Closure Report

for

NASA Maestro Format Test Tool

**Version 2.0**

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**Revision History**

|  |  |  |
| --- | --- | --- |
| **Revision** | **Date** | **Description** |
| 1.0 | 04/19/2020 | Initial draft and structure set up |
| 2.0 | 04/25/2020 | Formatted and update document structure |

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# Project Closure Report Purpose

The project closure report document is created to communicate the final status of the NASA Maestro FTT system. This document also describes the summary of activities that were performed to develop and execute the project to accomplish the following:

* Analysis and authenticate the milestones and success of the project
* Set outlines for any outstanding issues, risks, and recommendations
* Prepared displayed tasks and activities required to close the project
* Recognize project highlights and best practices for future projects.

# Project Closure Report Summary

## Project Background Overview

As of right now, the team has been given information that NASA has created spacewalk procedures known as EVAs. These procedures include the astronauts associated with the task that is located outside of two stations known as EV1 and EV2. Also, there is to be a robotics operator inside the spacecraft and Mission Control on the ground assisting in the walk.

There are circumstances in which EV1 is focused on a task where all the steps can be done independently of EV2’s actions. There has shown to be other times steps that are considered heavily intertwined. This goes for robotics operators and Mission Control steps. The customers at NASA need to programmatically parse procedures, map each step to its respective actor, and the ability to display documents given within the application converted between other known formats.

Maestro currently extracts procedure data in many file types (HTML, DOCX, specific XML types), as well as a different project, which is essential for the fulfilment of the UMGC Spring 2020 SWEN-670 Software Engineering Project.

## Project Objectives

Below are the NASA Maestro FTT application objectives that were collected from the project team members. The implementation and the design of these objects were set to be shared with the stakeholders however due to a task for application reviewing has been placed for the PM to review.

1. Launch the Maestro (FTT) software.
2. Select a document to use for a new project.
3. After selecting the document, the user will be presented with the option to convert the document.
4. The system displays the options, as well as any images, associated with selecting a document.
5. User can navigate through the software with the following:
   1. ***Create a New Project*** – selects to start a new project.
   2. ***Upload a DOCX file*** – selects the document to upload in the software.
   3. ***Convert DOCX file to PDF file*** – selected document converted for other applications.
   4. ***Converting a PDF document to a PNG file*** – shows converted documents can be shown as PNG.
   5. ***Compare Images*** – navigates back to the landing page where the user can select an option to compare images.
6. When the user advances past the last page of software, the user can have all documents that were converted. After a few moments, the UI should be redirected to the selected document page.
7. All this information is displayed in any web browser.

## Project Timeline

|  |  |  |  |
| --- | --- | --- | --- |
| Milestone | Start Date | End Date | Actual End Date |
| Project Start | 02/03/2020 | | |
| Milestone 1 | 02/03/2020 | 02/23/2020 | 02/23/2020 |
| Milestone 2 | 02/24/2020 | 03/15/2020 | 03/15/2020 |
| Milestone 3 | 03/16/2020 | 04/05/2020 | 04/05/2020 |
| Milestone 4 | 04/06/2020 | 04/26/2020 | 04/24/2020 |
| Project Closure | 04/26/2020 | | |

## Project Closure Synopsis

The main achievements of the project include the following objectives:

* Developed backend code to handle the following:
  + Parse a list of documents
  + Parse roles within a software
  + Obtaining specific documents
  + Obtaining selected applications
* Developed frontend to be controlled via the following selected options:
  + Create a new project
  + Project Name selected
  + Select a DOCX file
  + Choose from the dropdown list
  + Convert DOCX file to PDF file
  + Convert PDF document
  + Compare Images
* Wire backend contents to be displayed through frontend
* Deployed the project using Heroku web services

The project was not able to fully implement the following:

* Create the Developer’s guide document

# Project Closure Tasks

## Knowledge Transfer

1. Project documentations are all held at the following link under NASA Team 1 – Verifier [Shared Document](about:blank)
2. An operational version of the application is hosted and available at https://appdev-nasa-maestro-verifier.herokuapp.com/home

## Issue Management

* The following issues were fixed, retested, and resolved by the team.
* (List of issues that the developers came across; Images placed here)

## Modules Learned

### What Went Well

1. Daily and Weekly communication, collaboration, and participation of all team members were great, despite team members being in different time-zones.
2. Using an external API for the voice commands to facilitate the development of feature 2 of the application. Please see section 2.2 product features of the SRS document
3. Interaction with the project sponsor was smooth and our work made them happy
4. The entire team gained great skills through the SDLC of this project

### What Did Not Go Well

1. Two of our team members volunteered to help with the ventilator project which limited the team resources to complete the project. However; they were still able to do the part of the tasks they volunteered for on the start date.

# Project Closure Recommendations and Future Work

## Further UI Development

The current UI is basic and designed to implement backend capabilities. The UI can use additional fixes and changes to allow full use of the backend.

The backend can validate and convert multiple files at the same time. Adding the ability to request the validation and/or conversion of additional DOCX files at the same would increase capabilities.

Additionally, the backend returns more information then is used within the UI. This information could be displayed as desired.

## The Ability to Catalogue Maestro Format Changes

The current application runs as a stateless use application. Meaning the user must maintain file storage if maestro format changes are to be tracked.

Historical tracking could be added using automatic file storage or the inclusion/tie into a database. This functionality should be added using an additional client and tied into the UI. Adding this functionality to the server backend is not advised.

## CodeBase Movement to Gitlab

NASA requested the codebase be moved to Gitlab and Gitlab would allow the automation of many components of the build process beyond the tools offered by GitHub.

The current team has no experience with Gitlab, and the creation of the application was made a priority of the move.

## Automated Testing

Automated testing using Mocha was partially implemented. Testing was almost complete when a need to refactor the codebase to aid the reusability of the backend docker was identified.

100% code testing was not completed.

## Additional File Comparison

The current file comparison technique is adequate and indicated changes. However, the technique compares the images pixel by pixel from the top only. This causes any difference near the top of the documents to make the rest of the document appear different even if only one line changed.

A potential fix would be the creation of multiple comparison images with comparison starting from different directions or the option to specify direction.

A more complex instruction set could also be used but performance considerations made this option less than ideal in our testing.

## Maestro Integration

The application does not currently integrate the original maestro application. Future work can be used to integrate the maestro application into the comparison tool.

The MFTT backend was developed to be self-contained and able to have its functionality easily added to other applications using HTTP requests. Therefore, Maestro functionality was not added to the backend.

The ideal method for adding integration would be to tie the UI into the Maestro application through its command-line interface or developing the Maestro application into a server/client architecture like this application and using the server to tie into the UI.