected on site – whether from photos, measurements, or existing archives – are connected to cadastral and GIS systems, creating an integrated database that can be easily updated and used by different professionals. A.I. can assist in sorting and comparing data, helping to identify priorities for action. This approach keeps the human experience at the center, supported – not replaced – by technology.

5. Expected outcomes/benefits

The main benefit is a faster and clearer reconstruction process. Having all information in one shared, digital environment helps authorities make better decisions and technicians to work more efficiently. It can also reduce bureaucratic delays, improve transparency, and give citizens faster answer. In addition, by analyzing collected data over time, it becomes possible to understand which are more vulnerable and how to improve prevention for future events. This makes the whole process more resilient and proactive.

6. Contribution to sustainable development

This approach encourages collaboration between professionals, institutions, and local communities. It supports resilient reconstruction through better data management and more efficient communication. Even without advanced instruments, a clear system for organizing and sharing information can make a big difference. The idea aligns with the UN Sustainable Development Goals for innovation and infrastructure, sustainable cities and communities, and climate action, promoting a smarter and more human-centered way to rebuild after disasters.