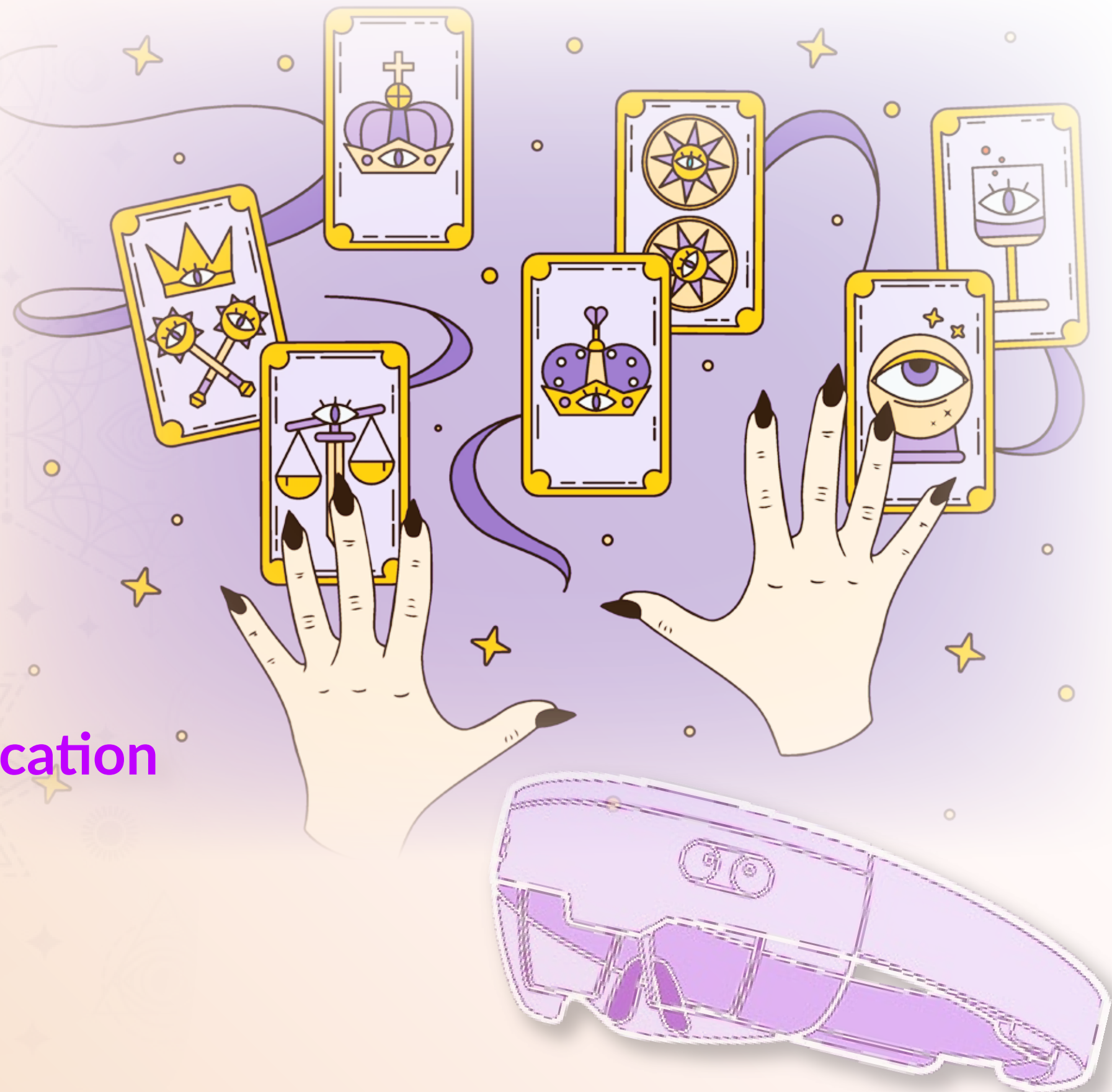


Virtual Tarot: A Mixed Reality application for Tarot Card Reading.

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Module: Designing for Immersion & Engagement
Module No. DESN5181M



Brief: Design Idea and Rationale

Virtual Tarot is a mixed reality application that allows users to experience the ancient art of tarot card reading (Arrien, 1997) through an immersive and interactive virtual environment. Each card in the virtual deck has its own unique symbolism allowing the users to receive personalized readings based on their selected cards (Media, 2017). The application combines cutting-edge augmented and virtual reality technologies to create a seamless and engaging experience (Milgram and Kishino, 1994) that brings the mystical world of tarot to life. This experience offers a unique and innovative way for the users to explore their inner selves and gain insights into their lives.

- Tarot card reading has been practiced for centuries as a means of gaining insight into the past, present, and future (Arrien, 1997). Virtual Tarot brings this ancient practice into the modern world by leveraging the power of mixed reality technology.
- By using a combination of augmented and virtual reality, the application creates an immersive experience (Milgram and Kishino, 1994) that allows users to feel as though they are sitting across from a real tarot card reader.
- The virtual environment provides a safe and private space for users to explore their inner selves, ask questions and receive guidance from the cards.
- Additionally, the application can appeal to a wide range of users including those who may be hesitant to visit a physical tarot reader or those who are simply curious about the art of tarot.
- The goal is to provide the users with a tarot reading experience that is more accessible, convenient, and personalized than traditional tarot readings.
- The experience is designed to provide users with an immersive and personalized tarot reading experience that goes beyond the physical constraints of traditional tarot readings such as the availability of a tarot reader or the need to be physically present for the reading.
- User research identifies the ability to ask specific questions and receive personalized interpretations as the most important feature and element of traditional tarot readings that users value (Giles, 1994; Arrien, 1997; Huson, 2004). Thus, in this mixed reality experience the users will be able to ask specific questions and receive personalized interpretations based on their individual needs and preferences by interacting with the virtual cards in a dynamic and engaging way.

User Research and Personal Expereince



Cards are shuffled and a Question is asked with faith and focus.



Using the Left hand, 10 cards are picked from a deck of 78 cards.



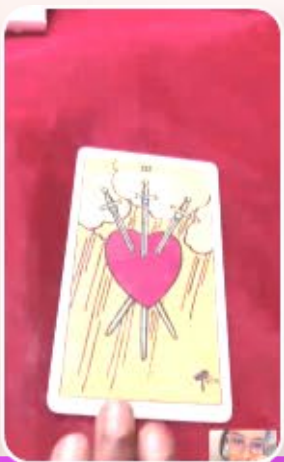
The 10 cards selected are placed in a specific pattern aligned to a strategically organized layout called the celtic display.



The placements of the cards in the layout are representations of conditions such as, past, present, near future, self, conscious mind, sub conscious mind, obstacle, environment, eventual future etc.



Each card in the virtual deck has its own unique symbolism.



The customer receives personalized readings based on their selected cards.



The readings are personalised responding to the Question asked by interpreting each card in the context of its placement position in the layout.



The ability to ask specific questions and receive personalized interpretations is the most important element of traditional tarot readings that the users value.



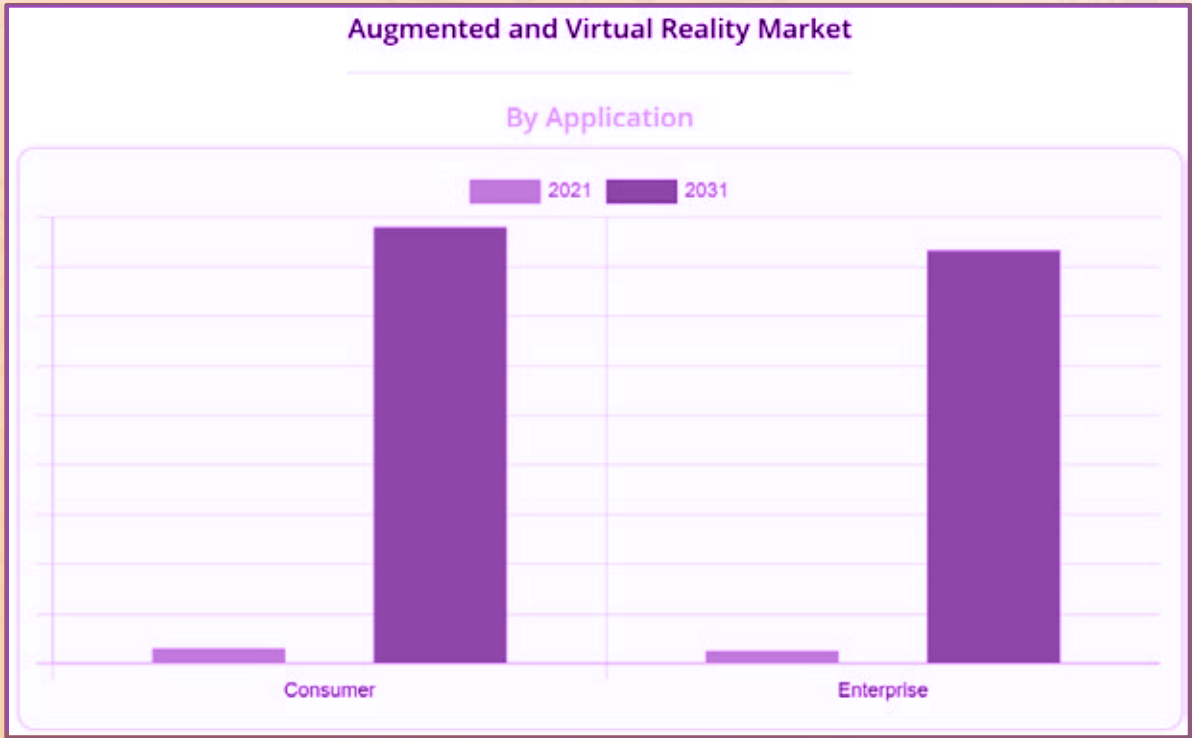
The reader helps the customer gain deeper insight into their inner self and their life by demonstrating the interpretation of key cards in the experience, explaining its symbolism and its relevance to the position placement in the layout.



The goal of the trained practitioner, the reader, is to provide the personalised readings to the customers as accurately possible, and the accuracy of their readings continue to improve with practice and experience.

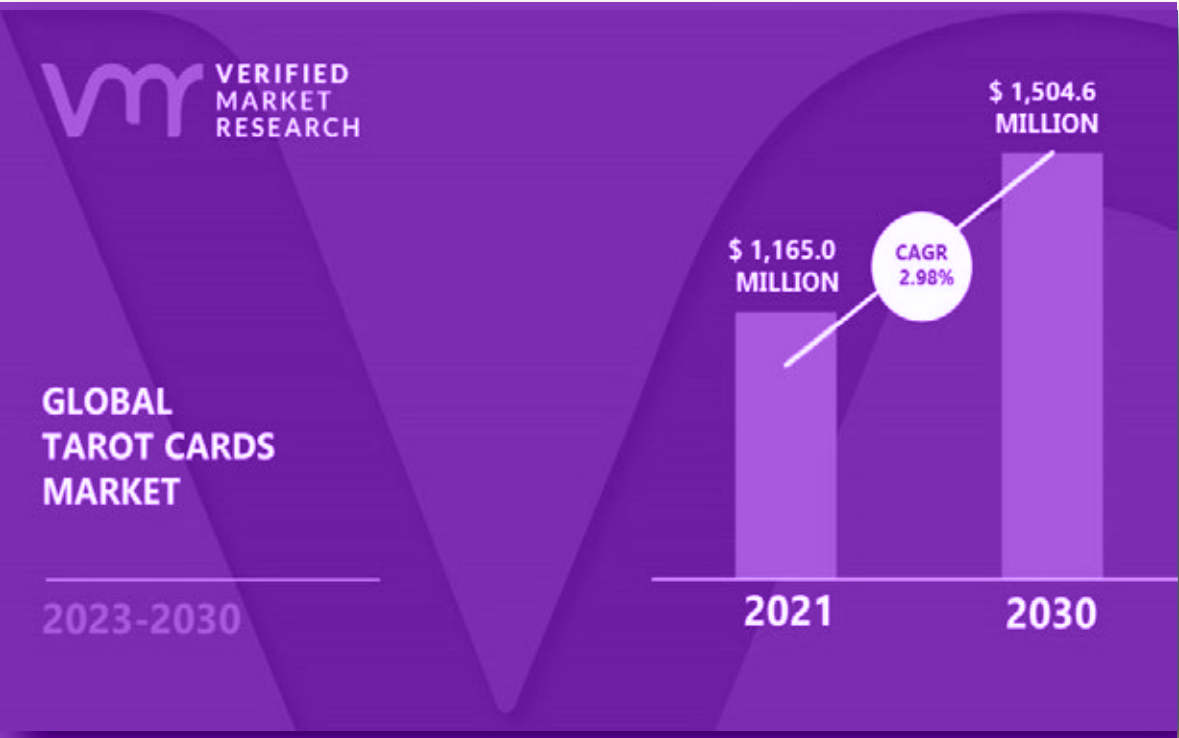
Market Survey

A recent report by Allied Market Research (2021) indicates that the worldwide market for augmented and virtual reality was worth \$27.6 billion in 2021 and is expected to increase to **\$856.2 billion by 2031**. The market is expected to grow at a **compound annual growth rate of 41.1% from 2022 to 2031**. MR-based applications combine both AR and VR technologies to create a more realistic experience for the user.



Allied Market Research. (2021). Virtual Reality Market by Component, Application, and Region: Global Opportunity Analysis and Industry Forecast, 2020-2030.

The market size for tarot cards was valued at \$1,165.0 million in 2021 and is expected to grow to **\$1,504.6 million by 2030**, with a **compound annual growth rate of 2.98% between 2023 and 2030**, according to Verified Market Research (2021). The increased popularity of online tarot card readings as a form of entertainment is a significant driver of market growth (Verified Market Research, 2021).



Verified Market Research. (2021). Global Tarot Cards Market Size By Product Type (French Suited Tarot Decks, German Suited Tarot Decks), By End-Users (Non-age and Major), By Channel (B2B and B2C), By Geographic Scope And Forecast.

Market Survey

Apps	Galaxy Tarot	Labyrinthos Tarot Reading	Golden Thread Tarot	Fool's Dog
Technology	AR	AR	AR	VR
Features	It has a simple and intuitive interface and provides detailed interpretations of each card. Users can use their device's camera to scan and view physical tarot cards, and the app will provide readings based on the cards that are displayed	The app's "Tarot School" feature allows users to learn about the meanings and interpretations of tarot cards through an AR experience where they can see the cards come to life on their device screen. Additionally, the app's "Tarot Reading" feature uses AR to scan physical tarot cards and provide a digital reading based on the cards that are displayed.The app has a wide range of decks to choose from.	The app uses VR technology to provide users with an immersive and personalized tarot reading experience. Users can create their own virtual tarot deck, select their preferred background and music, and then proceed to perform readings in a 3D environment. The app is designed to create a calming and relaxing atmosphere, and allows users to focus on their readings without distractions.	It has a unique 3D rendering of tarot cards, which makes the reading experience more engaging. Users can scan their physical tarot cards using their device's camera, and the app will recognize the cards and provide a digital reading based on the cards that are displayed. The app also includes features such as card of the day, a journal to record readings and interpretations, and the ability to share readings with others.
Differentiator	Large selection of tarot decks to choose from.	Offers tarot lessons and educational content.	Uses virtual reality technology.	Offers a wide selection of tarot decks, including historical reproductions.
OS Platform	iOS + Android	iOS + Android	iOS + Android	iOS + Android
Pricing	Free with in-app purchases	Free with in-app purchases	\$4.99	Varies by deck, but generally ranges from \$2.99 to \$9.99
Strength	Easy to use, offers personalized readings.	Easy to use, educational content.	Unique virtual reality experience.	Wide selection of tarot decks, accurate readings.
Weakness	Limited features without in-app purchases.	Limited features without in-app purchases.	Limited features compared to other apps.	Cost can add up if users want to purchase multiple decks.
Customer Review	Mixed reviews, some users find it helpful while others have reported glitches or inaccuracies in the readings.	Mostly positive reviews, users appreciate the educational content and personalized readings.	Mixed reviews, some users appreciate the virtual reality experience while others find it gimmicky.	Mostly positive reviews, users appreciate the wide selectionof decks and accuracy of the readings.

SWOT Analysis

- **Immersive experience:** A mixed reality-based tarot reading experience using a HoloLens can provide a highly immersive experience that feels more like a real-world interaction with the cards and the reader.
- **Interactive:** The use of mixed reality technology allows users to interact with the cards and the reading in a way that is not possible with traditional tarot readings.
- **Learning tool:** A mixed reality-based tarot reading experience can also serve as an educational tool for those who want to learn more about tarot cards and their meanings.
- **Privacy:** The virtual environment provides a safe and private space for users to explore their inner selves, ask questions and receive guidance from the cards.

- **Cost:** The HoloLens device is relatively expensive, which may make it inaccessible to some users.
- **Technical complexity:** The mixed reality technology used in the HoloLens is limited to windows OS and may be challenging for some users to set up and use, requiring technical knowledge or assistance.
- **Limited market:** The market for mixed reality-based tarot reading experiences using a HoloLens is still relatively small compared to traditional tarot readings, which may limit its adoption and growth.

Strength

Weakness

Opportunity

Threat

- **New user base:** A mixed reality-based tarot reading experience may attract new users who may be hesitant to visit a physical tarot reader or those who are simply curious about the art of tarot.
- **Personalization:** New features and capabilities may be added to enhance the personalization and accuracy of virtual tarot reading experience, for instance integration of Chat GPT.
- **Partnerships:** Collaborations with tarot deck creators or established tarot readers could bring new content and credibility to the mixed reality-based tarot reading experience.

- **Competitors:** There are many virtual tarot reading experiences available on various platforms, and the mixed reality-based tarot reading experience using a HoloLens may face competition from other platforms or technologies especially with respect to affordability and accessibility.
- **Skepticism:** Tarot readings are still considered by some to be a pseudoscience, which may deter some users from trying a mixed reality-based tarot reading experience.
- **Accuracy:** If the results are inaccurate or misleading, users may make decisions based on false information, which could have negative consequences.
- **Legal considerations:** If the app misrepresents their abilities, it could be considered fraudulent provoking a legal action.

Project Scope and Limitations

The scope of this project is to design a mixed reality tarot card reading application that utilizes mixed reality technology to create a unique and immersive tarot card reading experience. The application will allow users to receive a virtual tarot card reading using a HoloLens. The application will be designed to provide users with an personalized tarot card reading experience that reflects their individual needs and interests.

However, there are several limitations to consider for this work:

- **Accuracy of readings:** While the application can provide users with a virtual tarot card reading, it is important to note that the accuracy of the readings may not be the same as an in-person reading with a professional tarot card reader.
- **User experience:** The success of the application will depend on the user experience, and it may be challenging to create an immersive and intuitive user interface that accurately simulates an in-person tarot card reading experience engaging with a human reader. Users should understand the limitations of the technology and be aware of any potential biases or errors.
- **Technical limitations:** The integration of AI to provide users with personalised readings in response to the specific personal questions asked in the experience will depend on the successful integration of ChatGPT with Unity.
- **Ethical considerations:** Tarot card readings can be a sensitive and personal experience thus it is important to consider the ethical implications of providing virtual tarot card readings via a technological medium. Users must be informed about the nature of the virtual tarot card reading experience, the potential risks and benefits of participating. The readings must avoid perpetuating stereotypes or using cultural symbols inappropriately.

Considering these limitations, the application will be designed to provide a fun and engaging tarot card reading experience, but it is important to note that it may not replace the experience of an in-person reading with a professional tarot card reader.

User Persona #1



Rachel Patel

The “Skeptical Seeker”

Age: 35 Years

Education: Bachelor's degree

Occupation: Professional, Manager

Income: \$100K - \$150K Per annum

Relationship Status: Married

Location: Chicago, Illinois, USA

Personality traits: Analytical, logical, curious, open-minded

“ I'm not sure I believe in the accuracy of tarot readings, but I'm curious to see what insights the cards might offer me. ”

A 35-year-old business professional is a “skeptical seeker” who is curious about tarot card readings but is somewhat skeptical of the practice. She is interested in exploring a virtual tarot experience to gain a deeper understanding of how tarot readings work and to see if there is any truth to the predictions. She prefers a more educational experience that explains the meaning behind each card.

GOALS:

- Gain a better understanding of how tarot readings work.
- See if there is any truth to the predictions.
- Learn more about the meanings behind each card.

MOTIVATION:

- Curiosity about the tarot card reading experience.
- Desire to learn more about the meanings and interpretations of the cards.
- Hoping to gain insight into their own life or future.

FRUSTRATION:

- Unsure about the validity of the readings.
- Finding the experience overwhelming or confusing.
- Feeling like the experience is not personalized enough.

User Persona #2



Sofia Singh

The "Spiritual Explorer"

Age: 27 Years

Education: College

Occupation: Creative Industry,
Artist

Income: \$75K - \$100K Per annum

Relationship Status: Single

Location: Vancouver, Canada

Personality traits: Introspective,
creative, spiritual, open-minded

“I've always been drawn to spirituality and I'm excited to explore tarot readings as a tool for self-discovery.”

A 27-year-old yoga instructor is a “spiritual explorer” who is interested in exploring different spiritual practices. She is drawn to tarot readings and see it as a tool for self-discovery and personal growth. She is likely to use the virtual tarot application frequently and may prefer a more immersive experience that allows them to interact with the virtual cards and receive personalized insights based on their own life experiences.

GOALS:

- Use the tarot cards as a tool for self-discovery and personal growth.
- Connect with the spiritual aspects of tarot readings.
- Receive personalized insights based on their own life experiences.

MOTIVATION:

- Interest in spiritual practices and personal growth.
- Belief in the power and potential of tarot card readings.
- Desire to gain deeper insights into their own psyche and life path.

FRUSTRATION:

- Tarot card readers not providing enough depth or complexity to the readings.
- The tarot readings not providing enough guidance or support for navigating life's challenges.

User Persona #3



Tyler Lee

The "Entertainment Enthusiast"

Age: 21 Years

Education: High School

Occupation: Part-time Job, Student

Income: 15K - 20K GBP Per annum

Relationship Status: Single

Location: London, United Kingdom

Personality traits: Outgoing, social, adventurous, curious

“ I'm curious to see what the cards might reveal about myself and my friends and have a good time doing it.. ”

A 21-year-old college student is an “entertainment enthusiast” who is looking for fun and entertaining ways to spend their free time. He is not particularly interested in the spiritual aspects of tarot readings but is intrigued by the idea of a virtual experience. He is likely to use the virtual tarot for entertainment purposes and share the experience with friends and family.

GOALS:

- Have fun and enjoy the experience.
- Discover new and interesting insights about themselves.
- Share the experience with friends and family.

MOTIVATION:

- Seeking fun and engaging experiences.
- Curiosity about tarot card readings as a form of entertainment.
- Desire to discover new insights and perspectives about themselves.

FRUSTRATION:

- Missing entertainment value in the experience.
- Looking for enough variety to have fun and enjoy the experience.

User Scenarios and Design Mapping

SCENARIO #1 THE "SKEPTICAL SEEKER"

Rachel Patel is a busy professional who has always been skeptical about tarot card readings. She's curious to try it out, but wants to learn more about how it works and what to expect. She downloads a mixed reality-based virtual tarot card reading app and is immediately drawn into a visually appealing, immersive experience. The app provides her with a brief introduction to tarot card readings and explains the process step by step. The app also provides detailed explanations of each card's meaning and interpretation, helping her to better understand the insights she receives from the reading. By the end of the experience, Rachel feels like she's gained a new perspective on herself and is excited to explore more tarot readings in the future.

SCENARIO #2 THE "SPIRITUAL EXPLORER"

Sofia Singh is a spiritual explorer who is passionate about discovering new tools and practices for personal growth. She's been interested in tarot card readings for a while and is excited to try out a mixed reality-based virtual tarot card reading app. The app provides her with a personalized and intuitive experience with a detailed explanation of the cards and their meanings, and encourages her to reflect on how they relate to her own life experiences. The app also provides her with guidance and affirmations to help her connect with her inner self and navigate life's challenges. By the end of the experience, Sofia feels more in tune with herself and is eager to continue exploring her spiritual journey through tarot readings.

SCENARIO #3 THE "ENTERTAINMENT ENTHUSIAST"

Tyler Lee is an entertainment enthusiast who is always looking for new and exciting experiences to share with his friends. He discovers a mixed reality-based virtual tarot card reading app and is intrigued by the concept. He invites his friends over and they all experience the app together. They have a great time interpreting the meanings of the cards. The app provides them with a fun and interactive experience that keeps them engaged and entertained throughout. By the end of the experience, Tyler and his friends feel like they've learned more about themselves and each other, and are excited to share their insights with others. They make plans to continue exploring tarot card readings together in the future.

USER: LAUNCHES APP

VT: PRESENTS THE USER WITH A DECK OF TAROT CARDS AND PROMPTS ITS TO PICK CARDS USING HAND GESTURES.

USER: PICKS 3 CARDS FROM THE DECK AND PLACES THEM ON THEIR RESPECTIVE MARKED POSITIONS 1, 2 AND 3.

USER: INPUTS A QUESTION AND THE NAME OF THE CARDS IN THE CHAT BOX.

VT: PROVIDES DETAILED EXPLANATION OF EACH CARD'S MEANING. AND APPLIES CARD MEANINGS TO THE QUESTION ASKED BY USER TO GIVE A PERSONALIZED READING.

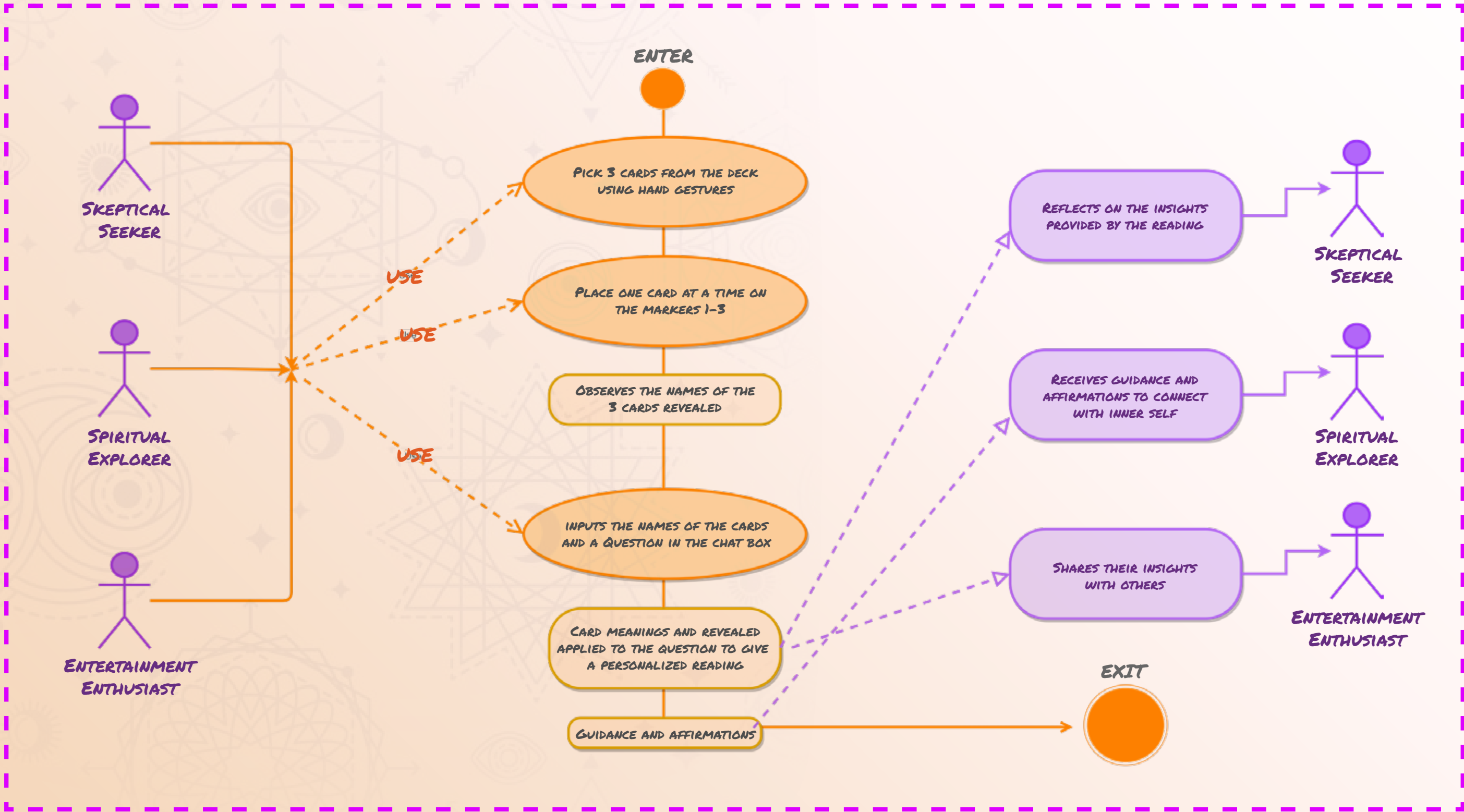
USER: REFLECTS ON THE INSIGHTS PROVIDED BY THE READING.

USER: RECEIVES GUIDANCE AND AFFIRMATIONS TO CONNECT WITH THEIR INNER SELF.

USER : SHARES THEIR INSIGHTS WITH OTHERS.

USER: EXITS APP OR EXPLORES FURTHER BY TRYING AGAIN.

Scenario: Use Case Diagram



Synthesis: Use Case Specification Table

Use Case Name	Virtual Tarot (VT)	Actors	User, Chatbot/VT
Goal	To provide the user with a personalized virtual tarot card reading experi-		
Preconditions	User has a compatible device to run the mixed reality-based virtual tarot card reading app. User has an internet connection. User has launched the app.		
Main Flow	User picks 3 cards from the deck, places them on markers and inputs the name of the card in the chat box as it is revealed. App provides detailed explanations of each card's meaning. User types a question in the chat window. App applies card meanings to the question asked by user to give a personalized reading. User reflects on the insights provided by the reading. User receives guidance and affirmations to connect with their inner self. User shares their insights with others. User exits app.		
Alternate Flow 1: No Questions Asked	User launches the app without typing a question in the chat window. App provides a general reading for the user without personalization.		
Alternate Flow 2: Fewer than 3 Cards Selected	User picks fewer than 3 cards from the deck. App provides a reading based on the cards selected by the user.		
Alternate Flow 3: No Internet Connection	User launches the app without an internet connection. App displays an error message and prompts the user to connect to the internet.		
Postconditions	User receives a personalized virtual tarot card reading experience. User has the option to share their insights with others. User exits the app.		
Assumptions	The app is compatible with the user's device. The app has a reliable internet connection. The chatbot provides accurate and helpful interpretations of the tarot cards. The user is familiar with the basics of tarot card readings		

Ideation: Brainstorming

VIRTUAL TAROT CARDS AND READER

Should the virtual reader have a specific personality?

- WISE OLD SAGE
- FRIENDLY SPIRITUAL GUIDE

How can we provide both image and text descriptions of each tarot card to enhance the user's understanding?

- HIGH-QUALITY GRAPHICS
- BRIEF SUMMARY OF THE CARD'S MEANING AND SIGNIFICANCE.

Can we add animations to make the tarot cards come alive and create a more immersive experience?

- ZOOM-IN EFFECT WHEN A CARD IS REVEALED

USER INTERFACE

How can we make the virtual tarot card deck look visually appealing and easy to use?

- MINIMALIST DESIGN
- SIMPLE, ELEGANT GRAPHICS
- MYSTICAL SYMBOLS OR IMAGERY
- CLEAN LAYOUT.

What colors, fonts, and backgrounds should we use to create a calming and mystical atmosphere?

- SOFT, MUTED COLORS
- SERIF FONTS
- SOOTHING SPATIAL SOUND
- GENTLE INSTRUMENTAL MUSIC
- SOUND OF WIND CHIMES.

Can we add animations or special effects to enhance the user experience?

- CHARACTER ANIMATIONS FOR VIRTUAL THE TAROT READER
- SPECIAL EFFECTS SUCH AS A GLOW EFFECT OR SHIMMER EFFECT FOR THE TAROT CARDS

USER INTERACTION

How can we create a chat functionality that feels natural and intuitive for users to ask questions or seek clarification?

- CHAT GPT INTEGRATION

What navigation options should we provide to help users move between scenes?

- CLEAR NAVIGATION OPTIONS
- CALL TO ACTION BUTTONS

Can we integrate social media to allow users to share their readings with friends and family?

- SAVE AND SHARE OPTIONS
- INTEGRATING SOCIAL MEDIA

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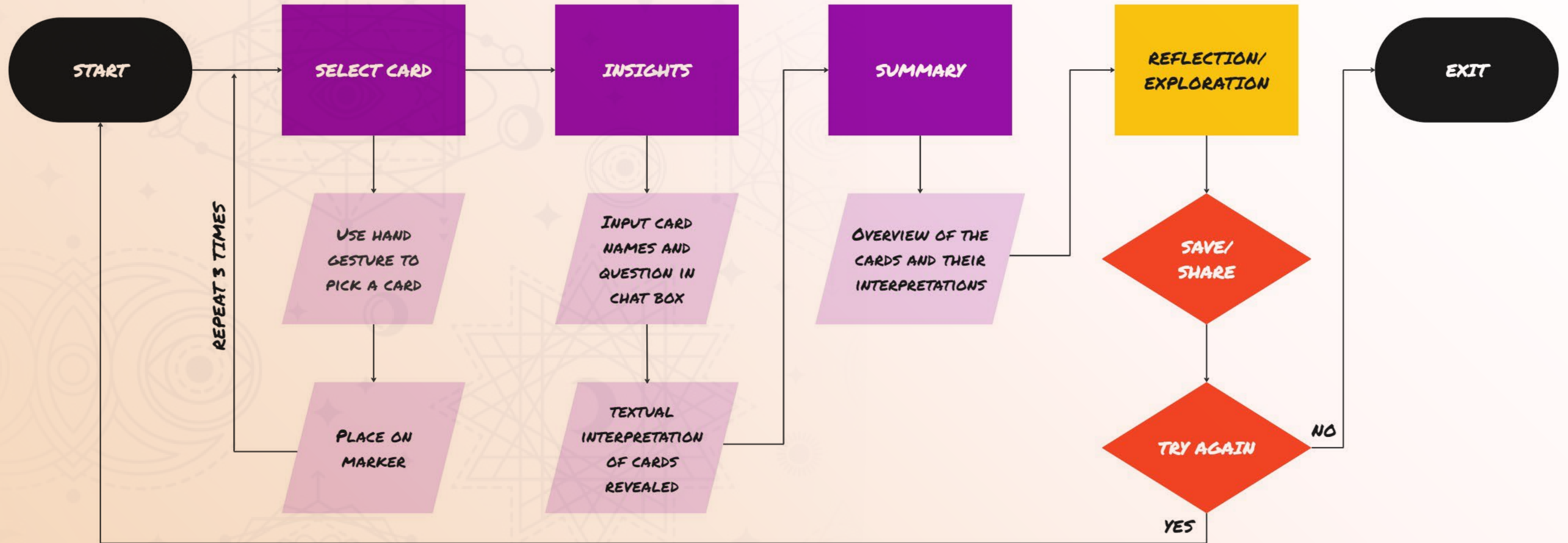
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- CLEAR NAVIGATION OPTIONS
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Can we integrate social media to allow users to share their readings with friends and family?

- SAVE AND SHARE OPTIONS
- INTEGRATING SOCIAL MEDIA

Workflow



User Journey Map

User Experience

Solution

Virtual Tarot

Goals:

- Learn more about the meanings behind each card.
- Receive personalized insights based on their own life experiences.
- Share the experience with friends and family.

Frustrations:

- Finding the experience overwhelming or confusing.
- Tarot card readers not providing enough depth or complexity to the readings.
- Feeling like the experience is not personalized enough.

Stage 1 :
Cards Selection

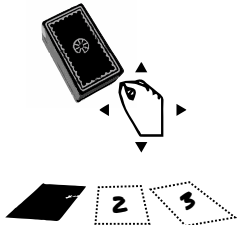
Stage 2 :
Interpretation

Stage 3 :
Personalized Insights

Stage 4 :
Summary

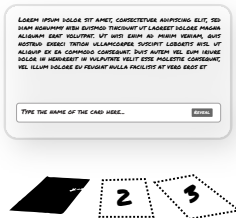
Stage 5 :
Reflection/ Exploration

User:
"How do I pick cards and
where do I place them?"



Action 1: Select card from the deck
using hand gestures.
Action 2: Place on the markers.

User:
"What does my cards selection
reveal about me?"



Action 3:
Input the name of the card in the
chat box to reveal interpretation.

User:
"I have been suffering from finanacial
and emotional distress. What do my cards reveal
about my future health, career and relationships? "



Action 4:
Input personal question in the chat box to reveal
additional insights and interpretaions based on life
experiences.

User:
"I feel there is alot there is alot to take in.
Can I review my readings?"



LOREM IPSUM DOLOR SIT AMET, CONSECTETUR ADIPISCING ELIT, SED DO eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Action 5:
Taps on the CTA button for a reveal
of an overview of the readings
summerizing insights from the
entire experience.

User:
"Can I share my readings with others
or my personal records for self reflection?"



Action 6:
Taps on Save / Share to share the experience
with self or friends and family. Taps on next
for options on further explortaion or to end
the experience.

Opportunities

- Include a standard set of 78 tarot cards in the virtual deck, and use a randomization algorithm to shuffle and select cards for each reading.

- Add animated visuals to provide additional context can enhance the user's understanding and engagement with the experience.

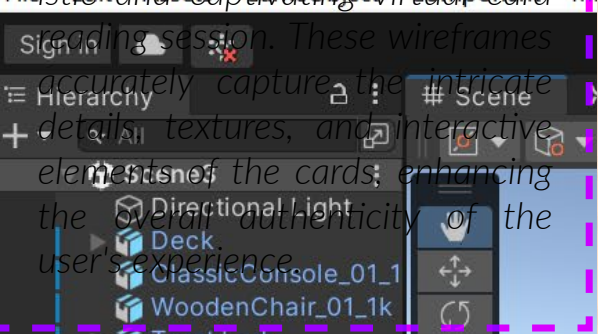
- Add voice commands and give the Virtual reader a natural conversational voice over to make it sound more human-like and engaging.
- Chat functionality also allowing users to ask questions or seek clarification at any point during the reading.

- Offering multiple language options can make the experience more accessible to a wider audience.

- Integrating social media can allow users to easily share their readings with others, increasing engagement and reach.

Wireframe

High fidelity wireframes created in Unity for HoloLens provide an immersive and visually stunning representation of the tarot cards, allowing users to interact with a Platform Fidelity and capturing the virtual card reading session. These wireframes accurately capture the intricate details, textures, and interactive elements of the cards, enhancing the overall authenticity of the user's experience.



SCENE TITLE
LAUNCH

USER INPUT

CIRCLE ALL THAT APPLY

- ☒ AIR TAP
- ☐ DOUBLE AIR TAP
- ☐ VOICE INPUT
- ☐ DRAG
- ☐ HOLD
- ☐ BLOOM
- ☐ GAZE

REALITY SEQUENCE



USER SELECTION

START BUTTON



AUDIO
360

“ SOUND EFFECT - MRTK GEM ”

SCENE TITLE
SUMMARY + REFELCTION

USER INPUT

CIRCLE ALL THAT APPLY

- ☒ AIR TAP
- ☐ DOUBLE AIR TAP
- ☐ VOICE INPUT
- ☐ DRAG
- ☐ HOLD
- ☐ BLOOM
- ☐ GAZE

REALITY SEQUENCE



USER SELECTION

BUTTONS



AUDIO
360

“ MUSIC FROM #UPPBEAT (FREE FOR CREATORS!):
[HTTPS://UPPBEAT.IO/T/AMBIENT-BOY/MINDFULNESS-JOURNEY](https://uppbeat.io/t/ambient-boy/mindfulness-journey)
LICENSE CODE: CTZIZ9ERYK3TP3QC ”

SCENE TITLE
SELECTION + READING

USER INPUT

CIRCLE ALL THAT APPLY

- ☒ AIR TAP
- ☐ DOUBLE AIR TAP
- ☐ VOICE INPUT
- ☐ DRAG
- ☐ HOLD
- ☐ BLOOM
- ☐ GAZE

REALITY SEQUENCE



USER SELECTION

CARDS, KEYBOARD
+ BUTTONS



AUDIO
360

“ MUSIC FROM #UPPBEAT (FREE FOR CREATORS!):
[HTTPS://UPPBEAT.IO/T/AMBIENT-BOY/MINDFULNESS-JOURNEY](https://uppbeat.io/t/ambient-boy/mindfulness-journey)
LICENSE CODE: CTZIZ9ERYK3TP3QC ”

SCENE TITLE
FURTHER EXPLORATION / EXIT

USER INPUT

CIRCLE ALL THAT APPLY

- ☒ AIR TAP
- ☐ DOUBLE AIR TAP
- ☐ VOICE INPUT
- ☐ DRAG
- ☐ HOLD
- ☐ BLOOM
- ☐ GAZE

REALITY SEQUENCE



USER SELECTION

BUTTONS



AUDIO
360

“ MUSIC FROM #UPPBEAT (FREE FOR CREATORS!):
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Functionalities

OBJECTIVE: Display virtual tarot card deck
FUNCTION: Render virtual tarot card deck in mixed reality

OBJECTIVE: Introduce users to the virtual tarot experience
FUNCTION: Present introductory text and visuals

OBJECTIVE: Allow card selection using hand gestures
FUNCTION: Implement hand gesture recognition

OBJECTIVE: Place selected card on the designated marker
FUNCTION: Track hand movement and position in mixed reality

OBJECTIVE: Input card names and enable user question and clarifications in the chat box
FUNCTION: Provide a chat interface for user input and implement a text-based chat for user queries

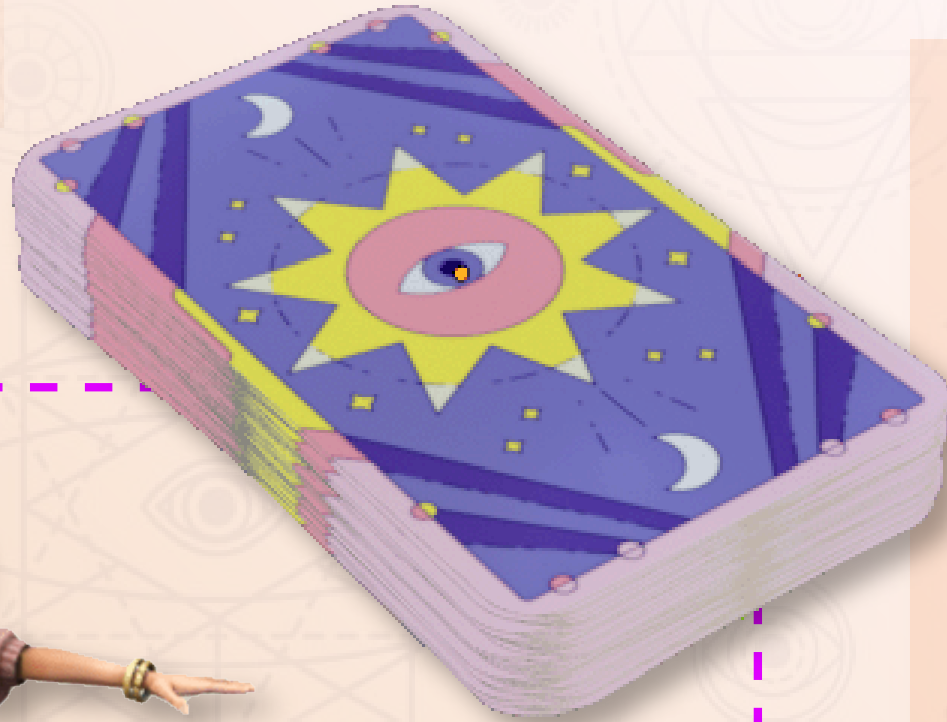
OBJECTIVE: Interpret and provide personalised insight and interpretations for each card
FUNCTION: Access a database of card interpretations and generate personalized responses based on user input via open AI language model integration

OBJECTIVE: Summarize the reading and provide overview
FUNCTION: Compile card selections and their meanings

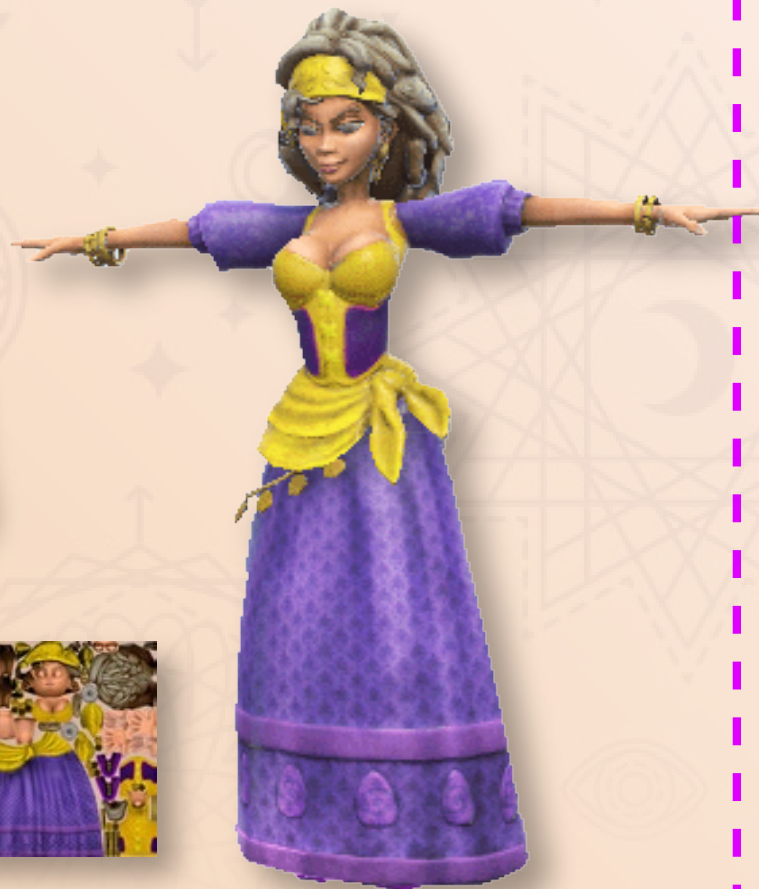
OBJECTIVE: Save or share the reading for future reference
FUNCTION: Implement save and share functionality

OBJECTIVE: Offer recommendations for further exploration or exit
FUNCTION: Display buttons for retrying or ending the experience

3D Resources



- The 3D organic model of the **Virtual Tarot Lady** character was sourced from Mixamo and customized to match the theme of the experience by adjusting textures using Photoshop.
- The textures for the **Tarot cards** and deck were obtained from freepik.com and applied as materials for the 3D models created in Blender.
- For the inorganic **3D assets**, such as vintage furniture was sourced from Polyhaven and an antique candlestick was sourced from Turbosquid, and their textures were modified to enhance the ambiance of the experience.
- The **3D buttons and virtual keyboard** were acquired from the MRTK (Mixed Reality Toolkit) and modified to align with the overall theme of the virtual tarot card reading app.
- Additional assets utilized in the project include the **spatial sounds** "Mindfulness Journey," sourced from Uppbeat with a free license for creators (License code: CTZIZ9ERYK3TP3QC), and the Chat GPT integration, sourced from GitHub and OpenAI.



Design Techniques

IMMERSION AND VIRTUAL ENVIRONMENT

- **Rich Virtual Environment:** Designed a visually rich and immersive virtual environment (Wienrich, Komma, Vogt, and Latoschik, 2021), featuring carefully crafted 3D assets and thematic elements to create a captivating atmosphere for the tarot card reading experience.
- **Contextual Ambience:** Leveraged appropriate soundscapes, and environmental details (Wienrich, Komma, Vogt, and Latoschik, 2021) such as antique aesthetics to reinforce the desired mood and ambience for the virtual tarot card reading setting.

EMOTION AND COGNITION

- **Emotional Design:** Incorporated design elements, such as color palettes (playful), ambient music (calm/ spiritual), character animations (interactive) and environment aesthetics (vintage/ antique) to capture the mood and engage users on an emotional level during the tarot card reading process (Norman, 2004).
- **Cognitive Load Management:** Ensured a balanced cognitive load by presenting information and feedback in a clear and digestible manner, facilitating comprehension and decision-making for users (Sweller, Ayres, and Kalyuga, [no date]).

OPENAI INTEGRATION

- **Chat GPT Integration:** Integrated the Chat GPT from OpenAI and Github by Greason (2023) to enable text-based interactions and conversations between the user and the virtual tarot reader, providing personalized and dynamic responses based on user input.

INTERACTIONS

- **Intuitive Gestures:** Employed hand gestures for selecting and placing tarot cards, providing a natural and immersive interaction experience (Wienrich, Komma, Vogt, and Latoschik, 2021).
- **Responsive Feedback:** Implemented visual and sound feedback to acknowledge user interactions, ensuring a responsive and engaging interface (Norman, 2013; Hartson and Pyla, 2012).

NAVIGATIONS

- **Clear Navigation Hierarchy:** Designed a clear and hierarchical navigation system (Krug, 2000; Hartson and Pyla, 2012) to guide users through the different stages of the tarot card reading, ensuring a seamless user experience.
- **Minimalistic UI:** Adopted a minimalistic and unobtrusive user interface (Google, 2000; Hartson and Pyla, 2012), allowing users to focus on the virtual tarot cards and their interpretations.

GRAPHICS AND ANIMATIONS

- **Visually Rich Tarot Cards:** Created visually appealing and detailed tarot card designs, leveraging high-quality textures and intricate illustrations to enhance the aesthetic appeal of the virtual cards (Hartson and Pyla, 2012).
- **Smooth Animations:** Utilized smooth and fluid animations for transitions and virtual reader interactions, providing a polished and immersive experience.

3D CHARACTER AND MODELING

- **Virtual Tarot Lady:** Developed a realistic and visually appealing 3D model of the virtual tarot reader, paying attention to details such as gestures, and attire to create an authentic character representation.
- **Texturing and Shading:** Applied high-quality textures and shading techniques to the 3D character model, ensuring a visually appealing and believable appearance.

3D SPATIAL SOUND

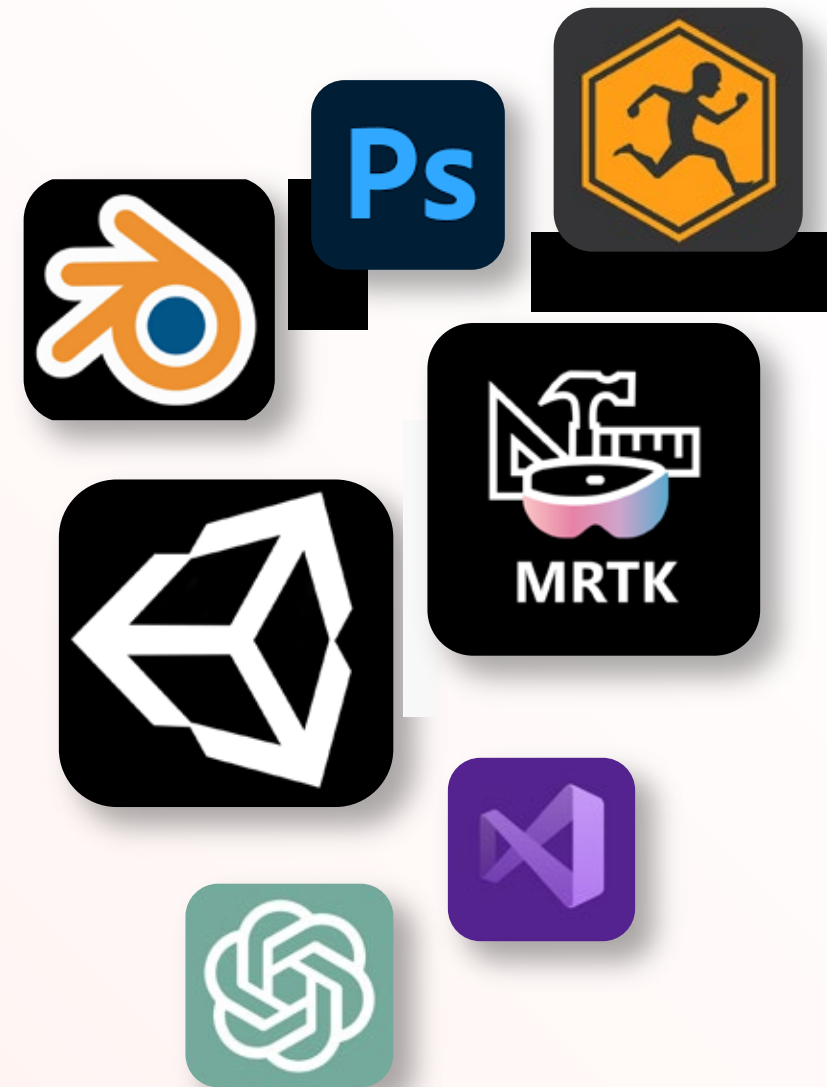
- **Ambient Music:** Incorporated calming and immersive background music, such as 'Mindfulness Journey' (License code: CTZIZ9ERYK3TP3QC) to create a soothing and introspective atmosphere during the tarot card reading experience.
- **3D Sound Effects:** Integrated subtle audio cues and sound effects to enhance user interactions, reinforcing the responsiveness of the virtual environment.

VIRTUAL TAROT

Development: Tools, Software and Plugins

Several tools, software, and plugins were applied in the development process to bring together various aspects of the mixed reality experience , to enhance the overall user experience, foster engagement, and create a compelling and immersive virtual tarot card reading prototype.

- **3D Modeling and Texture Modification:** Blender was used to create and edit the 3D models for the virtual tarot cards and deck and facilitated texture painting to customize and enhance the appearance of other 3D assets. Adobe Photoshop was used to modify and create textures for the virtual character, tarot cards, deck, and other 3D assets. Unity provided tools to import and apply the textures to the 3D models, ensuring they looked visually appealing in the virtual environment
- **Character Customization and Animation:** Mixamo was used to select and customize pre-rigged 3D characters, enabling the integration of the virtual tarot lady character into the prototype. Unity was used to import the Mixamo character model and apply animations for the virtual tarot lady's movements and gestures during the card reading.
- **Interaction Implementation and Navigation:** Mixed Reality Tool Kit (MRTK), along with Unity and Visual Studio C#, enabled the implementation of hand gesture recognition and user interactions for selecting and placing tarot cards. Unity, through scripting in Visual Studio C#, allowed the development of custom interactions and navigations within the virtual tarot card reading experience.
- **UI Essentials:** MRTK canvas provided ready-to-use UI components, such as buttons and text input field, which were seamlessly integrated into the prototype to enhance the user interface and interactions.
- **AI Integration:** OpenAI's ChatGPT was integrated into Unity using Visual Studio C# scripting, enabling dynamic and interactive conversations between the virtual tarot reader and the user.
- **Sound Deisgn:** Unity's audio tools and components were employed to implement 3D sound effects and spatial audio, enhancing the overall immersion of the virtual tarot card reading app.
- **Virtual Environment Creation and Scene Development:** Unity's scene editor and tools were utilized to design and build the virtual environment, including lighting, effects, and spatial layout, contributing to an immersive mixed reality experience. MRTK provided a framework and components for creating mixed reality virtual scenes, allowing for the integration of 3D assets, interactions, and immersive features within the prototype.



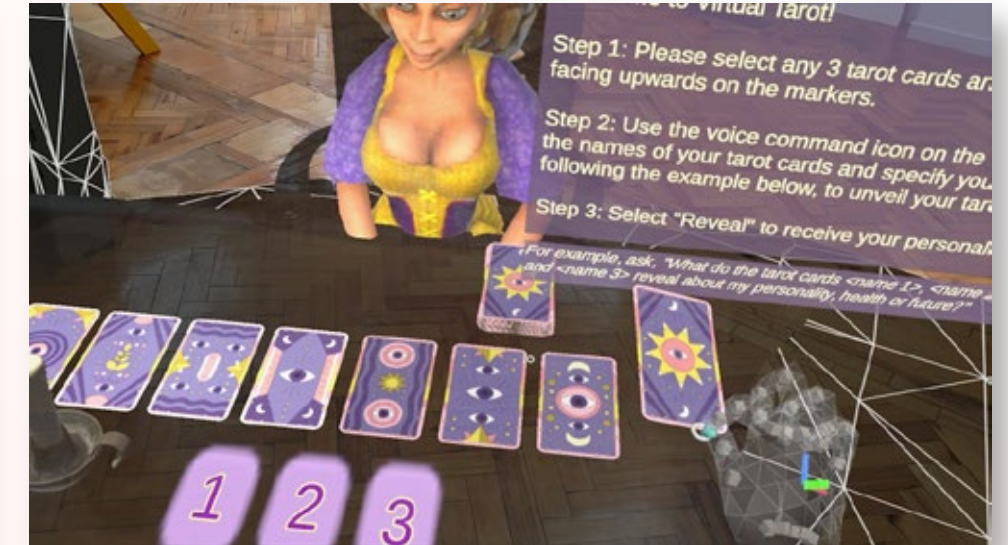
Design Production: Final Outcome



LAUNCH SCENE - INTRODUCTION TO VIRTUAL TAROT APP. USER SELECTS START BUTTON TO ENTER THE EXPERIENCE.



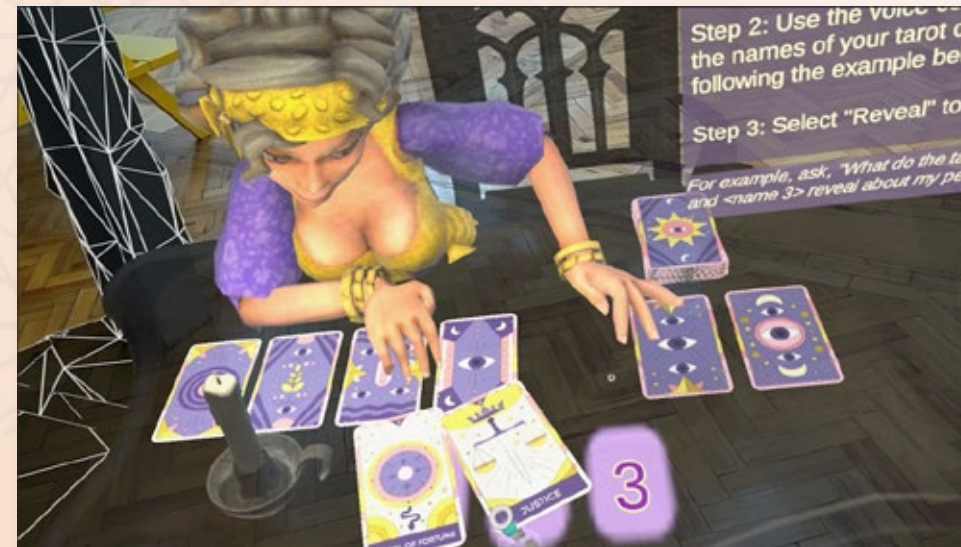
ENTER VIRTUAL TAROT EXPERIENCE. USER FOLLOWS INSTRUCTIONS ON THE VIRTUAL SCREEN.



USER SELECTS FIRST CARD FROM THE DECK USING HAND GESTURES.



USER SELECTS SECONDS CARD FROM THE DECK USING HAND GESTURES.



EVERY CARD SELECTED IS PLACED FACING UPWARD ON THE MARKERS. VIRTUAL TAROT READER OBSERVES THE CARDS BEING REVEALED FOR INTERPRETATION.



USER SELECTS THIRD AND FINAL CARD FROM THE DECK USING HAND GESTURES.

Design Production: Final Outcome



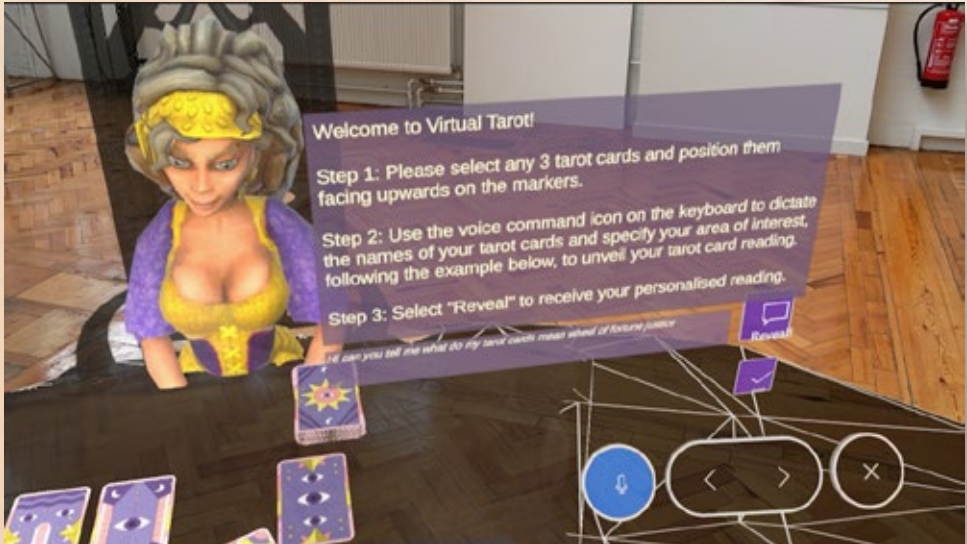
USER ENABLES THE INPUT FIELD USING HAND GESTURES TO ASK THE TAROT READER WHAT THE CARDS REVEAL.



VIRTUAL KEYBOARD IS ENABLED FOR THE USER TO INPUT THE NAMES OF THE CARDS SELECTED AND ASK FOR INSIGHTS AND INTERPREATION ABOUT ANY AREA OF INTEREST.



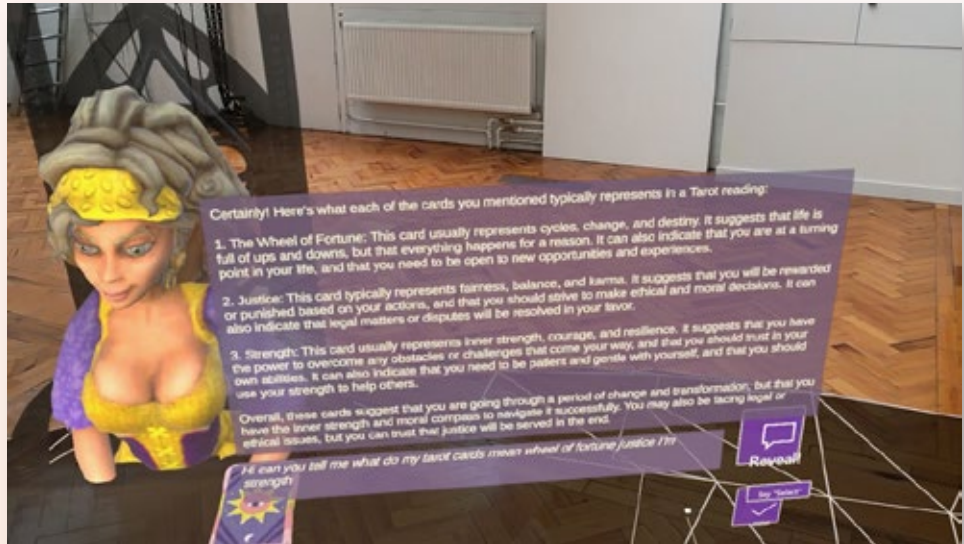
USER ENABLES THE SPEECH RECOGNITION OPTION ON THE KEYBOARD TO PROVIDE THE INPUT USING VOICE COMMAND.



THE INPUT FIELD TYPES THE INPUT PROVIDED BY THE USER VIA SPEECH RECOGNITION.

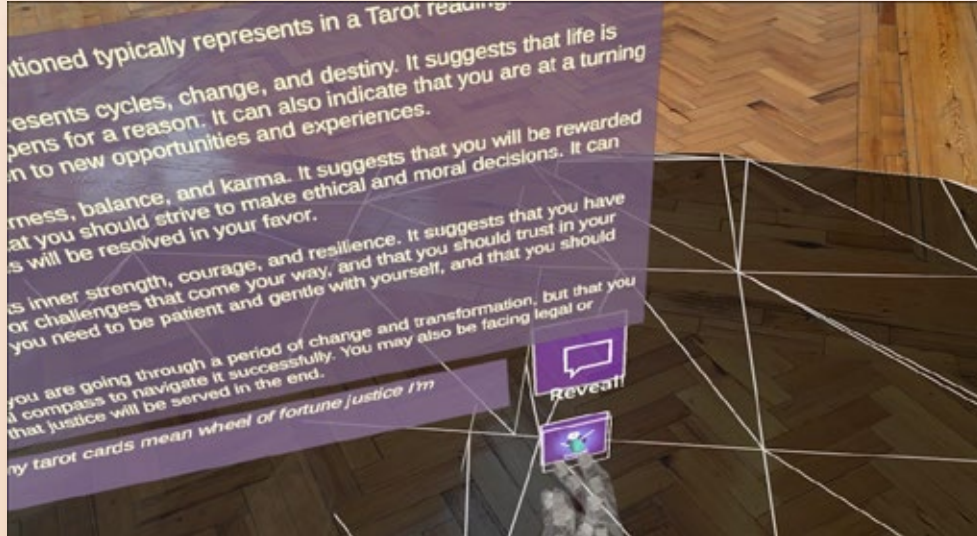


USER SELECTS THE "REVEAL" BUTTON USING HAND GESTURES TO GAIN A RESPONSE FOR HIS INPUT.



VIRTUAL TAROT READER RESPONDS TO THE USER'S INPUTS IN REAL TIME PROVIDING RELEVANT INSIGHTS AND INTERPRETATION VIA OPEN AI INTEGRATION

Design Production: Final Outcome



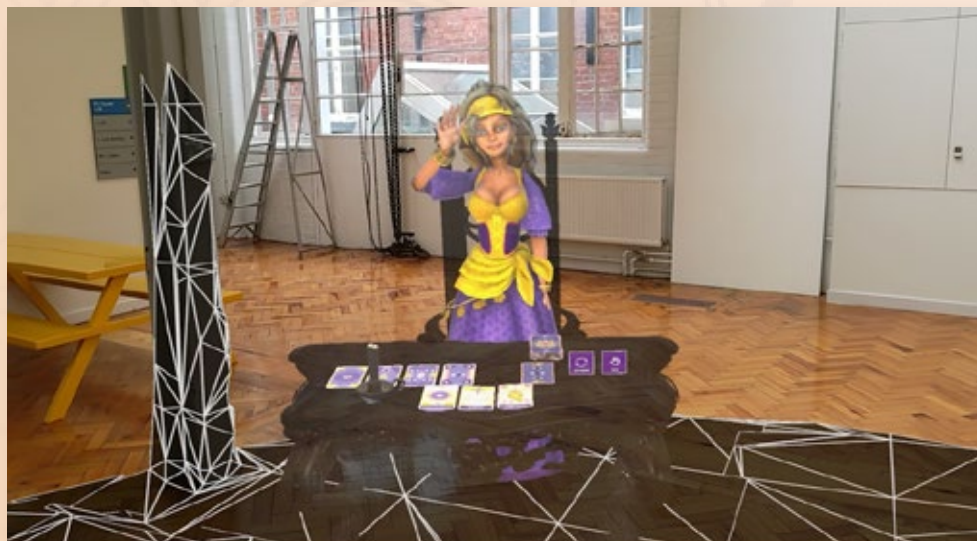
USER SELECTS THE "DONE" BUTTON USING HAND GESTURES ON COMPLETING THE TAROT CARD READING EXPERIENCE.



VIRTUAL TAROT READER PROVIDES THE USER WITH A SUMMARY OF THE INSIGHTS FROM THE EXPERIENCE AND OPTIONS TO SAVE, SHARE OR EXIT FROM THE EXPERIENCE.



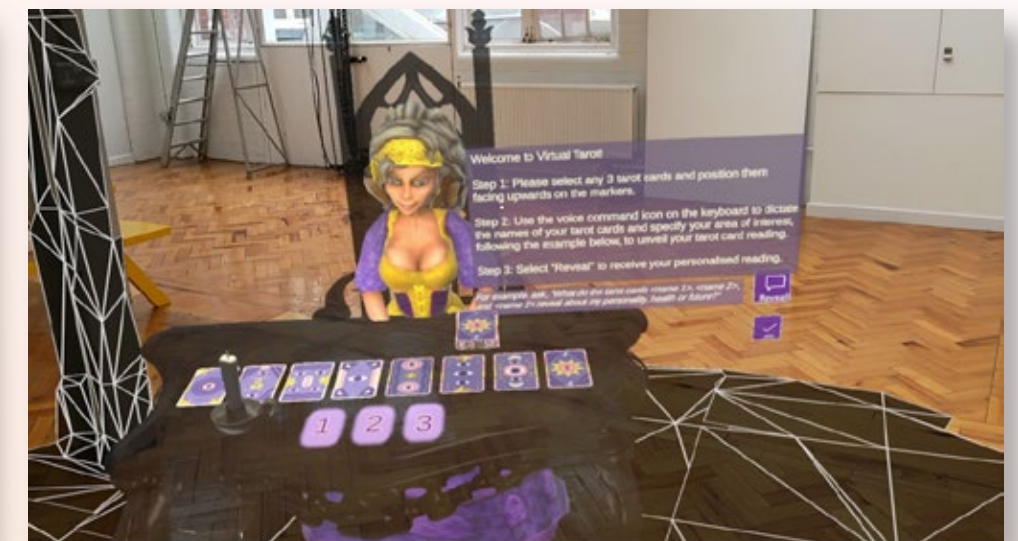
USER SELECTS THE "EXIT" BUTTON USING HAND GESTURES



VIRTUAL TAROT READER GREETS THE USER GOODBYE FOR COMPLETING THE EXPERIENCE AND PROVIDES OPTIONS TO TRY THE EXPERIENCE ONCE AGAIN OR CLOSE THE APP.



USER SELECTS THE "TRY AGAIN" BUTTON TO BEGIN A NEW READING EXPERIENCE.



USER IS TAKEN BACK TO THE BEGINNING OF THE EXPERIENCE FOR FURTHER EXPLORATION.

Design Production: Technical Testing

CLICK HERE
To View Final Prototype

TEST CASE PLANNING AND EXECUTION

TEST TITLE		PRIORITY	TEST CASE ID	TEST NUMBER	TEST DATE	
PROTOTYPE TESTING		HIGH	TC023	023	18.05.2023	
TEST DESCRIPTION		TEST DESIGNED BY		TEST EXECUTED BY	EXECUTION DATE	
EXECUTE THE PROTOTYPE AS INTENDED BY THE DESIGN.		MALLIKA		MALLIKA	18.05.2023	
TEST DESCRIPTION		TEST DEPENDENCIES		TEST CONDITIONS	TEST CONTROL	
THIS TEST CASE AIMS TO VALIDATE THE FUNCTIONALITY AND USER EXPERIENCE OF THE VIRTUAL TAROT CARD READING PROTOTYPE.		SYSTEM CONNECTIVITY WITH HOLOENS		PROTOTYPE IS INSTALLED AND RUNNING PROPERLY.	ENSURE NO EXTERNAL FACTORS AFFECT THE TEST ENVIRONMENT.	
STEP ID	STEP DESCRIPTION	TEST DATE	EXPECTED RESULTS	ACTUAL RESULTS	PASS / FAIL	ADDITIONAL NOTES
1	LAUNCH THE VIRTUAL TAROT CARD READING APPLICATION.	18.05.2023	THE APPLICATION OPENS SUCCESSFULLY AND THE MAIN MENU IS DISPLAYED.	THE APPLICATION OPENS SUCCESSFULLY, AND THE MAIN MENU IS DISPLAYED.	PASS	
2	SELECT THE "START" BUTTON.	18.05.2023	THE USER IS DIRECTED TO THE VIRTUAL TAROT CARD DECK AND READING EXPERIENCE.	THE USER CAN SMOOTHLY NAVIGATE BETWEEN SCENES.	PASS	NAVIGATION TEST: SCENE TRANSITION AND NAVIGATION WITHIN THE APP.
3	PERFORM HAND GESTURES TO SELECT AND PLACE THE FIRST TAROT CARD ON THE DESIGNATED MARKER.	18.05.2023	THE USER CAN MANIPULATE AND GRAB OBJECTS IN THE VIRTUAL ENVIRONMENT ACCURATELY.	THE CARD IS CORRECTLY RECOGNIZED AND DISPLAYED ON THE MARKER.	PASS	INTERACTION TEST: OBJECT MANIPULATIONS AND GRAB INTERACTIONS
4	ENTER THE NAME OF THE REVEALED CARDS AND ASK A QUESTION IN THE CHAT BOX.	18.05.2023	THE VIRTUAL READER INTERACTS CORRECTLY WITH THE OPEN AI LANGUAGE MODEL FOR RESPONSES.	THE VIRTUAL TAROT CARD READING PROTOTYPE RESPONDS CORRECTLY TO KEYBOARD AND VOICE INPUTS	PASS	INTERGRATION TEST: OPEN AI CONFIGURATION + LANGUAGE MODEL INTEGRATION, KEYBOARD + VOICE COMMAND INPUTS.
5	CONFIRM THAT THE VIRTUAL READER SUMMARIZES THE READING AND OFFERS THE OPTION TO SAVE OR SHARE.	18.05.2023	THE USER CAN SMOOTHLY NAVIGATE BETWEEN SCENES.	THE VIRTUAL READER PROVIDES A SUMMARY AND OPTIONS TO SAVE OR SHARE THE READING.	PASS	NAVIGATION TEST: SCENE TRANSITION AND NAVIGATION WITHIN THE APP.
6	VERIFY IF THE VIRTUAL READER PROVIDES OPTION TO TRY AGAIN FOR FURTHER EXPLORATION OR EXIT THE EXPERIENCE.	18.05.2023	THE VIRTUAL READER SUGGESTS OPTIONS TO TRY AGAIN OR EXIT.	THE VIRTUAL READER SUGGESTS OPTIONS TO TRY AGAIN OR EXIT AND HE USER CAN SMOOTHLY NAVIGATE BETWEEN SCENES.	PASS	NAVIGATION TEST: SCENE TRANSITION AND NAVIGATION WITHIN THE APP.
7	VERIFY THE POSITION, DIMENSIONS AND SCALE OF 3D OBJECTS IN THE SCENE IN THE CAMERA VIEW	18.05.2023	THE 3D OBJECTS ARE CORRECTLY POSITIONED, DIMENSIONED AND SCALED IN THE CAMERA VIEW.	THE 3D OBJECTS ARE CORRECTLY POSITIONED, DIMENSIONED AND SCALED IN THE CAMERA VIEW.	PASS	MULTIPLE ITERATIONS OF TESTING WERE PERFORMED FOR THE VIRTUAL ENVIRONMENT TO ATTAIN THE INTENDED CONFIGURATIONS.
8	TEST SOUND EFFECTS AND BACKGROUND MUSIC.	18.05.2023	THE SOUND EFFECTS AND BACKGROUND MUSIC PLAY CORRECTLY.	THE SOUND EFFECTS AND BACKGROUND MUSIC PLAY CORRECTLY.	PASS	THE OPTIMAL EFFECTIVENESS OF SPATIAL SOUND IS ACHIEVED WHEN IT IS PLAYED AT MAXIMUM VOLUME.
9	TEST THE ANIMATIONS OF THE VIRTUAL TAROT CARD READER CHARACTER.	18.05.2023	THE CHARACTER'S ANIMATIONS ARE SMOOTH AND APPROPRIATELY TIMED.	THE CHARACTER'S ANIMATIONS ARE SMOOTH AND APPROPRIATTLY TIMED.	PASS	

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During the technical evaluation process, a comprehensive testing approach was employed to ensure the quality and functionality of the mixed reality prototype. Various types of testing, such as functionality, integration, interaction, navigation, virtual environment, sound, and animation tests, were conducted. Each test was meticulously executed following pre-defined test cases, test conditions, and expected results.

The testing process involved multiple iterations and refinements, resulting in approximately 23 builds of the prototype. These builds incorporated enhancements and adjustments based on the findings and feedback from each round of testing. Through this iterative approach, the prototype was rigorously evaluated in all test categories.

The final prototype successfully passed all the tests on 18th May 2023, indicating its adherence to the desired standards and specifications. The technical evaluation process demonstrated the dedication and effort put into ensuring a high-quality virtual tarot card reading experience.

In future development, the project could benefit from implementing scripting capabilities to enable randomization of tarot cards, as well as utilizing position marker triggers to accurately capture the cards selected by the user. Integration of voice-over AI technology could enhance the virtual tarot card reader character, enabling real-time conversations and deeper user engagement. Additionally, expanding the range of animations and expressions for the character would add further personality and immersion to the experience. Other potential improvements include including scripting capabilities for generating summaries of insights and interpretations, integrating features for saving and sharing readings, and providing a smooth exit option to enhance overall user satisfaction.

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