

GNG2101 Report

Project Deliverable B Needs, Problem Statement, Metrics, Benchmarking and Target Specifications

Submitted by

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22/10/03

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Abstract

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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

1 Introduction

1.1 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.

1.2 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.

1.3 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 difficulty in the case of a student or new user.

Aside from these 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.

1.4 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.

2 Body

2.1 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

2.2 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

2.2.1 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.

2.3 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.

2.4 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	

2.5 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+

2.5.1 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.

2.6 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

2.7 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.

3 Conclusions and Recommendations for Future Work

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

4 APPENDICES

4.1 Link to spreadsheet of metrics

[Benchmarks.xlsx](#)