

## Project Proposal: Sheet Metal Client Hub

To: Jacqui Bijster

Date: March 17, 2025

Subject: SCQF Level 7 Software Development Project (J5RH47) Approval

### Project Title

Sheet Metal Client Hub: Basic Cost Calculator Prototype

### Objectives

Develop a Python-based GUI application using Tkinter to calculate sheet metal part costs with manual inputs, demonstrating SCQF Level 7 skills in planning, design, coding, and testing, while leveraging my sheet metal expertise as the foundation for a scalable fabricator customer hub.

### Purpose & Scope

Sheet metal fabricators rely on slow, manual quoting processes. This prototype automates basic cost calculations with a secure desktop GUI, replacing initial manual steps. It features three main screens—**login, input, and output**—plus a hidden settings GUI for rate management, saving results to a file, meeting college requirements while proving viability for a future client hub.

### Functionality

**Screen 1 GUI:** – Introduction/User Login: Displays “Welcome to Sheet Metal Client Hub.” Requires username (e.g., “laurie”) and password (e.g., “moffat123”), stored in a text file for user management. Success proceeds to Screen 2; failure shows an error message.

**Screen 2 GUI:** – User Data Input: Dropdowns for material grade (e.g., 304 Stainless, 5052 Aluminum), thickness (0.5mm-2mm), flat length/width (50-2000mm), bends (0-20). “Add Part” stores in a list with validation (e.g., no empty fields), displays parts, “Calculate” proceeds to Screen 3. Settings cog in top corner opens hidden GUI.

**Screen 3 GUI:** – Calculation Outputs: Shows material cost (length \* width \* thickness \* user-set rate \* 1.2), labor cost (bends \* user-set rate), total cost, “Save to File” (text output with user ID).

**Hidden Settings GUI:** Pop-up (via settings cog) with fields to adjust material rate (e.g., £/mm<sup>3</sup>) and labour rate (e.g., £/bend), saved to a text file (e.g., rates.txt) and loaded on startup.

### Methodology

*Approach:* Waterfall—plan, design, develop, test—due to fixed scope and timeline.

*Tools:* Python 3.9, Tkinter (GUI), PyScripter (IDE), Git/GitHub (version control).

### Deliverables

*Development Plan (docs/development\_plan.md):* Timeline, tools

*Test Plan (docs/test\_plan.md):* Normal, extreme, exceptional cases.

*Design:* Wireframes (docs/wireframes/), data dictionary (docs/data\_dictionary.md),

structure chart (docs/structure\_chart.png), pseudocode (docs/pseudocode.md).

*Source Code:* src/main.py, src/gui.py, src/calculator.py (commented).

*Test Logs (docs/test\_logs.md):* Unit, integration, system tests.

*README (README.md):* Instructions.

*Professional Conduct Addendum (docs/professional\_conduct.md):* Ethics, quality.

## **Timeline**

*Phase 1:* Planning, design (wireframes, pseudocode) – 15-20 hours.

*Phase 2:* Development (GUI, login, settings, calculations) – 25-30 hours.

*Phase 3:* Testing, documentation – 25-30 hours.

*Total:* 65-80 hours (within 80-hour guideline).

*Start Date:* April 1, 2025 (pending approval).

*Completion:* June 2, 2025.

## **Skills Demonstrated**

**J5RE47 (Implementation & Testing):** Subprograms (cost functions), parameters, expressions (formulas), sequencing/selection/iteration (login, navigation), file handling (rates, save), arrays (part list), records (Part class), input validation (login, rates, dropdowns), linear search (part list), unit/integration/system testing, debugging (dry runs, trace tables).

**J5RB47 (Analysis & Design):** Waterfall approach, requirements (functional: cost calc, login, rate management; non-functional: usability), UI design (wireframes), data dictionary, structure chart, pseudocode.

**J5RH47 (Project):** Planning, design, development, testing, professional conduct.

## **Future Vision**

This prototype is the first step of the Sheet Metal Client Hub, evolving into a web plugin with CAD parsing, ERP integration, and a % revenue-share model, targeting 125 fabricators for £1.5M turnover by Year 5, replacing staff roles globally.

## **Approval Request**

I request your approval to proceed with this project, ensuring it meets SCQF Level 7 criteria. Feedback on scope or deliverables is appreciated.

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