

Integrated National Damage Assessment System

Modern Approach Ensuring
Faster and Smarter Assessment



Gaza Strip

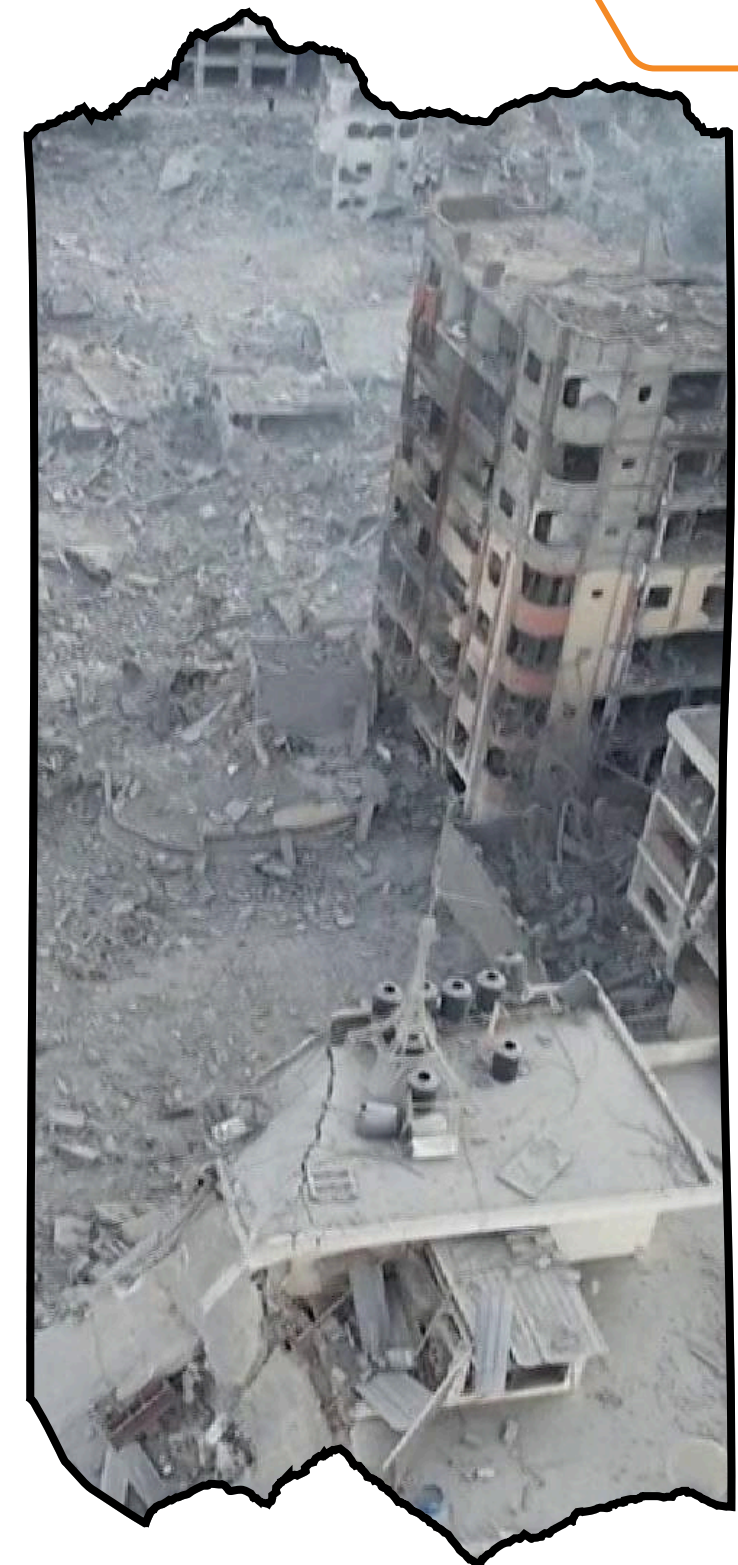


Introduction

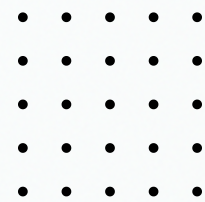
Context & Scale of Damage

The Gaza Strip has faced extensive destruction since **October 7, 2023**, impacting housing, infrastructure, public facilities, and essential services across all sectors. This large-scale devastation created an urgent need for an organized, accurate, and modern methodology to guide reconstruction planning.

- More than **200,000** buildings (**+500,000 Housing Unit**) were damaged across the Gaza Strip.
- Extensive destruction affected **residential, commercial, and public infrastructure**.
- Widespread structural collapse created **dense damage zones** throughout most urban areas.
- Major utilities and lifeline **services** | water, electricity, roads—suffered severe disruption.
- The scale of impact represents **one of the largest** urban destruction events in recent decades.



ASSESSMENT SECTORS

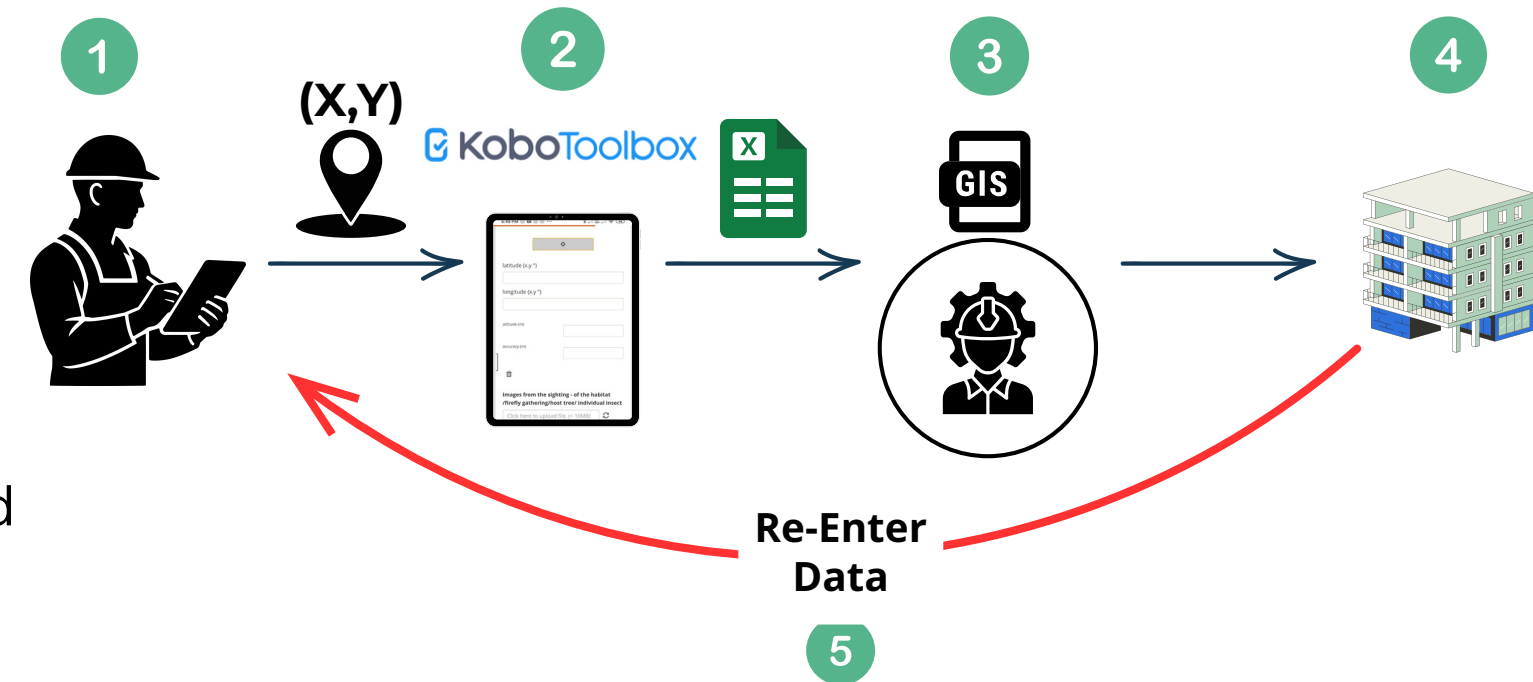


Assessment context

Previous Damage Assessment Experiences in Gaza

ACROSS MAJOR CONFLICTS (2008 – 2021)

- **2008 War - Manual Paper-Based Assessment**
 - Data collected manually on paper forms.
 - Teams returned to the office to re-enter all records into desktop systems.
 - Tools: Paper forms, manual sketches, basic office data entry.
- **2014 War – Manual Paper-Based Assessment (160,000 Housing unit)**
 - Assessment repeated using the same paper-based method as 2008.
 - Delays and errors increased due to the large scale of damage.
 - Tools: Field notebooks, paper checklists, office computers.
 - The destruction was **concentrated** in specific areas and not spread across the entire Gaza Strip.
- **2021 War – Kobo-Based Digital Input (60,000 Housing unit)**
 - Field teams entered data directly into the Kobo mobile system.
 - Additional data refinement and validation completed later on computer systems.
 - Tools: Kobo Toolbox app, mobile devices, centralized desktop database.



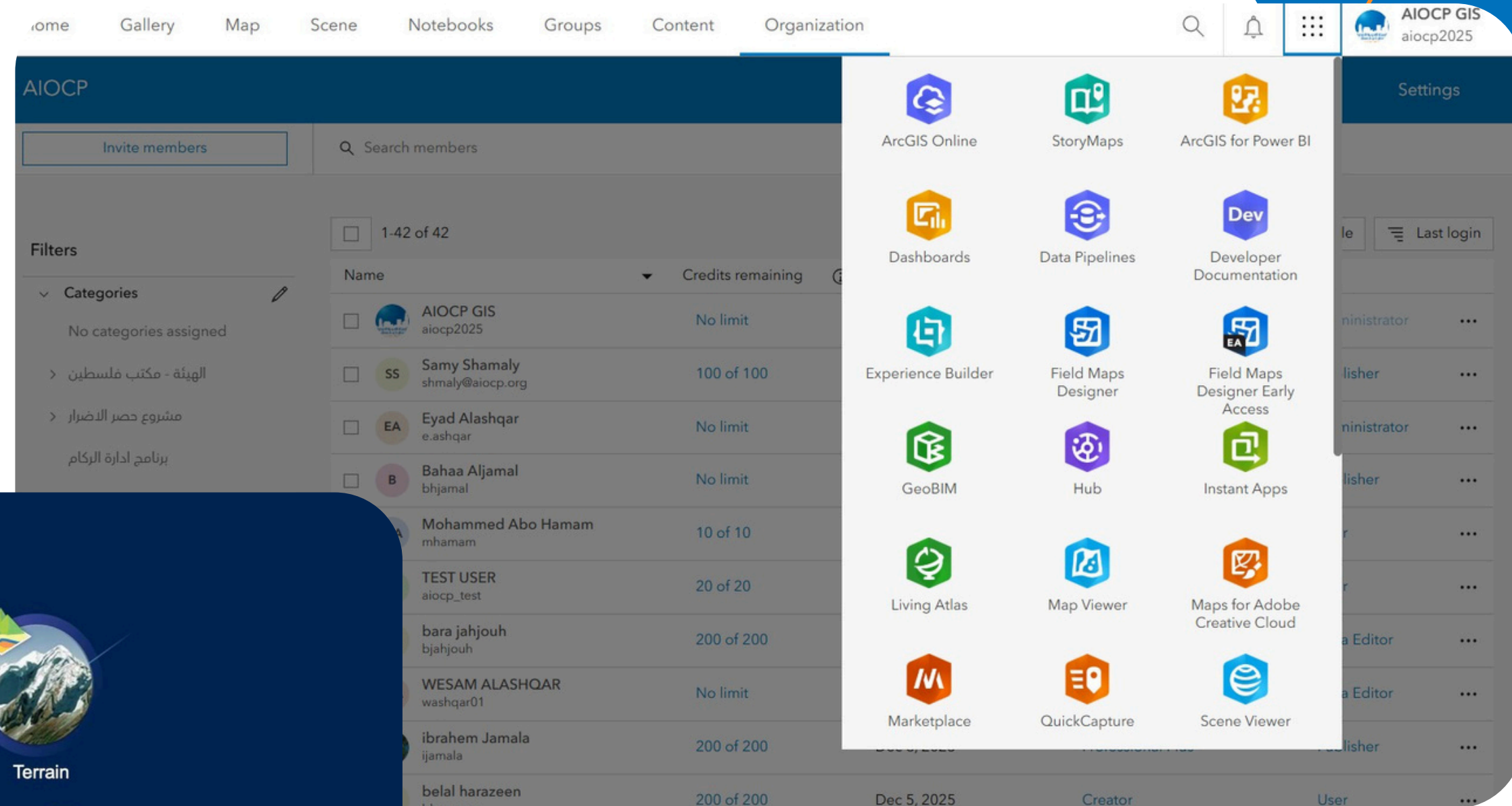
Limitations of the Traditional System

- **Weak handling of maps and spatial data**, with no support for geometry editing.
- Inability to **manage large-scale projects** that rely on **extensive** engineering **datasets**.
- Does not provide **high-resolution maps or advanced GIS spatial analysis tools**.
- Limited capabilities for **team management** and **geographic work-zone assignment** compared to GIS platforms.
- Basic and **insufficient permission system** for multi-stakeholder, large projects.
- **No** advanced engineering **dashboard** built into the platform.
- Heavy **reliance** on **external tools** for data synchronization, analysis, and reporting.

Esri (ArcGIS Platform)

ArcGIS Platform Tools

the main ArcGIS applications available for AIOCP—such as Dashboards, Field Maps, and StoryMaps—used to manage spatial data and support the damage assessment workflow.



ArcGIS Data Ecosystem

Illustrates the wide range of data sources ArcGIS can integrate, including imagery, 3D, LiDAR, vector data, and external platforms.

Esri (ArcGIS Platform)

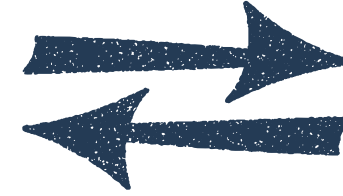
Field Maps



A field application for collecting damage data directly on-site.

It allows engineers to select a building on the map, fill out the assessment form, capture photos, with instant data synchronization.

Data validation and processing



ArcGIS Dashboard



An interactive dashboard for real-time visualization and analysis of assessment results.

It enables management to monitor the number of assessed buildings, damage distribution, team progress, and the most affected areas through clear maps and charts.

Supporting Applications:

ArcGIS Online/Enterprise for data storage, processing, and sharing.
Quality Control workflows (QC/QA) to ensure high data accuracy.
Real-time tracking and notifications to coordinate teams and resources.

Global Experiences Using Esri & Field Maps for Disaster Damage Assessment

- **North Carolina – Hurricane Helene (2024)**

Central disaster recovery portal for damage assessment, debris management, and infrastructure monitoring using Survey123 and Dashboards.

Over **1,000 field assessments**

- **Florida – Hurricane Milton (2024)**

Real-time response platform for damage reporting, rescue operations, debris removal, and road reopening using Field Maps, Survey123, and

QuickCapture. **6,500 Field Maps User**

- **Houston, Texas – Hurricane Harvey (2017)**

Large-scale building damage assessment using Field Maps and Dashboards to support housing recovery and FEMA assistance. Over **100,000**

buildings assessed within **one week**.

- **Hawaii – Lahaina Wildfires (2023)**

AI-based building damage classification linked to ArcGIS maps and dashboards for emergency decision support. **2,200 Damaged Building**.

- **Croatia – Zagreb Earthquake (2020)**

Rapid building damage surveys using Collector/Field Maps, Survey123, and real-time ArcGIS Dashboards. **30,000 Damaged Building**.

- **Lebanon – Beirut Port Explosion (2020)**

Create a unified damage map, using Collector/Field Maps, receive citizen reports through Survey123, and display results on

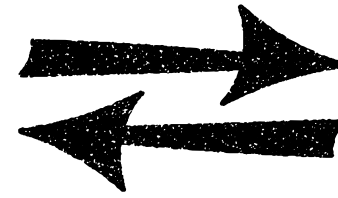
Dashboards to support crisis management. **77,000 housing units**

AIOCP Integrated Damage Assessment System



AIOCP PLATFORM

- **CITIZEN PLATFORM**
- **AUDIT SYSTEM**
- **STRUCTURAL ASSESSMENT SYSTEM**
- **NGOS AND GOVERNMENTAL ENTITIES PLATFORM**
- **ADMINISTRATIVE SYSTEM**



ESRI PLATFORM



FIELD MAP



DASHBOARD



ARCGIS WEB DESIGNER



EXPERIENCE BUILDER



ORACLE AI DATABASE 23AI



ARCGIS PRO



LARAVEL

AIOCP DATA BASE

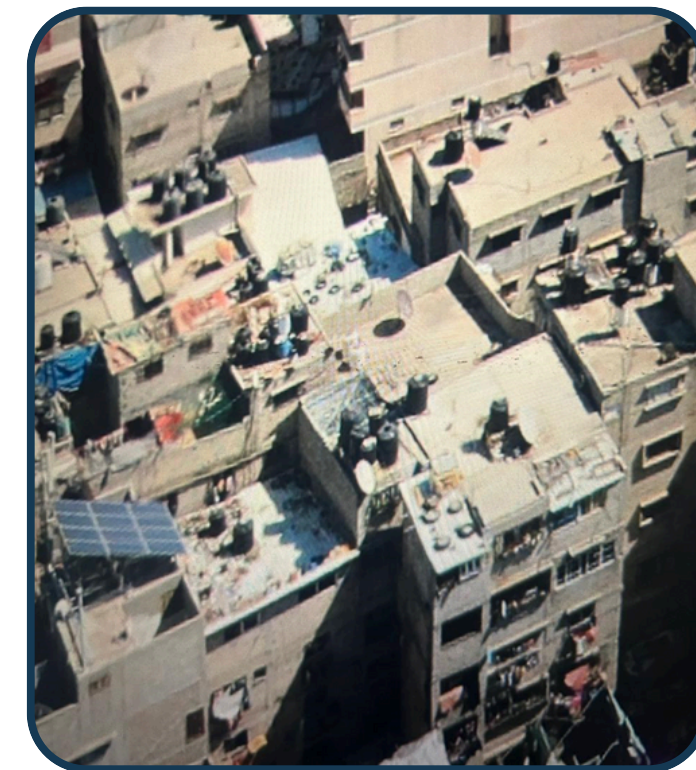
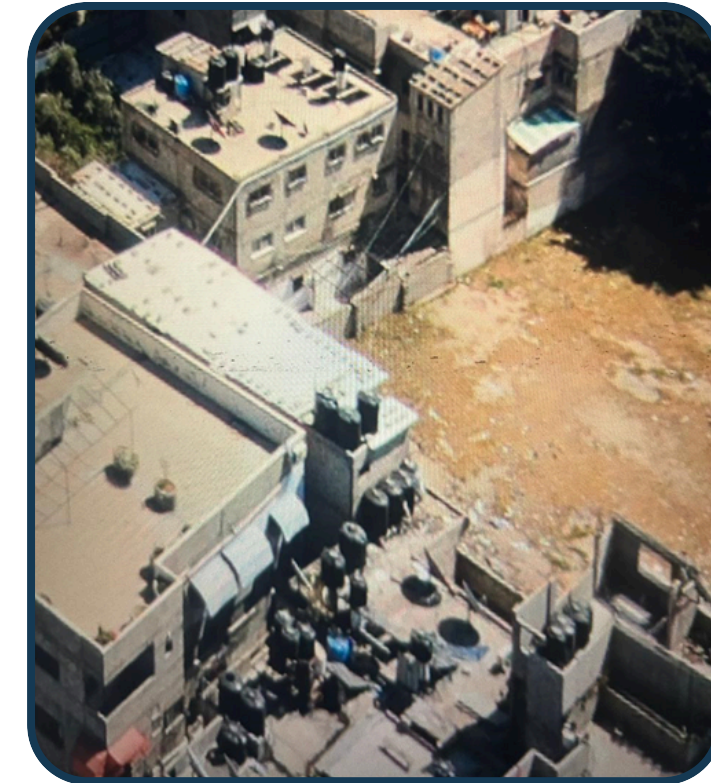
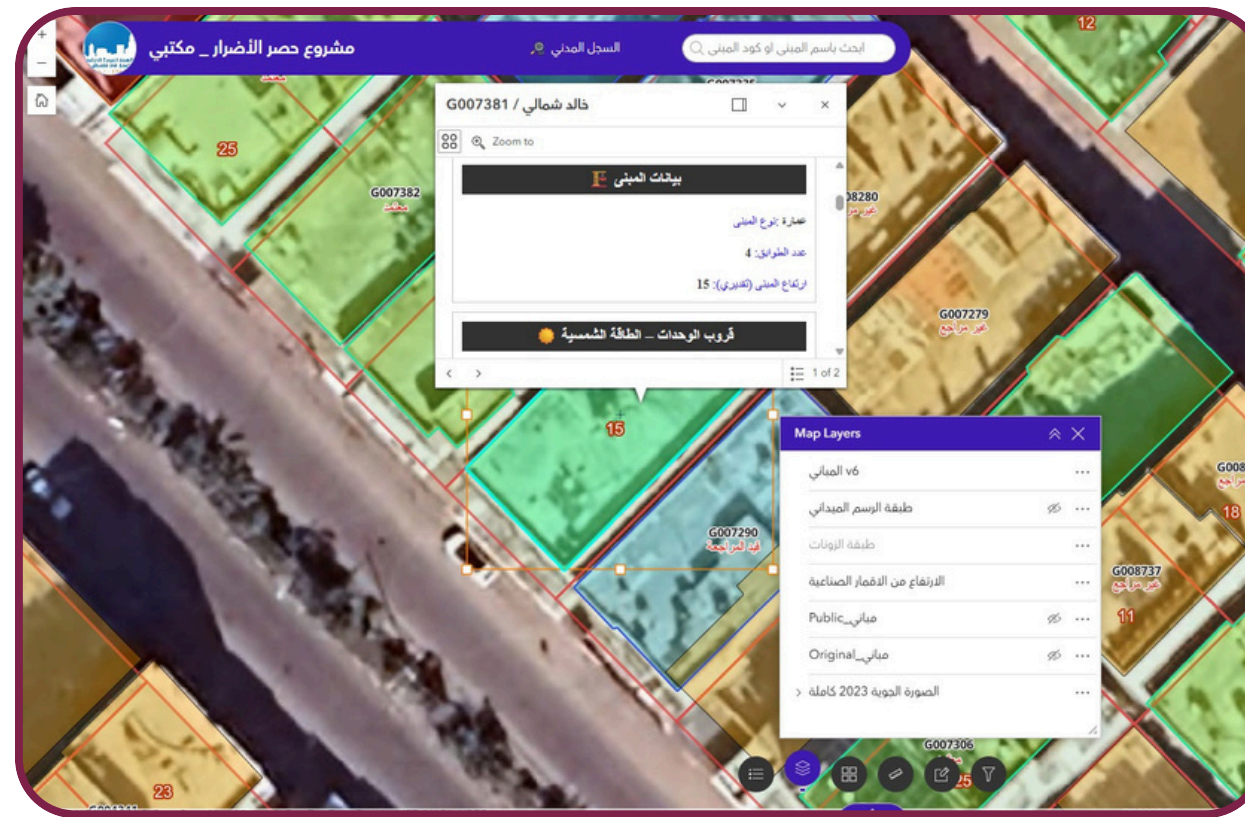
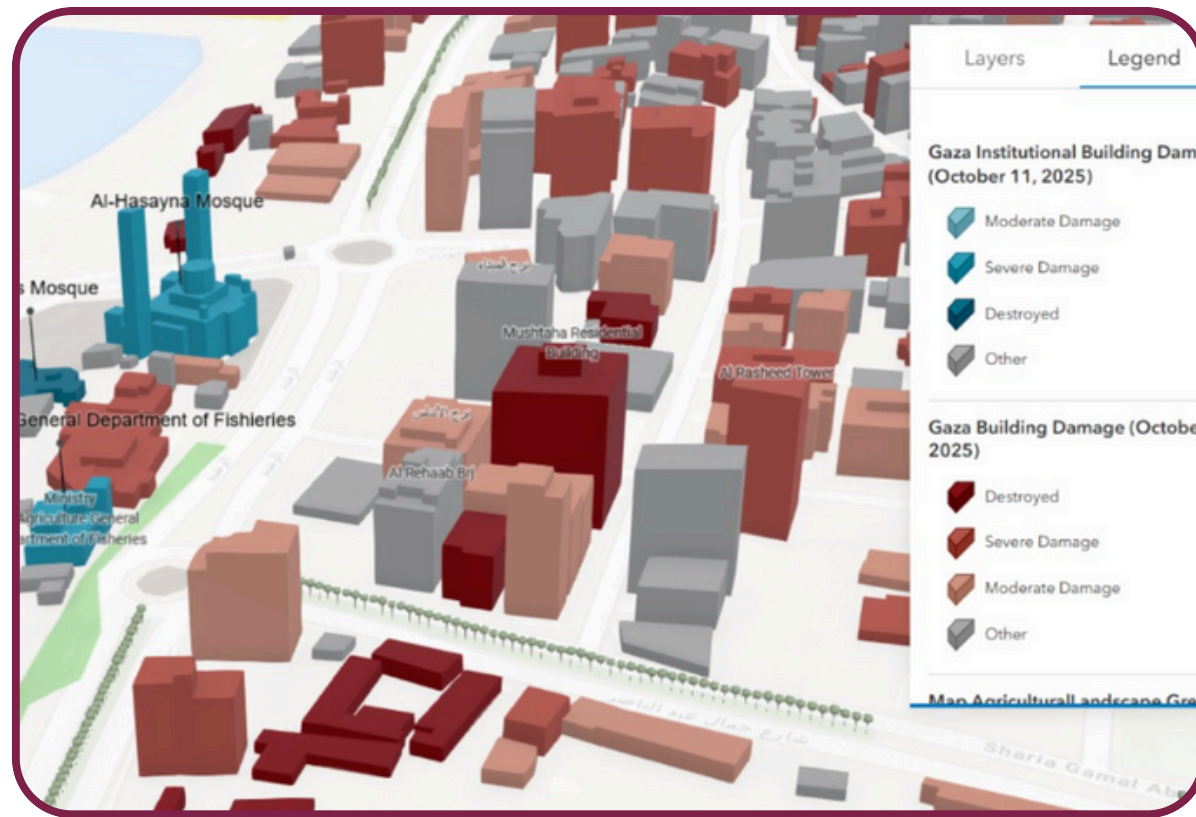
AIOCP possesses a comprehensive geospatial database for the Gaza Strip, which has been integrated into the damage assessment system and includes:

- A comprehensive geospatial database covering the entire Gaza Strip, fully integrated within the damage assessment system.
- **High-resolution aerial imagery (<10 cm)** dated **15/10/2023**, used to delineate and map **+275,000 buildings (226,858 residential)** and link them with field damage assessment data.



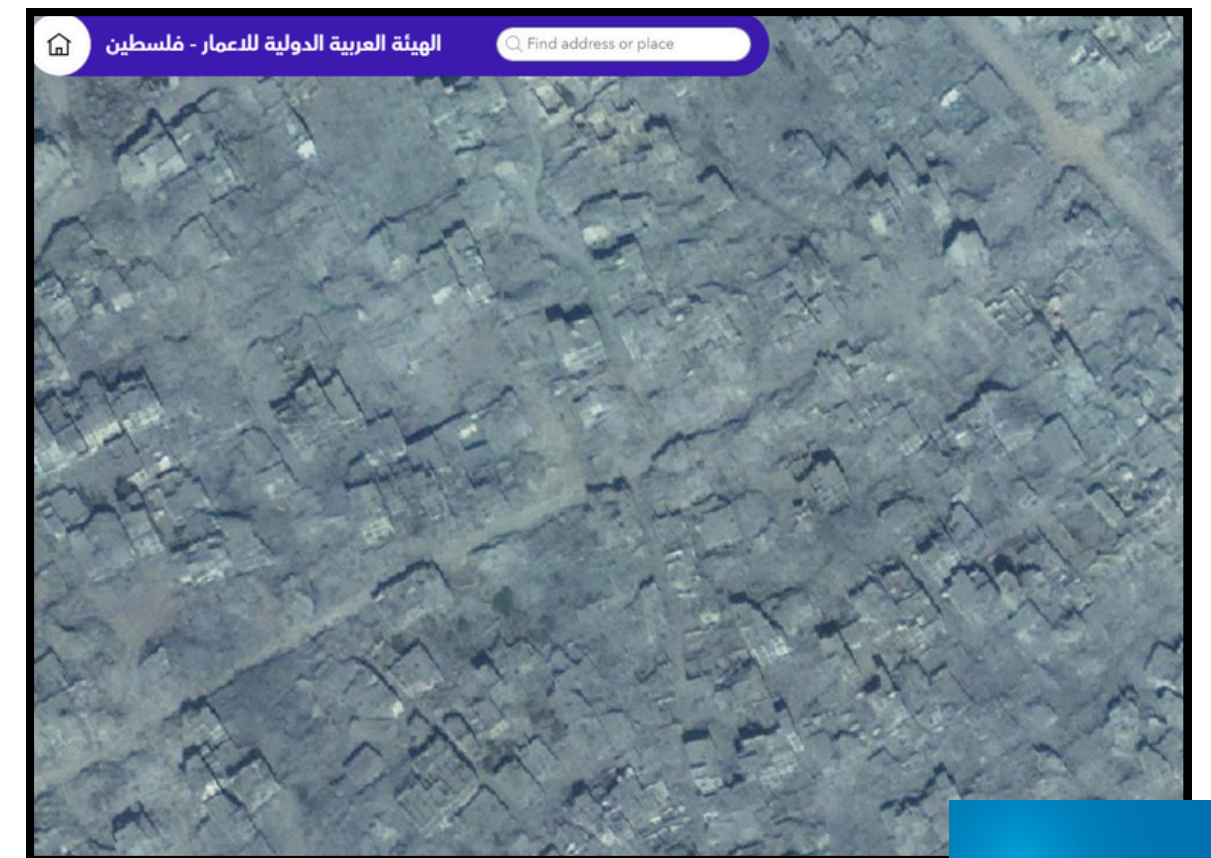
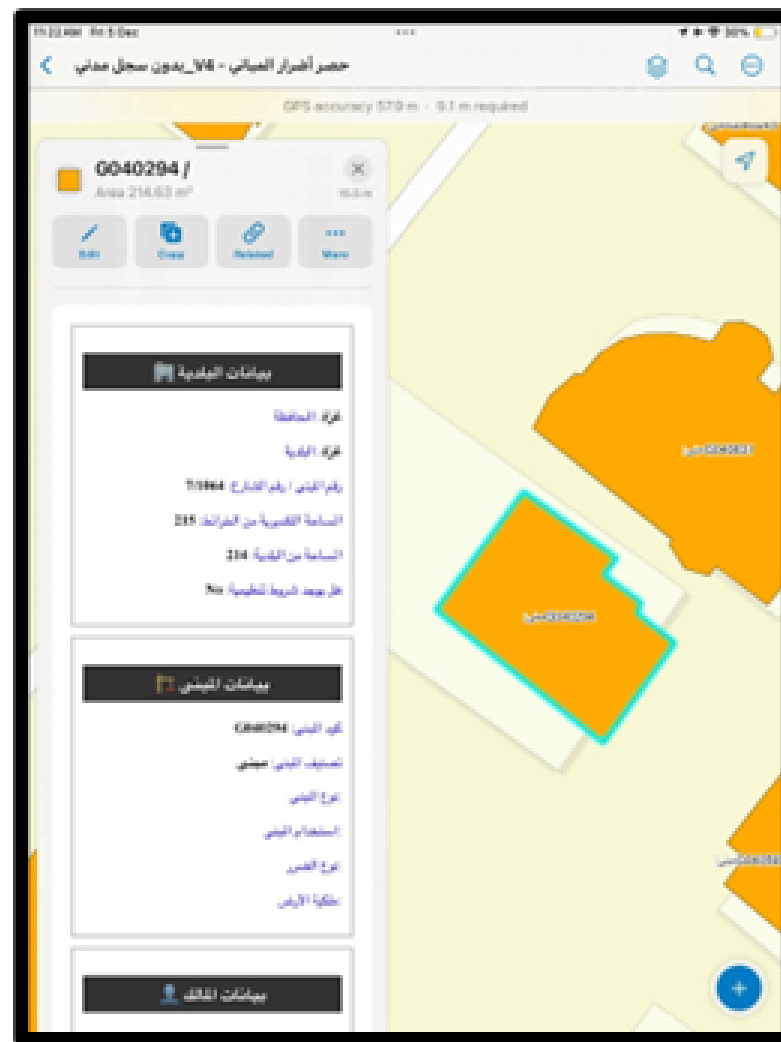
AIOCP DATA BASE

- Pre-war Digital Elevation Models used to generate 3D models for all buildings, including the Digital Surface Model (DSM) and the Digital Elevation Model (DEM).
- 3D panoramic imagery covering wide areas of the Gaza Strip.



AIOCP DATA BASE

- Up-to-date pre-war municipal datasets integrated within the Field Maps application.
- Artificial intelligence techniques for detecting technical errors (areas, number of floors, and units).
- A time series of aerial images captured over multiple periods and used for analysis.
- 3D panoramic imagery covering wide areas of the Gaza Strip.



Integrated Damage Assessment System

1 Draw buildings and collect data

Through high-resolution aerial images and mapping local authority data onto the building

2 Develop models and Connect Data in the integrated platform

Verify data and prepare digital forms for field survey, and merge all data into the system and prepare it for field work using tablets.

3 Enter field data

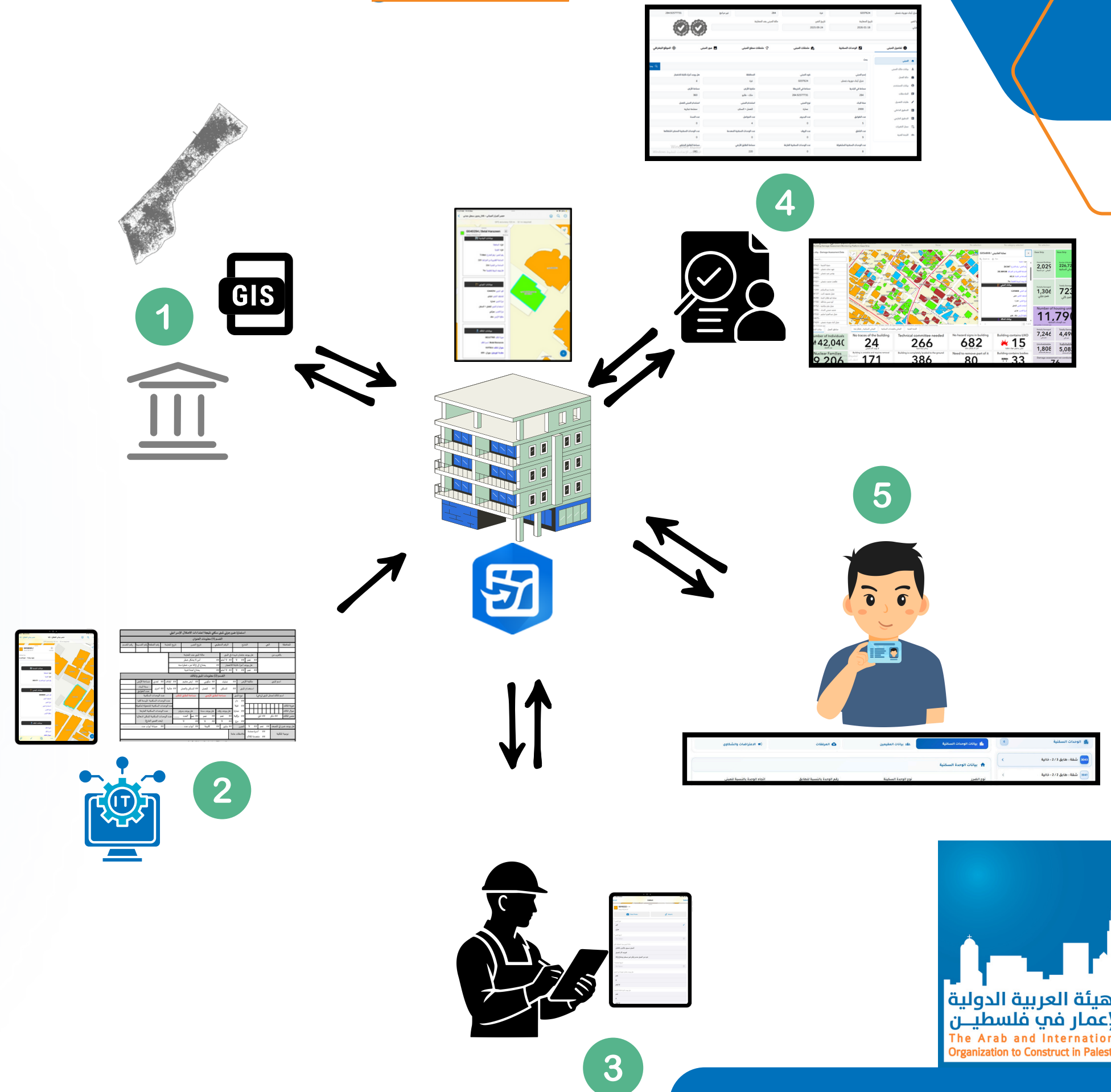
Engineers fill forms on the map via the GIS tablet app, and data syncs instantly with the central database.

4 Synchronize and verify data

Verify data through audit teams and integrate AI into the database

5 Damage assessment portal

Damage assessment portal will enable citizens to submit feedback or objections.



Value Added of the System



**A UNIFIED NATIONAL
DATABASE THAT IS
UPDATABLE**



**SUPPORTING
EMERGENCY
RESPONSE**



**REDUCING
DUPLICATION
AND ERRORS**



**SUPPORTING SHORT-
AND LONG-TERM
PLANNING FOR
RECONSTRUCTION**



**RAISING LEVELS OF
TRANSPARENCY AND
ACCOUNTABILITY**

From The Rubble... We Build Hope

CONTACT US

 [palimar.org](https://www.palimar.org)

www.diocp.org

 **+970-597120125**

