Hari Markonda Patnaikuni (n10789511)

Professional Reflection

# Context:

Engineering professionals need to have strong oral and written communication skills in professional environments. These skills contribute to the quality of engineering projects such as the design portfolio referenced in this document.

# Engineers Australia Stage 1 Competency 3.2:

As stated as an ‘Indicator of Attainment’ in Engineers Australia Stage 1 Competency 3.2 ‘Effective oral and written communication in professional and lay domains.’, ‘effective oral and written communication’ is critical when preparing ‘high-quality engineering documents’ such as a design portfolio. (Engineers Australia, 2017)

It is also stated in this competency that proficiency in ‘listening, speaking, reading and writing English’ is needed to meet the requirements of this proficiency. (Engineers Australia, 2017) This includes the use of ‘expressing information effectively and succinctly,’ and the use of ‘textual, diagrammatic, pictorial and graphical media best suited to the context;’ which are relevant to the design portfolio referenced. (Engineers Australia, 2017) Hence, both ‘Indicators of Attainment’ are needed to effectively create a high-quality engineering project. (Engineers Australia, 2017)

The target audience for the design portfolio is an electrical engineer or third party who would like to reproduce the two-tone siren. It is expected that most electrical engineers or third parties such as PCB manufacturers will have the background electrical engineering knowledge required to reproduce the same two-tone siren.

Electrical engineers will likely be more focused on the circuit schematic, prototype photos, simulation, and experimental results. Whereas the PCB manufacturers are expected to be more interested in the PCB assembly overlay and the PCB layout, and the Bill of Materials. In addition to this, both audiences are expected to be focused on the general theory used to determine the component values as shown in section 2 of the design portfolio.

Due to the context in which the design portfolio is produced which is for a two-tone siren the way schematics, simulations, prototyping, and experimental results are presented affect the content. For example, the documenting of a design process for a PCB two-tone circuit will require the background theory required to produce the circuit schematic. This must be described in detail with electrical engineering terminology. In addition to this, the summary of the design and its operation is also expected to have standard electrical engineering terminology. Hence, this contributes to the use of the EA Stage 1 Competency 3.2 ‘Indicator of Attainment’ of ‘textual media best suited to the context;’. (Engineers Australia, 2017)

Whereas illustrative sections of the design portfolio are presented in a way that assumes the target audience has some background knowledge related to circuit theory, PCB layouts and assembly overlays, prototype photos, Bill of Materials required to reproduce the design, simulation, and experimental results. Hence, these illustrative sections of the design portfolio are presented clearly and succinctly with only informative titles and captions to explain the context of each illustration. The use of these illustrative sections can also be described as a discipline norm for electrical engineering design portfolios.

Illustrative sections of the design portfolio follow the ‘Indicators of Attainment’ for ‘expressing information effectively and succinctly’ and using ‘pictorial and graphical media best suited to the context;’. (Engineers Australia, 2017) In addition to this, the illustrative sections of the report contain the units in which certain measurements are made to further consolidate the effectiveness of written communication.

I believe I have effectively documented and communicated my design process to the extent that a third party would be able to reproduce the design. For example, documenting the initial theory such as electrical engineering equations needed to select component values for the circuit. Also, the references to the datasheets used to decide on frequency values for both tones of the siren effectively give the background information required to reproduce the design.

Another aspect of the design portfolio that makes the design easy to reproduce is the illustrative sections of the report. Hence, the documenting of the circuit schematic, prototype photos, simulations results, and experimental results give the required information needed for a third party to replicate the design. It can be said that these aspects of the portfolio follow the ‘Indicators of Attainment’ for the ‘using diagrammatic, pictorial and graphical media best suited to the context;’. (Engineers Australia, 2017)

Nevertheless, there are still aspects of the design portfolio that could have been improved to achieve a more clearly written portfolio. For example, the documentation could have been enhanced by having more clear and consistent titles for figures featured in the experimental results section of the design portfolio. Also, the way the circuit schematic was conceived could have been more descriptive concerning the background theory in relaxation oscillators. In addition to this, the reason why certain circuit components were used over others could have been explained in more detail in the ‘Summary of design and operation’ section of the portfolio.

# References

Engineers Australia. (2017, 03). *STAGE 1 COMPETENCY STANDARD FOR PROFESSIONAL ENGINEER.* Retrieved 04 18, 2022, from Engineers Australia: https://www.engineersaustralia.org.au/sites/default/files/resource-files/2017-03/Stage%201%20Competency%20Standards.pdf