Software Requirements Specification

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Tabs2XML

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EECS 2311 Software Development Project

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1.0 Introduction

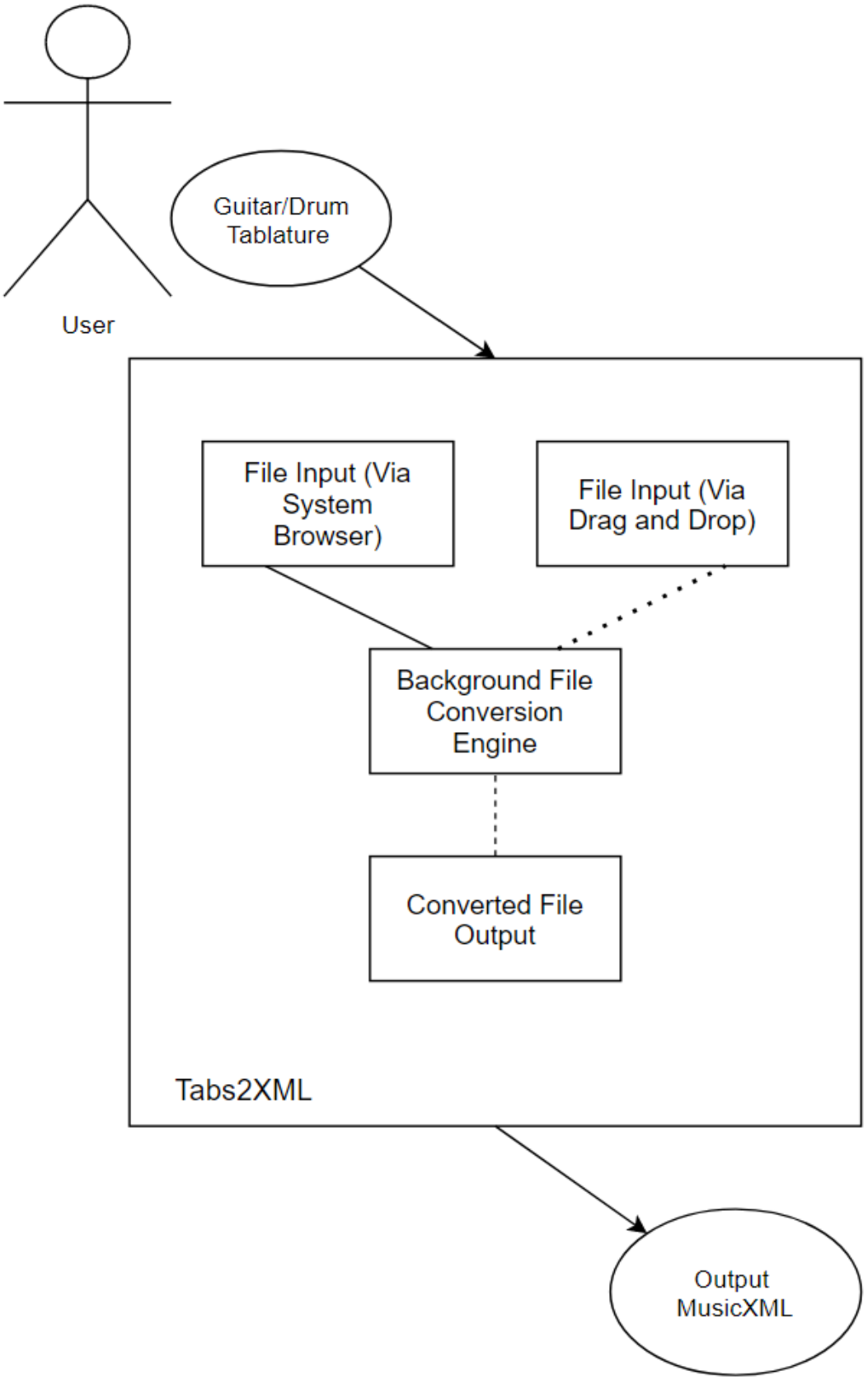

Figure 1 - Diagram aid for sections 1.1, 1.3, and 1.4. Depicts the core flow the User would go through and a little behind the scenes of what the Tabs2XML is doing in the background.

1.1 Purpose

The purpose of this document is to present a detailed description of the Tabs2XML system. This document will explain the purpose and features of the system, the interface of the system, what the system will do, the constraints under which it must operate, and how the system will behave when interacted with.

Tabs2XML is developed for the purpose of converting guitar tablature files and drums tablature files into MusicXML files. Due to the relatively new format, there aren't many music pieces written in MusicXML. While tablature for guitars and drums are easy to understand, they offer a low degree of readability and modification. The MusicXML format builds on these shortcomings to allow readers to better understand the music piece and easily play it. Tab2xml is developed for those who want to play songs in the format of MusicXML, but find that they can only find the tablature of those pieces (common occurrence as there aren't as many pieces of song in the MusicXML format). Tabs2XML also allows users to freely modify their music pieces. Tabs2XML is also developed for those who only have a tablatures for a song but want to view it in a music sheet. Tabs2XML converts tablatures into MusicXML files that can be modified and viewed as a music sheet using a third party app, such as MuseScore.

1.2 Intended Audience

Tabs2XML is being built for guitarists and drummers. These two groups of people will get the most out of our software as they would have access to another format to play songs from – one that can more easily read and modified. With our application they can convert their existing tablature collection or new tablature to MusicXML. Tabs2XML is also built for guitar/drum players who only have tablatures but want to view it in a music sheet, as it is much easier to read.

While guitarists and drummers have the most to gain, others like music teachers, students learning how to play the guitar or drums, and anyone wanting to convert tablature (for guitars and drums) to MusicXML will also benefit from the use of Music2XML.

1.3 Intended Use

The main use of Tabs2XML is its capability to convert tablature of guitars and drums to MusicXML. There are also extra built in features to help users select tablatures and convert them into MusicXML files. A user manual is also included in the event that the user does not know how to operate the program.

1.4 Scope

The software system will be a file conversion system which will turn locally stored guitar and drum tablatures into MusicXML files. The system is designed to help musicians who prefer to view their music in music sheet form but only have access to the tablature for a given song. The system will meet the customers needs while remaining easy to understand and use. The conversion then stores the file in a local chosen directory and a preview of the MusicXML file is also shown. A user manual is included to help new users install and operate the system.

1.5 Definitions and Acronyms

Term	Definition
MusicXML / XML	The modern file format for editable music that Tabs2XML converts text to.
Tablature Format / Tab	The rudimentary, text-based music format that Tabs2XML converts from.
UI	User interface. Aspects of the program that the user can see and directly interact with.
Conversion Engine	The algorithm that Tabs2XML runs to convert tablature to MusicXML

2.0 Overall Description

2.1 User Needs

Tabs2XML is meant to be a simple program that allows all music players to convert guitar and drum tablatures into MusicXML files which can then be viewed as a music sheet. As so, it is important for the program to be able to efficiently accomplish its task while remaining user friendly. Further needs of the user is discussed in detail in the Intended Audience section (1.2).

2.2 Assumptions and Dependencies

- The tablature the user is trying to convert is of a type that is supported.
- The user has successfully and properly installed the program onto their device(A detailed guide on how to install the program is shown in the user manual).

2.3 User Stories

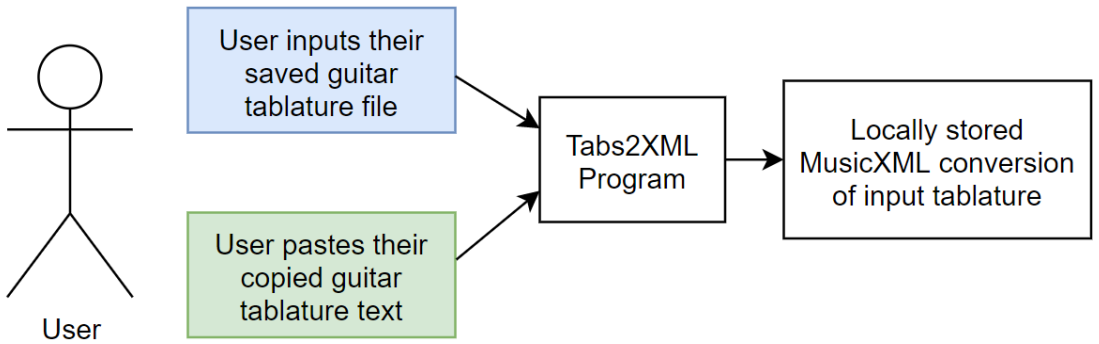

Figure 2 - Diagram aid for the first two user stories (blue for “User Converts Guitar Tablature from a Text File”, and green for “User Converts Drum Tablature from Clipboard”). Depicts the steps the User would go through for a successful interaction with Tabs2XML.

Title: User Converts Guitar Tablature from a Text File

Primary Actor: A user who has a text file containing guitar tablature for the song titled “Example” saved on their desktop (time signature 2/4). They wish to convert this file to MusicXML format, so it can be used/edited in MusicXML-supported software.
Success Scenario:

1. After opening Tabs2XML, the user clicks the “Browse” button at the top left of the window.
2. After the computer’s file explorer window appears, the user navigates to the computer’s “Desktop” folder (C:\Users\JohnDoe\Desktop), and clicks “Select Folder.” This causes a list of files to appear on the window’s left side (these are the files contained in the selected folder).
3. The specific text file containing the tablature is selected on the left side of the window, causing the tablature to appear on the right side of the window.
4. The user selects the 2/4 as the time signature, and guitar as the instrument. The name of the song, “Example,” is typed in place of the default song name, “Classical Guitar” (all of these options are found on the left side of the window).
5. The user clicks on the “Browse” button on the bottom left of the window, after which the file explorer once again appears. The user then selects a folder to save the final output file to, using the same method as step 2.
6. Finally, the user clicks “Convert,” and the newly created MusicXML file “appears” in the selected output folder.

Precondition: User has locally stored guitar tablature, and has enough local storage for the converted output file (~10kb).
Extensions: In the event that the tablature has incorrect formatting or is not a tablature, an error message is returned to the user when trying to press the convert button. The file does not convert and the user can then select a valid file.

Title: User Converts Drum Tablature from Clipboard

Primary Actor: A user who has discovered drum tablature for the song titled “Second Example” on their favourite music sharing website (time signature 4/4). They wish to convert this text to MusicXML format, so it can be used/edited in MusicXML-supported software.
Success Scenario:

1. Before opening Tabs2XML, the user highlights and copies the tablature to the computer’s clipboard (CTRL + C).
2. Tabs2XML is opened by the user.
3. The user clicks on the right-side text box. The user presses CTRL + V to paste the drum tablature into the text box.
4. The user selects the 4/4 as the time signature, and drums as the instrument. The name of the song, “Second Example,” is typed in place of the default song name, “Classical Guitar” (all of these options are found on the left side of the window).
5. The user clicks on the “Browse” button on the bottom left of the window, after which the file explorer appears. The user then finds the folder they wish to save the final output file to, and click “Select Folder”.
6. Finally, the user clicks “Convert,” and the newly created MusicXML file “appears” in the selected output folder.

Precondition: User has locally stored tablature for drums and User has enough local storage for the converted file (~10kb).

Extensions: In the event that the tablature has incorrect formatting or is not a tablature, an error message is returned to the user when trying to press the convert button. The file does not convert and the user can then select a valid file.

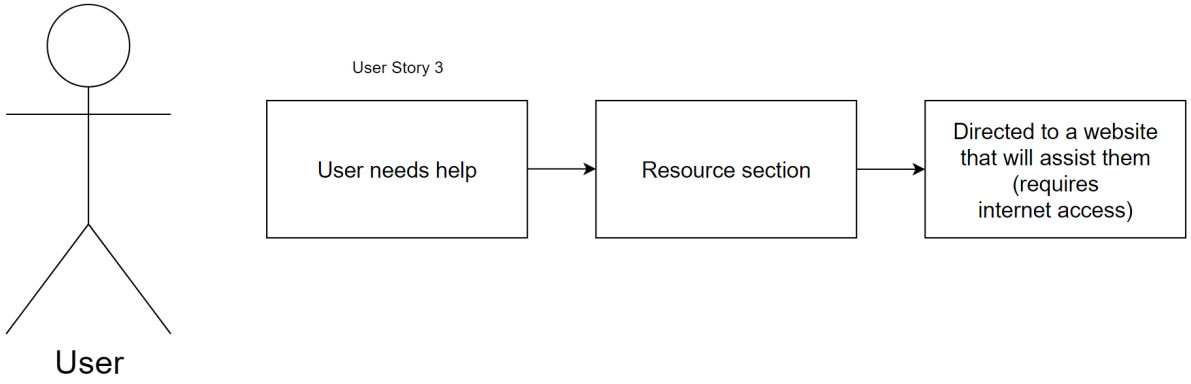

Figure 3 - Diagram aid for "The User Requires Assistance" (below). Depicts the steps the User would go through if they needed help from the resource feature of Tabs2XML (this feature is described extensively in the Intended Use section (1.3)).

Title: The User Requires Assistance

Primary Actor: User (can be anyone described in the Intended Audience section (1.2)).
Success Scenario:

1. User requires assistance (the cases and extent of assistance Tabs2XML offers is detailed in the Intended Use section (1.3)).
2. User navigates to the Resource section and finds an appropriate link to asset them.
3. User is then directed to a resourceful site which will help/guid/assets/teach the User.

Precondition: User has an internet connection and is able to navigate web pages.
Extensions: In the event that the User incurs any troubles that are not dealt with in our resource section, they are encouraged to research the issue independently.

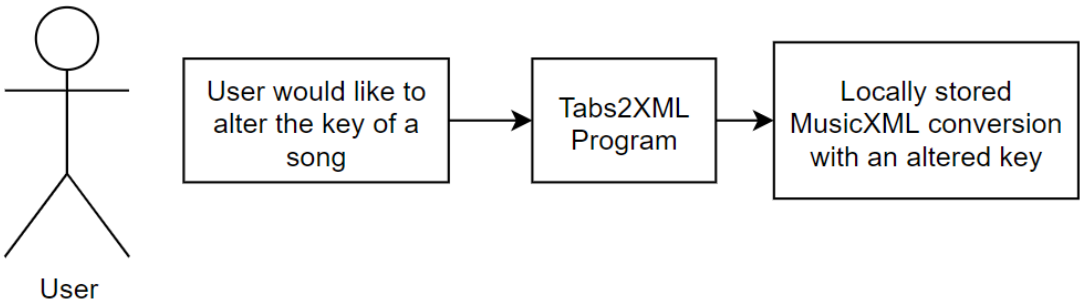

Figure 4 - Diagram aid for "Changing the Key of a Song" (below). Depicts the steps the User would go through if they wanted to change the key in which their song is played in.

Title: Changing the Key of a Song

Primary Actor: User (can be anyone described in the Intended Audience section (1.2)).
Success Scenario:

1. User wants to play a song, but would like the key that it is played in to be changed.

2. User inputs their file and chooses which key they want to have the converted file in.
3. User then saves the converted file to their local system.

3.0 System Features and Requirements

3.1 Functional Requirements

- System allows users to import a tablature (either drum or guitar) to be converted and edited.
- System is able to convert tablatures (only for guitar and drums) into MusicXML files.
- Outputted MusicXML files can be used in other applications that can view MusicXML files as music sheets (such as MuseScore).
- System is able to identify if the input is a guitar or drum tablature.
- System can identify notes, chords, frets, strings, and more when trying to convert into a MusicXML file.
- System gives an error if tablature is not properly formatted or it is not a drum or guitar tablature.
- System must allow the user to modify the MusicXML output by editing the input text tab. For example, if they want to edit a measure or time signature the user should be able to edit the output before saving onto their device.
- System must report repeated measures.
- System must support grace notes. For guitar, any sequence of hammer-ons, pull-offs, or slides that is preceded by the character “g” should be treated as grace notes. For drums, flams (“f” character in tablature) must be implemented as graces notes.
- System must deal with errors in the input in a user-friendly way. Minor errors should be treated as warnings but should not stop the conversion process. Major errors in measures must be presented to the user to fix them.
- System must support all three instruments and with as many features as possible.
- System is able to run Python programs. Please refer to the following link for a list of OS system requirements in order to execute programs: https://docs.python.org/3.9/faq/general.html.

3.2 External Interface Requirements

- Users can change time signature/measure of the converted tablature.
- A custom name can be given to the converted tablature.

3.3 System Features

- Browse button to select the directory where the tablature(s) are in.
- List of files in the directory which can be selected.
- Display on the right side which shows a preview of the file that is inputted.
    - Display changes the preview of MusicXML file when the file is converted.
- An input area to enter the name of the piece.
- List of time signatures to select from(1/4, 2/4, 3/4, 4/4).
- Another browse button to choose the directory that the converted MusicXML file will be saved in.
- Convert button which converts the file to MusicXML and saves it in the directory that was chosen.

3.4 Nonfunctional Requirements

Performance

- The application should operate quickly and smoothly, with a text to MusicXML conversion.
- The quality of the application should be good and not contain bugs.

Usability

- The application should have an intuitive user interface.

3.5 Assumptions and Dependencies

- Text files that are input by the user will only be of drums and guitar tablatures.
- That the text imported is a tablature of correct formatting and design.
- Everything such as beat, key, etc. will be set to system default unless specified by the user.
- Due to the variety of forms that tablature comes in, Tabs2XML will have a list of acceptable forms that are guaranteed to work(see user manual for recommended tablatures).

4.0 Timeline

February 3: Completion of Requirements Document.

February 17: Completion of GUI interface and parser.

February 28: Completion of Music XML conversion for at least one instrument along with the first rendition of the user manual.

March 16: Completion of MusicXML conversion for all instruments with little to no errors.

March 28: Debugging system complete.

March 30: Draft of Design Document must be submitted.

April 13: Final submission.

References

Krüger, Nico. “How to Write a Software Requirements Specification (SRS Document).” *Perforce*, Perforce Software, 23 October 2018, https://www.perforce.com/blog/alm/how-write-software-requirements-specification-srs-document. Accessed 26 2 2021.