How to Design a VR Gym

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1. Abstract

The design of a VR Gym combines technology like a VR Headset with fitness as it creates an innovative space that refines the user experience. This research explores how to design a VR Gym which focuses on accessibility, interior layout, aesthetics and technical elements. By connecting with Virtual Reality,

This essay will introduce literature review, breakdowns of designing the VR Gym and design considerations to understand the most effective design strategies for a VR Gym. The literature review examines books and journals about Virtual Realities; They have interesting feature that can be used for designing a VR Gym. The breakdowns of designing a VR Gym reveals the contents for each of the main parts for design a VR Gym to make sure it functions for users to use. The objective of the gym is to give an immersive workout environment which is customised to users of all abilities. Design considerations explains about the design concept and existence of the VR Gym; It reveals about the appearance and functionality of the main part that need to function properly for the VR Gym. The method is to have a breakdown for each components, additional features to add and explain clear how each respected parts are relevant for designing a VR Gym that will function properly.

There will be key considerations that will include user flow, comfort, lighting, materials and ventilation to give a smooth and comprehensive experience. The study will show the importance of placemaking in designing a usable and attractive VR Gym; this can demonstrate how design solutions can shape the future of fitness spaces.

2. Introduction

This dissertation focuses on the design of a VR gym both in its physical, material embodiment and in its virtual space avatar. I will employ a literature review to understand the trends and techniques and collect a series of techniques to successfully design a VR gym.

The research aims to show that VR has become irrelevant to the modern era in the present day as people are obsessed with their smartphones, creating less attention to VR because of less content and higher prices, making people care less about VR. Another reason is that many people have been affected by the aftermath of the lockdown; remote work and mental health have caused people to decrease their fatigue, fitness level and morale. They become that they do not care about new things and are too lazy to go to the gym as they think it is impossible as it is boring and hard to reach the peak fitness level. I will address these issues

by using people's technology habits as leverage for people coming to the gym and trying out VR headsets to assess the relevance of the VR gym paradigm.

I will start the dissertation by exploring the physical reality of the buildings where the VR Gym will be designed and explain the contextual factors that can affect the VR Gym. I will then delve into the Technology for the VR, in terms of hardware and in terms of software. Next, I will explore Design solutions descriptive of all the aspects discussed, including a focus on the interior design. Finally, I will describe the design of a VR gym as an output of the research, showing the relevance of the research to current placemaking.

3. Glossary

Immersive – Creating a deep, engaging experience that surrounds the user, often through technology like virtual reality, making them feel fully involved in a digital or physical environment.

Innovative – Introducing new ideas, methods, or technologies that improve or transform existing concepts, often leading to creative and groundbreaking advancements.

Obesity – A medical condition characterized by excessive body fat accumulation, increasing the risk of various health issues such as heart disease, diabetes, and high blood pressure.

Traditional – Relating to long-established customs, beliefs, or practices that have been passed down over time, often contrasted with modern or innovative approaches.

Haptic – A technology that simulates the sense of touch through vibrations, force feedback, or motion, enhancing user interaction in virtual and digital environments.

Cognitive – Related to mental processes such as thinking, learning, memory, and problem-solving, often studied in psychology and neuroscience.

Aesthetic – Concerned with beauty, visual appeal, and artistic expression in design, architecture, and other creative fields. It refers to the principles that define what is visually pleasing or harmonious in an object, space, or experience.

4. Literature Review

Eaton (2020) breaks down the functions and explains of how to use Virtual and Augmented Reality to design a VR space, and with a series of insights useful to understand how to design a VR Gym. The book shows what to expect for using VR and AR; it shows the breakdown of how each function for the systems to read and analyse respectfully. The book was made when VR and AR headset was introduced to the world that people using it most often like for an example, Apple Vision Pro and PSVR2. It has sections for the book to explain the breakdown from the content like the section is for Hardware, Design, User Interface, Production, Development, Quality and Future.

One critical factor is ensuring that users feel relaxed wearing the VR headsets. “Hardware comfort is another contributor to physical comfort. Ensuring that a head-mounted display or wearable is fitted properly will reduce the potential of headaches” (Eaton, 2020:6)

Another critical factor is ensuring that users need to receive a basic ‘need-to-know’ tutorial on the controls of the VR headset to avoid confusion. This explanation talks about the tutorials which it “should be designed to wait and confirm that the user fully understands what you are trying to teach them. In the case that you are teaching them how to pick up an object, do not progress to the next step until they have successfully picked up that object. To enhance the tutorial, you can add failure prompts so that if they do perform the task incorrectly, the system explains why and then prompts them to try again with the correct instruction repeated”. (Eaton, 2020:9) Eaton wanted to give explanation the user to have the familiarity of the controls to use the VR Headset.

Furthermore, for the critical factor is using Artificial Intelligence for the VR Headset but AI may sometimes be inaccurate. It uses AI voices services in the Headset to “generate temporary voice-overs while we are working through storyboarding and initial implementation of narrative elements. Not all AI voices have realistic human emotion just yet. So, unless it is very straightforward instruction, we want to use human actors to get that emotion across.” (Eaton, 2020:7) Eaton warns that even when using AI to access features that are not available but still handling content for VR headsets, it’s likely to make minor mistakes in key areas required for the headsets.

Alturki and Gay (2007), introduced obesity and explained what it is and the impact to people health to give a solution to use fitness mobile app to make better for their lifestyle. This document displays the statistics of the people and the function for the fitness app, Virtual and augmented reality; In addition, it includes the breakdown of the features and analysis of the app, VR and AR. It has sections for breakdowns, results and conclusion of the investigation

on the benefit of using both AR and VR in fitness mobile apps and the literature review of obesity that impact people's lifestyle.

One key aspect is explaining about the obesity's affection to people lifestyle which is the cause for the major health problem around the world. The result is negative which from "Around the world, 15% of the current population are obese and almost 40% of the current population are suffering from overweight. [2]. Both obesity and overweight are seen as the main reason for several dangerous chronic diseases, for example, diabetes and hypertension [3] and [4]." This document shows the impacts of people's lifestyle affected by obesity and showing the results.

Another key aspect is both VR and AR are compactable to each other which the app can work on both technologies. We can see that the two technologies "have been applied in serval mobile apps. They have been used in different fields, for example education, transportation and tourism. Moreover, both technologies can be used amongst those with declining cognitive ability such as the elderly." Alturki and Gay (2007), Alturki and Gay learnt something interesting that both VR and AR can be compactable with the app which it will be not exclusive only on any of the platform which they want to develop "a fitness mobile apps that include the use of both AR and VR technologies as a motivational tool."

5. How To Design a VR Gym

The VR Gym delivers an immersive and dynamic experience with the potential to transform users' lives. To create a structure, it is essential to show a clear breakdown of the critical requirements to ensure the design and spaces are designed for seamless functionality. Without these critical requirements, there is a significant risk of the gym not meeting user expectations; This can eventually jeopardize its success.

The location is a crucial factor as it must be accessible and immense enough to accommodate VR workouts which often require more movement than traditional gym exercises. The building's infrastructure should support high-speed internet, power supply and ventilation to ensure a seamless experience.

Technology plays a key role with VR headsets, motion tracking systems, haptic feedback and AI-powered virtual trainers that can improve engagement and personalization. The user experience is a key consideration in ensuring that workouts are both effective and enjoyable through gamification, interactive challenges and entertainment features. Personalisation through avatars and adaptive workouts keeps users motivated while controls and tutorials make the system unrestricted to beginners.

Inclusivity is essential with adaptive workout options, user-friendly interfaces and physical accessibility features which allow people of all fitness levels and abilities to take part. The gym layout must prioritise safety with clear workout zones, proper ventilation and open movement areas to prevent collisions or discomfort. Other considerations like locker rooms, charging stations and sensory-friendly adjustments further enhance the user experience.

By merging fitness with innovative VR technology, a well-designed VR Gym transforms traditional workouts into engaging, interactive and personalized experiences. With careful planning, it can revolutionise the way people exercise, making fitness more immersive, accessible and enjoyable for all.

These breakdowns will have key elements that are necessary for designing a fully functional and impactful VR Gym.

5.1. Location

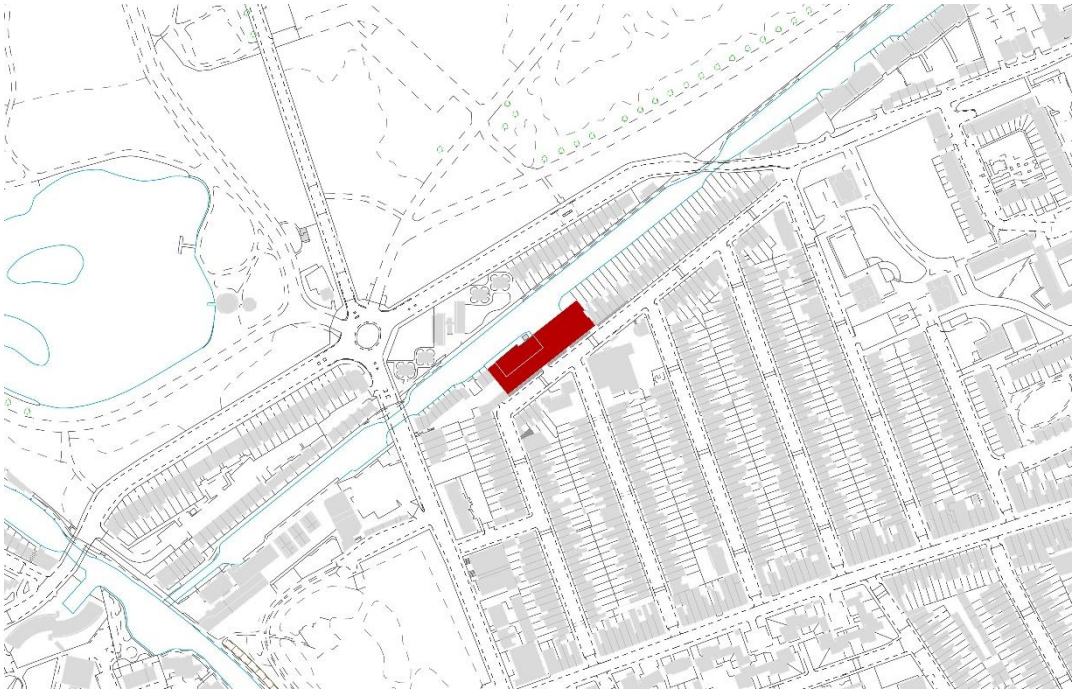

Figure 1 - Site Location Map of the VR Gym at 64 Chisenhale Road, London. The highlighted area in red shows the proposed building for the gym, situated within the Tower Hamlets district.

The VR Gym is at 64 Chisenhale Road, London, E3 5RG. This abandoned structure, shown in **Figure 1**, is in the Row district of the Tower Hamlets area in London. The surrounding area includes a primary school and an apartment complex; the streets nearby feel unusually quiet, giving the neighbourhood a deserted atmosphere.

The key reason why this building is a good decision to choose for the location is because of its historical significance. It has still been abandoned since World War II but over decades, it has been left unused and neglected; making it a perfect prospect for reviving a building that

has a massive space. Repurposing this building would not only bring life to a deserted space but also keep a piece of history while turning it into something meaningful and beneficial for the community.

Another key reason for selecting this building is its massive interior spaces. The spaces can be reimagined as a public facility, such as a VR Gym, which would provide a resourceful and attractive experience for people. Furthermore, transforming this abandoned building into a dynamic space would bring new life into the Chisenhale Road area as this can encourage a stronger sense of community and address the quiet nature of the neighbourhood which needs to respect the history of the building instead of being abandoned.

5.2. User's Experience

VR Gym delivers an immersive experience. When users put on their VR headsets, they are transported into a customizable digital world where they can be teleported to any fictional planet such as Mars, Saturn, Jupiter, Mercury, etc.

5.2.1. Comfort

One of the critical parts of the VR Gym is 'comfort'. Every traditional gym in every place can feel intimidating and discomfort specifically for beginners and specialised users who are using the facility. The VR Gym stops this tension by allowing users to exercise in their own virtual space making them feel free from restrictions embarrassment and free from unneeded judgment from people's perspectives. Whether someone chooses a solo workout or a multiplayer session with friends, the experience can be amusing and adjusted to their preferences. The addition of haptic feedback devices enhances the realistic effect which can make movements feel more natural and impactful like doing the activity for real.

5.2.2. Controls & Tutorials

Navigating a VR Gym should feel to be able to know and understand clearly as it is accessible which can ensure that both beginners and experienced users; This method can confront them with relief and a clear knowledge of what they need to do to start. Unlike traditional gyms where machines have physical handles to push, and pull and levers to adjust, the VR Gym relies on virtual controls, motion tracking, and haptic feedback to create an interactive workout experience.

To provide an accessible and smooth workout experience, the VR Gym holds a control system with complete tutorials. Since VR fitness can be unknown to inexperienced users, an onboarding process is designed to help them understand movement mechanics, interaction methods and workout techniques within the virtual environment.

Upon entering the VR Gym, users are guided through an interactive tutorial that introduces basic controls. This includes navigating the space using hand-tracking, VR controllers, or body-motion sensors. Users will learn how to select workout routines, interact with gym equipment and adjust settings for their personalized experience. In addition, the tutorial covers movement to ensure that exercises are properly tracked which will optimise posture and alignment for safe and effective workouts.

5.2.3. Avatar

Figure 2 – Representation of the 'Avatar' in the VR Headset showing user's own personalisation.

In the VR Gym, the avatar (**Figure 2**) acts as the user's digital representation as a key interface between the physical and virtual environments. Upon entering the virtual reality, users can customize their avatars by selecting their customisable characteristics, clothing and fitness attributes that align with their preferences. This step of personalization enhances user immersion and creates an adjusted workout experience.

Beyond stylish, the avatar is a critical tool for keeping motivation and monitoring fitness progression. Rather than find exercise as a tiresome task, users experience engaged through the evolution of their avatars, which adapt to their achievements such as improved posture, increased muscular strength, or the addition of virtual rewards like upgraded equipment and animations. This gamified approach encourages goal attainment.

Furthermore, the avatar enables social interactions within multiplayer virtual workout sessions. It enables users to collaborate or compete with friends and other gym participants in shared digital spaces which formulates a sense of community. Whether taking part in competitive challenges, cooperative group exercises or trainer-guided activities, the avatar ensures a heightened feeling of presence and connectivity.

By using avatars as the core part of the user's experience, the VR Gym revolutionizes the fitness experience transforming it into an innovative, interactive and personalized journey that exceeds the boundaries of traditional workout habits.

5.2.4. Haptic Feedback

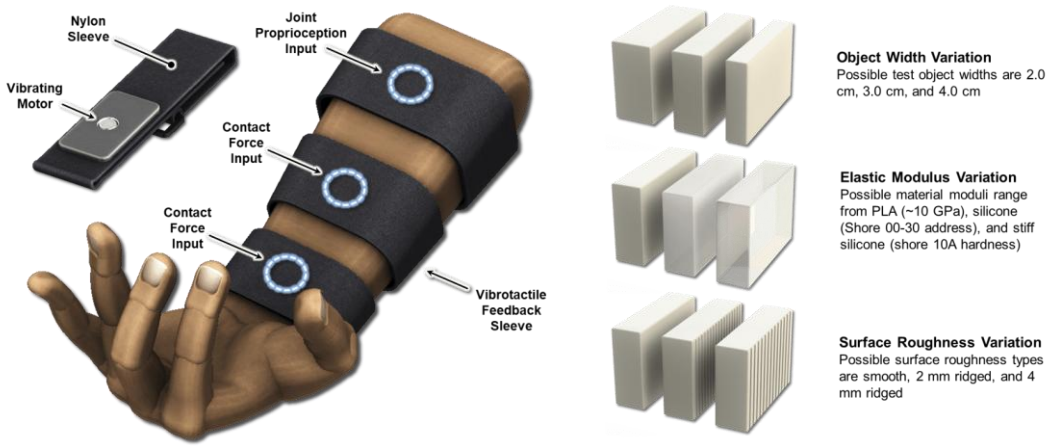

Figure 3 – Diagram of the haptic wearable devices of how it functions when doing physical activities.

Haptic feedback plays a crucial role in enhancing the realism and immersion of the VR Gym experience. Unlike traditional gyms where users depend on physical resistance and weight, the VR Gym combines haptic technology to mimic touch, pressure, and movement; this makes workouts more interactive and tempting.

When lifting virtual weights, haptic gloves or controllers provide realistic feelings, mimicking the strain and grip of real dumbbells. This tactile feedback allows users to feel the weight, ensuring that their form and technique remain exact even in a digital environment. Similarly, when performing bodyweight exercises such as push-ups or squats, small vibrations can show correct posture which guides users to keep correct alignment and avoid injuries.

Beyond strength training, haptic wearable devices enhance cardio-based activities. For example, during a virtual boxing session, users can feel the impact of punches through controlled vibrations, adding an extra layer of realism to the workout. In activities like running or cycling, haptic feedback can simulate environmental elements, such as resistance when going uphill or the sensation of wind rushing past.

The involvement of haptic feedback in the VR Gym creates a more in-depth level of attention, making workouts feel more realistic and physically stimulating. By providing sensory responses that simulate real-world interactions, haptic technology bridges the gap between digital fitness and real physical activity, making virtual workouts as effective and immersive as those in a traditional gym.

5.3. Entertainment Features

One of the key factors that make the VR Gym unique is its inclusion of entertainment features; This will ensure that workouts are still engaging, dynamic and enjoyable. Unlike traditional gyms where it has repetitive exercises can feel bland, the VR Gym enhances motivation by including interactive and immersive entertainment options.

5.3.1. Video Games

Users can transform their workout into a gamified experience. Rather than only lifting weights or running on a treadmill, they can engage in fitness-driven video games that require movement, coordination and endurance. For example, users might meet themselves dodging obstacles in a virtual obstacle course, boxing against AI opponents or even taking part in fantasy adventures where completing exercises unlocks new challenges and rewards. This element keeps workouts fresh and exciting while encouraging users to push themselves further.

5.3.2. Multiplayer – Online

The VR Gym enables a sense of community by allowing users to work out together in a shared virtual space. In online multiplayer, users can join group fitness classes, private spaces with friends, compete in virtual races, or collaborate in team-based challenges. This social part not only adds motivation but also makes workouts feel less isolating even if people feeling alone to do workouts by themselves. Users can connect with friends or meet new fitness partners from around the world or locally which can help to build a strong and supportive fitness community.

5.3.3. Streaming Apps

For users who choose a more relaxed workout experience independently, the VR Gym includes access to streaming apps where users can watch videos, listen to music or follow guided workout sessions from experienced trainers. Whether it is watching a cycling class, yoga session or playing their favourite music videos, streaming integration guarantees that users stay entertained and engaged throughout their workout.

By including entertainment features such as video games, online multiplayer and streaming apps, the VR Gym alters exercise into an enjoyable and immersive experience. This approach not only enables users to stay active but also helps them develop a long-term commitment to their fitness journey.

5.4. Accessibility

VR Gym is welcome for everyone; If is everyone it means people who are physically unable to do their physical activity from their circumstances which will be a key role for the accessibility.

Providing accessibility in a VR Gym is critical to creating an inclusive environment where individuals of all capabilities can take part and benefit from immersive fitness experiences. VR Gym must be 'well-designed' and must provide users with altering physical, sensory and cognitive needs by enforcing thoughtful design choices and adaptive technologies.

One crucial aspect is physical accessibility. The gym layout should be wheelchair-friendly with wide pathways, ramps and adjustable workout stations to accommodate users with mobility impairments. Equipment and VR interfaces should be adjustable, allowing seated and standing workout options to ensure that everyone can engage with the exercises comfortably.

Haptic feedback and adaptive controls play a key role in accessibility. Customizable controller settings, motion-tracking alternatives and tactile feedback provide users with alternative ways to interact with the VR environment. Personalized adjustments ensure that workouts are created to individual abilities, preventing frustration and promoting engagement.

By prioritizing accessibility, a VR Gym becomes an inclusive fitness space that allows people of all abilities to enjoy and receive help from innovative, immersive workouts.

5.4.1. Disabled Toilets

Diagram 18 **Unisex wheelchair-accessible toilet with corner WC**

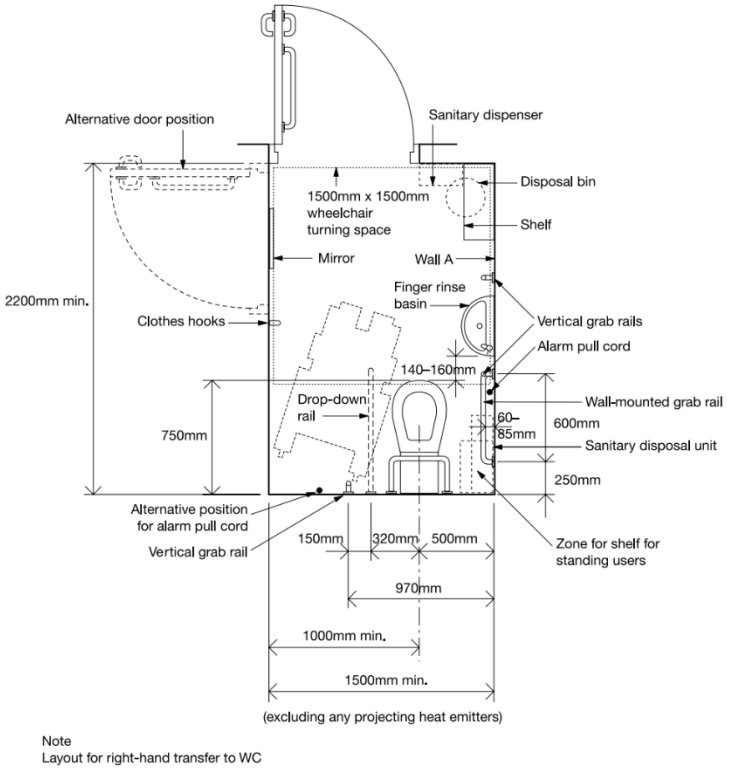

Figure 4 – Diagram of the Disabled Toilet's structure with annotations and measurement.

Making a VR Gym accessible is critical to making sure everyone, no matter their ability, can take part in the experience. A major element of that is having disabled toilets that meet the needs of users with mobility challenges. This diagram (**Figure 4**) is based on 'Building Regulation Part M.' Since the building is designed is a public space rather than a private dwelling, it fully complies with these regulations.

The wheelchair-accessible toilets with corner WCs (**Figure 4**) follow Building Regulations Part M, which requires public buildings to have appropriate facilities for disabled users. Since the VR Gym is a public space and not a private home, these toilets aren't just about obeying the rules; they're an important part of making sure the space works for everyone.

5.4.2. Elevator Access

Diagram 11 **Key dimensions associated with passenger lifts**

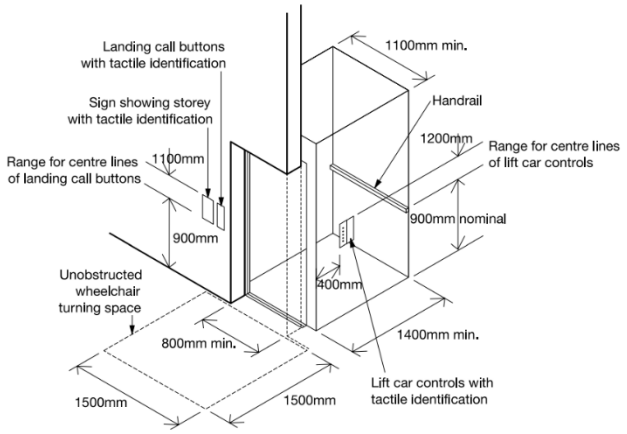

Figure 5 – Diagram of the Elevator Access with annotation and key dimensions measurement.

The inclusion of passenger lifts (**Figure 5**) is an essential part of ensuring accessibility throughout the VR Gym, especially in a massive building. Elevators are not only important for users who are handicapped but also benefit users recovering from injuries, elderly users and users carrying their gym equipment.

Given that VR-based fitness activities encourage full-body movement, users may experience temporary exhaustion or disorientation after an extreme session. Elevators provide an alternative to stairs which allows users to transition between floors without additional physical pressure. This is crucial in a fitness environments where maintaining user comfort is critical.

From a design perspective, providing the placement of elevators enhances the flow of movement within the facility. Elevators should be positioned in a busy areas such as near entrance areas, main workout spaces and accessibility paths. This placement improves wayfinding and circulation, preventing blockages and assuring that all users can navigate the facility effortlessly.

5.5 Design Considerations

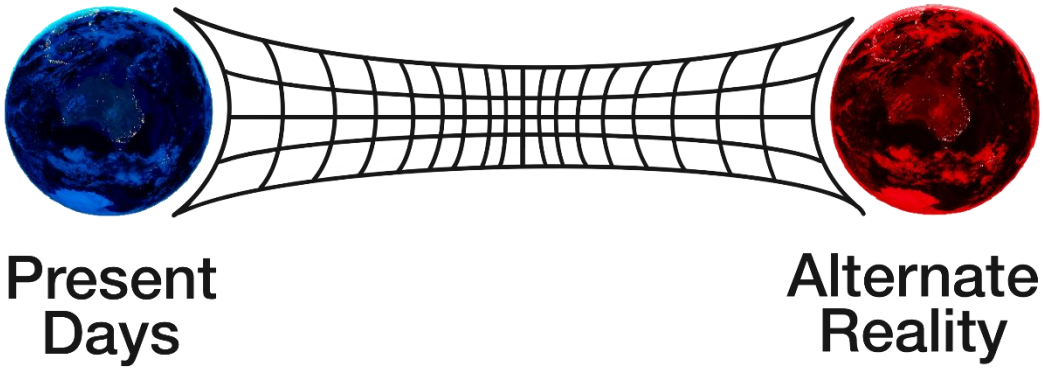

Figure 6 - Illustration of the Parallel Universe Concept: Being the coexistence of two realities—'Present Days' and 'Alternate Reality'—happening simultaneously but never intersecting.

The design will be based on the concept of 'Parallel Universe'. Namely,' Two worlds do not meet but happen as a same time but in different realities. The 'Parallel Universe' concept implies that two separate realities exist simultaneously which both realities are parallel to each other but never cross into each other.

Key reason why using this concept for designing a VR gym because it enhances the fitness experience, making workouts more immersive and engaging. Unlike traditional gyms, this approach motivates users by transforming exercise into an interactive and enjoyable activity. By using the idea of the Parallel Universe concept, the design supports the existence in both physical and virtual worlds which allows users to push their limits in an environment that feels exciting, engaged and fascinating. Furthermore, it focuses the attention on the growth of fitness spaces, showing how an evolved technology in the present day can create a new dimension of exercise where traditional gym routines are transformed into an immersive, customised experiences.

Based on the concept, it needs to have two spaces that are created and does not meet or touch each other being these parallel universes. If a user wants to change space, instead of passing from the same point back and send they will pass from a central hub, that works as a point of transition between the parallel universes. The hub is akin to a train station, where people gather to travel and at the same time it allows for the management of the flow of people and allow people to meet.

Figure 7 - Two opened paths acts as a portal to travel to two different reality worlds

For the hub to have the transportation to go to a long place, it needs to have the inspiration like to teleport instantly or like hyperjump like from the movie of 'STAR WARS' or other sci-fi movies. The design of the portal from **Figure 7** is great idea as to design a frame of the portal to the door that led to one of the two spaces from one world respectfully. This can be for bespoke design elements and design concept representation.

For the ideas to go to places, What if thinking to go to the places like Mars, Saturn, Venus, and any other planets; reason for this is because users well recognised other places that are popular around the globe like Tokyo, Paris, London and other famous places which users will be too familiar of it which can have expectation easily.

5.5.1. Layout

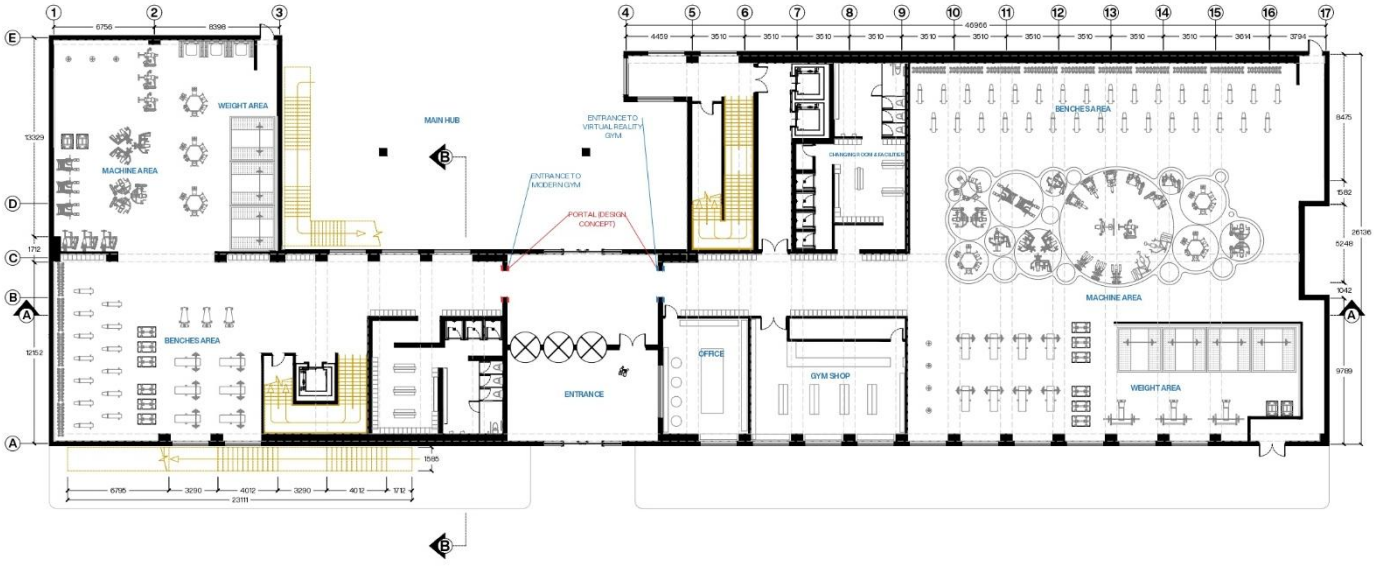

Figure 8 - Ground Floor Layout of the VR Gym at 64 Chisenhale Road, London. The plan illustrates key areas, including entrance zones, workout sections, machine areas, weightlifting spaces, and the VR fitness hub.

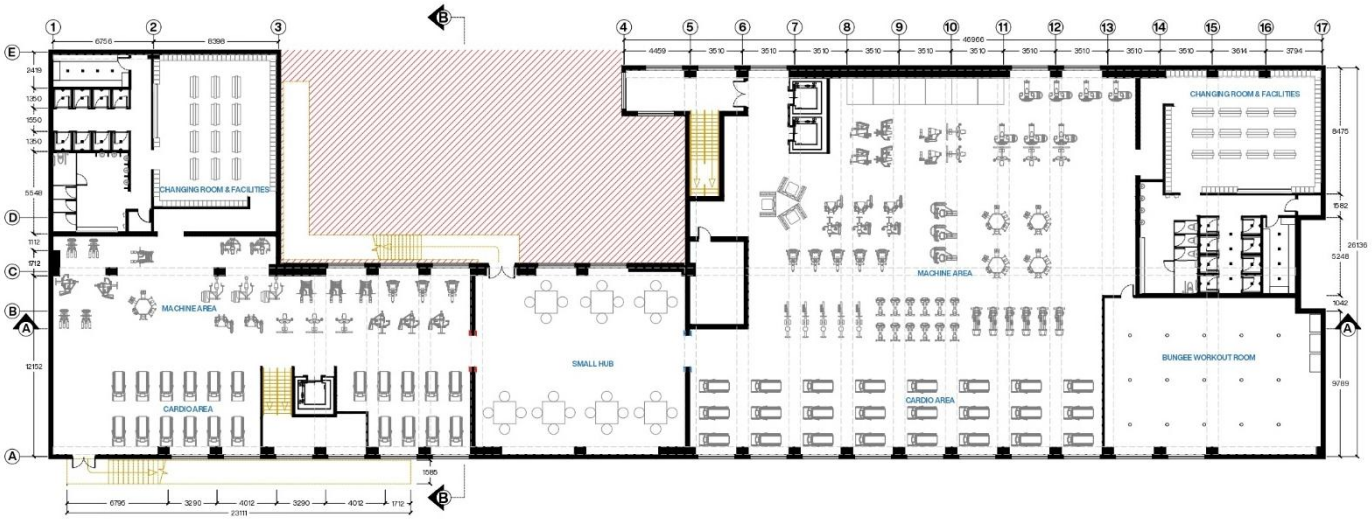

Figure 9 - First Floor Layout of the VR Gym at 64 Chisenhale Road, London. This plan highlights other workout zones, specialized fitness areas, and VR-integrated spaces, further enhancing the immersive fitness experience.

The layout of the VR gym in **Figure 8** and **Figure 9** is a critical factor in ensuring smooth user movement, accessibility, and an immersive experience. The spatial design must combine both elements and requirements to optimise user engagement and comfort.

The gym layout has two main areas: a Modern Gym and a Virtual Area that represents the concept of a 'Parallel Universe'. Each area is divided into distinct zones which include: Benches, Weights, Cardio and Machine areas. Each zone is designed to enhance flow movement throughout the facility which allows users to navigate between environments..

One of the most critical factors of the layout is balancing the spatial needs of VR and traditional workouts. Unlike conventional gyms, a VR fitness environment requires more considerations for safe movement within virtual sessions. As illustrated in the floor plan, key elements such as open movement areas, structured equipment zones, and designated pathways are combined to ensure VR experiences is smooth without collisions or interference.

In addition, The layout needs to consider having fire escape strategy to evacuate users to safety without any compromise when unexpected incident occurs. This will link to design pathways and fire exit included in the layout plan which users will have many options to escape the building if fire occurs. This links to **Building Regulation Part B** as it is the law to comply the requirement to design the layout for the VR Gym.

The ‘circular bubble’ in **Figure 8** located at the east is a platform for users which it is a concept where people standing on the radius of the circle represents the planet based on the design concept. Users will remain stationary while working out acting it is their own respective zone on their own world.

5.5.2. Appearance

The appearance should have the innovation and immersion that represent its meaning. The VR Gym have two area that represent the their own universe based on the design concept of ‘Parallel Universe’. With two areas that are divided, it can change the theme, aesthetics, and immersion of the design appearance which both areas would have different design respectfully.

The modern gym will have an aesthetic appearance, relaxed and nostalgic-like area that focuses on the present days for users who prefer traditional gym instead rather than relying on technology. An essential design choice for the VR Gym is the division of the gym into two distinct areas: one that embraces futuristic VR technology and another that presents a traditional gym aesthetic. This method ensures that the gym entreats users who would use both technologies as fans and those who choose a traditional fitness environment.

The appearance will have the futuristic theme for the Virtual Reality area (found on the right space area) to show the evolution of the future technology by using VR headset for gym. The VR area should feature a sleek, modern materials, interactive walls and LED lighting that enhances the digital experience to users.

On the other hand, the traditional gym area offers a relaxed and familiar aesthetic. This can have natural materials, warm lighting and soft colour tones that entreat users who are not feeling comfortable with the virtual workout environment.

5.5.2.1. Materials

The choice of materials in a VR Gym is critical for making a functional and different environment that balances both the modern gym area and the virtual reality area.

For the walls, the acoustic panels will be installed to minimise noise to avoid complaint from neighbourhoods; this ensures a distraction-free workout experience. These panels will help take sound and prevent echo across the interior as this makes the space more comfortable for users engaging in VR workouts or standard exercises.

The flooring will depend on the gym area. Rubber flooring will be used in high-impact zones to provide cushioning, improve grip and enhance safety. Epoxy resin flooring will be installed in VR areas for a sleek, futuristic aesthetic that completes the digital experience. This material is durable, easy to clean and invulnerable to wear and tear.

The ceiling design will include grid panels and wood slats; this will enhance both functions and appearances. Wood slat ceilings will add warmth and a 'modern glimmer' to the

traditional gym space. However, grid panel ceilings will allow for integration of lighting, ventilation and soundproofing parts in the VR zone.

Concrete elements will be used to maintain a minimalist and industrial aesthetic as it will reinforcing the gym's durability and strength. By carefully selecting materials for different zones, the VR Gym will achieve a well-balanced design that enhances user experience, comfort, and overall atmosphere.

5.5.2.2. Colour palette

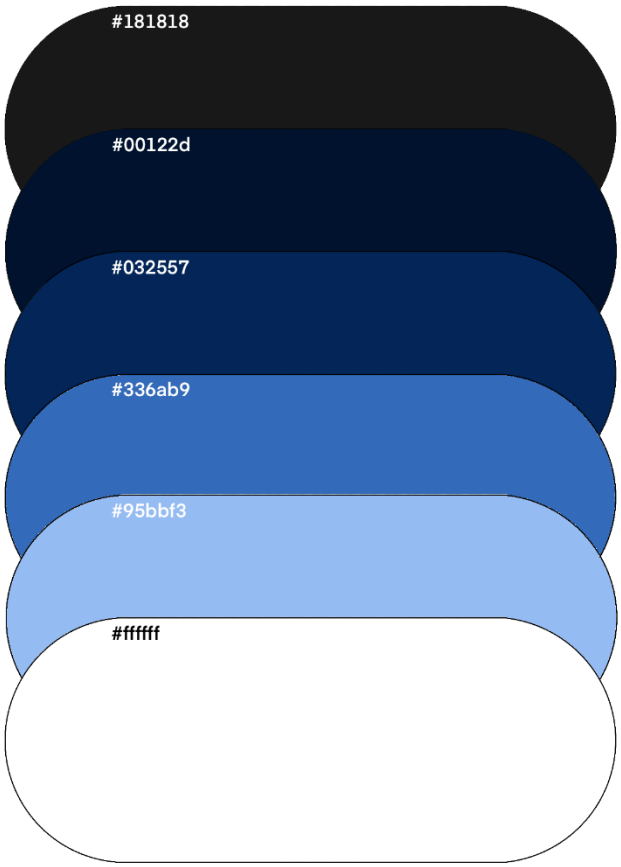

Figure 10 - Colour palette for the VR Gym, creating the balance between futuristic and traditional aesthetics.

The colour will have major affect when it comes to the appearance of the building; The colour represent what does it tell of where it origins comes from. Based on the Design concept, The colours from **Figure 10**, will have a futuristic theme and Modern mixture which the appearances need colours to represent it. This balance with the Concept and using VR and Modern theme to represent technologies and the present.

The colour palette in **Figure 10**, plays a critical part in shaping the surroundings and user experience for the appearance of the interior. Unlike gyms that have originality where colours are neutral or bold to make an energetic environment, VR Gym needs a more strategic selection to support both immersion and functionality. Darker shades such as deep

blue and black enhance the futuristic aesthetic which creates a feel of technical advancement while letting VR projections stand out clearly. However, depending on dark colours can make the space feel enclosed so including lighter tones such as soft blues and greys is critical to keep balance.

5.5.2.3. Furniture

Furniture is an important part of creating the user experience for designing the interior of the building. It is not only about aesthetics but also includes functionality, comfort and accessibility; This ensures that users can move within the space without any obstruction in the way. The position of furniture must be considered to maintain user flow movement; This can allow users to transition smoothly between different zones of the gym without interference.

Comfort is a key factor when choosing furniture for the VR Gym. As users need to take breaks between workouts, a fixed seating area should be provided which can offer chairs or benches that help relaxation and recovery. These areas must be positioned to avoid disrupting functional workout zones while always being accessible.

5.5.2.4. Lighting

The key factor for the appearance is how the lighting interact the interior of the building and other surrounding that can affect the view. Lighting is an important function in creating the atmosphere and functionality of the interior appearance. It must balance aesthetics, visibility and user comfort to create an immersive and sensible environment. For the VR Gym, choosing types of lighting can enhance the gym's futuristic theme while assuring a smooth transition between VR and physical workout areas.

'Warm white' lighting will be used in general workout areas to give a comfortable and attractive environment; This can prevent harsh glimmer and reduce eye strain. The virtual area will feature LED strip lights in blue or white; This can reinforce the futuristic aesthetic and improve user immersion in the digital experience.

5.5.3. Technical plants

Gym can be tiring after workout that drains user’s energy which ventilation will have a key role for design a VR Gym. Ventilation plays a crucial role in the design of a VR Gym, ensuring a comfortable and breathable environment for users. Since workouts, both traditional and VR can be demanding.

The ventilation system will be installed into the ceiling to maintain an open and immense design while optimising airflow distribution throughout the gym. This placement allows for circulation and prevents hot spots which it will maintain a consistent temperature.

6. Conclusion

The research into designing a VR Gym highlights the importance of combining both physical and virtual elements to create an interesting and accessible fitness area. One of the key findings is that modern gym users struggle with motivation and accessibility which can be addressed through immersive VR technology and considerate spatial design.

Accessibility remains an essential part as it can ensure that users of all abilities can navigate the space comfortably. Features such as disabled toilets, elevators and planned user flow give to an inclusive environment.

The choice of materials including rubber, epoxy resin flooring, acoustic panels and wood slat ceilings brings comfort while in addition, handling sound levels for an optimal experience.

Lighting plays an important part in defining different zones within the VR Gym. The 'warm white' lighting gives a welcoming atmosphere while LED strip lights in blue (or white) help make an exclusive virtual area.

Another key factor is the furniture selection; It is designed to help user flow, movement and comfort. With adjustable and ergonomic furniture, it can ensure that users can transition between physical and virtual workouts without any obstruction.

For the technical plants like ventilation, gives a part in keeping air quality and energy levels. It needs to be positioned on the ceiling so that the ventilation systems stop fatigue and give to an enjoyable workout environment.

This research indicates that designing a VR Gym needs a balance of technical creation, accessibility and user-centred design. By combining these elements, the VR Gym can show a futuristic and functional space that makes fitness experiences great and relates to current placemaking principles.

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