In modern software systems, databases and software maintenance are widely regarded as two of the most fundamental and critical technical pillars. The former provides structured support for information storage and management, while the latter guarantees the long-term stable operation and adaptability of the system. In the construction of disaster management and emergency response systems, these two technologies not only play a fundamental role, but also play an irreplaceable function in real-time, reliability and sustainability. This paper will focus on the database and software maintenance of the two core technologies for systematic elaboration, and to explore their practical application scenarios and coping strategies in unexpected disaster situations.

Database is a systematic tool for storing, managing and retrieving structured data. In software design, databases are usually implemented through relational (e.g., MySQL, PostgreSQL) or non-relational (e.g., MongoDB, Redis) database systems with key features such as data consistency, transaction support, concurrency control, and persistence. Key modules in database design include data model construction, query optimisation, indexing mechanisms and permission control.\cite{jatana2012survey}

Relational Database (RDB) is built on Relational Model (Relational Model) to store data in the form of two-dimensional tables (Table). Each table consists of a number of ‘columns’ and ‘rows’, usually with a strict structural definition, the requirement to write data before the explicit field types and constraints.

Relational databases have the following characteristics: 1, data through the table and the primary key / foreign key connection (Join); 2, strong consistency (ACID transaction support); 3, suitable for structured data storage and complex queries; 4, the query language for the standard structured query language (SQL).\cite{date1989sql}

Non-relational database (NoSQL) is a class of databases developed to address the limitations of traditional RDB under the demands of massive data, high concurrency and flexible structure. It does not rely on a fixed table structure and pays more attention to scalability and flexibility. Its main features are: Weak structure (Schema-free), can be flexibly adapted to frequently changing data; High scalability and high availability , support for distributed deployment;

More suitable for processing semi-structured or unstructured data;

The query language varies from system to system, for example, MongoDB uses JSON-like query syntax.

Software Maintenance is the process of modifying, optimising, repairing and upgrading software after it has been deployed, with the aim of prolonging its life, fixing defects or adapting to environmental changes. According to IEEE standards, software maintenance can be classified into four categories: \cite{lientz1978maintenance}

Corrective maintenance, adaptive maintenance, improvement maintenance and preventive maintenance. In the software design process, scalability, modularity and document standardisation are important prerequisites for software maintenance.

Disaster scenarios in the system environment is highly uncertain, user needs may change at any time, software maintenance capabilities directly determine the system's resilience and adaptability. Specific applications include:

Emergency system repair and patch release: to cope with unexpected situations such as system paralysis, vulnerability attacks or hardware failure, rapid response and security repair;

Rapid iteration of functional modules: as the development phase of the disaster advances, it may be necessary to temporarily add functional modules such as personnel tracking, route planning, and outbreak notification;

Adaptation to changes in hardware and network conditions: adjustments to system parameters, such as switching to lightweight services, enabling offline mode, etc., are made under conditions of restricted network or damaged equipment;

Future-oriented system evolution: in the post-disaster recovery phase, the system can be expanded into a regular early warning and risk management platform on the existing basis, realising a smooth transition from an emergency response system to a regular service.