Technical Requirements

TR ID	Technical Requirement	Final Requirement Statement
TR-01	Cloud Infrastructure	The system shall be hosted on secure cloud infrastructure with ≥99.9% uptime and geographic redundancy.
TR-02	Production Environment	The production environment shall be hosted in a primary region with secondary-region replication for business continuity.
TR-03	Environment Separation	The system shall maintain separate development, staging, UAT, and production environments.
TR-04	Three-Tier Architecture	The system shall implement a three-tier architecture separating presentation, application, and data layers.
TR-05	Load Balancing & Scaling	The system shall support load-balanced application servers with auto-scaling capabilities.
TR-06	Blockchain Node Servers	Dedicated blockchain validator nodes shall meet minimum hardware specifications defined in the infrastructure standard.
TR-07	Application Framework	The web application shall be implemented using ASP.NET Core MVC.
TR-08	CMS Exclusion	The system shall be custom-built without reliance on a traditional CMS.
TR-09	Development IDE	Development shall be conducted using Microsoft Visual Studio or equivalent supported IDEs.
TR-10	Admin Portal	The system shall provide a web-based administrative portal for user, contract, and system management.
TR-11	CLI Tools	The system shall provide CLI tools limited to deployment, configuration, and monitoring functions.
TR-12	Monitoring & Logging	The system shall provide centralised logging and real-time monitoring dashboards.
TR-13	Payment Processing	Payment processing shall be handled through existing ERP integrations in Phase 1.
TR-14	Future Payment Integration	The system shall support extensibility for future payment gateway integration.
TR-15	HL7/FHIR Compliance	The system shall support HL7/FHIR R4 standards for Epic EHR integration.
TR-16	API Performance	The system shall respond to 95% of API requests within 2 seconds.
TR-17	Integration Testing	All external integrations shall be validated in sandbox environments prior to production deployment.

TR-18	API Compatibility	The system shall maintain backward compatibility for the two most recent API versions and publish a deprecation policy.
TR-19	Backend Language	Backend logic shall be implemented using C# with .NET 6.0.
TR-20	Frontend Languages	Frontend components shall be implemented using HTML5, CSS3, and JavaScript ES6+.
TR-21	Smart Contract Language	Smart contracts shall be written in C# for the Stratis platform.
TR-22	Database Language	Microsoft SQL Server with T-SQL shall be used for off-chain data storage.
TR-23	Encryption at Rest	All data at rest shall be encrypted using AES-256.
TR-24	Encryption in Transit	All data in transit shall be protected using TLS 1.3.
TR-25	Access Controls	The system shall enforce RBAC and MFA for administrative accounts.
TR-26	Audit Logging	Audit logs shall be retained for a minimum of seven years.
TR-27	Backup & Recovery	The system shall perform daily automated backups with RPO ≤24 hours and RTO ≤4 hours.
TR-28	Maintenance Window	Scheduled maintenance shall not exceed four hours per month during off-peak periods.
TR-29	CI/CD Pipeline	The system shall use automated CI/CD pipelines for build, test, and deployment.
TR-30	Blue-Green Deployment	The system shall support blue-green deployment with rollback capability.
TR-31	Patch Management	Security patches shall be applied within 48 hours of release.
TR-32	Data Migration	The system shall provide migration tools with post-migration validation reports.
TR-33	Legacy Synchronisation	The system shall support limited legacy-system synchronisation during transition periods.
TR-34	Migration Validation	All migrated data shall be validated for completeness and integrity.
TR-35	Rollback Plan	A documented rollback plan shall exist for migration failures.
TR-36	Browser Support	The system shall support modern desktop and mobile browsers.

TR-37	OS Compatibility	The system shall support Windows, macOS, and modern Linux distributions.
TR-38	Mobile Responsiveness	The web UI shall support responsive design for mobile devices.
TR-39	Cross-Browser Testing	Automated and manual cross-browser testing shall be conducted prior to release.
TR-40	Page Load Performance	Initial page loads shall complete within defined performance thresholds.
TR-41	Interaction Response	Standard user interactions shall respond within one second.
TR-42	Concurrent Users	The system shall support at least 500 concurrent users.
TR-43	Transaction Volume	The system shall support defined daily and peak transaction volumes.
TR-44	Blockchain Confirmation	Blockchain transactions shall confirm within agreed operational thresholds.
TR-45	Database Performance	Database queries shall meet defined latency thresholds.