## Objectives

Functionality Objectives

Functionality defines the operations by which users can expect to interact with the service.   
The list of functions is characteristically composed of two subgroups:

* system operation functionality, required to keep the system functional, and
* end-user functionality, required by business service provider users and business service consumer users.

Quality Objectives

The quality of a system is the degree to which the system satisfies the stated and implied objectives of its various stakeholders.

The ISO-25010 quality model defines which quality characteristics (security, functionality, adaptability, maintainability, etc.) are considered when evaluating the characteristics of a software service.

The Qualities are defined as Quality Requirements, defined elsewhere.

Quality Objectives

The amount or degree to which the Quality Requirements must be adhered to are defined as Quality Objectives.

This document lists these Quality Objectives.

## Target Quality Objectives

The following table catalogues key quality objectives referenced by the subsequent Baseline System Quality Requirements.

| Quality | Category | Subcategory | Value | Rationale and/or Notes |
| --- | --- | --- | --- | --- |
| Deliverability | Deadlines | First deployment to the  PROD-DATA environment | 1.5 months | *The service must be securely deployed by automation to the PROD-DATA environment for access by an authorised subset of users for user validation of whatever configuration and/or functionality is available at that point in time.* *Important: the business service is not expected to be feature complete by this deadline -- the purpose of the requirement is to ensure that an automated deployment pipeline service is in place to further develop the orchestration of compilation, testing, packaging, deployment and host environment configuration.* |
| Max Deployment Iteration |  | 2 weeks | *Note: automated deployments to PROD are idempotent, and are done approximately every 2 weeks, whether new features have been developed or not (max 4 weeks if not). The rationale to force automation of testing to be addressed from the start, to ensures IP is encoded, available for a long time after resources leave a project.* |
| Functionality | Service | Groups |  | Note:  a key characteristic of the sector is that |
|  | Roles | Group-Specific Permissions-Based | Note:  a key characteristic of the sector user base is that a user may belong to multiple groups, having different roles in each (Teacher in one, Admin in another higher one, Learner in yet another, Assessor in yet another) |
|  | Auditing | All operations, including Search and View | Note: As a government entity, we are mandated to meet target NZISM auditability objectives. As a NZ Entity we are obligated to immediately investigate irregular activity, report breaches and provide information to quantify as accurately as possible potential impact. |
|  |  |  |  |
|  | Removal |  | Note: As a government entity, we must provide the functionality to remove access to records by end users, while obligated to keep all records within a service, without removal, using reversible logical state changes. Note that we also mandated to be capable of removing PII from records, to meet Privacy Act objectives. |
|  | Diagnostics |  | Note: To collaboratively provide service access to secured diagnostics is recommended. |
| Security | Hash Algorithms |  | Min: SHA-3 |  |
| Protocol Encryption Protocols |  | Min: TLS 3+ |  |
| Certificates | Max Length | 90 days | Note: For Services hosted outside of the organisation’s cloud infrastructure (eg: on vendor cloud infrastructure) the following will be require to regularly redevelop certs and deliver them to the vendor: a) an ability and agreement by the vendor to update the certs regularly b) a documented and security verified process  c) a secure organisation managed file transfer service  d) a budget  e) a agreed schedule (endorsed if it varies from the 90 days). |
| Data Classification | Resource | UNCLASSIFIED | Note: This is in regards to the *individual* resources managed within the service. |
|  | Service | IN CONFIDENCE | Note: The system is intended to hold UNCLASSIFIED individual resources,  but the volume of user Personally Identifiable Information (PII) demands the information be treated as IN CONFIDENCE.  Reference:  <https://protectivesecurity.govt.nz/home/information-security-management-protocol/new-zealand-government-security-classification-system/>  References:  [http://www.gcsb.govt.nz/publications/th e-nz-information-security-manual](http://www.gcsb.govt.nz/publications/the-nz-information-security-manual) |
| Physical Hosting | Min level of Physical storage accreditation | ISO-27001 Level2+ |  |
| Compatibility/ Interoperability | Integration Systems | Hosting | Organisation  Cloud Accounts |  |
| Identity | - (I/O) Organisation specific Identity Provider | Note: Integration protocols are: - OIDC for Persons,  - OAuth for Services |
| Diagnostics & Errors | (O)Organisation SIEMs | Note: Sighting of Diagnostics MUST be performed during Security validation, to ensure confidential information (PII,etc.) is being cleansed before being recorded.  Subsequent access to Diagnostics Logs depends on Support Terms within Development and subsequent Support contracts. |
| Reporting | (I/O)Reporting Database | Note: Confidential information stripped (ie PII) data is required to be made available by secure automation for use within organisation reporting services. Duplication to secondary databases via ETL using API is preferred, FileDrops are agreeable if need be. |
| Data | (O) Data warehouse | Note: Data extracts with PII information is to be made available by secure automation for subsequent importing into the organisation’s data warehouse. Preferred ETL methods include API, FileDrops are acceptable. |
| Other | (I/O) Te Rito (via APIs)  (O) Student Management System (SMS) (via APIs)  (I/O) Learning Management System (LMS) (via APIs) | Note: Almost all student-information based services integrate with the following 3 systems:  - FIRST, for repository of information regarding Schools  - ENROL, for repository of information regarding which students are in which Schools, - Te Rito, the repository of student achievements |
| Integration Methods | Protocols | JSON API | Note: Although XML is still supported, JSON is the preferred protocol when both are available. |
| Identity | OIDC, OAuth, SAML | Note: As discussed under IdPs, OIDC and OAuth are preferred. Legacy SAML is endorsable if required. |
| Education specific standards | cmi5, xAP, SCORM | Note: If the service is required to integrate with Te Rito, custom APIs are expected to be used, but depending on the system, the information contained may required being formatted using international and sector standards. |
| IT Standards | JSON, REST OpenAPI,  ODATA, GraphQL (for queryability). | Note:  Proposals and deliverables are evaluated based on the currency of services expected to be in current services. Such as those to the left. |
| Reliability/ Availability | Throughput | Surge Average Concurrent Requests/sec | 3000 user interface requests per sec, or  3000 API req/sec |  |
| Downtime | Duration | 20 minutes | Assuming part of a lunch break. |
| Ratio/Fortnight | 99.9% | 20 minutes per fortnight. |
| DR | Recovery Point Objective (RPO) | Max 15 mins | Iterative Backups are expected to not lose more than 15 minutes. |
| Recovery Point in Time (RPT) | 60 mins | A full restoration of a database should be a rare occurrence, and not take longer 3x time the permitted downtime. |
| HR | Horizontal Scaling Up | >50% over 120 seconds. | Note: These settings are if installed on cloud infrastructure. If not, equivalencies must be sighted. |
| Horizontal Scaling Down | <33% for over 500 seconds | Note: These settings are if installed on cloud infrastructure. If not, equivalencies must be sighted. |
| Backup | Full | Every 24 hours |  |
| Incremental | Max 15 minutes |  |
| Duration kept | 31 days | Note: This duration must be mentioned to users in the Data Usage declarations, mentioned elsewhere. |
| Vendor Support Response Times (mins) During normal business hours | P1 | 15 minutes | Expected, but negotiable. |
| P2 | 2 hours | Expected, but negotiable. |
| P3 | 4 hours | Expected, but negotiable. |
| Reliability/  Availability/  Capacity | Minimum Users |  | 85,200 minimum Editors  2,000,000 Clients providing feedback | Assuming:  Estimated number of potential users   * 800,000 learners, * 55,000 teachers, * 30,000 Early Learning teachers * 920,000 parents & whanau * 200 MOE users   Note: Although national public services do not often require being ready for use by all stakeholders from day 1, the service must be able to dynamically grow to meet the needs of the full spectrum of users.  Note also that although the initial planned user base may be smaller, the scope of functionality may increase over time to a larger ratio of the full potential user base. Note that compiled languages and caching may permit using less servers than other solutions (eg: all other aspects equal, 1 .NET.Core server running a .NET.Core application may provide the equivalent throughput to 40 Python based servers). |
| Minimum new Users/year | New/Leaving students | 62,000 | Note: Leaving users do not release storage, but may be impacted by Offboarding obligations as per Privacy Laws and regulation. |
| Minimum Users requiring IdP changes | Changing school/year | 110,000 | Note: The number of changing conditions requires the service permit account self-management, so as to not add unnecessary workload to teachers and admin. |
| Minimum User Groups |  | 14,400 | Assuming:  Sector groups and organisations:   * 2500 schools, * 5000 early learning providers, * 4000 home schools, * 600 Tertiary organisations. * 850 playgroups * 200+ Kahuo Ako/Communities of Learning grouping 1700+ schools. * 220+ Learning Support Clusters, comprised of 1800+ schools. * Unknown number of sports, learning, etc. groups (1000)   *Note:  Providers, in turn, can have nested groups per subject, year, and group.*  The grouping of Users into one or more nested Groups, and assigning them Group-specific Roles (as opposed to Service-specific Roles), is a defining characteristic of the education sector. |
| Minimum Media Resources |  | 100,000 | Assuming: Estimated number of individually managed media resources:   * 5,000 documents * 17 drafts spread over   3 published versioned |
| Minimum Storage (Gb) |  | Estimate Max 500 Gb | Assuming:   * 7 years x 100,000 tests, x 3 times, x 0.25Mb   Note: The cost of Storage is cheap and should not be a deciding factor. The only deciding aspect is to ensure there is enough. |
|  |  | 12,000/4 = 3000 users | Assuming:   * 121,000 users/year, * 10% being concurrent over 25 seconds: * NCEA 1: 140,000 * NECA 2: 88,0000 * NCEA 3: 33,000   Note: The user base is large, and classes take place at different times of the day. There are not envisioned moments when the service is expected to be used by all users at the same time. |
| Performance | Response Time | Peak Concurrent Requests/sec | 12000 requests per sec. | Note: That said, in a large population, the throughput of eager users is considerable and unnecessary delays are not desired. |
| Average *Completed* Response Time |  | 0.5 seconds | *Note:  latency is always a problem. Please state strategies to minimizing this problem, which may include minimising the number of requests by using a SPA interface (as opposed to an MPA architecture), combined with bundling imagery, styles and scripts, caching, CDN, asynchronous requests – especially database calls.* |
| Max *Completed*  Response Time |  | 2 secs | Note: It is accepted that although the majority of pages must complete within 0.5ms, not all will. But it is unacceptable to delay users productivity by more than 2 seconds for those that can’t the 0.5ms expected delay. |
| Resource Usage | Client Memory | 25Mb | Per Interface instance/tab | Note: Client side development must cause onerous use of client system resources – or potentially lead to difficult to diagnose and correct error reports. |
| Client CPU | 10% | Interfaces should not consume excessive CPU at rest. | Note: Same. |
| Server Memory | 2Gb |  | Note: Beyond system code base itself, and caching, correctly developed stateless services should not require atypical memory. |
| Server CPU | 25% | See HR settings. | Note: Same |
| Db Server CPU | 4 | Preferably 2. | Note:  The Number of CPU can severely impacts DB Server licensing costs. |
| Maintainability | Tech Preferences | Host Environment | Cloud. Hosting provider must have ISO-27001 level 2+ | *Note: This organisation already has enterprise wide licenses with Azure as well as Amazon, along with associated billing & maintenance processes.* |
| Database/Store | SQL Server preferably | *Note: Applicable only if custom services are being developed: in order to be able to encrypt at the Db, Table, Column, Row level as required by different Data Classification needs. Others are acceptable if the above are not required.* |
| OS | Endorsable Mainstream (Windows, Red Hat, etc.) | Note: The preference for Windows is only relevant due to the current available in-house capabilities. |
| Service Framework | Supported, Preferably | Note: Applicable only if custom services are being developed: Supported Frameworks provide more security over the supply chain. |
| Service Language Type | Compiled | Note:  Applicable only if custom services are being developed: Compiled servers in PROD consume less resources, therefore cost less over the service lifecycle. |
| Service Client Framework | Vue.js, Angular, React  Electron or equivalent | Note:Applicable only if custom interfaces are being developed: SPA based architectures require less server resources than MPA architectures, while providing the benefits of having to develop according to API-First principles. |
| Service Client Language | Typescript preferably | Note: Applicable only if custom interfaces are being developed: Transpilable languages demonstrably reduce error count, while increasing maintainability. |