A close-up of a logo

Description automatically generated

**Department of Computing**

**Professional Software Projects**

**(55-508208-AF-20245)**

**Software Requirement Specification**  

**Project:**

**Team ID: Autodesk 4**

**Team Members:**

| Name | ID |
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# Introduction

## Project Overview

Our Autodesk project focuses on the use of Artificial Intelligence/Machine Learning (AI/ML) to make interacting with 3D models and designs more natural.

By utilising the Revit API by Autodesk, the system will make it easier for modification to plans, geometry or scenes or even creating an entirely new project. With built-in AI/ML, it will do this by helping to catch flaws, automate repetitive tasks, produce documentation or even predict what the user may do next. In result, creating a much more streamlined workflow for the user.

This tool will be oriented towards architects and professionals in the construction industry to help simplify their workflow and improve the quality of their individual projects.

**Problem Statement**

When working with 3D models using Revit, architects and professionals in the construction industry are consistently required to modify plans, geometry or scenes due to updated instructions, design revisions or flaws and inefficiencies found in designs. These tasks can be highly time-consuming and result in significant delays, particularly when human error is involved. The effect of these delays, revisions and adjusts lead to a significant amount of time wastage, increased production costs and reduced productivity.

With the use of AI/ML, this project's aim is to be the solution for these real-world difficulties for architects and people in the construction industry by giving real-time feedback that helps find design flaws early in the process and automates repetitive tasks. Our aim is to improve work quality, significantly reduce turnaround time and minimise the amount of time spent on mundane tasks.

## Project Objectives

* To integrate AI/ML to assist automating available functions within the Revit Api, especially when users are modifying their 3D models or designs.
* To allow users to easily view their 3D models or designs and complete analysis.
* To help users save time by predicting their actions and offer helpful insights or suggestions.
* To allow users to create an entirely new project with minimal effort.
* To enable users to modify geometry, scenes and plans with natural inputs.
* To provide a user-friendly experience with an easy-to-navigate interface that minimises complexity.

# System Requirements

## 

## Functional Requirements

| ID | Description | Priority (MoSCoW) |
| --- | --- | --- |
| FR01 | The system must be able to accept a user text prompt and be able to interpret the text and act accordingly. | Must |
| FR02 | The system must keep a log of previous user prompts as well as the type of type of prompt | Must |
| FR03 | The system should offer recommendations of tasks it could perform based on that user’s occupation and previous prompts. | Should |
| FR04 | The system should delete previous prompts after a given amount of time in compliance with the Data Protection Act. | Must |
| FR05 | Upon prompt, the system should be able to create add-ins and macros to automate repetitive tasks in the Revit user-interface | Should |
| FR06 | Upon prompt, the system should be able to enforce design standards by automatically checking for errors in a project. | Should |
| FR07 | Upon prompt, the system should be able to extract project data to analyse and generate reports. | Should |
| FR08 | Upon prompt, the system should be able to import external data to create new elements or parameter values. | Should |
| FR09 | Upon prompt, the system should be able to create documentation for a Revit project. | Should |

## Non-Functional Requirements

*Table 2: Non-Functional Requirements Indicative Examples*

| ID | Theme | Description | Priority (MoSCoW) |
| --- | --- | --- | --- |
| NFR1 | Performance | The System Must Not Freeze Under Reasonable Use On Any Device That Meets Revit’s System Requirements. | Must |
| NFR2 | Performance | The System Must Be Stable and Not Crash. | Must |
| NFR3 | User | The System Should Be Intuitive | Should |
| NFR4 | User | There Should Be Documentation About How To Use The System | Should |

## User Roles

Each plan has a different level of security, reporting, automation, and support features.

<https://www.autodesk.com/uk/collections/architecture-engineering-construction/overview?term=1-YEAR&tab=subscription>

<https://www.autodesk.com/solutions/revit-subscription-faq>

<https://www.scan2cad.com/blog/cad/revit-pricing/#1_Standard_Plan>

<https://www.plot-it.co.uk/p/autodesk_revit_lt_quarterly_desktop_subscription?srsltid=AfmBOopsnV7XWCyQpE5xt1Y3xr2eabtRpv-fLS4sqXjkbbz8oR8K2Q9T>

<https://www.cadservices.co.uk/cad-software-revit/autodesk-revit-2025-subscription-plan-1-Year-p-7633%7B3%7D5.html>

<https://www.trustradius.com/products/revit/pricing>

<https://tekpon.com/software/revit/pricing/>

To Do:

* Research what each plan allows user to do on revit
* Find out what features are available to each user for each plan
* Research what each user actually does e.g. what does student architect do, what tech do they have available
* Figure out what goals and frustrations are based on the features available to the user
* Then use research to make persona

**Research:**

### Standard Plan:

* Every Revit [subscription](https://www.autodesk.com/plans) you purchase on the Autodesk store, through an Autodesk representative, or through a reseller includes the Standard plan. You can elect to purchase the monthly, annual, or 3-year plan.
* Based on the newly introduced changes, the Standard plan is based on usage by user name rather than by serial number. In this regard, you must specify the number of users (seats) beforehand during the purchase. For instance, if your team comprises five users, you will have to purchase five seats under the Standard license. You can even purchase as many as 20, 30, or 50 seats, but Autodesk will not give you a discount on your bulk purchase. To purchase and manage your purchases, you must have an Autodesk account.

The Standard license includes the following benefits:

* All the functionalities of Revit
* Two-step verification
* Aggregate usage reports by product, frequency, and version
* Live support during local weekday working hours (8×5)
* Ability to invite, add, and assign users to a Revit product
* User organization into groups to quickly assign the same products to many users simultaneously
* Fewer user management tools compared to Premium and Enterprise plans

### Education Plan:

* The [Education](https://www.autodesk.com/education/edu-software/overview?sorting=featured&filters=class-lab#!) license is reserved for eligible students and educators. It gives these users free one-year educational access to the Revit desktop software and cloud services through the Autodesk Education Community. This license is renewable, bgg hgprovided you remain eligible. [Eligibility](https://www.autodesk.com/company/terms-of-use/en/subscription-types#education) is anchored in whether a person is an employee or independent contractor working for a qualified educational institution or a person enrolled as a student in a qualified educational institution.
* There are two types of education licenses: those meant for individual students and those meant for an entire class/lab. The former license provides access to about 45 Autodesk products, including Revit, while the latter offers access to 55 Autodesk products, including Revit.

### Premium Plan:

* The Premium plan is a prepaid subscription available on either a 1-year or 3-year term. This plan is suited for organizations that need to purchase more than 10 Revit seats. According to Autodesk, this plan is designed for small and medium-sized organizations that manage 50 or more subscriptions. It facilitates more efficient user management by including the single sign-on (SSO) tool that enables users to access their accounts using company credentials. In addition, it offers a usage reporting API that facilitates data transfer between different software.
* This plan costs about $300 (suggested retail price) per Revit subscription. You can upgrade anytime from the Standard plan or at subscription renewal by contacting an Autodesk representative or an authorized reseller. However, as this is a prepaid plan, you have to wait for your subscription to expire in order to downgrade to the standard plan.

The additional price offers the following benefits:

* All the functionalities of Revit
* Usage reporting by user, product, frequency, and version
* Single sign-on
* Directory sync: This tool connects your company’s directory with Autodesk’s user management platform
* Automated addition of users upon first sign-in
* API access that enables you to integrate usage data with third-party software
* 24/7 support

### Enterprise Plan:

The Enterprise plan is designed for large customers that enter into an Enterprise Business Agreement (EBA) with Autodesk. This plan offers several benefits, including:

* Customization, e.g., inputting metadata that is relevant to your business to enrich reports
* Control over admin rights, i.e., ability to restrict product downloads to admins only
* Autodesk’s support on individual projects
* Autodesk’s assistance in the development of procedures, workflows, and overall BIM implementation
* Ability to work with an assigned Customer Success Manager (CSM) to build, implement, and capture value from the customer success plan

| Role | Description |
| --- | --- |
| Student Architect  (Piper Pavers) | **Plan:** Education Plan  **Age:** 21  **Experience Level:** Undergraduate architecture student  **Main Functions accessible to user:**   * User can open chatbox * User can refresh & start anew * User can clear whole/certain parts of chats * User can access log of user prompts/ chatbox * User can create a new chatbox * User can input test prompt (as in ask question etc.) * User can access log of user prompts * User should get recommendations * User can prompt system to check for errors * User can prompt the system to give brief information on how to fix error * User can prompt the system to give information on the actual error e.g. what it is, why it’s causing a problem * User can use a screen reader * User can prompt system to be in another language * User can import external data to create new elements/ parameter values * When user is idle will be asked to save project * User gets reminder to save project in certain time increments (can change time for said reminder) * Archie (ai) gives inspirational quotes/help when they’re stuck on an error for more than 15 minutes (can be disabled)   **Specific Functions accessible to user:**   * User gets 20 prompts per day |
| Standard Home Developer  (Steven Crane) | **Plan:** Standard Plan  **Age:** 35 **Experience Level:** Experienced in home design and development  **Functions accessible to user:**   * User can open chatbox * User can refresh & start anew * User can clear whole/certain parts of chats * User can access log of user prompts/ chatbox * User can create a new chatbox * User can input test prompt (as in ask question etc.) * User can access log of user prompts * User should get recommendations * User can prompt system to check for specific errors * User can prompt the system to give brief information on how to fix error * User can prompt the system to give information on the actual error e.g. what it is, why it’s causing a problem * User can use a screen reader * User can prompt system to be in another language * User can import external data to create new elements/ parameter values * User can clear specific chats * When user is idle will be asked to save project * User gets reminder to save project in certain time increments (can change time for said reminder) * Archie (ai) gives inspirational quotes/help when they’re stuck on an error for more than 15 minutes (can be disabled)   **Specific Functions accessible to user:**   * User gets 50 prompts per day * User can prompt for the system to create add-ins/ macros to automate repetitive tasks * User can prompt the system to enforce design standards by automatically checking for errors * User can prompt system to give full information on how to fix error * User can prompt system to extract project data and analyse & generate reports * User can prompt the system to create documentation for Revit project |
| Premium- Architect  (Bill Dozer) | **Plan:** Premium Plan  **Age:** 40  **Experience Level:** Senior Architect in a mid-sized firm  **Functions accessible to user:**   * User can open chatbox * User can refresh & start anew * User can clear whole/certain parts of chats * User can access log of user prompts/ chatbox * User can create a new chatbox * User can input test prompt * User should get recommendations * User can prompt system to check for errors * User can prompt the system to give brief information on how to fix error * User can prompt to automatically give information on how to fix error * User can prompt the system to give information on the actual error e.g. what it is, why it’s causing a problem * User can use a screen reader * User can prompt system to be in another language * User can import external data to create new elements/ parameter values * User can prompt the system to create documentation for Revit project * When user is idle will be asked to save project * User gets reminder to save project in certain time increments (can change time for said reminder)Shape * Archie (ai) gives inspirational quotes/help when they’re stuck on an error for more than 15 minutes (can be disabled)   **Specific Functions accessible to user:**   * User gets 200 prompts per day * User can prompt for the system to create add-ins/ macros to automate repetitive tasks * User can prompt the system to enforce design standards by automatically checking for errors * User can prompt system to give full information on how to fix error * User can prompt system to extract project data and analyse & generate reports * User can prompt the system to create documentation for Revit project * User can prompt system to create documentation that showcases the project for a client * User can have ai check work when finished and have it give document on how project looks overall * User can ask for usage reporting by user, frequency and version * User can ask for info in regards to company directory as they should be signed in and there should be a directory sync * User can ask AI info on usage data with third-party software |
| Enterprise Company Director  (Mark Skids) | **Plan:** Enterprise Plan  **Age:** 50  **Experience Level:** Director of a large architecture firm  **Functions accessible to user:**   * User can open chatbox * User can refresh & start anew * User can create another chatbox * User can input test prompt * User can access log of user prompts * User should get recommendations * User can prompt the system to enforce design standards by automatically checking for errors * User can prompt system to check for errors * User can prompt the system to give brief information on how to fix error * User can prompt the system to give information on the actual error e.g. what it is, why it’s causing a problem * User can use a screen reader * User can prompt system to be in another language * User can import external data to create new elements/ parameter values * User can prompt the system to create documentation for Revit project * Archie (ai) gives inspirational quotes/help when they’re stuck on an error for more than 15 minutes (can be disabled) * When user is idle will be asked to save project * User gets reminder to save project in certain time incrementsShape (can change time for said reminder)   **Specific Functions accessible to user:**   * User gets unlimited prompts per day * User can prompt for the system to create add-ins/ macros to automate repetitive tasks * User can prompt the system to enforce design standards by automatically checking for errors * User can prompt system to give full information on how to fix error * User can prompt system to extract project data and analyse & generate reports (Customization, e.g., inputting metadata that is relevant to your business to enrich reports) * User can prompt the system to create documentation for Revit project * User can prompt system to create documentation that showcases the project for a client * User can have ai check work when finished and have it give document on how project looks overall * User can have ai check if work done by others was helped by ai and in which parts * Use can prompt ai to create report on what a subordinate's process of making a project was * User can have multiple reports to be made into a summary * User can ask for usage reporting by user, frequency and version * User can ask for info in regards to company directory as they should be signed in and there should be a directory sync * User can ask AI info on usage data with third-party software * User can ask AI to access info on admin rights i.e. ability to restrict product downloads to admin only * User can ask AI to help with Autodesk’s assistance in the development in procedures, workflows, and overall BIM implementation * User can ask AI to get info from an assigned Customer Success Manager (CSM) to build, implement, and capture value from a customer success plan |
| Quantitative Surveyor | **Probably Unnecessary User:**  **5. Trent Chers – Quantity Surveyor**  **Plan:** Standard Plan (with potential for Premium upgrade)  **Age:** 45  **Language:** English & French  **Experience Level:** Expert in cost estimation and construction budgeting  **Functions accessible to user:**   * User can open chatbox * User can refresh & start anew * User can clear whole/certain parts of chats * User can access log of user prompts/ chatbox * User can create a new chatbox * User can input test prompt (as in ask question etc.) * User can access log of user prompts * User should get recommendations * User can prompt system to check for specific errors * User can prompt the system to give brief information on how to fix error * User can prompt the system to give information on the actual error e.g. what it is, why it’s causing a problem * User can use a screen reader * User can prompt system to be in another language * User can import external data to create new elements/ parameter values * User can clear specific chats * When user is idle will be asked to save project * User gets reminder to save project in certain time increments (can change time for said reminder) * Archie (ai) gives inspirational quotes/help when they’re stuck on an error for more than 15 minutes (can be disabled)   **Specific Functions accessible to user:**   * User gets 50 prompts per day * User can prompt for the system to create add-ins/ macros to automate repetitive tasks * User can prompt the system to enforce design standards by automatically checking for errors * User can prompt system to give full information on how to fix error * User can prompt system to extract project data and analyse & generate reports * User can prompt the system to create documentation for Revit project |

* Architect
* Quantitative surveyor
* Student architect
* Engineer
* Brand Manager
* Chief architect
* Standard - Homedevelper
* Premium - Architect
* Enterprise - Company Director
* Education (Student)
* **Standard  
   A plan for individuals and small teams that includes product usage reporting and 2-step verification**
* **Premium  
   A plan for medium to large teams that includes product usage reporting with user details and single sign-on (SSO)**
* **Enterprise  
   A plan for extra-large teams that includes product usage reporting with user details, single sign-on (SSO), and API access**
* **Education  
   A plan for students, educators, and academic institutions that includes the same features as the Standard plan**
* **Revit LT  
   A more cost-effective option that focuses on architectural design and documentation**
* **Autodesk Flex  
   A pay-as-you-go option that allows users to pre-purchase tokens for daily access to Revit**

**Subscription terms**

* **You can purchase subscriptions on a monthly, annual, or 3-year basis**
* **Longer terms offer greater savings**
* **Monthly subscriptions are best for project-based work**

## Personas

| **1. Piper Pavers – Student Architect** | |
| --- | --- |
| **Plan:** Education Plan  **Age:** 21  **Occupation:** Undergraduate Architecture Student  **Location:** Manchester, UK  **Quote:** *“Revit is an amazing tool, but I wish it were easier to learn and more intuitive.”* | |
| **Background** | Piper is in her third year of university, studying Architecture. She’s passionate about sustainable design and urban planning. She often works on academic projects and personal design experiments using Revit. Since she’s still learning, she relies heavily on tutorials, forums, and university support. |
| **Goals** | * Learn and experiment with Revit’s tools for 3D modelling and documentation. * Use AI/ML features to streamline project workflows. * Develop a strong foundation in BIM (Building Information Modelling) before entering the industry. |
| **Frustrations** | * Limited access to advanced collaboration tools and premium automation. * Steep learning curve of Revit and AI/ML integrations. * Managing complex designs on a student budget. |
| **Technology** | * Revit (Education License) * Cloud storage for project backups * University-provided workstation |
| **Scenario** | Piper is working on her final-year project and needs to create a detailed 3D model of a sustainable building. She wants to use AI-powered analysis to detect inefficiencies but finds the Education plan lacks some advanced automation tools. She spends hours manually adjusting elements, wishing the software could predict her next moves more accurately. |

## 

| **2. Steven Crane – Self-Employed Home Developer** | |
| --- | --- |
| **Plan:** Standard Plan  **Age:** 35  **Occupation:** Self-Employed Home Developer  **Location:** Birmingham, UK  **Quote:** *“I need efficient tools to speed up my workflow without breaking the bank.”* | |
| **Background** | Steven runs a small home development business, designing and renovating residential properties. He works solo or with a small team, using Revit for planning and visualisation. Since he juggles multiple projects, he needs cost-effective tools to improve efficiency. |
| **Goals** | * Use Revit for residential design projects. * Ensure cost-effective use of AI/ML for automating repetitive design tasks. * Improve design efficiency and error detection. |
| **Frustrations** | * Limited automation and AI-driven analysis compared to Premium and Enterprise users. * Lack of advanced team collaboration features. * Managing multiple software licenses independently. |
| **Technology** | * Revit (Standard Plan) * CAD software for additional design needs * Home office workstation |
| **Scenario** | Steven is designing a new housing development. He wishes Revit could automate some of the repetitive design tasks, such as generating floor plans based on previous projects. However, without access to Premium automation tools, he has to manually tweak each plan, slowing him down. |

## 

| **3. Bill Dozer – Architect in a Firm** | |
| --- | --- |
| **Plan:** Premium Plan  **Age:** 40  **Occupation:** Senior Architect in a Mid-Sized Firm  **Location:** London, UK  **Quote:** *“Revit’s AI tools help, but I still need better integration across my workflows.”* | |
| **Background** | Bill has been an architect for over 15 years and now leads projects at a mid-sized architectural firm. He works on large-scale commercial and residential developments, often collaborating with engineers and surveyors. He uses Revit extensively and values its AI/ML-powered automation features. |
| **Goals** | * Utilise AI/ML-powered Revit features for project management and automation. * Integrate Revit usage with third-party tools using API access. * Improve design efficiency and reduce human errors in blueprints. |
| **Frustrations** | * Need for faster design iteration cycles. * Balancing cost-efficiency while maximising automation benefits. * Keeping up with new AI-driven Revit features. |
| **Technology** | * Revit (Premium Plan) * Third-party API integrations * Cloud-based project management tools |
| **Scenario** | Bill is leading a project for a new commercial complex. He needs to ensure seamless collaboration between teams, but some engineers use different software. While Revit’s AI features help automate some workflows, he struggles with compatibility issues between various tools. |

## 

| **4. Mark Skids – Enterprise Company Director** | |
| --- | --- |
| **Plan:** Enterprise Plan  **Age:** 50  **Occupation:** Director of a Large Architecture Firm  **Location:** Edinburgh, UK  **Quote:** *“Managing multiple projects and teams is a challenge—automation is essential.”* | |
| **Background** | Mark is responsible for overseeing multiple projects across different teams in a large firm. He ensures workflows are efficient, budgets are met, and designs maintain high standards. With an enterprise-wide Revit subscription, he relies on advanced automation, AI-powered analytics, and API integrations. |
| **Goals** | * Oversee multiple projects and teams using enterprise-wide Revit integrations. * Ensure company-wide efficiency using AI-powered automation. * Leverage Autodesk’s API for custom workflow automation and project reporting. |
| **Frustrations** | * Complexity in managing multiple subscriptions and user roles. * Training staff to utilise AI/ML features effectively. * Ensuring high-quality standards across all projects. |
| **Technology** | * Revit (Enterprise Plan) * Custom-built AI/ML integrations for workflow efficiency * Cloud-based company-wide BIM solutions |
| **Scenario** | Mark’s firm is handling multiple large-scale projects. He needs detailed reporting on Revit usage across different teams, but getting consistent data is difficult. He wishes AI could provide deeper insights into project progress and efficiency. |

## 

| **5. Trent Chers – Quantity Surveyor** | |
| --- | --- |
| **Plan:** Standard Plan (with potential for Premium upgrade)  **Age:** 45  **Occupation:** Quantity Surveyor  **Location:** Newcastle, UK  **Quote:** *“Revit helps with cost estimation, but I need better AI-driven tools.”* | |
| **Background** | Trent works on large-scale construction projects, ensuring budgets are managed effectively. He relies on Revit for cost estimation and project analysis, but he’s considering upgrading to a Premium plan for better AI-driven insights. |
| **Goals** | * Use Revit’s AI-driven analysis to streamline material cost estimation. * Minimise project costs through automation and error detection. * Ensure cost control for large-scale projects. |
| **Frustrations** | * Limited AI-driven cost estimation tools. * Balancing project costs while ensuring quality and compliance. * Collaboration between architects and financial teams. |
| **Technology** | * Revit (Standard or Premium Plan) * Cost estimation software * Cloud-based project management tools |
| **Scenario** | Trent is working on a large commercial project and needs to ensure material costs stay within budget. While Revit helps with estimation, he finds it lacks deeper AI-driven insights that could help predict cost overruns before they happen. |

## User Stories

| **Title**: Media Search | **Priority**: Must | **Estimate:** 5 points |
| --- | --- | --- |
| As a user, I want to search for media by title, author, or genre, so that I can easily find the media I am looking for. | | |
| **Acceptance Criteria**  **Given** I am on the search page,  **When** I enter search criteria such as title, author, or genre,  **Then** the system should:   * Offer autocomplete support, * Query the database for media that matches my search criteria, * Display the list of matching results with relevant details (availability, location, format), * Allow me to filter the search results based on additional options like publication year or media type. * Allow me to sort the search results based on media name, author, or publication year. | | |

## 

# User Story 1: Piper Pavers – Student Architect

# ID: US01 Theme: Revit User Interaction for Learning and Experimentation Description: As a Student Architect, I want the system to interpret my text prompt and offer recommendations based on my academic focus, such as learning BIM and 3D modelling tools, so I can efficiently practice and experiment with Revit’s tools. Priority (MoSCoW): Must

# Functional Requirements

# FR01: The system must be able to accept a user text prompt and be able to interpret the text and act accordingly.

# FR03: The system should offer recommendations of tasks it could perform based on that user’s occupation and previous prompts.

# FR09: Upon prompt, the system should be able to create documentation for a Revit project (e.g., project plans, sections, elevations).

# FR06: Upon prompt, the system should be able to enforce design standards by automatically checking for errors in a project (e.g., design validation based on academic standards).

# NFR03: The system should be intuitive, as the student is still learning the tools.

# Non-Functional Requirements

# NFR01: The system must not freeze under reasonable use on any device that meets Revit’s system requirements.

# NFR02: The system must be stable and not crash during learning sessions or when running complex models.

# Shape

# User Story 2: Steven Crane – Self-Employed Home Developer

# ID: US02 Theme: Revit User Interaction for Residential Design Description: As a Self-Employed Home Developer, I want the system to help automate repetitive design tasks, such as generating floor plans and elevations, so I can improve efficiency and ensure accuracy in my residential projects. Priority (MoSCoW): Must

# Functional Requirements

# FR05: Upon prompt, the system should be able to create add-ins and macros to automate repetitive tasks in the Revit user-interface.

# FR07: Upon prompt, the system should be able to extract project data to analyse and generate reports (e.g., cost analysis, material quantities).

# FR08: Upon prompt, the system should be able to import external data to create new elements or parameter values (e.g., using cost estimation software data for accurate budgeting).

# FR06: Upon prompt, the system should be able to enforce design standards by automatically checking for errors in a project (e.g., regulatory compliance in building design).

# Non-Functional Requirements

# NFR03: The system should be intuitive for quick implementation in a small business environment.

# NFR01: The system must not freeze under reasonable use when handling residential design projects with moderate complexity.

# Shape

# User Story 3: Bill Dozer – Architect in a Firm

# ID: US03 Theme: Revit User Interaction for Large-Scale Design Projects Description: As an Architect in a firm, I want the system to be able to automate design and project management tasks, such as checking for design errors and generating project reports, to help me improve efficiency and reduce human error in large-scale projects. Priority (MoSCoW): Must

# Functional Requirements

# FR05: Upon prompt, the system should be able to create add-ins and macros to automate repetitive tasks in the Revit user-interface.

# FR06: Upon prompt, the system should be able to enforce design standards by automatically checking for errors in a project (e.g., design consistency in large projects).

# FR07: Upon prompt, the system should be able to extract project data to analyse and generate reports (e.g., project progress, resource usage).

# FR09: Upon prompt, the system should be able to create documentation for a Revit project (e.g., construction documents, technical specifications).

# Non-Functional Requirements

# NFR02: The system must be stable and not crash when handling large and complex architectural models.

# NFR04: There should be documentation about how to use the system, as the firm uses various team members with different experience levels.

# Shape

# User Story 4: Mark Skids – Enterprise Company Director

# ID: US04 Theme: Revit User Interaction for Enterprise-Level Management Description: As a Company Director of a large architecture firm, I want the system to offer custom workflow automation and detailed project reporting capabilities, so I can ensure high-quality standards and streamline the management of multiple teams across large-scale projects. Priority (MoSCoW): Must

# Functional Requirements

# FR07: Upon prompt, the system should be able to extract project data to analyse and generate reports (e.g., team performance, project milestones).

# FR09: Upon prompt, the system should be able to create documentation for a Revit project (e.g., enterprise-level reports on BIM compliance, workflow efficiency).

# FR05: Upon prompt, the system should be able to create add-ins and macros to automate repetitive tasks in the Revit user-interface (e.g., automating project standardisation).

# Non-Functional Requirements

# NFR03: The system should be intuitive, especially for diverse teams within the company with varying levels of technical expertise.

# NFR04: There should be documentation available for managing custom workflows and project reports.

# Shape

# User Story 5: Trent Chers – Quantity Surveyor

# ID: US05 Theme: Revit User Interaction for Cost Estimation and Budget Management Description: As a Quantity Surveyor, I want the system to help analyse material costs, detect potential errors in budgeting, and generate cost reports so that I can efficiently manage and control the budget for construction projects. Priority (MoSCoW): Must

# Functional Requirements

# FR06: Upon prompt, the system should be able to enforce design standards by automatically checking for errors in a project (e.g., cost discrepancies or quantity miscalculations).

# FR07: Upon prompt, the system should be able to extract project data to analyse and generate reports (e.g., cost estimation reports, material quantities).

# FR08: Upon prompt, the system should be able to import external data to create new elements or parameter values (e.g., integrating cost estimation data into Revit).

# Non-Functional Requirements

# NFR02: The system must be stable and not crash when performing cost analyses or handling large datasets.

# NFR01: The system must not freeze under reasonable use when calculating large-scale cost estimations.

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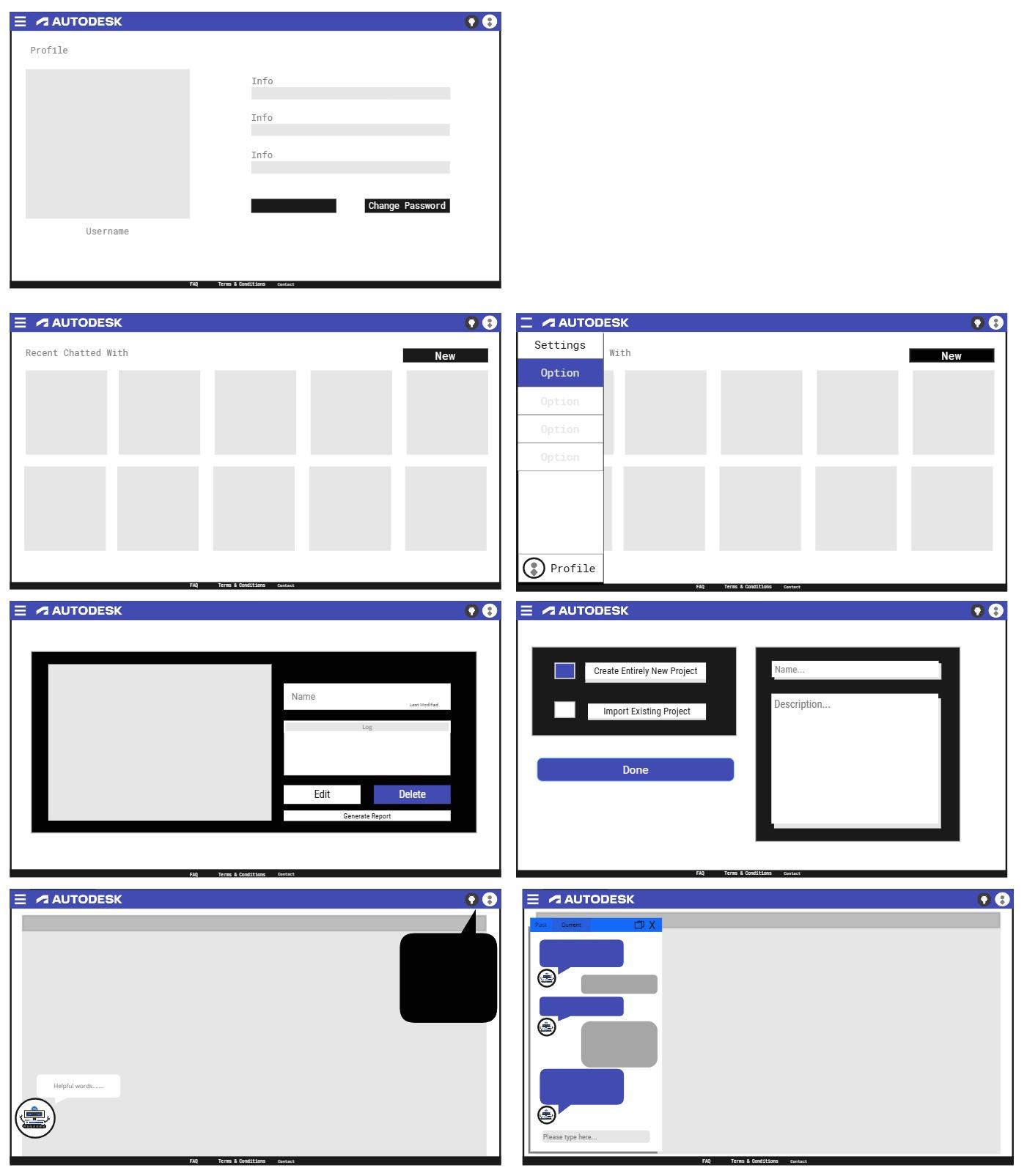
## Test Specification

| **Test ID** | **Test Description** | **Test Scenario** | **Expected Result** | **Test Result** | **Remark** | **Response** |
| --- | --- | --- | --- | --- | --- | --- |
| S1-ID01 | Account Details | User views profile page. | The profile page displays the user’s email, username and other details accurately. |  |  |  |
| S1-ID02 | Account Details | User updates account details with unique email and username. | Account details are updated successfully. Account details are displayed correctly. |  |  |  |
| S1-ID03 | Account Details | User attempts to update account details with duplicate email/username. | Account details are not updated. Error message is produced. |  |  |  |
| S1-ID05 | Account Details | User attempts to update account details with information partially filled in. | Account details are not updated. Error specifically highlights what information is missing. |  |  |  |
| S2-ID01 | View project | User is on the home page. | All projects the user has chatted with are successfully displayed. |  |  |  |
| S2-ID02 | View project | User clicks on existing an project. | The 3D model loads correctly showing the thumbnail. |  |  |  |
| S3-ID01 | Edit Project | User edits a project. | User is able to successfully edit the 3D model or design. The homepage is updated accordingly. |  |  |  |
| S4-ID01 | Create New Project | User creates a blank project or imports an external file. | Project is successfully created. User is redirected to the editing page. |  |  |  |
| S5-ID01 | Log of User Prompts | User views log of all AI changes. | All prompts to the AI are logged as well as the type of prompts. List is displayed in chronological order. |  |  |  |
| S6-ID01 | Generate Report | User requests to generate documentation for project. | The system generates documentation for the project. The report is downloaded in the selected format. |  |  |  |
| S7-ID01 | AI Interaction | AI recommends tasks it could preform. | Recommendation aligns with the user's attributes. |  |  |  |
| S7-ID02 | AI Interaction | User enters a prompt to AI bot | Prompt is correctly interpreted and appropriate reaction is initiated. Feedback is displayed. Action and prompt is logged. |  |  |  |
| S8-ID01 | AI Automation | User triggers the AI to generate recommendations for improving the design. | The suggestion is relevant and inline with the users attributes. |  |  |  |
| S8-ID02 | AI Automation | Error is found when user is editing a project. | AI points out error and suggests to automatically fix it. The fix is done successfully and logged. |  |  |  |

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# System Architecture

## Wireframes

Check: https://c4model.com/

## C4 Context Diagram (level 1):

## C4 Container Diagram (level 2):

# Appendix 1: Tasks Completed

*Table 1-Tasks Completed by each Member:*

| Name: | Tasks Completed: |
| --- | --- |
|  |  |
|  |  |
|  |  |

# Appendix 2: GitHub Repository

Add here a link to your GitHub Repository.

*Table 2 - GitHub Usernames*

| **Student name** | **GitHub name** |
| --- | --- |
|  |  |
|  |  |
|  |  |

# References