

# Final Crit

## Project Type: Game

### TASKBUDDY

23 November 2022

Total Combined Hours To Date: 648Hours

(Group Meetings > 170hrs, Nhlanhla > 240hrs, Luyolo > 238hrs)

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Nhlanhla Langa [Lead Character Designer + Programmer] (2119331)

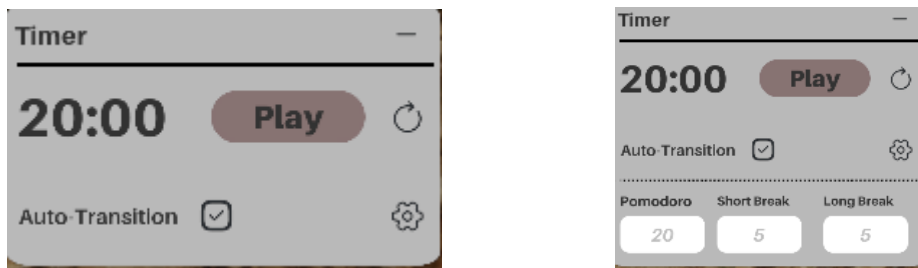
Luyolo Mbatha [Lead Asset Designer + UI/UX Designer] (1874467)

## Overview

Our project *taskbuddy* is a 3D productivity application that creates a balance between work and play. Players are afforded various customisation options, including character, environmental and atmospheric changes. A mood changer and music player are also provided to the user. We offer a timer and task manager for productivity.

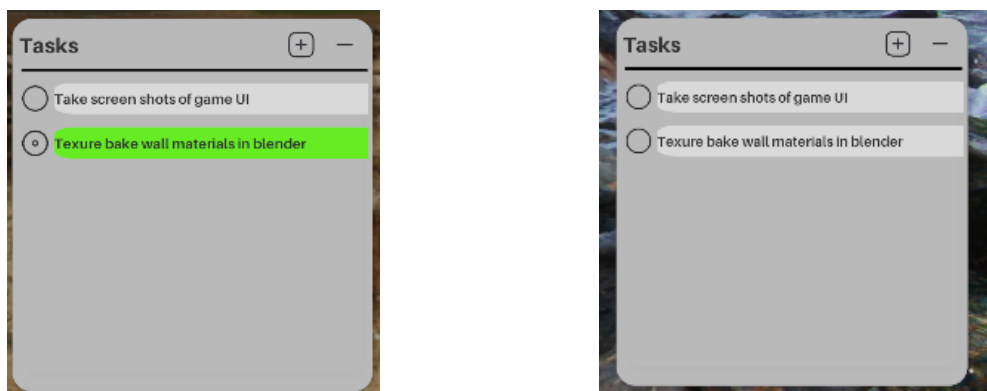
### Task Management:

**Pomodoro Timer** - Users can make use of the in-app timer to better manage their time when completing tasks. The timer makes use of the Pomodoro technique, whereby an individual works on a task for a set amount of time –uninterrupted– the task will be worked on until the set time ends, thereafter the user takes a short break, and the cycle repeats three more times, then a long break can be taken. When the timer runs down to zero the user is notified by one of three possible bell alerts. See *figure 1*.



**Figure 1.** Image showing the application timer settings expanded and collapsed along with the Pomodoro settings afforded to users.

**Task Manager** - The task manager allows the user to document tasks they wish to complete. Once a task is complete the user checks off or clears the task. The task manager stores the user's incomplete tasks, allowing users to come back and complete their tasks at a later stage. See *figure 2*.



**Figure 2** shows the in-app task manager along with the accessibility settings.

## Customisation Settings:

**Atmosphere Customisations** - Users are able to change the atmosphere in the application to simulate different weather. Playtest feedback received highlighted that some users prefer working with ambient noises. The ambient noises implemented are weather/daytime related and are accompanied by a visual representation. The different atmospheric settings include:

- Daytime
- Night time
- Thunderstorm
- Rain
- Snow

**Music Player** - Users have access to a music player they can listen to while working. Initially, the application only provided one genre of music –Lofi music– and to accommodate for this we implemented a Spotify plug-in that would allow users to import their playlists from the Spotify app, however, this implementation was inconsistent, furthermore, we were aware of the potential security concerns of logging in personal details. We, therefore, opted to introduce a greater number of genres to the music player, to cater to a wider audience, we further afforded the user the ability to import music from their own devices, we believed this would be a great middle point where we could cater to a wider audience without raising concerns about security and cater to those whose musical needs are simply not met by our application.

**Light Adjustment** - Users are able to adjust the lighting in the application. The lighting adjustments are intended to further develop the tone of the application based on the users' preferences.

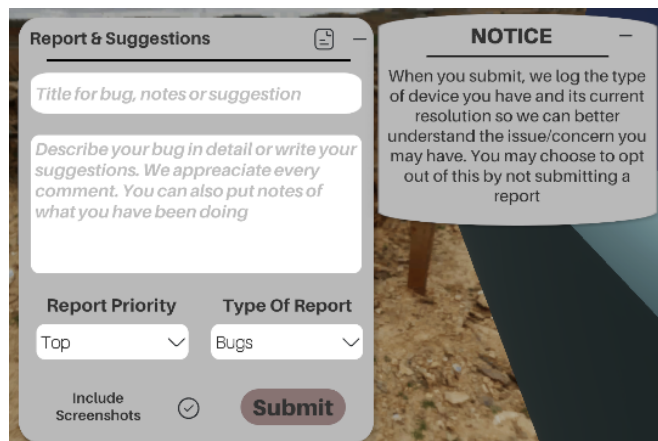
**Character Customisation** - The character customiser allows the user to make changes to the in-app avatar. The customisation settings range from facial and body structure to room objects. The character avatar is fitted with a number of body customisations, this is intended to make the avatar more relatable to the user. These customisations will be coupled with animations that will aim to mimic the user's actions, these animations include

- Working at a desk
- Exercising
- Resting on a bed
- Resting on Couch

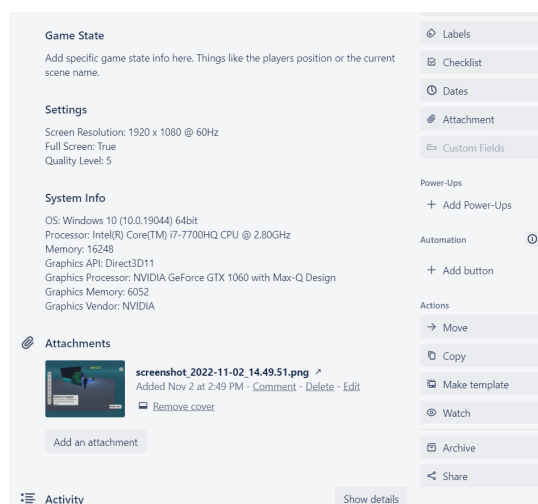
For the most part these customisations are intended to be interacted with while users are taking a break, therefore when the time is being used it is presumed that the user is working on a task, therefore the customisation options cannot be accessed. The users believed this addition was necessary as without it there is too much freedom afforded to the user as well as there is no real incentive to work on tasks otherwise. This would go against the core aspect of the application, which is productivity. In future iterations, we are open to implementing a reward-based system that will reward users with a greater set of customisations based on the number of hours spent working, along with a variation rewarding the user for the number of tasks they complete per week/month.

## Player Designer Feedback:

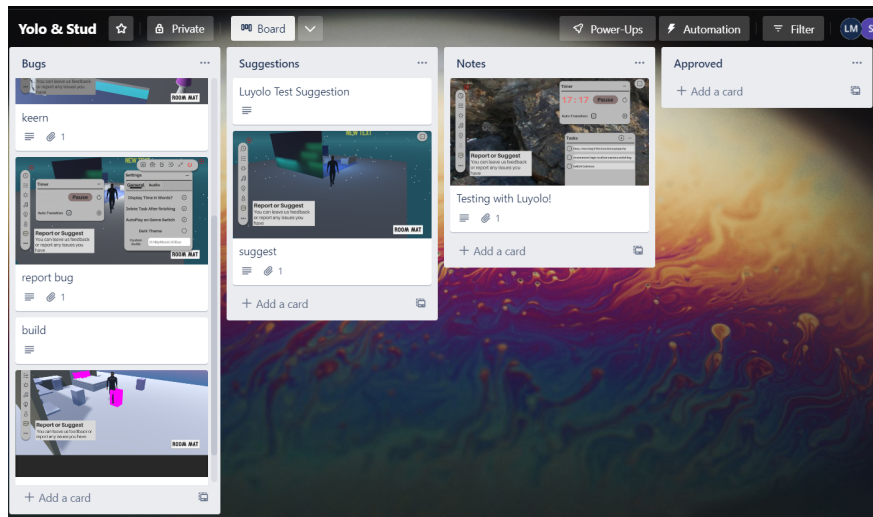
**Bug Report and Submission tab** - At a later stage the designers intend to publish *taskbuddy*, we, therefore, believe it is important to receive feedback from users as frequently and efficiently as possible. We introduced a suggestion and bug report tab that allows users to document bugs missed by us the developers, along with any suggestions they might have to enhance their experience with the application. Through the use of the website [Trello](#), we are able to receive feedback immediately from users. The report and suggestions of the system are categorised into three parts: bug reports, suggestions and notes. When feedback is sent by the user we as developers are able to see the specifications of the device the user is using, this allows us to better deduce what the possible issue maybe if a bug is reported, furthermore, there is an option to screenshot the application scene as the feedback is sent through, this would allow us to immediately know when and where the issue occurs in that app or where we can implement the suggested changes. Because we will be capturing user data it was imperative for us to ensure that people who engage with the application are aware that their data will be captured. **See Figures 3, 4 & 5.**



**Figure 3** Image showing the report and suggestion tab, along with the notice warning, notifying the user of the implications of using the system.



**Figure 4** Image showing the statistics of the application along with the device specifications after submission



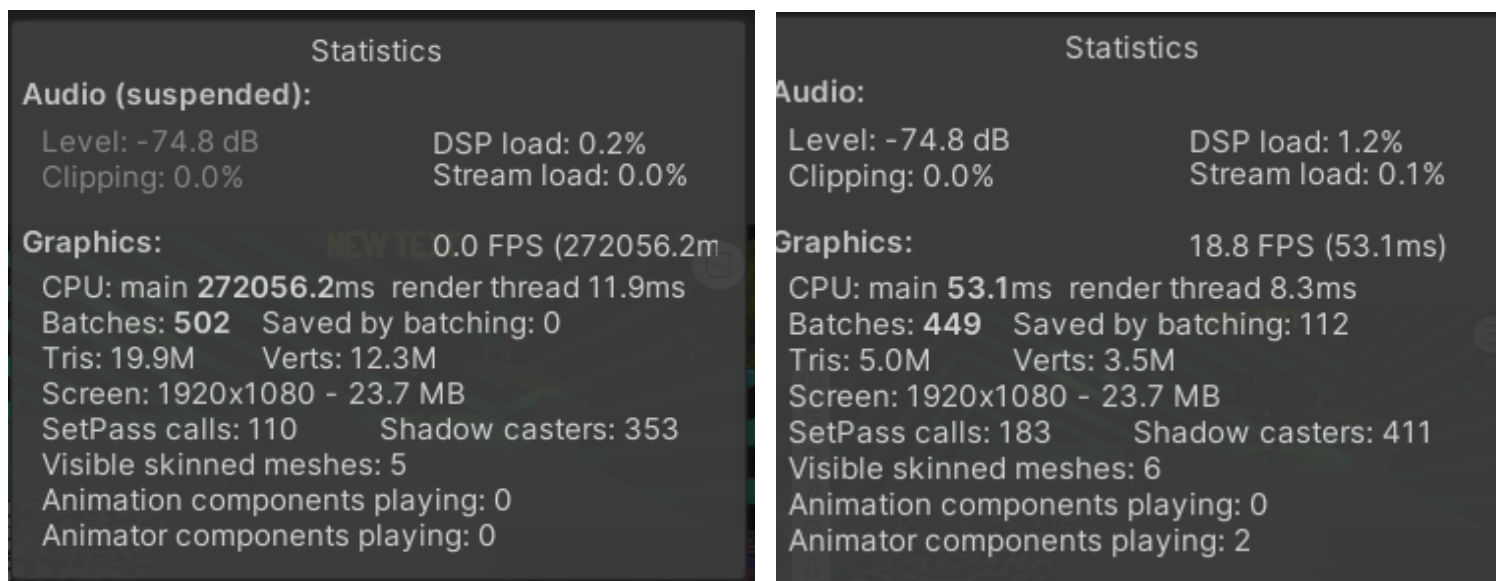
**Figure 5** Image shows the backend structure of the Bug report and suggestions system.

## Iterations

- A personal greeting for users when opening the application.
  - This addition is intended to further develop the overall personal experience of the player. Upon opening the application for the first time the player is greeted with a friendly quote. Users have the option of adding their names and when opening the application on other occasions the user will be greeted by name. This addition along with the application's customisation setting –promoting personal expression– and the task manager's memory factor aims to create a uniquely personal experience for the player even though the application provides the same service for all users.
- We had a complete overhaul of the UI. Changing from an office-themed UI to a more minimalist UI.
  - The decision to change to a minimalistic UI was influenced by our intention to deliver an experience that was fluid and prioritised user preference. This was done by placing all the UI in containers(Buttons). When clicked the containers expand, revealing more options for the user. The expanded UI can also be dragged to different parts of the screen which cater to the user's visual preference.
- More accessibility settings
  - These settings include a light and dark mode. The checking off of tasks versus destroying/deleting them, the option for the music player to automatically start playing music after switching genres versus manually starting the playlist. The addition of these settings is a result of playtesting data received, whereby there was a lot of conflicting feedback from different testers, we as the designers opted to cater to a wider audience by allowing as many systems changes as possible.

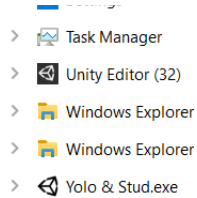
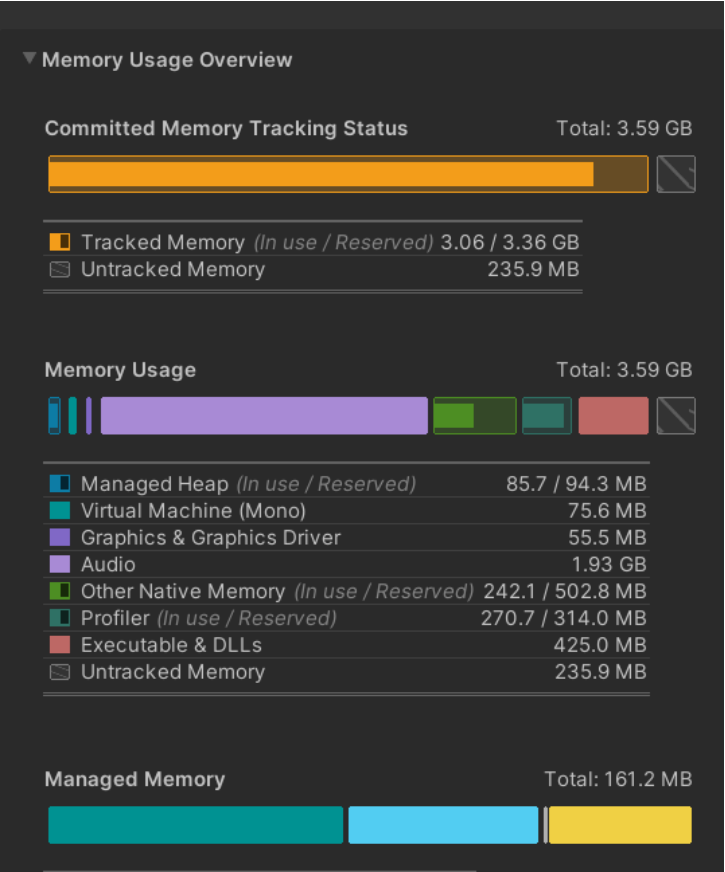
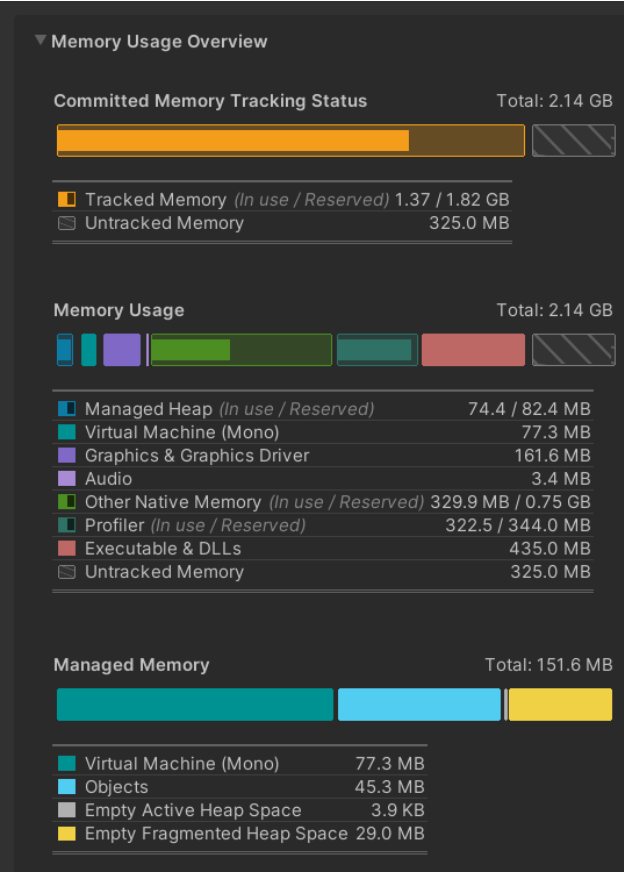
## Challenges & Solutions

- **Application Optimisation** - a development oversight that became a major priority for us was optimisation, especially because the application is to be run in the background. We faced many issues regarding memory, to the point where our devices struggled to run the application. The main contributors to the drop in performance were the method in which we played music, a large number of the power-intensive lights in the scene and a large polygon/vertices count. The lighting system was changed to a more advanced lighting system – from the universal render pipeline(URP) to the high definition pipeline (HDRP). The new lighting system afforded us a greater set of options regarding efficient lighting setups. The issue of a high polygon count was combated by creating low poly objects from our high poly objects in Blender and reimporting them to unity. See **Figure 6** for a clearer timeline of differences in performance post-optimisation changes. Through research, we found that the best way to handle large files of background audio was to compress the audio quality by 50% and load the audio clips as streaming assets rather than compressing them in memory. See **Figure 7** for the difference in performance. The only audio that is compressed in memory is from the user's custom files. We did try to mitigate the problem by only loading the songs when the user changes genres. For other textures, we created atlases which compressed the files whilst retaining their crispness, however, some UI elements were bleeding out so we had to remove those few.



**Figure 6** shows the difference in polygon count(tris), pass calls and CPU demand after the optimisation process.





1,3%	34,0 MB	0 MB/s	0 Mbps
2,4%	3 839,4 MB	0 MB/s	0 Mbps
0%	16,6 MB	0 MB/s	0 Mbps
0,1%	16,5 MB	0 MB/s	0 Mbps
10,8%	861,9 MB	0,1 MB/s	0,1 Mbps

**Figure 7**, displays three screenshots taken during testing. The first two indicate a memory profile capture, the one on the left indicates the current usage of memory whilst the one on the right is from the previous crit. You will notice that audio has been reduced significantly from almost 2GB to merely 3.4 MB. The tracking committed memory has also been decreased by 1GB. We attached a screenshot from the task manager to indicate that of the 2.88GB remaining, a bunch of it is from the unity editor itself whilst our app labelled (Yolo & Stud) has been reduced to less than 1GB of memory. We should note too that it significantly decreases after a few minutes of playtime to around 500mbs, going as low as 250mbs when the player is on the lowest resolution.

- **Animating Process** - Creating the animations for the character proved to be difficult as the playback speed feature in Blender had a low frame rate even after we had optimised the character, the reason we believe is the age our laptops have become. We solved this playback issue by importing the blender files inside Unity which allowed us to playback the animations in real-time, ultimately allowing us to iterate on our animations at will, however, this process was time-consuming and highly dependent on how quickly the time to import would be.
- **Character Implementation**- The initial character we intended to be in the final iteration of our project unfortunately was not optimally implemented in the unity game engine. This was the result of an oversight by the creators when animating the character. The issue arose when the rigged character was scaled down to fit the size of the objects in the game scene, rather than scaling up the objects in the scene to fit the character's needs. This resulted in inconsistencies in scaling when the animations were rendered in the unity game engine. Because of the lengthy animation process and time remaining before submission, both members agreed that redoing the animations was not a viable option. The designers agreed to make use of online models and animations. As we're planning to publish this application, we plan on redoing the character with this understanding of the problems at hand.

### Rubric Of Goals (Exam)

Goal (Nhlanhla Langa)	Description	Weight	Grade
Implementation of customisation	Create an easy-to-use customisable screen that functions. It should allow players to customise their bodies and the rooms they live in with ease.	10%	8%
Implementation of Music Player & UI	Makes it possible to control the music. Allow players to switch genres and perhaps import their music	10%	10%
Game-ready animations, acceptable rigging practices and poses	Ensuring that the rigged character has been weight painted, the animations created can be exported and are broken down or split into their own NLA clips (NonLinear Animations) to make it easier to implement them inside Unity	5%	2.5%
Understand texturing, UV unwrapping, retopology and base modelling	Ensure that the model is optimised for video games. The character's poly count should not be costly to the system. High poly and low poly characters should be made so baking can be possible i.e normal maps, ambient occlusions, UV maps and texture maps	10%	7.5%



Expand character to be customisable	Create blend shapes to have a variation of body sizes, and eye shapes, and hair	15%	10%
<b>TOTAL</b>		<b>50%</b>	<b>38%</b>

Goal (Luyolo Mbatha)	Description	Weight	Grade
Minimum of three variations of prop types	Create recognisable styles within each category of props created i.e different architectural styles withing in each prop category.	15%	5%
A better understanding of model retopology and texture baking for third-party software	To model and sculpt objects more efficiently to ensure the process of texturing is easier for other artists in the production pipeline along with taking into account the performance demand of the models made.	15%	10%
Acceptable rigging practices	Ensuring the rigged objects created for animated objects work pleasantly within Blender and third-party applications i.e Unity.	5%	4%
Contextualised Animations	Creating animations that serve to emphasise the theme of the application. An example of this would be the acknowledgement of a productivity application, thus ensuring the idle animation of the avatar show traits associated with productivity, such as eagerness.	10%	6%
Intuitive UI format	Being aware of common UI formats and practices, to create a seamless interface that is easy to under by new users.	5%	5%
<b>Total</b>		<b>50%</b>	<b>30%</b>

Goal (Project)	Description	Weight	Grade
Portfolio-Worthy	We want this project to showcase all the hard work, lack of sleep and endless hours of cursing, smiling and torture. We want to show the world, mostly friends, peers and family, that it was worth it!	25%	23%

	The project should demonstrate our progress as game design and animation students ready to be employed		
A playable demo/build	<p>The game should be playable from other Windows devices. It should be industry ready. There shouldn't be a disconnect between art assets, music, the choice in lighting and game view framing</p> <p>It should contain the Main Menu (if possible), Splash Screen and main game scenes with transitions and audio cues ready.</p>	25%	24%
<b>Total</b>		50%	<b>47%</b>

## Deliverables

For the final submission, we will deliver two builds, the first will consist of the character we had intended to display and the second will consist of an open-source character. We mentioned the oversight and error above and we believe that presentation is very key for projects. We're submitting two as one is intended to showcase the entire application as it was supposed to be and is for the exhibition. The second is for the marker to look through the project and our blender files to validate that we had actually done work (character modelling, animations, prop modelling and clothing). We will also provide the blender files.

## Glossary

**Pomodoro** - The Pomodoro technique refers to a time management method that encourages uninterrupted focus in 25-minute intervals, with a 5 to 10-minute break between intervals.

## References

<https://github.com/JoshLmao/Spotify4Unity> by JoshLmao licensed under MIT

<https://assetstore.unity.com/packages/tools/integration/s4u-automatic-spotify-integration-129028#description>

<https://assetstore.unity.com/packages/2d/textures-materials/sky/customizable-skybox-174576#content>

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