Department of Computer Science
Faculty of Engineering, Built Environment & IT
University of Pretoria
COS301 - Software Engineering
CAPSTONE PROJECT
Software Requirements and Design Specifications V1

Item: Capstone Project 2022
Team Name: iCreateSoftware
Team Project: Team Utilisation Monitor
Team Members:

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1. Introduction

1.1. Description

Team Utilisation Monitor will allow companies to manage teams, evaluate team performance and team members as well as manage and allocate resources.

1.2. Project Scope

1.2.1. Vision

Our vision is to develop a specialized system capable of efficient utilization of resources and management of teams and their synergies based on information sourced through monitoring individuals performance over continous projects while using the system

1.2.2. Objectives

Objectives that the system should achieve:
- Provide UI for desktop and mobile devices.
- Provide easy and intuitive usability.
- Provide team utilization percentage targets to ensure work is spread evenly across teams.
- Provide individual utilization targets that can determine if a resource is under/overused, or requires more training.
- Provide Key Performance Indicators to indicate team/individual performance.
- Propose suggestions to lacking team skills based on what projects are currently being looked at, and trends in technology.
- Propose ideal teams for projects based on available skills and team synergy learned over time.
- Provide a visual depiction of all these elements in a clear concise manner
- Integrate with popular team chat applications such as Teams and Slack to notify of key events in the system.

1.2.3. Business Need

The current tools on the market allows for an overview of resources but falls short in the aspect of proper management of them as well as trend analysis. Most of the functionalities for the application can be inferred from gathered data and business rules put in place, however some such technology trends may require information sourcing of some kind from outside environments and predictive analytics using some sort of intelligent learning would be required for metrics such as team synergy over time. To make project management and team utilization easier, our system hopes to correct this gap in the market to allow for proper team utilization.

2. Class Diagram

2.1. Diagram
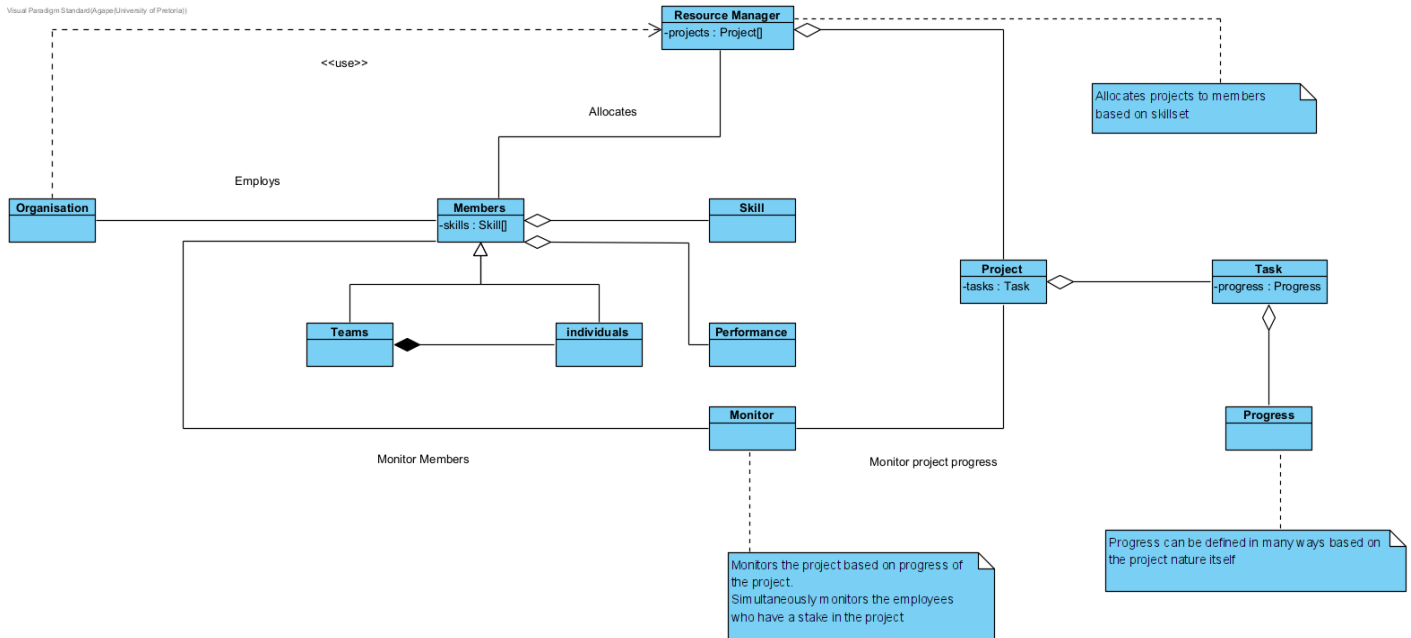
2.2. Description

- An Organisation employs Members.
- Members can be divided into Teams or Individuals
- Teams are composed of Individuals
- Each Member holds a Skill and Performance attribute used to measure their performance and skill levels for data analysis.
- The ResourceManager holds projects and intelligently allocates them to the Members based on Skill or Performance.
- A Project can be broken down into tasks.
- A Task has progress, which is used to measure the state of the Task.
- A Monitor monitors the Members and the state of their Tasks and feeds that information to the ResourceManager.

3. User Characteristics

3.1. Intended Users

The user should be able to operate a computer and/or be able to use a mobile device to download and use the application. The user should have access to the internet and a Team Utilisation Monitor account to make use of the full functionality of the app. Team Utilisation Monitor system will be used by the following users:

- Project Managers wanting to improve team managment
- Project Managers wanting to improve resource utilization
- Project Managers wanting to monitor team performance

3.2. User Stories

- As a user, I want to monitor current skills and trends in the workplace so I can improve on them.
- As a user, I want to monitor my teams performance on a project
- As a user, I want to monitor my teams resource utilization on a project
- As a user, I want to see if I am being under or over utilized on a project
- As a user, I want to find projects best suited to my skill sets and the skill sets of my team

4. Functional Requirements

4.1. Use Cases

4.1.1. User Sign In
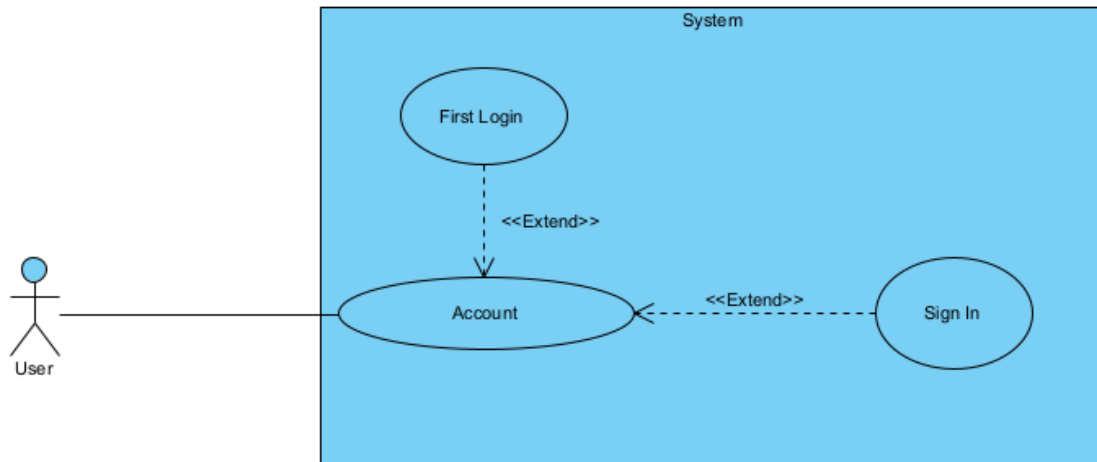
- First Login: This use case is identical to the "sign in" use case, but additionally it also ensures that when the user is logging in for the first time, they create an account and are assigned to a company.
- Sign In: This use case is for all the subsequent logins after the user has first signed in and created an account.

4.1.2. Team Allocation
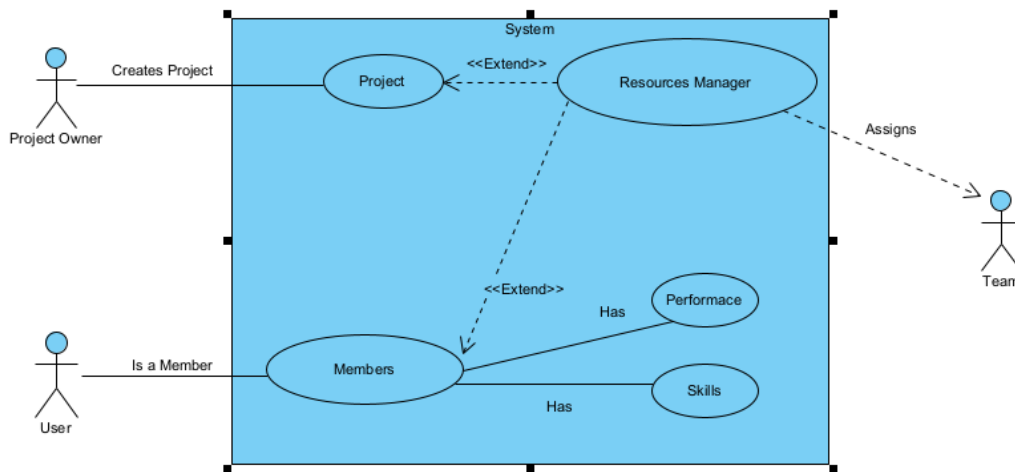
- Project: Allows a Project owner to upload a project
- Members: Allows a user to monitor their progress with performance and skills based off of previous projects
- Resource Manager: Views an uploaded project and determines resources needed to be allocated. Based on previous results the Resource Manager views and calculator members best suited for the project based on performance and skills. The Resource Manager then allocates members to a team to complete the project

4.1.3. Performance Monitoring
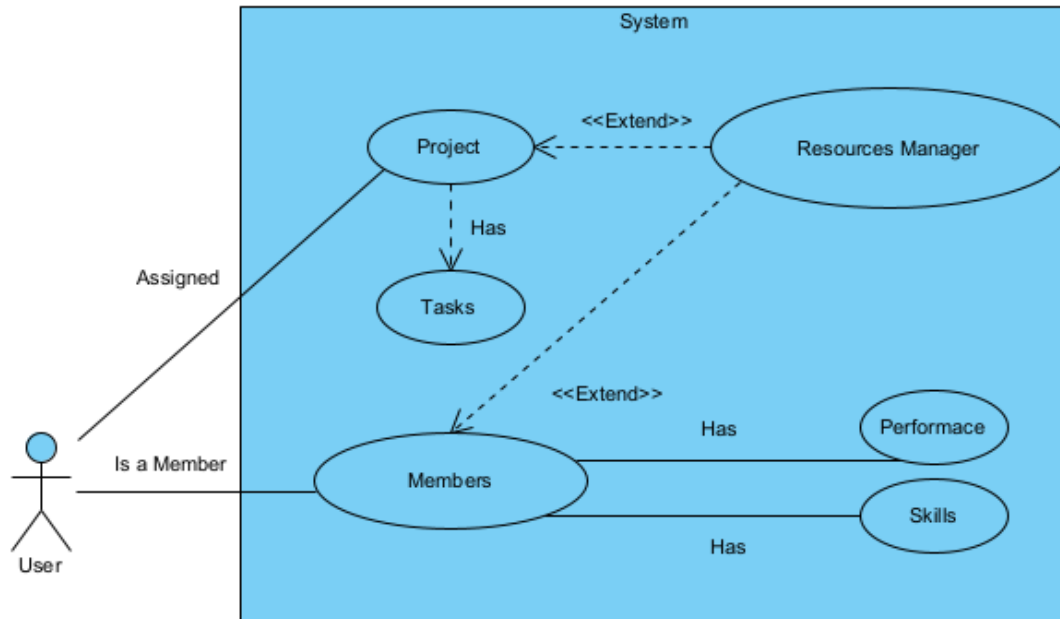
- Project: Once a team is assigned to a project the project gets broken down into tasks
- Members: A user's performance is monitored through the completion rate of a task by the resource manager.
- Resource Manager: Resource Manager will reallocate members to tasks based on skills and performance, a members performance is updated according to the completion of a task assigned by the resource manager

4.2. Requirements

The requirements of the system models the functionality that the Team Utilisation Monitor system offers. These requirements are necessary in order to successfully meet all the criteria needed for the system.

- FR1: Team Provide team/individual utilization over time measured against expected and project utilization
- FR2: Provide key metrics on team and individual performance that can be used for data analysis
- FR3: Provide suggestions for generating project teams based on past data using some method of intelligent learning
- FR4: Provide visual indicators of all the data including interactable graphs, charts and allow for reports to be pulled
- FR5: Provide an interactive web client that is fully mobile compatible

5. Quality Requirements

5.1. Performance

The system should be designed to continually monitor users and their skills sets as well as detect new trends in field

5.2. Reliability

The system should reliably capture all progress and completed tasks by the user to determine resource consumption.

5.3. Security

The system should require proper authentication in order to gain access to the user's personal information from the database.

5.4. Usability

The systems should be designed to be easy to use and for a user to quickly understand.

5.5. Scalability

The system should be usable by large industires with hundreds of employees that make up teams. The system should be designed to handle more and more uses as the need for the system grows.

5.6. Maintainability

The system is designed for long term use and continually monitors the users. The system should be easy to use for future changes and later developments.

5.7. Consistency

The software system experience should be consistent across the different interfaces (Web and Mobile). The user should have the same functionality across both systems.

6. Trac-ability Matrix

		Sub System		
		Login	Allocation	Performance
Requirements	FR1			X
	FR2			X
	FR3		X	
	FR4	X		
	FR5	X		
	Q1			X
	Q2			X
	Q3	X		
	Q4	X	X	X
	Q5	X	X	X
	Q6	X	X	X
	Q7	X	X	X