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 |
| --- | --- |
| Tom Richards | C3076111 |
| Asha Prawosudowicz | C3036163 |
| Aaron Wass | C3034586 |
| Olly Prince | C3012539 |
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**Table of Contents**

[Introduction 3](#_gjdgxs)

[Project Overview 3](#_30j0zll)

[Project Objectives 3](#_1fob9te)

[System Requirements 4](#_3znysh7)

[Non-Functional Requirements 4](#_2et92p0)

[User Roles 4](#_tyjcwt)

[Personas 5](#_3dy6vkm)

[User Stories 6](#_1t3h5sf)

[System Architecture 7](#_4d34og8)

[C4 Context Diagram (level 1): 7](#_2s8eyo1)

[C4 Container Diagram (level 2): 7](#_17dp8vu)

[Appendix 1: Tasks Completed 8](#_3rdcrjn)

[Appendix 2: GitHub Repository 9](#_26in1rg)

[References 10](#_lnxbz9)

# 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

| Role | Description |
| --- | --- |
| Student Architect | Student Architect  **Responsibilities:**   * Search for media.  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, provided 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. |
| Standard Home Developer | This would include a self employed home developer.  **Responsibilities:** 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 |
| Premium- Architect | This would be an architect that works for a company  **Responsibilities:** 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 Company Director | This person would oversee other architects work.  **Responsibilities:**   * **a**  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 |
| Quantitative Surveyor | A construction industry professional who manages and controls the costs of construction projects.  **Responsibilities:** |

* 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

| **Piper Pavers**  **Steven Crane**  **Bill Dozer**  **Mark Skids**  **Trent Chers** | |
| --- | --- |
| * Age: 34 * Occupation: Freelance Writer * Location: Leeds, UK * Library Member * Disability: Visually impaired (low vision) * Quote: “I love the convenience of borrowing audiobooks from AML online, but I need the site to be accessible” | |
| **Background** |  |
| **Goals** | * Easily |
| **Frustrations** | * Websites |
| **Technology** | **Devices**: |
| **Scenario** |  |

## 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. | | |

## 

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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