Empowering Rapid Response: Unleashing 51WORLD's Digital Twin for Smart Emergency Management!

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Digital Twin Pioneer

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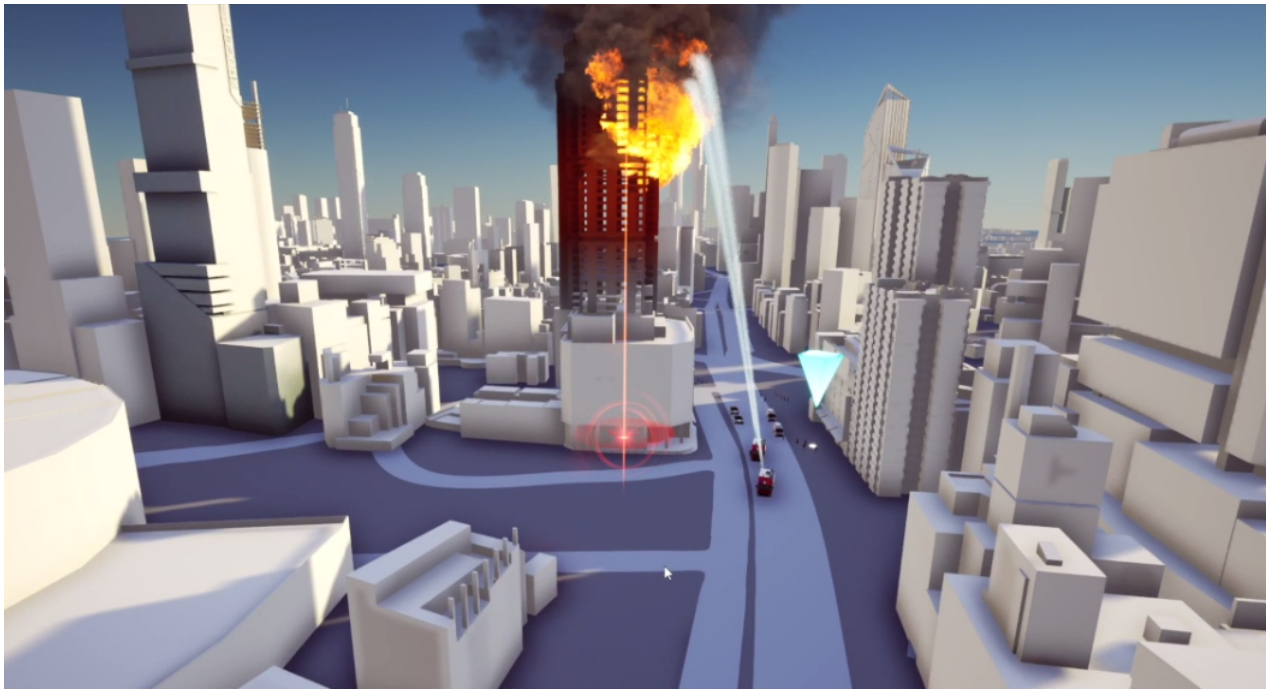

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Four Major Tools for Addressing Disaster Management Challenges

Emergency management has always faced four primary challenges: data sharing, information integration, emergency risk monitoring data awareness, and business application depth. To solve these issues, 51WORLD developed a comprehensive digital twin safety supervision platform based on years of digital twin experience. The platform maximizes the benefits of digital twin technology in cross-domain information association, data connectivity, integration, and sharing, strengthening industry intelligence assisting managers in conducting emergency management more efficiently, and reducing disaster losses.

Among them, the platform has four key capabilities.

Integration of different data sets from multiple sources

01

It can process, integrate, and manage diverse data from several sources, converting different forms of data into structured datasets to address challenges like data chaos and conflict, multiple sources for the same data, uneven quality, and missing data. Furthermore, it can interact with higher-level business supervision platforms and specialized application platforms through a unified standard data interface, addressing the issues associated with merging many datasets.

> Unified digital base

02

By creating a uniform digital twin foundation and using current information management systems in key industries, the business supervision platform and application platform can interconnect, resulting in a comprehensive and three-dimensional picture of diverse risk scenarios. This efficiently addresses the issue of data sharing issues.

> Integrated Management for Disaster & Risk Hazards

03

Using a state perception system as its foundation, it tracks and cares for numerous monitoring devices throughout their lives. It integrates monitoring and warning data with basic data such as weather, population, transportation, geological environment, and professional analytical models to determine the possible disaster range, impact, and trends of events. This improves the early detection and forecasting of risks.

> Integrated Cooperation Across the Entire Network

Establishing a Comprehensive Cross-Departmental Collaborative Disposal Process to improve coordinated response capabilities to various accidents, disasters, natural calamities, and urban comprehensive risks, thereby shifting emergency management from “reactive response” to “proactive prevention and control.”

04

02

Five Major Application Scenarios

> Urban Lifeline Projects

Lifelines in the city provide crucial resources such as water, power, and gas to keep the city operating. These lifelines are underground pipeline networks.

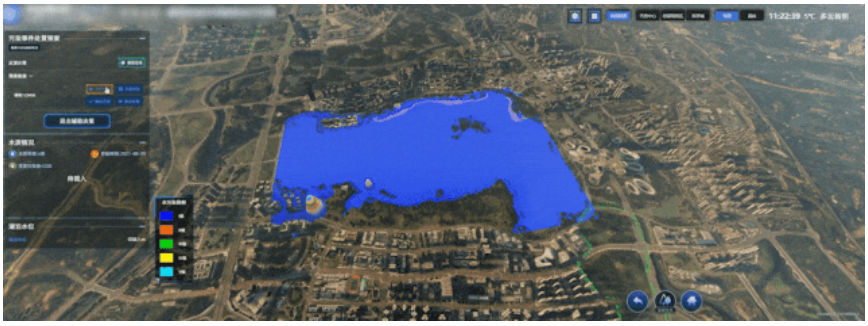
Based on digital twin technology, the digital twin safety supervision platform can monitor, analyze, and make decisions about the city’s main drainage networks, aged pipes, pipelines with structural flaws, and urban pipeline networks in high-risk locations. It is compatible with other modules for disposal. This maintains pipeline network safety while also improving emergency management efficiency.

> ● **Status Monitoring:**

Aggregating city basic pipeline network data and IoT perception data, the system performs component-level high-precision restoration of equipment such as gas pipelines, water supply networks, drainage networks, heating networks, and electrical networks. It enables real-time monitoring of the operational status of underground municipal infrastructure.

> ● **Data Analysis:**

Real-time perception of the pipeline network’s operational status, paired with monitoring thresholds, is used to examine pipeline leaks, damage, gas explosions, abnormal pressure, abnormal flow, and water depth. This enables the rapid detection of safety hazards and operational risks in underground municipal infrastructure, as well as the issuance of level-specific safety risk warnings. This improves the efficiency of urban underground municipal infrastructure operations and the capacity to predict accidents.



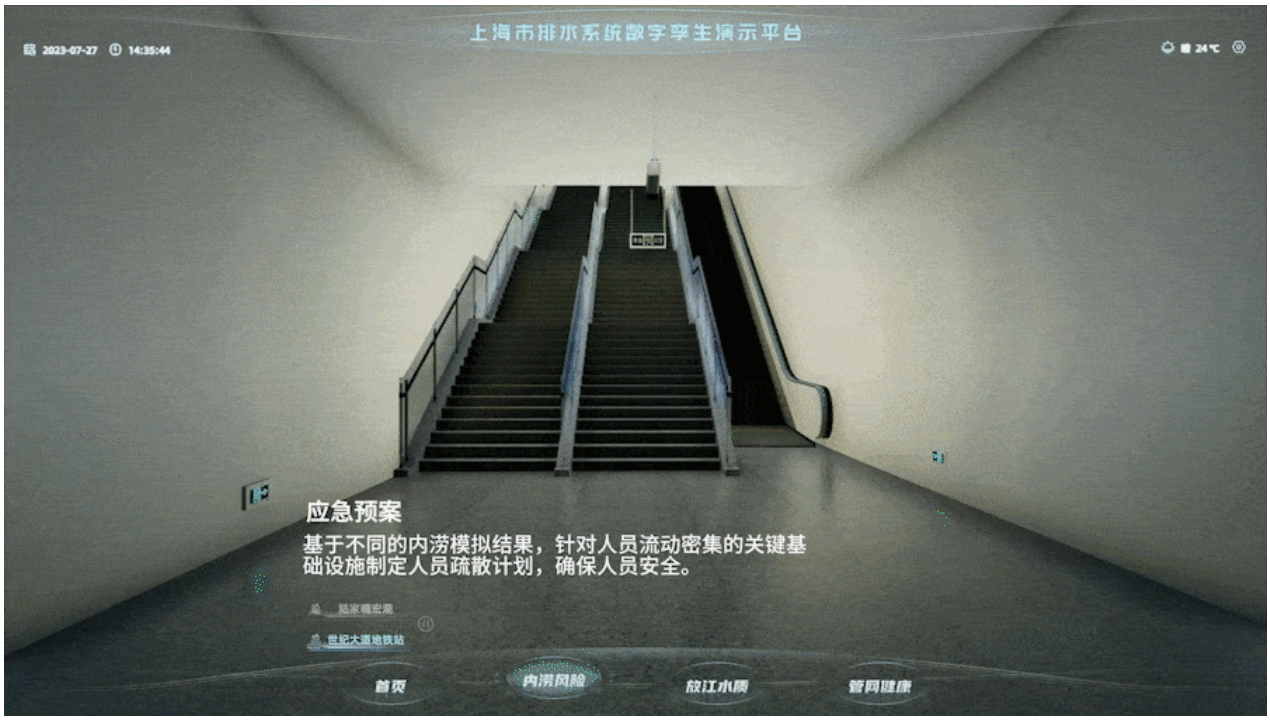
- **Coordination and Response:**

Emergency resources can be controlled digitally, dynamically, and visually, allowing for instant deployment of emergency plans. GIS, artificial intelligence, and Internet of Things technologies can be used to enable intelligent control and decision-making.

City Flood Management

Flooding in cities is a common natural disaster with complicated causes that are usually caused by high rainfall events. At a minor level, it can have an impact on the city's safety operating and the lives of its citizens; at a serious level, it can cause power outages and even risk lives. Rapid and effective disaster assistance measures are critical.

The digital twin safety integrated management platform aids city flood control by perfectly duplicating digital twin scenarios of cities and water-related facilities. It uses real-time meteorological data, city topography information, and flood model simulations to remotely manage and predict flood response processes such as starting and stopping pump stations, operating storage facilities, opening and closing gates and dams, and deploying on-site personnel.

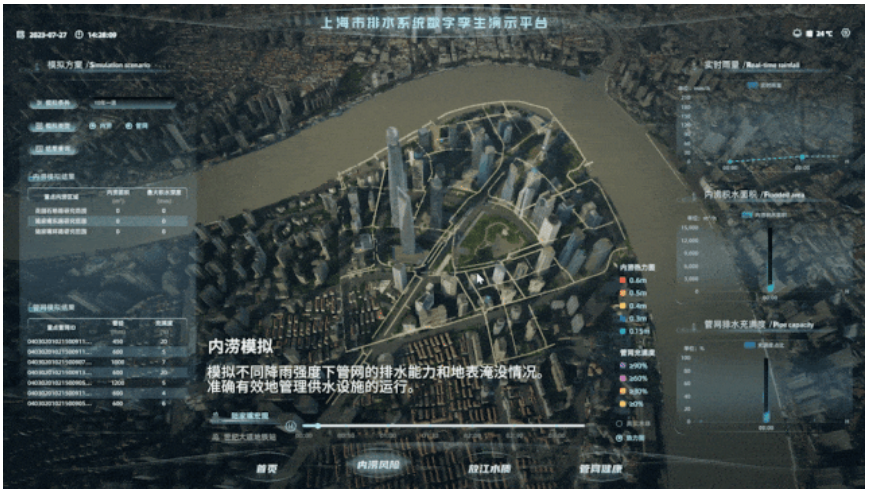


> ● **Real-time Monitoring and Early Warning:**

We can analyze and anticipate city flooding incidents and severity by combining real-time monitoring of sewage facilities with precipitation data. This allows for the early activation of flood risk warning measures, preventing dangers from escalating.

> ● **Simulation and Scientific Decision-making:**

Using comprehensive drainage model algorithms, multiple city drainage response strategies may be simulated under various rainfall patterns to predict development trends and flooding in city areas. The algorithm outputs are overlaid onto three-dimensional urban twin situations, visually displaying the breadth and severity of flooding using heat maps and realistic water material effects, allowing decision-makers to make more precise choices.



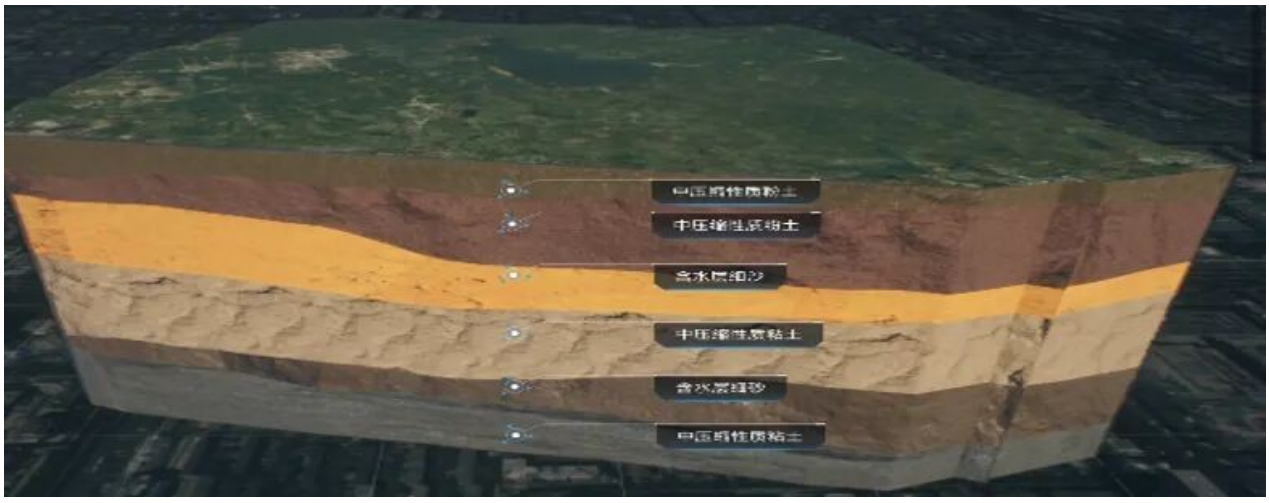
> ● **Risk Scenario Assessment and Management:**

By measuring the impact of city floods, important vulnerable locations within the city can be precisely identified, allowing for the development of effective risk management strategies to reduce losses.

▌Natural Disaster Emergency

Creating a three-dimensional geological digital twin scenario to continuously monitor geological hazards such as landslides, collapses, debris flows, city road cracks, sinkholes, and ground settlement in mountainous locations.

Dynamic simulation of geological disaster dynamics, combining monitoring and simulation, allows for integrated control of the full geological disaster management process and lifecycle, including monitoring, analysis, forecasting, early warning, and emergency response.



▌City Safety

City public safety threats include the collapse of old buildings, heavy passenger flow, building fires, elevator operation, and transportation of vehicles.

The software analyzes events intelligently by integrating public safety data, identifies and alerts to suspicious incidents, achieves exact deployment, and dynamically deploys law enforcement resources online. Simultaneously, it incorporates real-time video feedback to reduce the time between detection and resolution, resulting in public safety prevention and a control system that combines terminal perception, intelligent algorithms, and 3D scenarios.

> ● **Comprehensive Prevention and Control:**

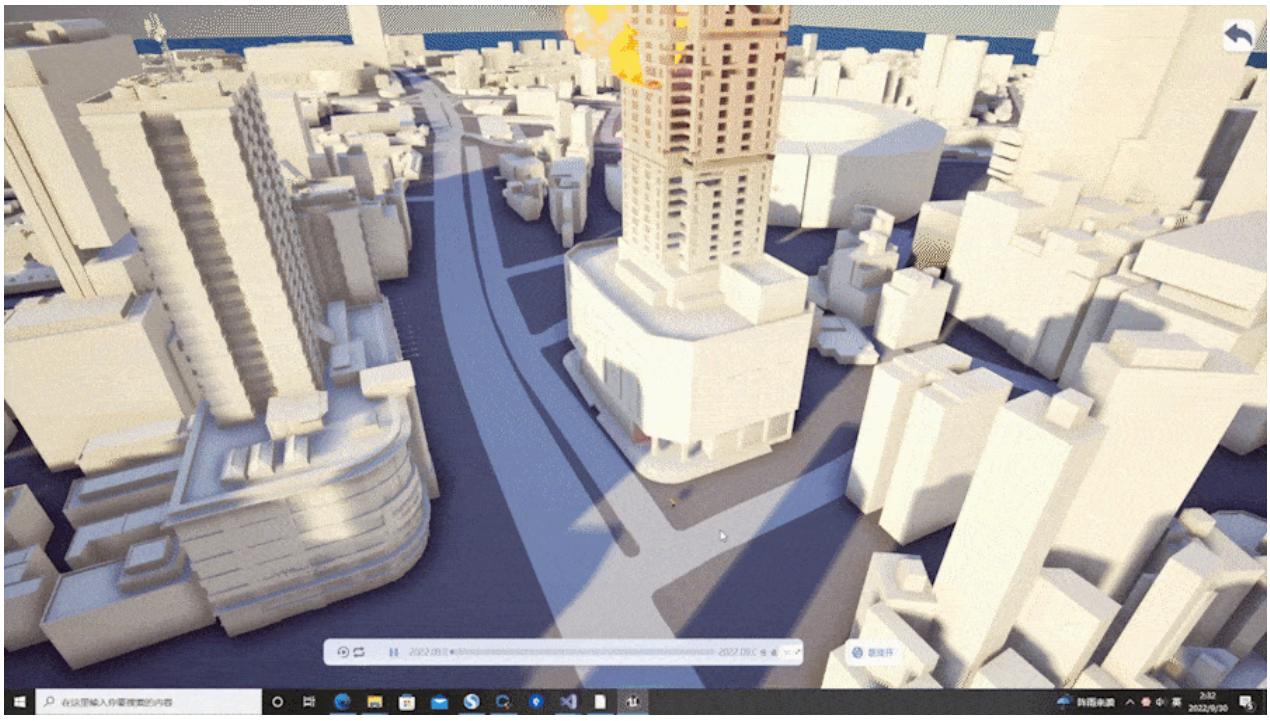
Support the effective administration of addresses throughout the region, including actual people, housing, and units.

Combine visual range analysis to determine the range of obstructed vision, so defining viewable areas and blind spots and exhibiting the visible range of vantage points.

> ● **Event Emergency Simulation:**

Before major public emergencies for example fires, written plans are converted into visual plans, resulting in a new sort of emergency plan that is operable, visual, measurable, easy to administer, and share.

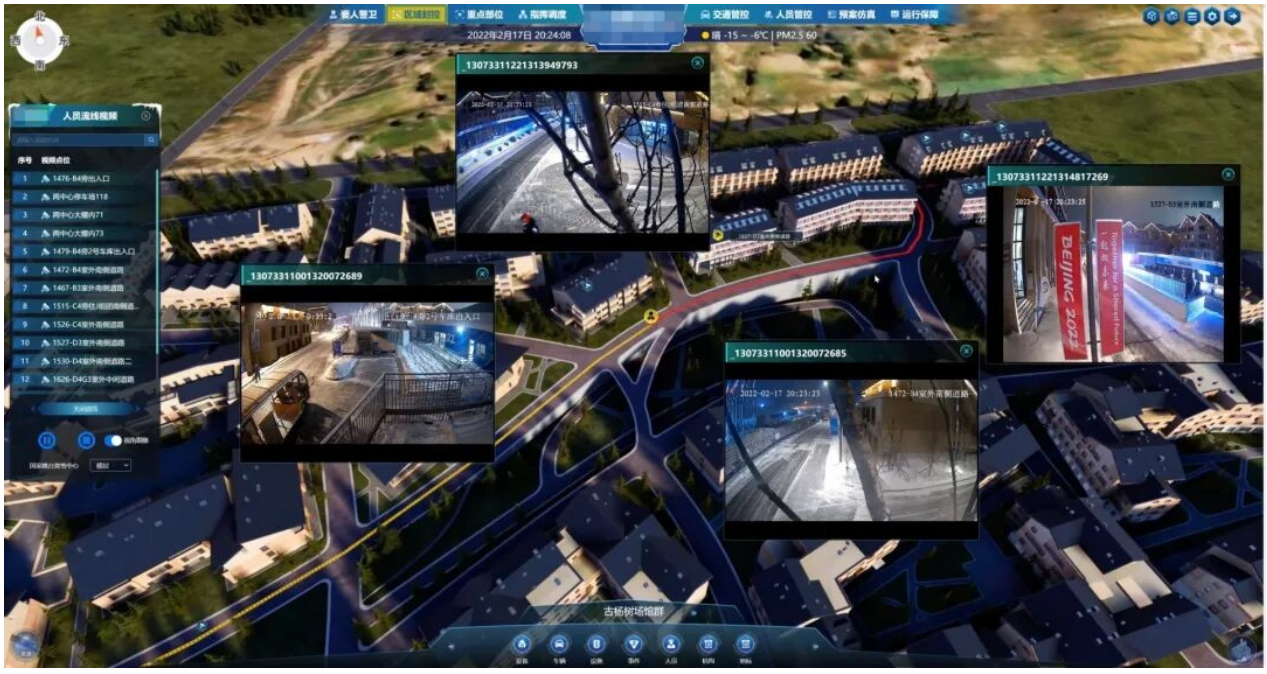
During an accident, multi-departmental business communication, one-click rapid deployment of executive plans, and unique security guarantees can be used to quickly pinpoint the event.



> ● **Major Event Security:**

“Large-scale events” are often characterized by their large scale, long duration, unexpected turnout, and complicated crowd compositions, rendering them more vulnerable to numerous safety risks.

The 51WORLD digital twin safety integrated management platform may provide critical individuals with route planning and security rehearsals, assuring their safety while traveling.



- **Key Resource Management:**

critical resources include key locations (e.g., railways, airports, ports, landmarks), police resources (e.g., fast reaction points, police stations, checkpoints), and critical facilities (e.g., vehicle checkpoints, facial recognition checkpoints, cameras, smart manholes). The platform includes features such as quick questioning and rapid positioning, which promote coordination among critical resources and improve the efficiency of handling public safety emergencies.

▌Safety Production

Monitoring the safety operation status of businesses in key high-risk industries, conducting real-time monitoring of personnel in areas such as factory premises, workshops, production lines, and equipment, and analyzing production safety accidents from multiple dimensions to predict trends in safety production risks. This creates a closed-loop management system for safety supervision, data analysis, emergency response coordination, and safety supervision.

In the future, 51WORLD will make it easier to integrate and apply digital twin technology to emergency management operations.

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