
*Online Portal Pursuing Purposeful Play (O4P)*

Project Documentation Submitted to the Faculty of the

School of Computing and Information Technologies

Asia Pacific College

In Partial Fulfillment of the Requirements for

Introduction to Systems and Design for CS/IT

M/S NTSDEV

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2024

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## Executive Summary

The proposed project innovative web portal, designed to streamline the process for both therapists and patients. The web portal will automate many manual tasks currently performed by therapists, freeing them to focus on patient interaction and treatment delivery. Features will include secure patient record management, appointment scheduling, progress tracking, and web augmented reality games.

The expected benefits of the web portal are significant. Therapists will experience increased efficiency, improved data-driven decision making, and the ability to conduct online therapy sessions through the Web-based Augmented Reality (WAR) games. Patients will benefit from a more streamlined experience, easier access to their treatment plans, and the ability to participate in therapeutic activities from the comfort of their homes.

The project is feasible from an operational, economic, technical, and schedule perspective. From an operational standpoint, the project is supported by clinic management and has the potential to improve efficiency through automated scheduling and record-keeping, as well as improve accessibility for patients who have difficulty traveling to in-person appointments. Economically, the project is expected to generate a positive return on investment through increased patient volume and potential cost savings. Technically, the project is feasible due to the availability of standard development tools, cloud-based infrastructure, and secure database management systems. Finally, the project can be implemented within a reasonable timeframe of 6-12 months through careful planning and project management.

Implementing this innovative web portal Therapro Therapy Clinic aims to improve their process efficiency and enhance patient and therapist experience.

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# I. Introduction

## 1.1 Project Context

Therapro Therapy Clinic is a family-owned clinic owned by Ms. Zoraide De Jesus Francisco. Established in 1999, the clinic specializes in occupational therapy for children with physical, sensory, or cognitive challenges. Ms. Zoraida's approach utilizes fun activities and play to develop essential skills and target the specific needs of her patients.

Therapro Therapy Clinic employs a manual and very hands-on, paper-based system for its processes. As illustrated in Fig. 1 this depicts the flow of the current system's processes.

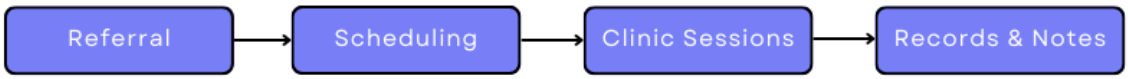


Fig. 1. Flowchart of current system.

1. **Patient Referral.** The process begins with a patient referral, typically from a pediatrician.
2. **Scheduling.** Patients contact the clinic via phone call or message to schedule appointments. This method can be time-consuming for both the clinic staff and the patients themselves. An online scheduling system is not currently available.
3. **Clinic Sessions.** Therapy sessions are conducted in person at the physical location of the clinic.
4. **Records & Notes.** maintain paper-based records documenting patient progress and treatment notes. This system makes it challenging to track progress longitudinally and share information effectively with patients and guardians.

Therapro's current system has several limitations, hindering the efficiency and potential growth of the business. The manual scheduling process can be time-consuming and is prone to errors. Communication to find the right data for an appointment can lead to delays and frustrations on both ends.

Additionally, the clinic's current system lacks the flexibility to offer online services. Nowadays telehealth and remote services are becoming increasingly popular, this inflexibility can hinder business growth. By not having an online platform, Therapro Therapy Clinic is missing out on the opportunity to reach patients who may not be able to attend face to face sessions due to geographical limitations. Furthermore, the lack of online presence can make it difficult for new patients to discover Therapro's services. This limitation hinders the clinic's ability to reach a wider range of potential patients.

Lastly, having a paper-based system to hold records prove to be inefficient to manage. These records are also susceptible to damage or loss. Additionally, sharing information and tracking the child's progress overtime would be difficult due to the physical nature of records.

This web-based portal project aims to address the limitations of the current system and enhance Therapro Therapy Clinic's overall operations. The primary goal is to improve efficiency,

increase patient volume, and provide a flexible enhanced therapy experience. This aligns with Ms. Francisco's vision of expanding her reach and positively impacting the lives of children to create a more accessible and engaging therapeutic environment.

The proposed web portal system would directly contribute to Therapro's business strategy in more ways than one:

- **Increased Efficiency.** The automation of appointment scheduling and recording-keeping through the web portal, with this, Ms. Francisco will be able to dedicate more time to her patients.
- **Improved Patient Access.** The website will also serve as an online presence for the clinic, increasing its visibility and allowing potential patients to discover its services conveniently.
- **Enhanced Therapy Experience.** The portal will introduce various gamified activities catering to specific skills that patients may need improvement on. It will also contain progress tracking features, ensuring an engaging and motivating therapeutic experience for children. These, however, will not serve as a diagnostic tool, since patients come to the clinic after already contacting a medical professional.

By achieving these goals, the project will directly contribute to Therapro Therapy Clinic's long-term growth and expansion of reach of providing occupational therapy services to a wider range of clients outside of the general area of Imus, Cavite.

## 1.2 Statement of the Problem

Therapro Therapy Clinic is facing issues that hinder the clinic's visibility, flexibility, and efficiency. As such, the proposed product aims to address such challenges to improve the current state of the clinic. Specifically, these problems are:

1. **Limited to onsite sessions.** Having only in-person sessions creates a barrier for patients that are facing issues with travelling. This may pose as a threat in reaching new patients and may cause constant rescheduling of regular patients.
2. **Inefficient scheduling system.** This issue may lead to appointment delays and negative patient satisfaction. The clinic's phone-based scheduling system can be laborious for the staff and lacks the option of online scheduling.
3. **Hard to manage records.** Having smooth clinic operations requires its database to be fast and easy to access. The clinic may be used to managing their patients with their long running paper-based records but maintaining it has proven to be a challenge because of the resources required in operating it. Ignoring this will certainly impact clinic operations in the future as it grows.
4. **Lack of online presence.** This problem impacts the clinic's reach in new patients. In addition, the clinic's dependance on referrals of pediatricians may cause inefficiency to accumulate more patients for the clinic due to sole reliance of how often the pediatricians refer their patients to Therapro Therapy Clinic.

## 1.3 Objectives

This project aims to develop a comprehensive a web-based portal and system for Therapro Therapy Clinic. The portal will address the limitations of the current manual system by streamlining appointment scheduling, offering secure patient portals for record access, and providing educational resources for their patients. Additionally, the portal will integrate Augmented Reality (AR) technology into therapy sessions, allowing the therapist to utilize engaging and immersive exercises for improved patient experience and motivation.

To achieve these goals, the project outlines the following specific objectives:

- **Decrease the amount of time it takes to complete the scheduling process by at least 40%.** The project will implement an online appointment scheduling system to reduce reliance on phone calls and streamline appointment booking. An automated appointment confirmation and reminder feature within the system will be utilized to minimize scheduling conflicts and missed appointments. With these augmented processes, Therapro's customers will be able to schedule their appointments faster. This will also result in the staff being able to focus on other processes in the clinic.
- **Enhance patient experience with therapy sessions through the implementation of AR technology**. This entails designing and integrating appropriate gamified activities within the system that target specific therapeutic goals as determined by the occupational therapist. A reward system within the gamified activities aims to motivate continued engagement and adherence to therapeutic activities. Additionally, these gamified activities will serve as tools to increase patient engagement that will be beneficial for the observations to accurately assess the patients. To measure the effectiveness, gathering feedback through regular surveys that address various aspects of the experience will be crucial in gaining the right information.
- **Increase the volume of patients after deploying the proposed system for a year by 20%.** This will be achieved through the development of a user-friendly and informative website for the clinic to increase online visibility and searchability. Additionally, a more efficient streamline of the business process subsequently increases the number of patients the clinic can handle. To measure this goal, data of the number of patients before the implementation of the proposed system will be compared to after the implementation.

This objective directly addresses the limitations of the clinic's current manual system by improving efficiency, increasing patient engagement, and facilitating online appointment scheduling and information access. It aligns with Ms. Francisco's vision of expanding her reach and creating a more accessible and engaging therapy experience.

## 1.4 Significance of the Project

If the proposal is approved, the client will have more opportunities to assist people that requires the services that she provides. Due to this wider scope of potential patients, the client's revenue may also increase significantly. Utilizing the technologies involved in the project, such as AR, will help the business to evolve and be ready for the near future. Aside from the benefits

already mentioned, the professionals in the clinic will also have their workload lessened. The automation of patient scheduling and reminders will be an impactful event as the client stated their current struggles regarding the matter.

The proposed project aligns with the third Sustainable Development Goal (SDG): “Ensure healthy lives and promote well-being for all at all ages”. If implemented, people outside the clinic’s geographical location can benefit from its services, creating more accessible health services. Therapro clinic may have niche patients when compared to other medical facilities such as hospitals or dental clinics, but the importance of healthcare access is crucial to all. The proposed project also aims to educate people about occupational therapy, specifically about its difference to physical therapy. Spreading useful information and awareness to the community also aligns with the mentioned SDG goal. The following groups of people will benefit from the project if implemented:

- **Patients.** Aside from the standard face to face therapy sessions, patients can also experience the immersive environment that AR brings.
- **Parents and Guardians.** Since the business’ primary patients are children, having a portal that presents their progress in an organized manner will greatly benefit their parents or guardians. Having digitalized records also improves ease of access when compared to physical files.
- **Therapists.** Having more selections of activities to assign allows the therapist to accurately target specific skills that she thinks a patient needs improvement on. The automation of processes will also improve efficiency and allows the therapist to focus more on other important tasks.
- **Researchers.** Future researchers may also benefit in the result of this project as it contributes to the larger body of knowledge. Topics such as the involvement of AR in gamified activities and occupational therapy can be improved with the approval of the project with proper data gathering techniques.

## 1.5 Scope and Limitations

The project aims to develop a web portal to streamline Therapro Therapy Clinic’s operations and enhance the patient experience. This system will address the limitations of the clinic’s current manual processes and create a more engaging experience for both therapist and patients.

The web portal will serve as a hub for the system and the online AR games. Patients and guardians can schedule appointments directly through the web portal. This online system will save valuable time for Ms. Fransico and the patients. This will also serve as a secure platform to access and manage patient information. This eliminates the need for paper records, improving efficiency and data security.

This portal will also hold the gamified activities designed to complement clinic therapy sessions. These games will target specific therapeutic goals determined by the occupational therapist, making therapy more fun and engaging for children. A built-in progress tracking system will allow patients and guardians to visualize the patients’ development over time. This

provides instant gratification and a sense of accomplishment that will further motivate patients to adhere to therapeutic activities.

The tools and technologies that will be used in project development would include the following:

- **Design and development.** Figma will be crucial in brainstorming, prototype creation, and ensuring a user-friendly design for the web portal. Development will utilize tools like VScode as the primary coding environment that will utilize different programming languages that will be used for this project.
- **Secure infrastructure.** The system will be hosted on Amazon Web Services (AWS) Lightsail. This cloud-based platform ensures the safety of patient information within the web portal. Additionally, a secure database, such as MongoDB or Apache MySQL, will be implemented to manage patient data effectively.
- **Seamless integration.** Application Programming Interfaces (APIs) will be utilized to integrate appointment scheduling functionalities within the web portal. This allows for a smooth and efficient scheduling process.

Since the project would only be focusing on occupational therapy and will be specifically designed for Therapro Therapy Clinic's services. The gamified activities and functionalities within the portal will cater to the unique needs of children receiving occupational therapy.

Core features of the portal like the gamified activities, the appointment scheduling, and others will require an internet connection. So, this system will need a stable connection for the users to access and utilize it. This project would also not include features like video conferencing. The focus remains on enhancing the therapeutic experience and providing supplementary tools for therapists and patients.

The initial phase of the system will not integrate a contactless payment system; however, future iterations may explore this possibility.

With this set of deliverables and tools, Therapro Therapy Clinic will be well-equipped to streamline operations, improve patient engagement, and expand its reach within the community. The project prioritizes security and scalability to ensure long-term growth and success for the clinic.

# II. Review of Related Literature / Systems

This section provides an overview of the potential integration of Augmented Reality (AR) into a web-based portal system for Therapro Therapy Clinic. It highlights AR's capabilities in creating engaging, interactive therapeutic environments that can improve cognitive and motor functions in children with conditions like cerebral palsy (CP) and autism spectrum disorder (ASD). The review emphasizes the importance of motivation in therapy, the benefits of AR-enhanced activities, and the need for further research to solidify AR's therapeutic efficacy. The proposed AR integration aims to enhance therapy outcomes and expand accessibility for children beyond Therapro's immediate geographic area.

**Efficiency Drives Innovation**

The success of any business initiative, including the implementation of innovative technologies like AR, ultimately hinges on its financial sustainability. Before exploring the potential integration of Augmented Reality (AR) into Therapro Therapy Clinic's web-based portal system, looking into how efficient business processes can contribute to a company's financial health is paramount.

This focus on financial health necessitates a closer look at Business Process Management (BPM). BPM is not a one-time fix, but rather an ongoing cycle of analyzing and improving a company's operations [1]. Dedicated teams constantly evaluate and refine processes through Business Process Improvement (BPI) and Business Process Reengineering (BPR). This continuous optimization is key to unlocking revenue growth. By streamlining processes, companies can free up valuable resources like staff time, materials, and equipment. These resources can then be redirected towards revenue-generating activities such as sales, marketing, and product development [1]. Additionally, efficient processes lead to faster turnaround times, fewer errors, and an improved overall customer experience – all factors that contribute to financial stability.

Financial optimization isn't just about cost reduction, as evidenced by research on Malaysian companies [2]. This study on profitability in Malaysian companies has identified various influencing factors that impact profitability. One of these factors is company efficiency. Their study [2] distinguishes itself from prior studies in two ways. First, it incorporates a novel independent variable - assets turnover ratio (ASTORIO) - as a measure of company efficiency. Second, it examines the relationship between ASTORIO and two profitability metrics: return on equity (ROE) and earnings per share (EPS). This focus on efficiency offers a more intricate view. While the study [2] finds a positive and significant correlation between ASTORIO and ROE (suggesting efficient companies have higher ROE), the link with EPS is absent. This implies that efficiency, as measured by ASTORIO, might primarily benefit profitability through improved overall company performance (ROE) rather than directly impacting per-share earnings.

In Therapro's case, implementing BPM can ensure the efficient use of resources and achieve financial stability. This strong foundation will allow the clinic to explore innovative solutions like AR therapy with greater confidence. By optimizing processes, Therapro can deliver exceptional care to its patients while maintaining a sustainable business model that supports the integration of cutting-edge technologies.

## Introduction to Augmented Reality

Augmented Reality (AR) is an interactive technology that enhances real-world environments with digital visual elements, sounds, and sensory stimuli. It integrates digital and physical worlds, facilitates real-time interactions, and accurately identifies objects in 3D. Compared to Virtual Reality (VR), which creates immersive environments that isolate users from reality, AR overlays digital elements onto the real world. Mixed Reality (MR) combines AR and VR elements, allowing digital and real-world objects to interact. Extended Reality (XR) encompasses AR, VR, and MR technologies. Businesses leverage AR through marker-based and marker-less technologies to improve processes and remote collaboration [3].

## Augmented Reality in Therapeutic Setting

Studies investigating the impact of video games on cognitive function in children reveal promising applications in therapeutic setting [4]. These studies suggest that video games can improve attention, memory, problem-solving skills, and decision-making abilities. Notably, the research [4] highlights the potential for video games to be particularly beneficial during lockdowns or situations limiting physical interaction. This aligns with the goals of this project, where a mobile application incorporating gamified activities could provide an engaging and effective therapeutic tool for children receiving occupational therapy.

The emergence of AR technology presents many possibilities for occupational therapy. Systems like WonderTree demonstrate the effectiveness of AR games in promoting specific therapeutic goals [5]. AR allows for interactive and immersive experiences that can be customized to the individual needs of children, potentially enhancing motivation and engagement during therapy sessions. Integrating AR elements within the web-based portal for Therapro could be a valuable addition, offering new and flexible services that would cater to young patients outside of the geographical location of Imus, Cavite.

## Effectiveness of Utilizing AR on Children with Cerebral Palsy

The use of virtual and augmented reality for therapeutic purposes is not a new topic to discuss as there are already existing systems that use this technology for games. Some examples include the Xbox Kinect and the Nintendo Wii, which are entertainment systems that can be used at home. This technology provides an immersive environment in real-time which can be a tool for both education and entertainment. Conventional occupational therapy is a type of rehabilitation that focuses on meaningful activities that patients can undergo. These activities involve actions that they do in their daily lives, which train specific motor skills. Utilizing the flexibility of augmented reality and combining it to the concise skill-targeting of occupational therapy results in a form of therapy with high engagement and entertainment value for the patient.

The study “Effects of Virtual and Augmented Reality on Occupational Performance in Children with Cerebral Palsy: A Systematic Review” tackles the effects of augmented reality on children with cerebral palsy (CP) in different aspects [6]. This condition is stated to be the most common motor disability, which affects two to three children in every one thousand child births. The researchers involved were occupational therapy students (OTS) that conducted a Rapid Systematic Review (RSR) on a net amount of twenty studies, which were filtered through numerous criteria.

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To measure this technology’s effect on children’s occupational performance, the researchers organized three themes based on intervention topics. These were “Motor Rehabilitation” which addresses the physical symptoms of CP, “Cognitive Rehabilitation” which discusses about cognitive and executive function deficits, and “Activities of Daily Living (ADL) Skills”, which encompasses children’s daily activities [6]. These activities range from simple movement of upper extremities, balance skills, and cognitive activities to train the brain.

The paper [6] concluded that moderate evidence supporting the use of augmented reality (AR) in therapy does improve the occupational performance of children in all themes exist. Even though this is the case, the study stated that more research is required to solely measure the effectiveness of AR and not be diluted by the motivational aspects that it brings. The studies included in the RSR were also limited. Originally, the researchers planned to only include Level I and II evidence to maximize credibility but opted to include Level III as well to have enough content.

Even though the paper’s content was directed towards children with CP, it is still relevant knowledge as the researchers’ client deals with children with similar conditions. Knowing that evidence exists supporting the benefits of virtual and augmented reality in this medical field strengthens the project's purpose. If implemented, it can also contribute to the larger body of knowledge as useful data concerning occupational performance can be obtained in the proposed system.

**Play and Occupational Therapy Interventions for Children with Autism Spectrum Disorder**

While play therapy has shown promise in promoting social and emotional development in children with autism spectrum disorder (ASD), the lack of standardized protocols and empirical evidence in some modalities raise concerns about their reliability and effectiveness. Innovative interventions, including equine-partnered play therapy, art therapy, and teleplay therapy, offer alternative approaches to traditional therapy methods [4]. However, the accessibility and feasibility of these interventions for all children with ASD, particularly from low-income communities, remain unclear. Additionally, the lack of standardized protocols and rigorous practical research in these modalities limit the ability to draw definitive conclusions about their therapeutic value.

Moreover, the exclusive focus on ASD in the article may overlook the needs of children with other mental disabilities who could benefit from similar therapeutic interventions. For instance, Therapro Therapy Clinic provides services for a diverse range of mental disabilities in children, yet the article predominantly emphasizes interventions tailored specifically for ASD. This narrow focus may limit the generalizability of findings and overlook potential therapeutic strategies that could benefit a broader population of these children.

There are several issues that need to be resolved even if research on play and occupational therapy interventions for kids with ASD offers encouraging options for therapeutic support. These include the need for standardized protocols and the exclusion of children with other mental disabilities from the research focus. By addressing these limitations and adopting a more inclusive and evidence-based approach, the project can better assist the therapist with the diverse needs of children with ASD and other mental disabilities, eventually enhancing their overall well-being and functional abilities.

**Motivation in the Context of Learning through AR Games**

Increasing a child's motivation to learn is crucial for successful occupational therapy. Motivation acts as the fuel that drives a child's willingness to participate, persevere, and put effort into therapy activities [7]. Related studies have shown that effective learning strategies can significantly boost motivation. According to this research [8], motivation is “a source of energy that is responsible for why learners decide to make an effort, how long they are willing to sustain an activity, how hard they are going to pursue it, and how connected they feel to the activity”. Intrinsic motivation theory sheds light on how motivation functions in learning environments [7]. This theory identifies key factors that influence intrinsic motivation, such as challenge, curiosity, control, and fantasy. Furthermore, maintaining motivation requires willpower and a positive attitude. Intrinsically motivated children participate in therapy activities not for external rewards, but rather for the inherent enjoyment, challenge, and unique experiences these activities offer [7].

This is where AR technology comes in. According to Khan, studies have consistently shown positive impacts of AR on student motivation. Specifically, research suggests that AR can significantly increase motivation in science learning [7]. This boost in motivation can be attributed to, as stated previously, the elements of curiosity, fantasy, and control that AR technology can introduce into the learning experience. After all, an attractive or stimulating medium like AR can directly influence a child's motivation to engage with the material.

**Advantages and Disadvantages of Using AR in Education**

AR technology presents exciting possibilities for occupational therapy with children. AR can create hybrid environments that blend real-world objects with virtual elements [9]. This allows therapists to introduce virtual objects or scenarios that wouldn't be possible in a traditional setting, potentially aiding in practicing social skills or visualizing abstract concepts relevant to therapy goals like practicing English pronunciation in a virtual setting [8]. The interactive and immersive nature of AR can also hold children's attention and make therapy sessions more engaging, leading to increased motivation and improved outcomes, as highlighted by Gopalan et al. [10] and Khan et al [11]. Furthermore, AR experiences that require manipulating virtual objects or observing complex phenomena can encourage critical thinking and problem-solving skills [11], both crucial for child development.

However, implementing AR in occupational therapy also presents challenges. Some children may find the technology difficult to use, especially if the interface is not user-friendly or technical problems arise [9]. Additionally, the combination of real and virtual elements could lead to cognitive overload, making it difficult for children to distinguish between real and virtual information [11]. The developers need to be mindful of this and carefully design AR experiences to avoid overwhelming children. Existing AR applications may also limit control and adaptability, as they might not offer enough flexibility to customize content to individual needs [11]. Finally,

AR technology can be unstable, and poorly designed interfaces or lack of clear instructions might further complicate its use. Additionally, children may need time to become comfortable with using AR technology [10].

**Utilizing Smartglasses as a Medium for AR**

Numerous proposed systems exist regarding the use of augmented reality in different forms of therapy. Some are also designed for people with specific conditions such as stroke, anxiety, phobia, and autism. It creates an immersive environment that can be a medium for therapeutic activities. Although further research can still be done regarding the effectiveness of augmented reality (AR) in occupational therapy specifically, it has the potential to make healthcare more accessible and learn more about its influence on occupational performance.

The proposed system titled “Feasibility of an Autism-Focused Augmented Reality Smartglasses System for Social Communication and Behavioral Coaching” involves the use of smart glasses with augmented reality capabilities and games utilizing the stated technology with the use of their Brain Power System (BPS) [12]. It creates a high engagement environment, in which the patient can work on skills that they need improvement on. Specifically using smartglasses includes advantages when compared to using smartphones. Liu et al. [12] stated that when using smartglasses, the user is heads-up and hands free, unlike smartphones users who are focused on the screen and occupying both hands. BPS also features quantitative data gathering and reporting features, which can be used for further analysis and research. The games in this project specifically target skills that a person may need improvements to. Some examples include the “Face Game” and “Emotion Game”, which tackle face and eye contact and emotional recognition respectively. This example exemplifies the potential of augmented reality when combined with other technologies such as smartglassses. Even though this project’s main benefactor are people with autism, its capabilities can also be utilized in other forms of therapy. It supports the benefit of involving augmented reality when improving the therapeutic experience.

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Though the system produced promising results, it has a few limitations that should be observed. BPS was specifically designed for people with autism and was tested only on applicable patients. The test’s population was also limited to two young males. The results

obtained may not be generalized to every person with special needs, but the environment created by AR has the potential to adjust based on the person's needs and lacking skills.

The mentioned system utilizes smartglassess, but numerous devices can be used as a medium for augmented reality such as smartphones. The data gathering capabilities of smartglasses through its numerous sensors does outshine smartphones, but the availability of said devices makes smartphones the viable option. The nature of "Face Game" and "Emotion Game" also aligns to what the project's proposed library of games will be. These types of gamified activities that target specific skills are the core of the project's use of AR.

**Conclusion**

To conclude, Augmented Reality (AR) is a transformative technology that overlays digital elements onto the real world, enhancing cognitive functions and engagement in therapeutic settings. The gathered related literature indicates AR's potential to improve attention, memory, motor skills, and daily activities in children. Systems like WonderTree demonstrate AR's effectiveness in creating customizable, engaging therapy experiences that boost motivation, essential for successful occupational therapy. Despite its promise, more research is needed to fully understand AR's impact, separate from its motivational benefits. Implementing AR in Therapro's web-based portal could significantly enhance therapy outcomes and broaden service accessibility beyond geographic constraints.

# III. Current Systems

## 3.1 Current System

Therapro's current process starts with their therapist being recommended to patients by their organization consisting of other medical professionals. Next, she schedules their first appointment, referring to her notebook for available date and time slots. This process is important as the clinic's schedule varies per day, and to ensure that there are no conflicts when assigning time slots. The first appointment serves as their assessment and evaluation, while the second appointment is the start of treatment. The payment is then sent through cash, Gcash, or bank transfer before the second session. The advance payment will cover all the sessions that will occur over the current month. The therapist allows greater leeway for individuals who lack the resources to pay for their treatment and informs them about the Local Government Units (LGUs) that can possibly shoulder their needs. The sessions themselves are conducted face to face in Imus, Cavite, accompanying multiple patients per therapy session. Notes for each individual are also written down to ensure detailed documentation for each session. This will also help the therapist later when making a summary of the patient's history. The therapist does this recap after six months and will be passed down to the patient's doctor for further analysis. The doctor will then instruct the patient or their guardians on the next step towards their treatment.

## 3.2 Technical Background

Currently, Therapro relies mainly on its physical database containing patient records and their progress history. The clinic does welcome change as it is currently in the process of moving the content of physical files into a singular excel file for easier sorting. For scheduling, the therapist relies on pen and paper, managing her schedule with her notebook which serves as a basis for her availability. The only recent technology that the clinic utilizes is smartphones for reminding patients of their upcoming schedules. The therapist uses applications such as Viber and Messenger, but SMS is still the most common option for her to contact patients.

## 3.3 List of Processes

TABLE I

LIST OF PROCESSES

| Process ID | Process Name | Process Details |
|---|---|---|
| **P001** | First Appointment Scheduling | A patient schedules an appointment to the clinic (via message or call) due to pediatrician's referral. |
| **P002** | Patient Evaluation | During the patient's first meeting, the therapist will acknowledge the pediatrician's referral and diagnosis, |

| | | |
|---|---|---|
| | | then she will conduct her own assessment using the SOAP method to determine the patient's treatment. |
| **P003** | Patient Record Keeping | After the patient's session, the patients get to keep their notebook and the therapist will have an initial evaluation document and progress report for next session. Refer to appendix D or Fig. 9 to see how the clinic keeps patient records. |
| **P004** | Advanced Payment | Payment is paid in advance and is based on the number of sessions that will happen on the current month. |
| **P005** | Late Payment | The therapist reminds the patient of their late fees through message or call. |
| **P006** | Payment through assistance of Local Government Units (LGUs). | The therapist informs individuals who lack resources about possible assistance from LGUs and the correct documents required for the matter. |
| **P007** | Recurring Appointments Scheduling | After the initial session, further sessions will be reoccurring and will be marked on the therapist's calendar to avoid overlapping or intersecting time slots. |
| **P008** | Therapy Sessions | Over 6 months, the patient is scheduled to have therapy sessions to improve their condition. They participate in gamified activities that target these specific conditions. |
| **P009** | Missed Appointment Rescheduling | If the client misses an appointment, they communicate with the therapist so that they can reschedule the missed appointment and have makeup sessions. If the patient is still unable to attend the makeup session, the therapist deducts the payment for that session to the total cost for the next month. |
| **P0010** | Graduation | After six months of treatment, the therapist releases a summary of the patient's performance history which the patient or their guardians receive. They will then give this information to a doctor who will then examine and decide what they will do next. |

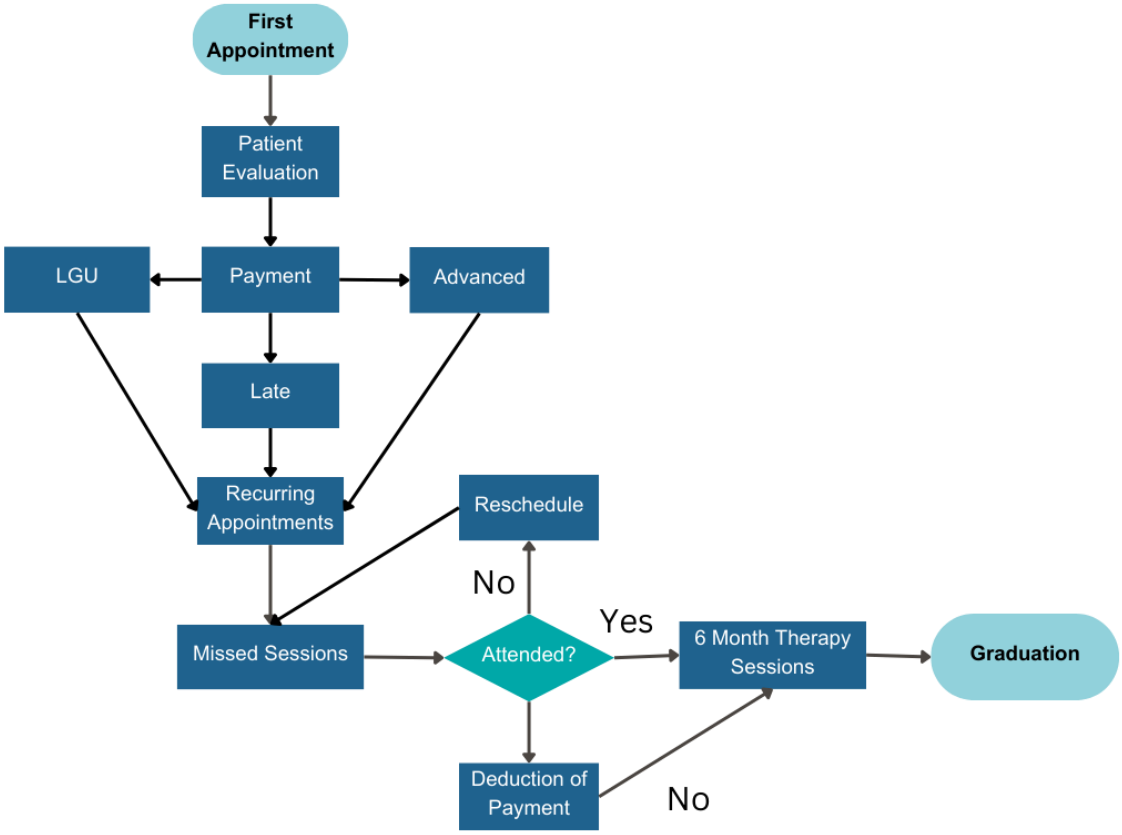


Fig. 2. Flowchart of processes.

### 3.4 Gap Analysis

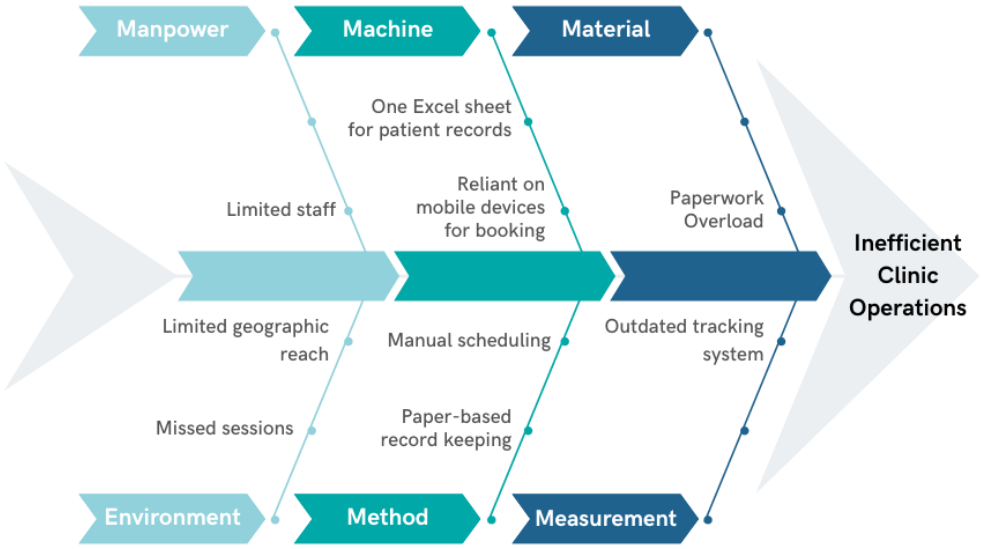


Fig. 3. Fishbone diagram.

Therapro Therapy Clinic's current system is hampered by a multitude of inefficiencies. A closer look at the contributing factors through a fishbone diagram as shown in Fig. 3 reveals limitations across various areas. These factors can all lead to a hindrance of productivity in their day-to-day operations, which can have a negative impact on patient care. By addressing these issues, Therapro Therapy Clinic can improve their efficiency and productivity, ultimately providing better care for their patients.

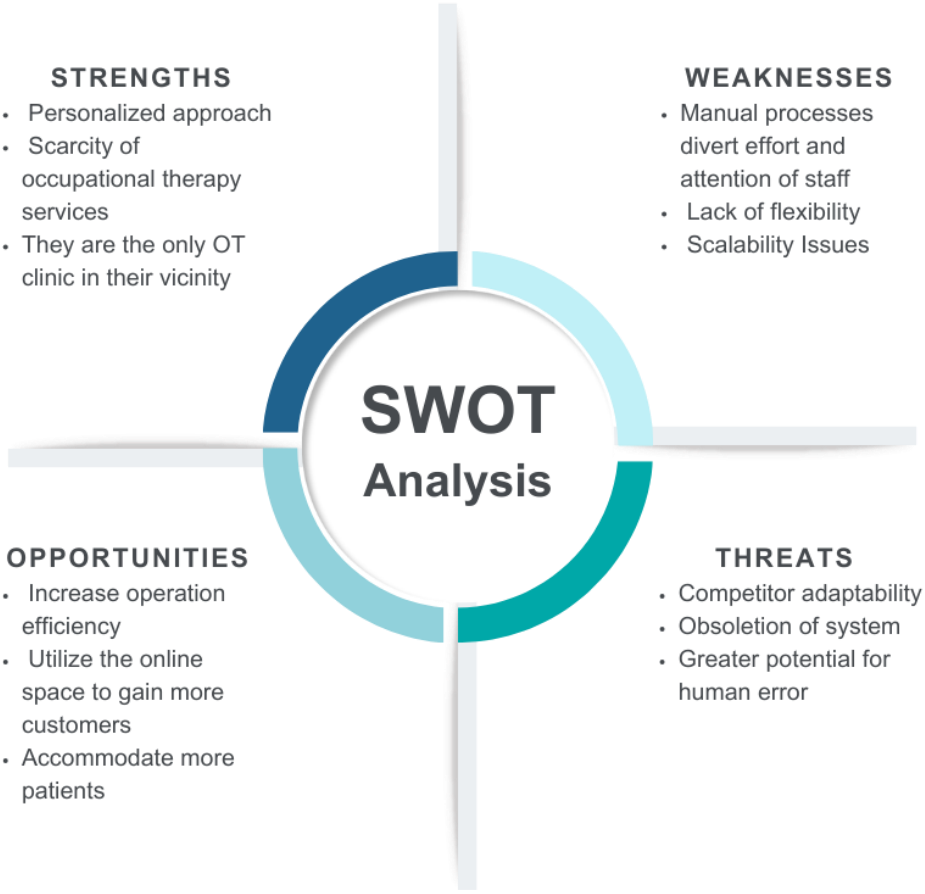


Fig. 4. SWOT analysis.

### 3.4.1 Strength

**Personalized Approach**

The current system allows therapists to personalize treatment plans and build a strong relationship with the patients. This approach can be a significant strength, especially in occupational therapy. The new system will be designed to support and enhance the current system, not replace it.

**Scarcity**

The scarcity but demand for occupational therapists brings potentially high patient volume.

### 3.4.2 Weakness

**Time Consuming Manual Processes**

Scheduling appointments and maintaining paper records are time-consuming tasks. This, in turn, reduces the therapist's time that she can use to spend with patients. This manual process is also potentially at an elevated risk of errors.

**Lack of Flexibility**

Scheduling by phone calls can be inconvenient for patients. They may have to wait on hold or reschedule appointments if they miss a call. As well as the geographic limitations of those outside the area might have trouble going to the clinic.

**Scalability Issues**

The current system might struggle to handle a significant increase in patient volume, or new services offered by the clinic. Adding new patients or therapists could lead to organizational challenges with paper-based records.

### 3.4.3 Opportunities

**Increased Efficiency**

Automating tasks such as appointment scheduling and record keeping can free up therapist's time for other crucial tasks. This involves adjustment of treatment plans, progress monitoring, and patient care. This can lead to better outcomes and increased patient satisfaction.

**Utilize the Online Space**

Having an online presence presents new opportunities for the clinic to attract customers who need their services. Aside from this, having information such as the clinic's address and detailed description of their services will keep individuals who have inquiries informed.

### 3.4.4 Threats

**Competitor Adaptability**

If competitors adopt modern systems, Therapro might lose in attracting and retaining patients. Clients may seek a more convenient and tech-enabled clinic rather than a traditional manual system such as Therapro's.

**Obsoletion of System**

Reliance on a paper-based system could make Therapro appear outdated and struggle to attract new patients and is in threat of being outdated and obsolete, potentially falling behind.

**Greater Potential for Human Error**

Since patient details are written down in their paper-based system, the manual and repetitive nature of tasks such as this presents a greater potential for human error. These errors are also more difficult to notice and fix with Therapro's style of operation.

TABLE II

GAP ANALYSIS

| Current State | Desired State | Impact |
|---|---|---|
| **P001** | The customer can book their appointment without the need to contact the client. | Improved patient convenience and accessibility. |
| **P003** | Store patient records electronically in a secure system. | Easier access, scalability, and security for sensitive data. |
| **P007** | Use a web-based calendar system for therapists to schedule recurring appointments. | Reduced risk of scheduling conflicts |
| **P008** | Incorporate gamified activities within the web portal to complement in-person therapy sessions | Have a new approach to therapy sessions that is accessible to more patients. |
| **P009** | Having suggested dates to reschedule easier within a reasonable timeframe | Increases efficiency and flexibility |

# IV. Proposed Solution

## 4.2 Lean Canvas

**Problems**

The clinic faces 4 challenges. First, the 2020 Covid-19 pandemic had brought to the therapist's attention how unprepared the clinic was. Social distancing measures and lockdowns significantly impacted their ability to hold sessions since occupational therapy often requires immersive activities that are difficult to replicate effectively online. Second, the pandemic had caused staffing shortages. Several key personnel, including speech therapists, assistants, and special education teachers, had been unable to return to work. To slightly lessen the workload, the therapist's son helps around the clinic during his free time. Third, the clinic's method of record-keeping. Since its founding in 1999, all documents and records had been stored physically in file cabinets. As a patch-up solution, the clinic has migrated their records into a single Excel spreadsheet. Lastly, the clinic lacks an online presence, making it difficult for new clients to find them. A search on popular websites such as Google Maps or Facebook wouldn't turn up any results for the clinic.

**Solutions**

To address these issues, the developers came up with these solutions:

First, an online portal with a variety of features was conceptualized. The portal would provide information about the clinic, including its services, contact details, and mission. It would also explain the difference between occupational therapy and physical therapy to help potential clients avoid confusion. An automated scheduling system would streamline appointment booking and follow-ups, and automated email and SMS reminders would be sent to new patients to ensure they didn't miss their appointments. Additionally, the website would be designed to be responsive and work seamlessly on any device.

Second, automation was also seen as a key to improving patient management. The ability to book appointments directly through the website, with clear displays of available dates and times, would make scheduling much easier. Recurring follow-up sessions could also be automatically scheduled, eliminating the need for manual intervention. Furthermore, all patient records and progress history would be digitized and accessible through a secure login on the website.

Lastly, the final piece of the puzzle involved creating digital, gamified activities for online sessions. These interactive games, accessible through the portal, would target specific areas where each patient needed improvement, allowing therapy to continue even in a virtual setting.

**Key Metrics**

The proposed system addresses several challenges faced by Therapro Therapy Clinic, such as lack of online presence. But to ensure its performance and if its purpose is being met, key metrics to gauge the system's impact are listed. The key metrics for this project are traffic and surveys. Traffic helps the clinic understand how effectively they are reaching potential patients online. Meanwhile, tracking post-session surveys improve the quality of the virtual sessions.

A strong online presence is crucial for Therapro to attract new patients to the clinic, and positive patient engagement ensures effective online therapy sessions and patient satisfaction. For the specific metrics of the system's traffic, the following data will be observed:

- **Unique Visitors.** This metric indicates how many new people are discovering Therapro online. The higher the number, the wider their online reach.

- **Page Views.** This indicates visitor engagement. By monitoring how many pages people view, Therapro can understand their interest in their services and the content on their portal.

- **Conversion Rate.** This measures how effectively the portal converts visitors into potential patients. This can be measured by tracking what percentage of visitors take desired actions, such as booking appointments or contacting the clinic for more information.

Next, specific survey metrics are also needed to examine the quality of service that the portal will provide:

- **Satisfaction & Experience.** This metric will gauge overall patient satisfaction with the virtual therapy experience. This includes factors like the ease of use of the portal, therapist interaction, and clarity of communication.

- **Effectiveness of Gamified Activities.** This metric will measure patient engagement and perceived effectiveness of these activities in achieving therapeutic goals.

- **Actionable Insights.** Most importantly, the developers will translate this feedback into actionable insights. This might involve improving technical aspects of the platform or refining specific game elements.

**Unique Value Proposition**

The proposed online portal goes beyond a standard patient portal by offering a unique combination of features. First, it incorporates gamified activities. These games can be played with the therapist during sessions or independently by patients at their convenience. This allows for continued therapy and engagement even outside of scheduled appointments. Additionally, the portal allows patients to track their progress and history throughout their treatment journey.

Automation is another key element of the project. The client expressed difficulty managing patient schedules and sending appointment reminders. The portal will automate these processes, freeing up the therapist's time and reducing the risk of missed appointments.

The portal draws inspiration from several existing applications. For example, note-taking apps like those found on smartphones can be used to track patient progress during sessions. Secondly, the online appointment scheduling functionality mirrors tools like Acuity, a popular scheduling app for mobile devices. The portal's calendar interface will also be user-friendly, similar to Microsoft Planner, ensuring easy navigation for patients with varying levels of technical expertise. Finally, the gamified activities borrow the engaging aspect of browser-based gaming websites like Y8 or Friv. However, the portal's games will be specifically designed to promote therapeutic goals while maintaining an enjoyable gameplay experience.

**Customer Segments**

The online portal caters to several key user groups:

- **Patients**. At the core are the patients themselves, who will benefit most from the gamified activities. These activities can be used during therapy sessions or independently by the patients, allowing for continued engagement outside of appointments.

- **Parents/Guardians**. The portal also recognizes the crucial role of guardians, typically parents or caregivers. These individuals will be able to easily schedule appointments for their children, access information

about specific services, and track their child's progress through the patient portal. This allows them to stay informed and involved in their child's therapy journey.

- **Therapist**. As the primary healthcare provider, will utilize a secure management system within the portal. This system streamlines appointment scheduling and record-keeping, allowing them to access and maintain patient information electronically. Additionally, therapists can incorporate the gamified activities into their sessions to create a more engaging experience for their patients.

- **Assistant**. They will also have access to the management system, enabling them to schedule appointments and manage patient records in support of the therapists.

**Channels**

The team relies on a combination of digital tools to collaborate and communicate effectively. For internal discussions and consultations, they leverage Microsoft Teams. When meeting with the client, Ms. Francisco, they utilize Google Meets. To share project updates, plans, and designs visually, the team creates presentations using PowerPoint and presents them on whichever platform is being used for the meeting.

Figma acts as the group's central hub for designing the patient portal. This online platform allows them to create interactive prototypes that showcase the portal's functionality and user experience. Within Figma, FigJam is also utilized, which is a subsection specifically designed for brainstorming and design thinking sessions. FigJam fosters real-time collaboration, enabling the team to develop design ideas together seamlessly.

For day-to-day communication, the team primarily uses Messenger. This platform allows for quick exchanges of information, such as small updates and questions, through a group chat. They also use Messenger to communicate directly with Ms. Francisco.

**Revenue Streams**

The online portal, while not directly generating revenue for the clinic, acts as a powerful tool for indirect income growth. Since it improves the clinic’s visibility by creating an online presence, more potential clients may become more aware of its existence. Having an online modality of therapy also expands the range of the clinic’s customers, influencing the amount of revenue it can generate. In conclusion, while it does not have any money generating capabilities or transaction features, it creates a more favorable condition for the clinic for further growth and profit.

**Cost Structure**

Maintaining the online portal does incur some costs. As a web-based platform, it requires hosting services to ensure smooth operation. Subscriptions such as Amazon Web Services (AWS) are needed to host the website with the right specifications. This subscription will cost around 600 to 800 Philippine Pesos (PHP) per month of activity.

The project will also utilize SMS messaging for reminding patients, which will also require fees to continuously be active. PLDT's SMS API costs 250 Philippine Pesos (PHP), but prices may vary. The group estimates the price range to be between 250 to 500 Philippine Pesos.

**Unfair Advantage**

The proposed online portal goes beyond what competitors offer with two key differentiators. First, it features a flexible and automatic scheduling system specifically designed for recurring sessions. This will significantly reduce the administrative burden on therapists at the clinic. Recognizing the challenges of manual scheduling, particularly when Ms. Zoraida had to consult a physical calendar to find available appointment slots, the automatic scheduler will streamline this process by suggesting her free dates and times.

Second, the portal offers a unique library of web-based games, including AR games, specifically designed for therapeutic use. This opens up a new and engaging way for therapists to interact with their patients. Beyond in-session therapy, these games provide an additional mode of educational entertainment tailored to each patient's specific needs. Furthermore, the online modality of sessions has the potential to attract new clients who might not be able to attend in-person appointments.

## 4.3 Product Vision

TABLE III

PRODUCT VISION

| **For** | **The staff at Therapro Therapy Clinic** |
|---|---|
| **Who** | Are looking for a more efficient and innovative system to manage both scheduling and patient care, including appointments, therapist and patient availability, and overall patient management, while also allowing for a more flexible approach to delivering therapy sessions. |
| **TheraPro Online Portal** | Is a web-based portal |
| **That** | Will not only streamline the process of scheduling appointments through automation and allow the assistant to view the therapist and patient's schedule and remind them of their upcoming appointments but will also allow the clinic to hold their therapy sessions online through the use of gamified activities available in the portal, leading to a more accessible mode of treatment. |
| **Unlike** | the clinic's current traditional face-to-face therapy sessions, manual process of paper-and-pen scheduling and record-keeping. |
| **Our Product** | will not only offer real-time views of the therapist and patient's schedule, eliminating |

| | |
|---|---|
| | the need for manual updates and ensuring everyone is on the same page, but it will also foster a flexible yet engaging environment that allows the therapist to optimize patient outcomes. |

## 4.4 Technology Specifications

**Hardware:**

**Development Devices**. Standard Windows computers, laptops, and mobile devices will be used by the development team for coding, designing, and testing the web portal. Any x86 or x86_64 based AVD Requires Android 8.1 (API 27) or later. The camera would emulate a virtual scene, both front and back.

**Software:**

**Design and development.** Figma will be crucial in brainstorming, prototype creation, and ensuring a user-friendly design for the web portal. Development will utilize tools like VScode as the primary coding environment. It will utilize different programming languages that will be used for the website, and Unity as the game engine that will be used for the development of Web-Augmented Reality games.

**Secure infrastructure.** The system will be hosted on Amazon Web Services (AWS) Lightsail. This cloud-based platform ensures the safety of patient information within the web portal. Lightsail charges a monthly fee based on the chosen virtual machine instance (vCPU, RAM, storage). This project will utilize the second tier which will cost 700 PHP monthly. Additionally, a secure database, such as MongoDB or Apache MySQL, will be implemented to manage patient data effectively.

**Database Management System (DBMS).** A secure database management system like MongoDB or Apache MySQL will be chosen to store and manage patient information within the web portal. The specific choice will depend on factors like scalability, security features, and team expertise.

**Security Protocols.** Implementing robust security measures is paramount. Secure coding practices, data encryption, and regular security audits will be essential to protect patient information stored within the system.

**Web Development Tools:**

**Front-End Development.** HTML, CSS, and JavaScript will likely form the foundation for building the web portal's user interface and interactive elements. Additional front-end frameworks like React or Angular may be considered for more complex functionalities.

**Back-End Development.** Programming languages including Python and web frameworks such as Django or Node.js are popular choices for building the server-side logic of the web portal, handling data processing, and communication with the database.

**Peopleware:**

**Project Manager**. The project manager oversees the entire development process of the project. Their role includes assigning the tasks of each member, managing the timelines and deadlines, and ensuring proper team communication.

**UI/UX Designer**. The user interface (UI)/user experience (UX) designer designs the required interfaces of the proposed project. It is their responsibility to ensure a seamless user experience across the website, portal, and the games. Additionally, they collaborate with front-end developers to translate designs into functional code.

**Front-End Developer.** The Front-End Developer collaborates closely with the UI/UX designer to bring the UI/UX vision to life. Together they will leverage front-end frameworks to build dynamic and scalable user interfaces. They will also act as a bridge between design and functionality, working together with both the UI/UX designer and back-end developer to ensure everything works together seamlessly.

**Back-End Developer.** The back-end developer builds the server-side logic and databases that power the platform. They handle data communication and user authentication, ensuring security and scalability. Together with the front-end developer, they define APIs for seamless communication.

**Game Developer.** The game developer is responsible for translating the therapist's activities into games that would cater to each patient's condition. They will cooperate with the front-end and back-end developer to implement the developed product to the website.

**Network:**

**Secure Internet Connection.** A reliable internet connection will be required for the team to access development tools and cloud-based resources. Recommended to have 2.4Ghz or more for the connection.

## 4.5 Feasibility

### 4.5.1 Operational Feasibility

Therapro Therapy Clinic's proposed web-based portal have a high potential for successful implementation. Management support from Ms. Francisco demonstrates an unobstructed vision for the project's value. Involving all staff members and potentially parents/guardians in the design process will ensure the system addresses their needs.

The clinic itself stands to benefit significantly. Automated scheduling and record-keeping will free up staff time, while improved data management will facilitate better treatment planning and overall efficiency. Online scheduling and potential online therapy sessions can attract new patients and increase patient volume, leading to increased revenue.

The potential benefits for patients include convenient online scheduling and the ability to hold online therapy sessions from the comfort and privacy of their own homes. This can improve

accessibility for patients with transportation challenges or those who live in remote areas. This can be especially helpful for children or those new to therapy who feel anxious or intimidated in a traditional clinic setting. The inclusion of engaging AR games within the portal can further enhance the patient experience, potentially making therapy exercises more fun and interactive, especially for younger patients.

Prioritizing robust security measures and data privacy compliance, the risk of negative impacts on the clinic's reputation is low. The project timeline needs to be carefully managed to avoid conflicts with other clinic priorities, but effective communication can ensure a smooth rollout. Finally, addressing Health Insurance Portability and Accountability Act (HIPAA) regulations throughout development will ensure legal compliance and patient data protection. Overall, the operational environment at Therapro Therapy Clinic is favorable for adopting the new system, and a user-centered approach will be the key to achieving high user adoption and maximizing the project's benefits.

### 4.5.2 Economic Feasibility

The economic outlook for Therapro Therapy Clinic's proposed web portal is promising, with potential long-term financial gains outweighing the initial investments. While upfront costs include development of the system itself, hardware, software licenses, and potential IT staff additions, the anticipated benefits offer a compelling return. Increased efficiency through automated scheduling and record-keeping can free up time for the therapist, leading to cost savings. Additionally, online appointment scheduling and online therapy sessions can attract new patients, increasing revenue. Improved data analysis capabilities could also contribute to cost savings by potentially reducing the overall number of therapy sessions needed per client. A user-friendly interface can improve therapist and staff satisfaction by reducing administrative burdens. A modern and accessible web portal could enhance the clinic's image and attract new patients seeking a tech-savvy therapy provider. Gamified therapy activities within the portal can improve patient engagement, potentially leading to better treatment outcomes and increased patient retention. There is some uncertainty in quantifying the exact impact on patient volume and potential revenue increases. However, online therapy sessions can potentially reach a wider patient base, including those who live in remote areas or who have difficulty traveling to in-person appointments. This could lead to a significant increase in patient volume and revenue.

### 4.5.3 Technical Feasibility

Bringing Therapro Therapy Clinic's web portal to life is technically feasible, thanks to the current technology landscape and available expertise. Key to this feasibility is the accessibility of standard development tools, cloud-based infrastructure, and secure database management systems. The clinic's existing network infrastructure will be assessed to determine if any upgrades are needed to ensure a smooth and reliable internet connection, crucial for system operation.

The development team will require a solid foundation in web development, UI/UX design, and secure database management. Therapists' participation in the design process is vital to ensure the system aligns perfectly with their needs. Additionally, incorporating Augmented Reality (AR) games into the web portal requires expertise in AR development tools and frameworks. If necessary, specialists can be brought in to fill any skill gaps within the team, whether for core functionalities or AR integration.

The system's scalability is a major advantage. Cloud-based solutions offer the flexibility to accommodate future growth in patient volume and data storage as the clinic expands. Performance specifications for the system will be clearly defined to guarantee it can handle the anticipated user traffic and transaction volume without a problem.

Developing a prototype can be a valuable tool. It allows for identifying and addressing technical challenges before full-scale development begins, including testing the functionality and user experience of the AR games. This prototype can also be used to gather valuable user feedback and ensure the system aligns with everyone's needs, including therapists, patients, and potentially parents/guardians.

Integration with existing clinic software used for managing patient records or electronic health records (EHR) is essential for seamless operation. Security is priority number one, and the system will be built with a robust user authentication and regular security audits to ensure safety of patient information. Additionally, compliance with relevant data privacy regulations like HIPAA will be a top priority.

#### 4.5.4 Schedule Feasibility

With careful planning and project management, Therapro Therapy Clinic's proposed web-based portal can be implemented within a reasonable timeframe. A realistic development and implementation timeline is estimated to be between 6-12 months, which needs to be established with clear milestones and deliverables to keep the project on track. Agile development methodologies can be implemented to ensure flexibility and adaptability to changing needs throughout the project lifecycle. Regular communication with the clinic staff and possibly parents/guardians will keep everyone informed and involved. Building buffer time into the timeline can help mitigate risks of external factors delaying project development, ensuring the schedule is flexible. By carefully considering these factors and implementing strong project management practices, Therapro Therapy Clinic can ensure the proposed system is implemented within a reasonable timeframe and meets its long-term goals.

# V. Requirements Analysis

## 5.1 Product Backlog / User Stories

TABLE IV

PRODUCT BACKLOG

| ID | As a… | I want to be able to… | So that… | Priority |
|---|---|---|---|---|
| 1 | Visitor | View business information | I can be informed about specific details | Must |
| 2 | Visitor | Create an account | I can benefit from member privileges | Must |

| | | | | |
|---|---|---|---|---|
| 3 | Member | Log-in | I can easily access the progress notes and my upcoming appointments | Must |
| 4 | Visitor | Schedule initial appointment | I can easily book an appointment with the clinic | Must |
| 5 | Member/Therapist | View my upcoming appointments with a calendar | I can be informed in advance of my next appointment | Must |
| 6 | Member | View my/my family member's progress throughout the sessions | I gain some insight about what happens in the sessions | Must |
| 7 | Member/Therapist | participate in AR therapy games | I can engage in interactive exercises | Must |
| 8 | Member | Modify account details | The information included is not obsolete | Should |
| 9 | Member | Receive SMS reminders | I don't miss a therapy session | Could |
| 10 | Administrator | Manage all patient records | I can view and edit information when needed | Must |
| 11 | Administrator | Manage schedules | I can make sure there are no conflicts and errors | Must |
| 12 | Administrator | Manage user accounts | I can ensure system security and access control | Should |
| 13 | Administrator | Set permissions | I can grant access based on user roles | Must |
| 14 | Administrator | Make changes to the website | The site can have constant updates | Must |
| 15 | Administrator | Monitor site traffic | I can make necessary improvements accordingly | Should |

| | | | | |
|---|---|---|---|---|
| 16 | Therapist | Add progress notes for the patients after every session | I can keep track of their progress throughout their treatment journey | Must |
| 17 | Therapist | Manage appointments | I can schedule reoccurring appointments with my patients | Must |
| 18 | Therapist | Add and view patient records | I can easily save and access patient information | Must |
| 19 | Assistant | View the therapist's progress notes for patients | I can assist the therapist accordingly during the sessions | Should |
| 20 | Member | Make a report when encountering an issue | I can help the system improve and fix bugs | Should |
| 21 | Therapist | Make a report when encountering an issue | I can help the system improve and fix bugs | Should |
| 22 | Assistant | Make a report when encountering an issue | I can help the system improve and fix bugs | Should |

## 5.2 Use Case Diagram

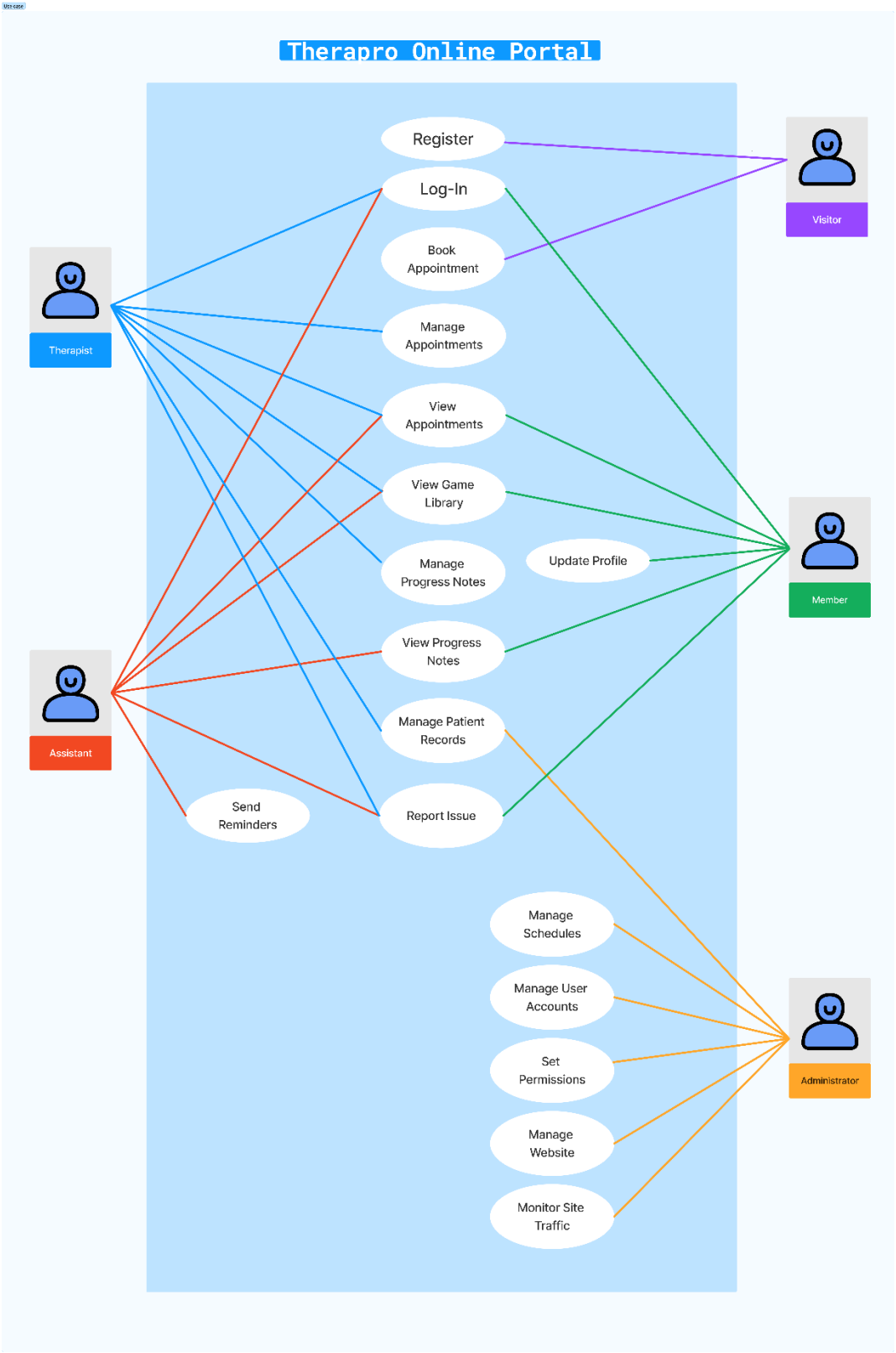


Fig. 5. Use case diagram.

## 5.3 User Classes and Characteristics

TABLE V

USER CLASSES AND CHARACTERISTICS

| ***Roles*** | ***Description*** |
|---|---|
| ***Visitor*** | A visitor is a person who is not a patient of the clinic. They are first-time visitors to the website who may be interested in the clinic's services, potentially leading them to becoming a patient (member). |
| ***Member*** | A member is a patient of the clinic who participates in recurring appointments. They are registered user of the clinic's website who has access to a wider range of functionalities compared to a Visitor. They can access appointment information, participate in treatment programs, and manage their account details. |
| ***Therapist*** | This user is a licensed healthcare professional who provides treatments and care to the patients at the clinic. They utilize the system to manage appointments, document patient progress, and participate in interactive therapy tools (such as Augmented Reality games). |
| ***Administrator*** | Administrators have high-level access to manage the clinic's systems and user accounts. They are responsible for ensuring smooth operation, data security, and website maintenance. |
| ***Assistant*** | This user is a clinic staff member who supports the therapist by performing administrative tasks. They may not have direct patient interaction but require limited access to patient information for further assistance. |

## 5.4 Prototype

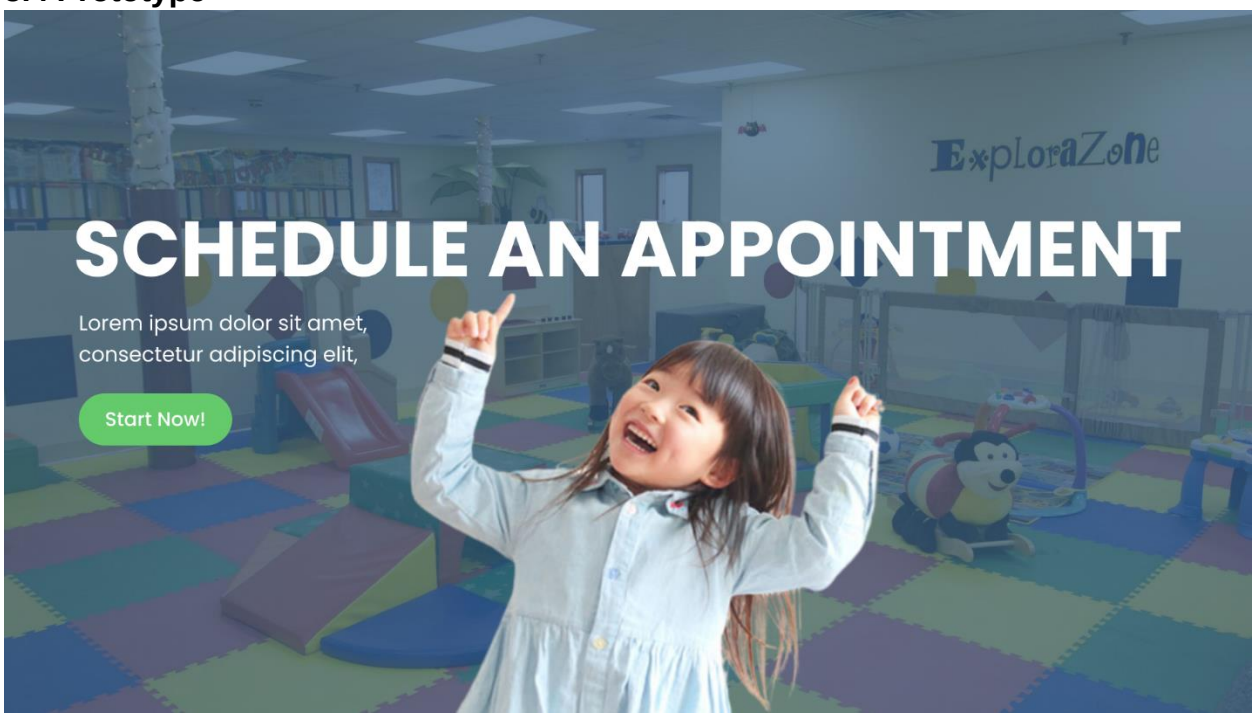


Fig. 6. Prototype: Scheduling an Appointment.

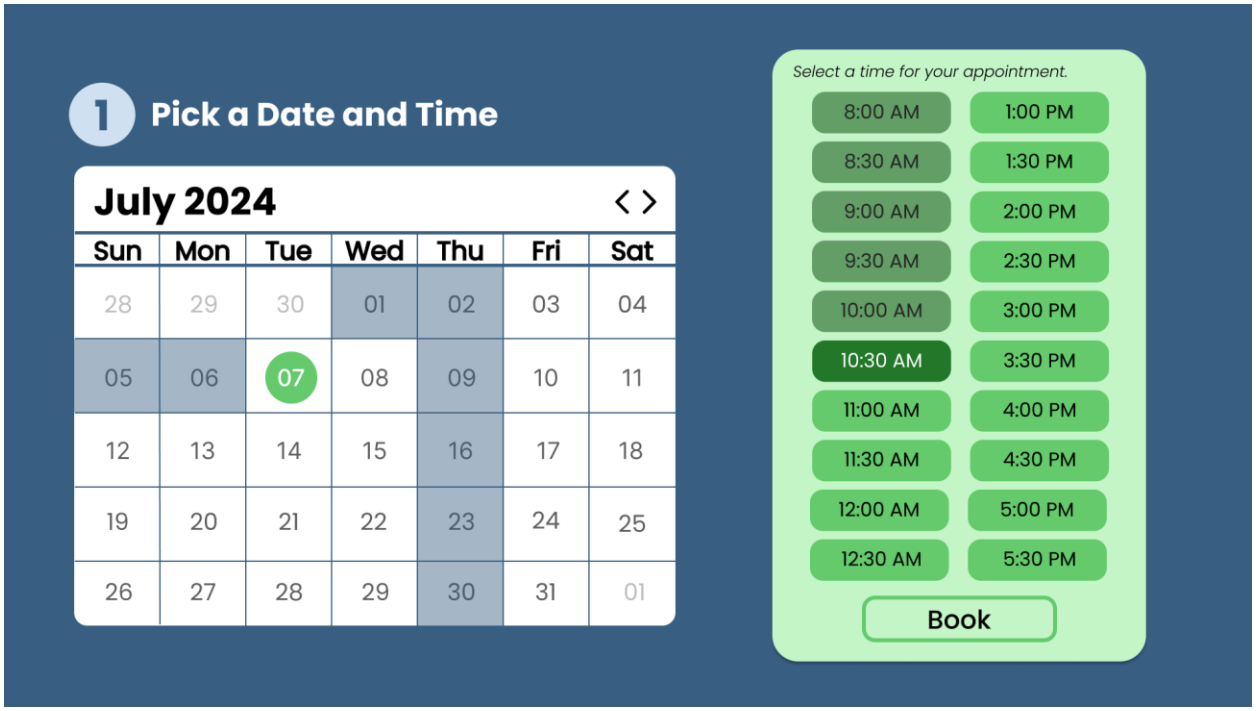


Fig. 7. Prototype: Picking a Date and Time.

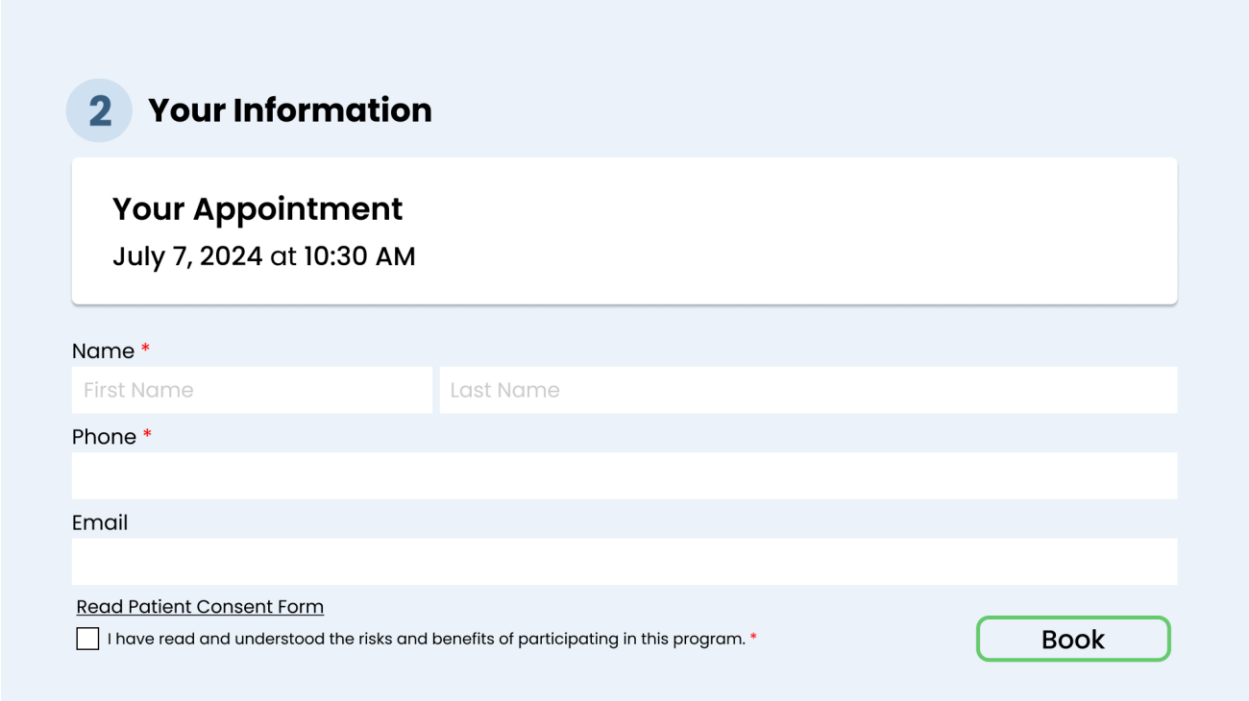


Fig. 8. Prototype: User Information.

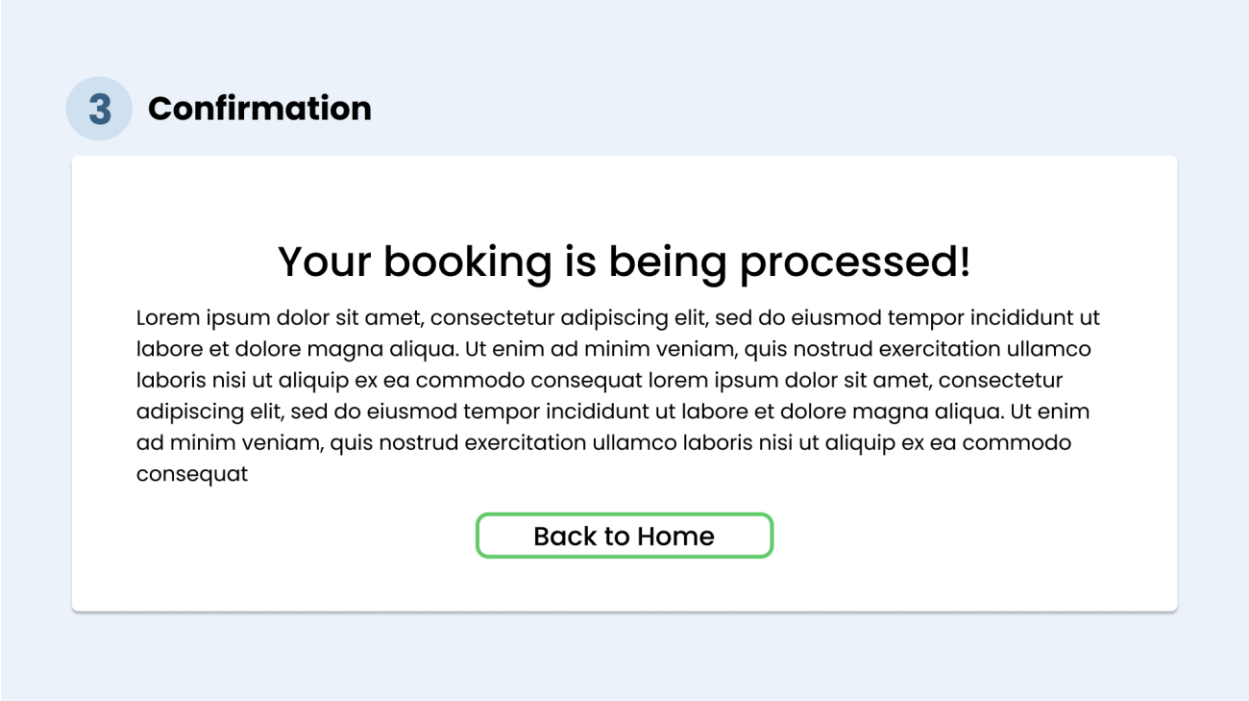


Fig. 9. Prototype: Booking Confirmation.

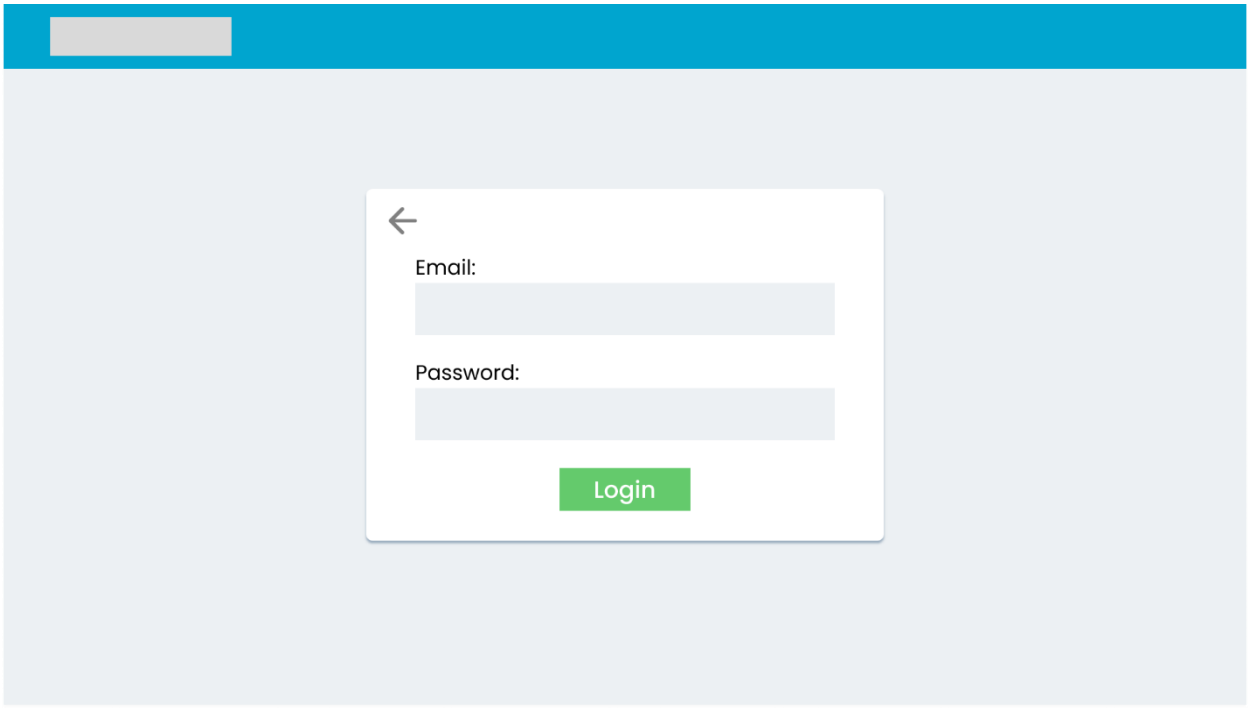


Fig. 10. Prototype: Portal Login.

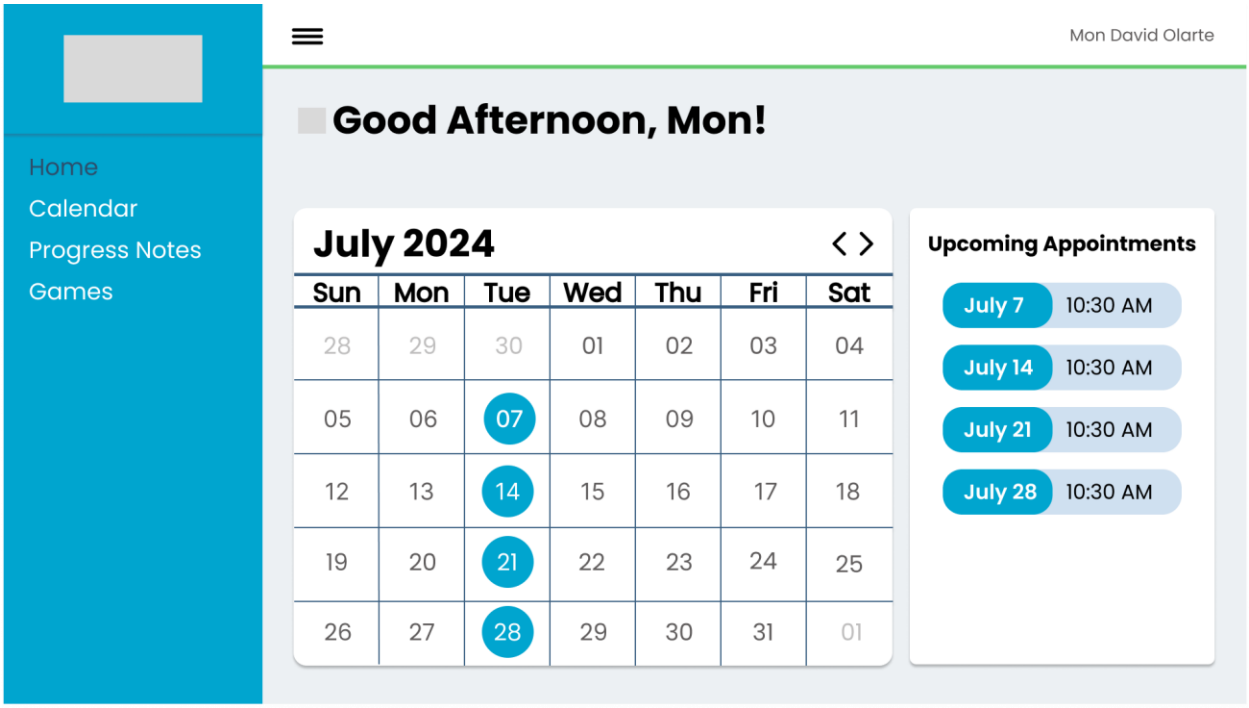


Fig. 11. Prototype: Portal Home.

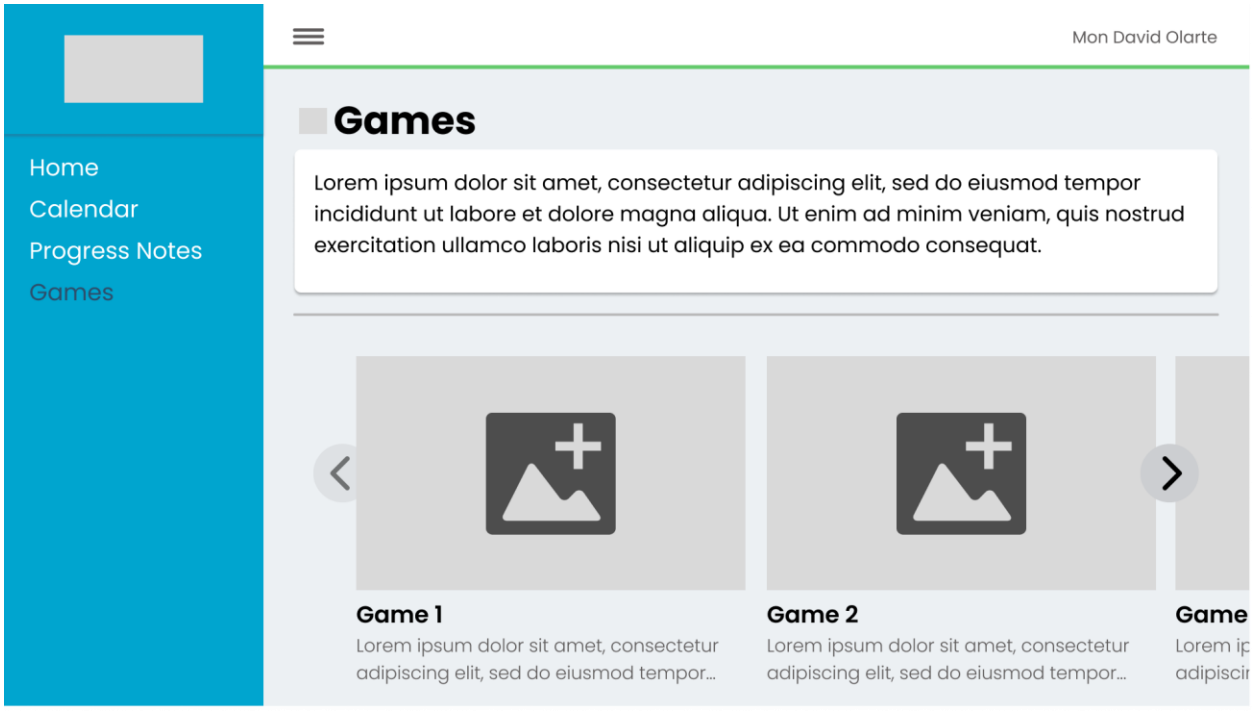


Fig. 12. Prototype: Game Library.

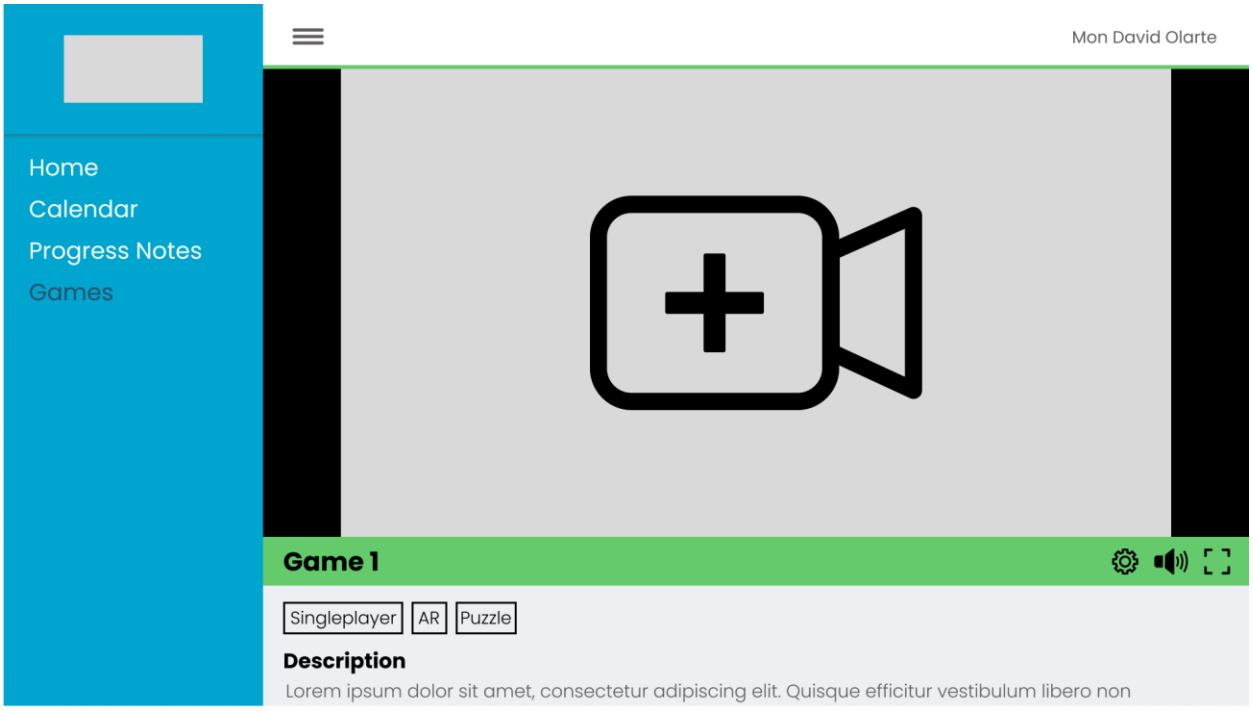


Fig. 13. Prototype: Game View.


Fig. 14. Prototype: Game Description View.

## 5.5 Release Plan

The project will be broken down into 3 terms of the Project Based Learning series, to see the product roadmap refer to appendix B. For a more detailed view of the timeline of the release plan, refer to appendix A for the Gantt chart of the project.

**Target Group:** Therapro Therapy Clinic

**Goal:** Implement a user-friendly web-based portal to streamline patient communication, improve appointment scheduling efficiency, and enhance therapy experiences through AR games.

**Needs:**

- Reduce administrative burden associated with appointment scheduling and communication.
- Improve patient engagement and access to information.
- Provide therapists with efficient tools for managing patient care.
- Make online sessions available to accommodate more patients outside the geographical area of the clinic.

**Value:**

- Increased operational efficiency for the clinic.

- Improved patient satisfaction and communication.
- Enhanced therapy experience through interactive AR games.
- Be able to hold online sessions with the addition of interactive AR games

**Key Features:**

**Release 1**

- User Accounts (Therapists, Patients, Administrators)
- Secure Login and Access Control
- Patient Portal:
    - View Appointment Schedule
    - Secure Communication with Therapists (optional)
    - Manage Profile Information
- Therapist Dashboard:
    - View Patient List (basic information)
    - Manage Appointments (schedule, reschedule, cancel)
    - Secure Communication with Patients (optional)
- System Administration:
    - User Management (add/edit/delete)
    - Basic Reporting (e.g., appointment statistics)

**Release 2**

- Appointment Booking System:
    - Online Appointment Scheduling for Patients
    - Appointment Reminders and Notifications
- Therapist Dashboard Enhancements:
    - View Detailed Patient Records
    - Secure Document Upload and Storage (e.g., therapy plans)
- Patient Portal Enhancements:
    - Progress Tracking Tools (optional)

**Release 3**

- AR Therapy Game Integration:
    - Library of Interactive AR Games for Patients
    - Therapist Assignment of Specific AR Games
    - Patient Progress Tracking within AR Games
    - Secure Data Storage and Management for AR Game Data

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# Appendices

## Appendix A: Schedule/Release Plan

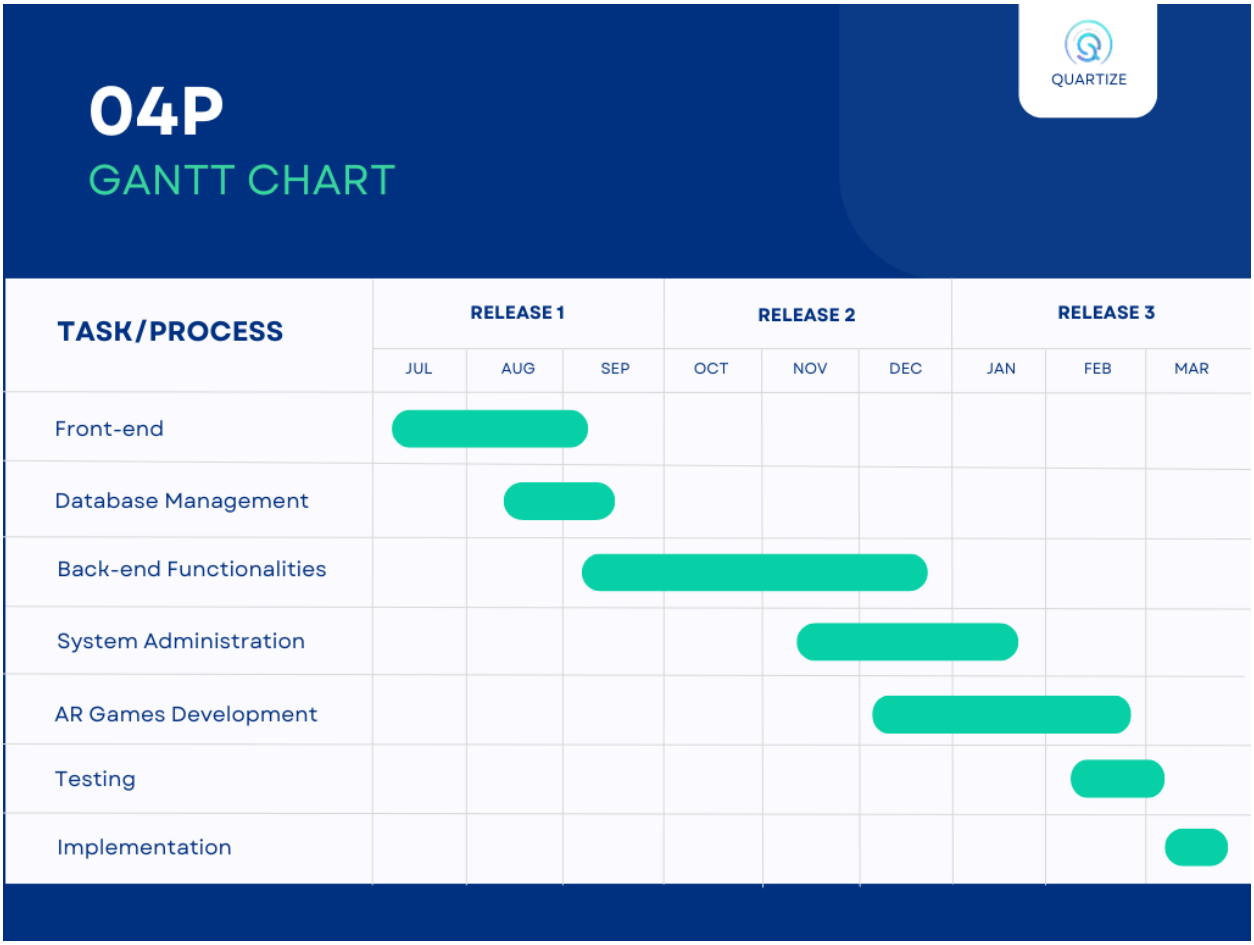


Fig. 15. Gantt Chart.

## Appendix B: Product Roadmap

TABLE VI

PRODUCT ROADMAP

| ***SNTSDEV*** | ***SSYADD1*** | ***SCSPROJ*** |
|---|---|---|
| **Finding a Client**<br>• Interview<br>• Collect general information<br>• Identify pain points<br>**Project Proposal**<br>• Documentation<br>• Prototype | **Website/Portal**<br>• Website design<br>• Patient portal<br>• Therapist dashboard<br>**Functionalities**<br>• Account creation<br>• Appointment booking system<br>• System administration | **Games Integration**<br>• Designing<br>• Developing<br>• Testing<br>**Portal Finalization**<br>• Security etc<br>• Testing and debugging |

## Appendix C: Teams Meetings

TABLE VIIVII

TEAMS MEETINGS: MIDTERMS

| Date | Minutes of the Meeting |
|---|---|
| March 26, 2024 | - Discussion of roles among group members, prospect advisers, and team name.<br>- Discussed possible clients (Therapro Therapy Clinic and Dalikayat Convenience Store) and project proposal<br>- Worked on the “Project Team” assignment. |
| April 20, 2024 | - Visiting Therapro Therapy Clinic to ask for general information about the clinic. |
| April 24, 2024 | - Preparation of second meeting with client: Therapro Therapy Clinic.<br>- Prepared questions for the client that will guide us in making the lean canva.<br>- Distribution of roles for midterm presentation. |
| April 25, 2024 | - Created initial prototype for the proposed system |
| April 27, 2024 | - Continued prototype for the proposed system |
| April 28, 2024 | - Second meeting with client: Mrs. Zoraida Francisco through Google Meet<br>- Deeper discussion of the clinic and their current problems and proposed solutions |
| April 28, 2024 | - Making the lean canva<br>- Discussing the finalized system: Online Portal |
| April 29, 2024 | - First meeting with consultant: Ms. Roselle Gadon.<br>- Talked about the feasibility and lean canva |
| April 29, 2024 | - Finalizing lean canvas |
| April 30, 2024 | - Preparation for midterm presentation: creating the first draft of the powerpoint presentation<br>- Distribution of parts for the presentation |
| May 2, 2024 | - Continued working on midterms powerpoint presentation |
| May 3, 2024 | - Continued working on midterms powerpoint presentation<br>- Started practicing the flow of the midterm presentation |
| May 6, 2024 | - Finalized midterms and flow of powerpoint presentation<br>- Dry run of midterms presentation<br>- Clarified possible panelist questions |

TABLE VIIIVIII

TEAMS MEETINGS: FINALS

| Date | Minutes of the Meeting |
|---|---|
| May 14, 2024 | - Rewatching and taking down notes of midterm presentation recording<br>- Discussion of panelist questions and suggestions |

| | |
|---|---|
| May 17, 2024 | - Finish comments matrix<br>- Discuss and research related literature<br>- Distribution of parts in the final paper |
| May 21, 2024 | - First meeting with adviser: Mr. Jayvee Cabardo<br>- Went through the panelists' comments and suggestions<br>- Reviewed the lean canva and made improvements |
| May 21, 2024 | - Integrated the comments and suggestions of the panelists and adviser to the contents of the paper<br>- Final draft of the lean canva<br>- Completed chapter 1 |
| May 22, 2024 | - Started on the RRL |
| May 24, 2024 | - Started on the technology specifications for the proposed solution<br>- Second meeting with adviser: Mr. Jayvee Cabardo<br>- Discussed and clarified objectives, feasibility, diagrams and prototype |
| May 25, 2024 | - Third meeting with client: Mrs. Zoraida Francisco through Google Meet<br>- Discussed and asked access for historical data<br>- Overviewed the technologies in their current system<br>- Clarify processes and diagrams |
| May 27, 2024 | - Distributed parts to every member for chapter 3<br>- Set deadlines for the completion of chapter 3 |
| May 28, 2024 | - Completed the list of processes and diagrams (SWOT, Fishbone) |
| May 31, 2024 | - Second meeting with adviser: Mr. Jayvee Cabardo<br>- Clarified chapter 4<br>- Reviewed chapter 3 |
| June 2, 2024 | - Made changes to the paper based on adviser comments<br>- Set deadlines for the completion of chapter 5 |
| June 3, 2024 | - Started on product backlog<br>- Discussed security |
| June 4, 2024 | - Defined users<br>- Completed product backlog<br>- Started on use case diagram |
| June 6, 2024 | - Completed use case diagram<br>- Discussion of release plan (Gantt chart, product roadmap) |
| June 8, 2024 | - Review of the final paper<br>- Created comments at parts to change |
| June 11, 2024 | - Third meeting with adviser: Mr. Jayvee Cabardo<br>- Reviewed the diagrams, chapter 5, and the appendices<br>- Sharepoint |
| June 12, 2024 | - Changes to the paper as suggested by the adviser<br>- Changes to the prototype |
| June 13, 2024 | - Proofread the paper<br>- Continued making of the presentation<br>- Distributed parts for the final presentation |

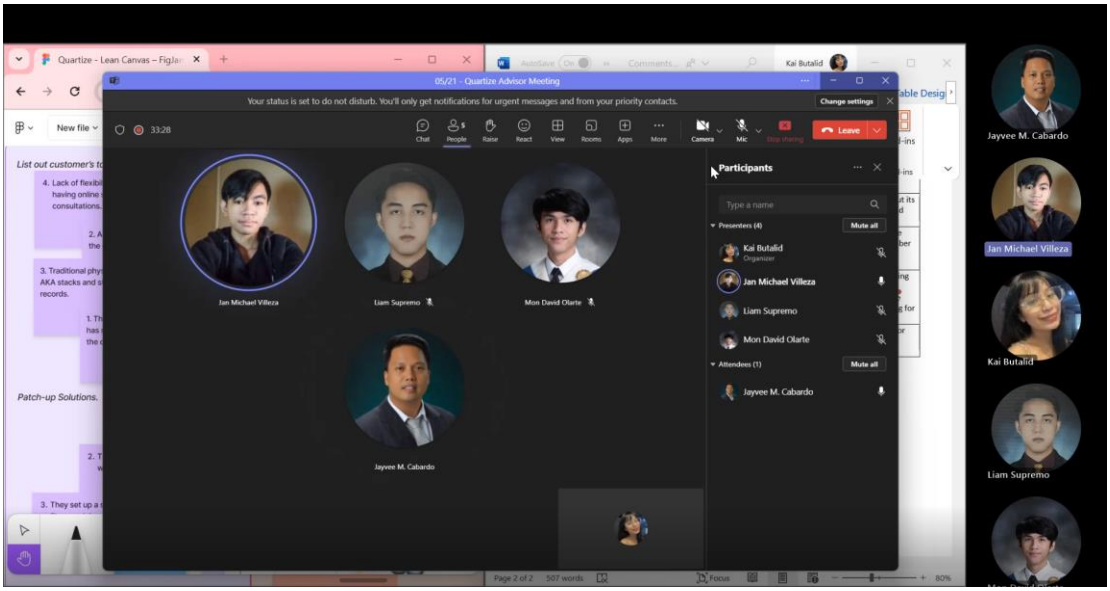


Fig. 16. First adviser meeting.


Fig. 17. Third meeting with the client.

## Appendix D: Clinic Pictures

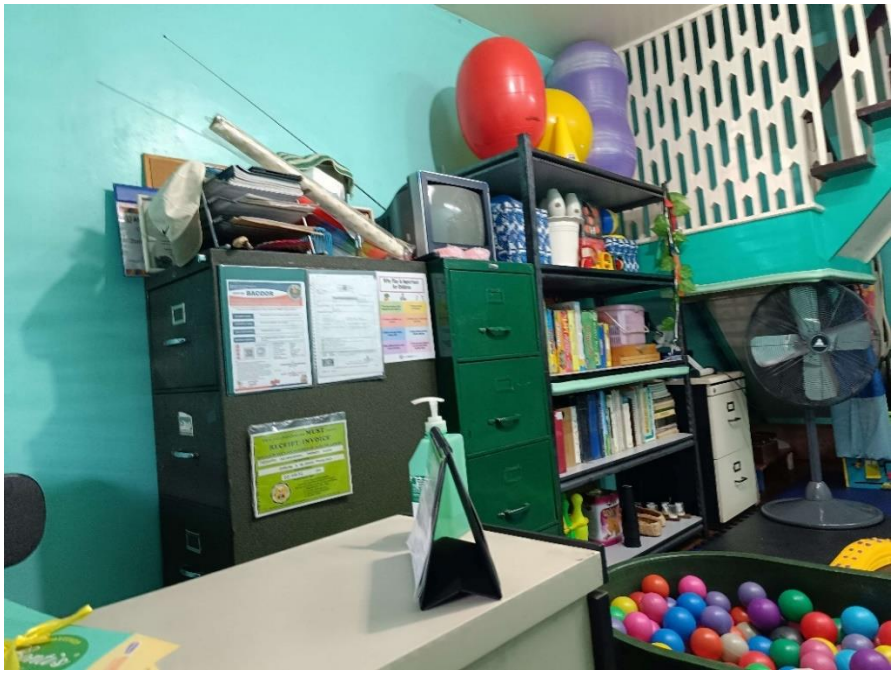

Fig. 18. Clinic's filing cabinets.

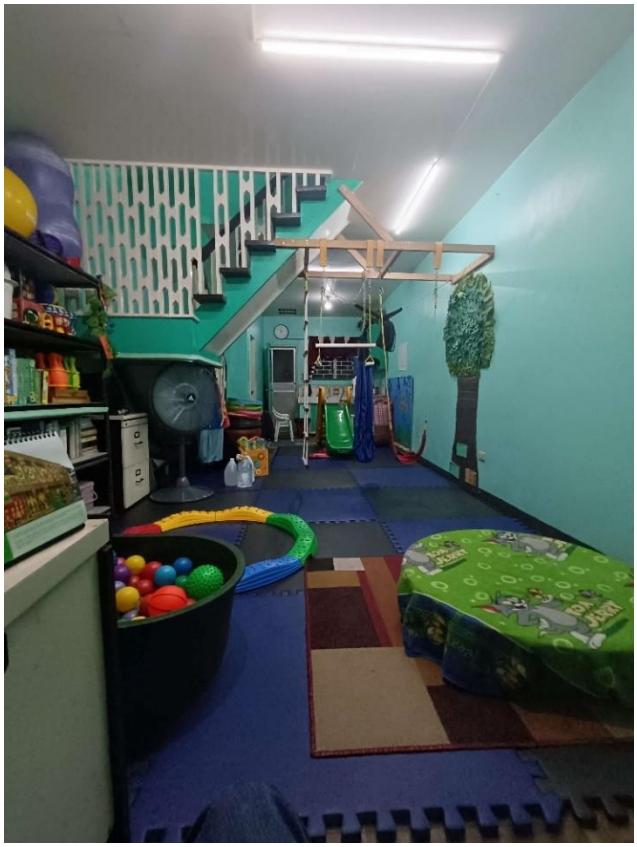

Fig. 19. Inside the clinic.

Fig. 20. Meeting with the client face to face.