GNG2101 Report

Project Deliverable B

Needs, Problem Statement, Metrics, Benchmarking and Target Specifications

Submitted by

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Abstract

Table of Contents

[Abstract i](#_Toc115883389)

[Table of Contents ii](#_Toc115883390)

[List of Figures iv](#_Toc115883391)

[List of Tables v](#_Toc115883392)

[List of Acronyms vi](#_Toc115883393)

[1 Introduction 7](#_Toc115883394)

[1.1 Relevance 7](#_Toc115883395)

[1.2 Requirements 7](#_Toc115883396)

[1.3 Key Aspects 7](#_Toc115883397)

[1.4 Topic 8](#_Toc115883398)

[2 Body 9](#_Toc115883399)

[2.1 Observations Obtained from Client Interviews 9](#_Toc115883400)

[2.2 Prioritized Customer Needs 9](#_Toc115883401)

[2.2.1 Prioritization Reasoning 10](#_Toc115883402)

[2.3 Problem Statement 10](#_Toc115883403)

[2.4 List of Metrics 11](#_Toc115883404)

[2.5 Benchmarking Similar Projects 11](#_Toc115883405)

[2.5.1 Conclusions Drawn from Benchmarking 12](#_Toc115883406)

[2.6 Target Specifications 12](#_Toc115883407)

[2.7 Reflection on Client Meeting 14](#_Toc115883408)

[3 Conclusions and Recommendations for Future Work 16](#_Toc115883409)

[4 APPENDICES 17](#_Toc115883410)

[4.1 Link to spreadsheet of metrics 17](#_Toc115883411)

List of Figures

**No table of figures entries found.**

List of Tables

[Tableau 1:Relevant observations derived from the notes taken during client interview one 9](#_Toc115880262)

[Tableau 2: Required Customer Needs 9](#_Toc115880263)

[Tableau 3: List of Metrics 11](#_Toc115880264)

[Tableau 4: Benchmarking of Competition Using our Metrics 11](#_Toc115880265)

List of Acronyms

|  |  |
| --- | --- |
| **Acronym** | **Definition** |
| PDF | Portable Document Format |
| MP3 | MPEG Layer 3 (audio file) |
| ePub | Electronic publication |
| OCR | Optical Character Recognition |
| UX | User Experience |
| UI | User Interface |

# Introduction

## Relevance

This project has is being developed to solve one goal. This goal is to increase the accessibility of online texts for students who attend the Ottawa public library. Often students would like to translate their books and schoolwork into a more understandable format. What defines an understandable format differs from case to case. We have been approached to create a project that will take a text input and output audio, this could help students who struggle focusing on long pieces of text, have dyslexia or learning and visual disabilities. These students deserve access to these written works in a manner that is reasonably clear for them.

## Requirements

While this project is being created to help students with difficulties understanding regular text, the users of the project will generally be librarians or other people providing support for the aforementioned students. This means that generally the users will have previous experience working with similar projects. There may be cases in which the students themselves would like to access the project directly, in this case are project’s UI would need to highly accessible and easy to understand, even for someone who is unfamiliar with this type of project.

## Key Aspects

There already exists many online resources to convert from a text document into a MP3 audio file. The issue with many of these sites are that there is a security risk when uploading potentially person information contained in the files to an unfamiliar website. These websites also generally only offer a few numbers of options of file types to convert to and from which may not match the desired file types of the student. Existing websites also tend to have a complicated UI which may provide difficultly in the case of a student or new user.

Aside from theses free online conversion websites there exists more accessible websites, for example Sensus is very accessible and provides the desired features, however, is not free to use as our project will be.

## Topic

The topic of this report is to communicate client needs/problems and identify all important information. This report also contains a list of metrics to be used for benchmarking and to develop target specifications.

# Body

## Observations Obtained from Client Interviews

Tableau 1:Relevant observations derived from the notes taken during client interview one

|  |  |
| --- | --- |
| a. | Users are primarily librarians. Ideally make it useable for students as well. |
| b. | Students can be blind, have learning disabilities, etc. |
| c. | Documents may be PDF or Word or EPUB. Want to convert to MP3 or Daisy Format. |
| d. | As many voices as possible are ideal, Natural Reader was mentioned. |
| e. | File size can be up to 12,000 pages split amongst 10 different files |
| f. | MP3s by chapter is ideal. |
| g. | Examples from chat: <https://www.naturalreaders.com>, <https://www.sensusaccess.com/> |
| h. | Only languages are English and French |
| i. | Include copyright disclaimer |
| j. | Dell laptops will be used |
| k. | Image scan into MP3 is possibly good. |
| l. | OCR image scan. |
| m. | Web based application is preferred. |
| n. | Functionality matters much more than UX |

## Prioritized Customer Needs

Tableau 2: Required Customer Needs

|  |  |
| --- | --- |
| a. | Capable of converting a text-based document to an audio-based document that can be downloaded. |
| b. | Free to use/access |
| c. | Web application shall be capable of accepting a text-based document with a size ranging from 50mb to 500mb. |
| d. | Fully accessible in both French and English |
| e. | Accessible from Dell Laptops |
| f. | Shall include a copyright Disclaimer |

### Prioritization Reasoning

The main goal for the user is to input a text document and output an MP3 file, if the program cannot complete this task, then the project can be considered a complete failure. The customer clearly explained that the program would need to be free to use or the library will not be able to use the software. The next four priorities are preferences we would like to reach however the project will may provide useful for a different scenario.

The four final priorities are purely a matter of preference of prioritization and should be confirmed in which order we should focus our efforts on in the next client interview. The team has decided from the current information that this order is most accurate to the information given in the first client interview. It was specified that there are often students who would like to convert their textbooks into MP3’s thus we have decided that the application should be able to handle file sizes up to 500 mb if possible. Next, because some of the users will be French speakers the library hopes that we can offer the software in both French and English. The librarian explained that most of her coworkers used Dell laptops at work and would like, if possible, to use this device to run the program. We have included the copyright disclaimer as the lowest priorities as it may not even be needed, however with legal matters it is better to air on the side of caution.

## Problem Statement

Design a web-based application for librarians and students with the purpose of converting text-based documents of large sizes to English and French mp3s.

## List of Metrics

Tableau 3: List of Metrics

|  |  |  |
| --- | --- | --- |
| **Metrics** | **Units** | **Reasoning** |
| Cost | USD |  |
| File Size | MB |  |
| Application Type | Website/app |  |
| Requires Internet | Yes/No |  |
| Voices Option | Yes/No |  |
| Input File Formats | Number |  |
| Output File Formats | Number |  |
| Languages | Number |  |
| Speed options | Yes/No |  |
| Accessible UI | 1 to 5  (5 best) |  |
| By Chapter | Yes/No |  |
| Copyright disclaimer | Yes/No |  |
| Runs on dell | Yes/No |  |
| Image Scan (OCR) | Yes/No |  |
| Editable by user | Yes/No |  |
| Max Conversion speed | MB/minute |  |

## Benchmarking Similar Projects

Tableau 4: Benchmarking of Competition Using our Metrics

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Name | | Zamzar | Text to Speech | Sensus | naturalreaders |
| Cost | USD | Subscription | 0 | Subscription | 0 |
| File Size | MB | 50 | 4 | 64 | 50+ |
| Application Type | Website/app | Website | Website | Website | Website/app |
| Requires Internet | Yes/No | Yes | Yes | Yes | Yes |
| Voices Option | Yes/No | No | Yes | No | Yes |
| Input File Formats | Number | 20+ | 5 | 20+ | 8 |
| Output File Formats | Number | 9 | 1(Only audio type) | 6 | 1(Only audio type) |
| Languages | Number | 2 | 2+ | 2+ | 2+ |
| Speed options | Yes/No | No | Yes | Yes | Yes |
| Accessible UI | 1 to 5 (5 best) | 3 | 4 | 4 | 5 |
| By Chapter | Yes/No | No | No | No | No |
| Copyright disclaimer | Yes/No | Yes | Yes | Yes | Yes |
| Runs on dell | Yes/No | Yes | Yes | Yes | Yes |
| Image Scan (OCR) | Yes/No | Yes | Yes | Yes | Yes |
| Editable by user | Yes/No | No | No | No | Yes |
| Max Conversion speed | MB/minute | 10 | Failed to convert | 5+ | 70+ |

### Conclusions Drawn from Benchmarking

Naturalreaders is the clear winner when it comes to users’ accessibility, our projects user interface should draw inspiration from the websites design as well as features. Sensus is the best option from a hardware perspective, it gives by far the most input file types as well as the most output file types. Zamzar seems to be the most popular for users who are looking for quickly converting their files and is recommended by many third-party websites. Although it does not provide the same extent of features of others this can be seen as a benefit, as it makes the process much more streamlined. It is worth considering if for our project that less is more as it will reduce the complexity of the interface.

## Target Specifications

Taking the input given during the customer interview and comparing to the benchmarks of other similar projects we developed a list of target specifications. For each metric we defined both a target and marginal specification.

Tableau 5: Target Specifications

|  |  |  |  |
| --- | --- | --- | --- |
| Units | Idea Target Specs | Marginal Target Specs | Reasoning for Specs |
| USD | 0 | 0 | Must be free to use and accessible to students and librarians |
| MB | 500 | > 50 | Should be able to handle textbooks (usually around 150mb) If not possible, divide into several smaller 50mb files |
| Website/app | Website | Website or Executable | Requested by customer |
| Yes/No | Yes | No | Websites will require internet |
| Yes/No | Yes | No | Students have reportedly not like voices in the past and would like the option to choose amongst different options if possible |
| Number | 6 | 4 | We would like to be able to process images (img,jpeg) and text documents (txt,docx,pdf,epub) |
| Number | 2 | 1 | MP3 required, daisy if possible |
| Number | 2+ | 2 | French and English mandatory as per library policy |
| Yes/No | Yes | No | Control the speed of the voice in the mp3 file to allow for easier listening for students of differing comprehension levels |
| 1 to 5 (5 best) | 5 | 2 | In the best case we would like students to be able to access the application on their own. If not, the application will be used by librarians |
| Yes/No | Yes | No | Breaking up mp3 files on a chapter-by-chapter basis will help students keep their place when listening to long text documents. |
| Yes/No | Yes | Yes | When handling works of others, we must include a copyright disclaimer at the beginning of our mp3 files |
| Yes/No | Yes | Yes | The librarians work using dell laptops |
| Yes/No | Yes | No | Occasionally students have image copies of books which they would like to copy to mp3 |
| Yes/No | Yes | No | Occasionally students have image copies of books which they would like to copy to mp3, if there are errors when converting between these different file formats the librarians would like to be able to edit the documents before the MP3 is created |
| MB/minute | 100 | 10 | The librarians would like to avoid waited extended periods of time to convert a file |

## Reflection on Client Meeting

The client meeting gave many details about the project that had not been discovered. Initially, the form of the application and the specific requirements were unknown. After the client meeting these have now been narrowed down. The options for how to begin have been limited, allowing for a swift decision on 3rd party applications and a start on actual work.

These unknowns are still what language to code in, what text to speech program to use, what filetypes to prioritize, and how efficient to make the code. Efficiency was left vague after the client meeting.

# Conclusions and Recommendations for Future Work

Summarize your lessons learned and your work and suggest the most productive avenues for future work.

# APPENDICES

## Link to spreadsheet of metrics

[Benchmarks.xlsx](https://uottawa-my.sharepoint.com/personal/ldusa012_uottawa_ca/_layouts/15/guestaccess.aspx?guestaccesstoken=zH8luVgnnN5Xs%2BR%2FzkhPyN6Fx6bjdpXJdT1KNQMzx%2B8%3D&docid=2_14d47f1ae0c094529b06f8f437aee80c1&rev=1&e=SpRUJF)