

# German Red Cross

## Cloud-Based Digital Transformation of Laboratory Infrastructure

### In Brief

The German Red Cross (Deutsches Rotes Kreuz – DRK) partnered with Gloster to digitize and modernize its laboratory operations, replacing outdated, paper-based processes with a secure, scalable, cloud-based laboratory information management system (LIMS). The new system streamlines data collection, automates workflows, and enables real-time reporting across the organization.

Developed using a microservices architecture, the platform enhances operational efficiency, supports rapid response needs, and lays the foundation for nationwide and future European expansion.

Gloster's solution reduced manual data entry errors by over 70%, accelerated sample processing by up to 60%, and enabled full cloud-based lab registration and deployment – all while ensuring GDPR compliance and operational continuity.



Manual data entry errors reduced by over 70%.



Sample processing time decreased by up to 60%.



System availability increased to 99.9% uptime.

### The Challenge

Despite its significant national and international responsibilities, the DRK's IT infrastructure had become a limiting factor.

-  No remote data access or real-time collaboration
-  High incidence of manual data entry errors
-  Cumbersome workflows, unsuitable for time-critical operations

# Our Approach

In partnership with Gloster, the DRK launched a complete overhaul of its laboratory IT infrastructure. At the core of this transformation was the development of a secure, scalable, cloud-native platform tailored to the full lifecycle of laboratory operations.

## Key Features

1

### End-to-End Workflow Integration

From sample collection to result delivery, the platform consolidates previously fragmented processes.

2

### Microservices Architecture

Built on Docker and Kubernetes for modularity and maintainability.

3

### Real-Time Data Flow

The entire system operates in the cloud, requiring no local installation. Labs can create and configure new virtual environments via a secure web interface, onboarding personnel, instruments, and sample workflows in minutes—dramatically accelerating deployment.

4

### Authentication & Access Management

Integrated with Keycloak for secure identity handling.

5

### Mobile-Optimized Data Entry

The platform introduced a secure mobile-based intake process: patients or donors enter their data via smartphone, which generates a personalized QR code. This code, paired with a sample barcode, is scanned by lab personnel—ensuring the data enters the system digitally, with zero manual transcription. This reduces friction at the most error-prone step in the workflow.

## Innovation Highlights

### ✓ Data Entry Process Modernization

- 🔗 Sample donors enter their data on a mobile site, which generates a QR code. The QR code is scanned at the lab, transferring data without storing it on external servers.
- 🔗 Ensures privacy and dramatically reduces data entry time.

### ✓ Cloud-Native Architecture

- 🔗 Enables real-time scaling based on workload demand.
- 🔗 Supports high availability and system redundancy.

### ✓ Decoupled Microservices

- 🔗 Each service (e.g., sample tracking, reporting, results evaluation) operates independently.
- 🔗 Enhances maintainability and simplifies system updates

## Business Impact

The solution provided by Gloster delivered immediate long-term value, significantly enhancing the capacity to respond to time-sensitive health and disaster scenarios with a centralized, scalable digital backbone for future expansion .

## Operational Improvements

- Manual data entry errors reduced by over 70%
- Sample processing time decreased by up to 60%
- System availability increased to 99.9% uptime

## Strategic Outcomes

- Improved cost-efficiency via reduced manual workload
- Scalable digital infrastructure ready for multi-site national deployment
- Enhanced compliance, traceability, and data governance

## What's Next?

The platform is already operational in selected DRK labs, with full production rollout underway. Following successful validation, a national rollout is planned. Long-term ambitions include extending the solution across the European Red Cross network, driving continent-wide standardization, and improving healthcare outcomes globally.

## Technologies Used



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