Test Plan for ‘Audio Cataloger Project’

1. Main goals

Development of a reliable tool to catalog audio files, find duplicates, and identify corrupted files with quick and simple user interaction, along with multiple output formats (HTML for browser viewing and CSV for spreadsheet editing).

2. Requirements to be tested

SC-3 Critical path testing
UR-1, UR-2, UR-3 Critical path testing
BR-1, BR-2, BR-3, BR-4 Smoke testing
QA-1 Smoke testing
QA-2 Smoke testing, stress test
QA-3 Critical path testing
L-4 Critical path testing
DS-2, DS-3, DS-4, DS-5 Smoke testing

3. Requirements not to be tested

SC-1. The application is a console one by design.
SC-2. The requirement to use Java and be distributed as JARcontainer are the development constraints, not the testable features.
L-1. The requirement to use Java is a development constraint, not a testable feature.
L-2. JRE version requirement is a development constraint, not a subject for direct testing.
L-3. JRE setup process is explicitly out of scope for testing.
DS-1. The requirement to use Java is a development constraint, not a testable feature.

4. Test strategy and approach

4.1. General approach

The application is a console tool designed for simplicity and reliability. Testing will focus on functionality, performance, and resilience to various input data. The application should never crash under any circumstances, so exception handling and error processing will be critical areas of testing.

4.2. Functional testing levels

- Smoke test: automated with batch files under Windows and Linux.
- Critical path test: executed manually.
- Extended test: not executed as the probability of defects detection on this level is negligibly small.

Unit-testing will not be applied due to extreme time limitations.

5. Criteria

- Acceptance criteria: 100% success of test cases on smoke test level and 90% success of test cases on critical path test level if 100% of critical and major bugs are fixed. Final requirements coverage by tests should be at least 80%.
- Testing start criteria: new build.
- Testing pause criteria: critical path test must begin only after 100% success of test cases on the smoke test; test process may be paused is that with at least 25% test-cases executed there is at least 50% failure rate.
- Testing resumption criteria: more than 50% of bugs found during the previous iteration are fixed.
- Testing finish criteria: more than 80% planned for the current iteration test cases are executed.

6. Risks evaluation

Personnel (low probability): if any team member is inaccessible, we can contact the representatives of the “Cataloger” project to get a temporary replacement.

Time (high probability): the customer has indicated a deadline of 15 days, therefore time is a critical resource. It is recommended to do our

best to complete the project by the 14th day so that one day remains available for any unexpected issues.
Quality risks (reliability concerns (high impact)): the application must never crash. Mitigation: Implement thorough error handling testing, stress testing, and code reviews focused on exception handling.

7. Schedule

- Day 1-2: Requirements analysis, test planning, and test environment setup
- Day 3-4: Test case design and test data preparation
- Day 5-6: Automated test scripts development (smoke tests)
- Day 7-10: Main testing cycle (execution of smoke and critical path tests, defect reporting)
- Day 11-12: Verification of fixed defects, regression testing
- Day 13-14: Extended testing (stress testing, performance)
- Day 15: Final verification, test report preparation, and project closure

8. Resources

- Software: four virtual machines (two with Windows 10 Ent x64, two with Linux Ubuntu 18 LTS x64).
- JRE 8.0.60+ installed on all machines.
- Hardware: two standard workstations (8GB RAM, i7 3GHz).
- Personnel:
    - Two developers with testing experience (100% workload during all project time). Roles: developers.
    - Two middle testers (100% workload during all project time). Role: testers.
- Time: 15 working days (120 work hours).
- Finances: according to the approved budget.
- Test data: Collection of audio files in supported formats (mp3, flac, wav, ogg, wma), including:
    - Standard valid files of different sizes
    - Files with corrupted headers/tags
    - Duplicate files with different metadata
    - Files larger than 2GB

9. Roles and responsibilities

Senior Developer (1):

- Technical design and architecture
- Core functionality implementation
- Code reviews
- Critical defect fixing

Junior Developer (1):

- Feature implementation
- Unit testing
- Defect fixing
- Documentation

Senior QA (1):

- Test planning and strategy
- Critical path test design and execution
- Defect verification
- Test metrics tracking and reporting

QA Engineer (1):

- Test case design and implementation
- Automated test script development
- Test execution
- Defect reporting

10. Documentation

- Requirements. Responsible persons – testers, deadline – the 2nd day.
- Test cases and defect reports. Responsible persons – testers, creation period – 2-4 days.
- Test result report. Responsible persons – testers, deadline – the 14th day.

11. Metrics

Test cases success percentage:

$T^{SP} = \frac{T^{Success}}{T^{Total}} \times 100\%$, where

T^{SP} – percentage of successfully passed test cases,

$T^{Success}$ – quantity of successfully passed test cases,

T^{Total} – total quantity of executed test cases.

Minimally acceptable borders:

- Beginning project phase: 10%.
- Main project phase: 40%.
- Final project phase: 80%.

Test-cases execution percentage:

$T^E = \frac{T^{Executed}}{T^{Planned}} \times 100\%$, where

T^E – test-cases execution percentage,

$T^{Executed}$ – quantity of executed test-cases,

$T^{Planned}$ – quantity of planned (to execution) test-cases.

Levels (borders):

- Minimal: 80%.
- Desired: 95%-100%.

Requirements coverage by tests:

$R^C = \frac{R^{Covered}}{R^{Total}} \times 100\%$, where

R^C – requirements coverage by tests (percentage),

$R^{Covered}$ – quantity of requirements covered with test-cases,

R^{Total} – overall quantity of requirements.

Minimally acceptable borders:

- Beginning project phase: 40%.
- Main project phase: 60%.
- Final project phase: 80% (90%+ recommended).