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Digital Avatars as a Guiding Agent for Enhancing User Experience

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ABSTRACT:

Digital avatars are transforming how individuals receive guidance and support across fields like customer service, online education, and virtual shopping. They enable real-time interaction, simplifying complex tasks and enhancing user experiences. As digital environments grow more immersive, designing avatars that effectively support multitasking has become essential. Establishing standards for visually appealing, effective, and user-friendly avatar design is crucial to enhance engagement and accessibility.

The research problem addresses the lack of clear design standards for AI-driven avatars that ensure visual appeal, functionality, and user-friendliness. The importance of the study stems from the increasing use of AI-driven avatars in user interfaces. The objective is to explore key principles such as simplicity, intuitive design, personalization, and consistency to foster user trust and comfort. The research hypothesizes that avatars incorporating these principles will demonstrate improved usability, engagement, and emotional resonance with users. Using a descriptive methodology, including a case study on "Jamie," ANZ Bank's AI-powered digital assistant, the study examines how avatars assist users with tasks such as credit card selection and loan applications. The study is limited to the context of banking and financial services. User surveys provide feedback on usability, engagement, and overall effectiveness, offering insights for refining avatar design, enhancing response speed, and improving emotional expression through optimized blend shapes.

1- Introduction.

Imagine an experience where your physical limitations are no longer a barrier, and you can effortlessly explore different time periods and civilizations. With the ability to interact with a 3D avatar that can be present in multiple locations simultaneously and share knowledge with others, even in areas beyond your expertise. This vision may seem like a distant dream, but it is already being utilized. digital professionals have recognized the value of Artificial intelligence (AI) avatars and bots in various business activities. These tools streamline processes improve efficiency, and enhance productivity in a cost-effective manner, making them essential components of the modern business landscape.

Over the past few years, avatars have gained increasing popularity due to advances in computer graphics and technology. These avatars can be used in a variety of contexts (Antone Gonsalves, 2024).

To make virtual guides more human-like, visual avatars are employed as storytellers, providing content in a more emotional and personalized manner, like real guides found in different places. With advancements in technology, it is now possible to create innovative storytelling that revolves around user experiences, enabling interaction with avatars and digital content.

Avatars, virtual representations of a person, have a long history rooted in mythology and literature. In modern times, avatars can be found in various forms of media and technology, including social media profiles, virtual reality experiences, and customer service chatbots. As technology advances, the use and presence of avatars are expected to continue growing in everyday life(Daniel CF Ng, 2024).

2- Digital Avatar.

Avatar are the digital representations of computer users; Avatar are characters or images that represent one person in an interactive exchange as shown in figure (1). They appear as a three-dimensional model of a human being, animal or mythical figure or as a two-dimensional model of human being.

A Digital human resembles a human in form, features and expression. It can express tone of voice and body language. Many Digital Humans can sense the user's body language, expression or tone of voice. This enables Digital Human to respond appropriately. For example, if a user looks confused, Digital Human can offer more explanation. (Arya,2024).

Figure 1: Digital Avatar. (Vision Labs, 2024)

2-1- Digital Avatar History.

Digital avatars and virtual assistants have a fascinating history that traces back to the early advancements in artificial intelligence and computer technology. The concept of a digital assistant emerged in the 1960s when IBM demonstrated shoebox a former of today voice recognition system, then Microsoft bob, Clippy then Apple Siri These early iterations laid the foundation for the development of more sophisticated virtual assistants and avatars. (Chloe Marshall,2022)

With the rise of natural language processing and machine learning algorithms, digital assistants became increasingly proficient at understanding human language and context. They evolved from text-based interactions to voice-activated platforms that could provide information, perform tasks, and even simulate human-like

conversations. (Oort | Decentralized Cloud, 2022).
Today, digital assistants and avatars have become integral parts of our daily lives, assisting us in managing tasks, answering questions, and providing personalized experiences across multiple devices and platforms. (Guild hawk, 2024).

2-2- Avtar as a Guiding Agents Examples.

2-2-1- Saya a Japanese school girl from Tokyo. While she might look like a regular teenage girl, Saya isn't human as shown in figure (2). Instead, everything from her lifelike eyes to her hair is entirely computer generated. Saya was engineered by Japanese husband-and-wife team Teruyuki and Yuka Ishikawa.

Figure 2: Saya digital avatar agent in Japan (John Shammas, 2015).

Saya, the first guide to learning human behaviors, possesses human expressions and utilizes broadcast information to acquire natural conversation skills and autonomous behavior. She warmly welcomes tourists at Japanese airports and can interact with you through a screen. (Mike Seymour, 2017)

2-2-2- Cleia a holographic avatar as shown in figure (3), prepared to guide visitors through the Almoina archaeological museum in Valencia (Spain). The experience was designed to help visitors discover the meaning behind some cryptic ruins belonging to the Roman period, when the city of "Valentia" was created.

Journal of
Design Sciences and Applied Arts

Figure 3: Cleia hologram avatar in Almoina archaeological museum.(Ana Martí Testón , 2021)

The tour began with a mandatory introductory presentation lasting five minutes, where a holographic avatar named Cleia presented and explained the experience and how to interact with the holograms. Once the visitor learned how to operate the system, four interactive content presentations of between five and ten minutes were accessible, located in four important historical spots in the museum. (Martí Testón, 2021)

2-2-3- Tutankhamun Avatar A 3D avatar of King Tutankhamun was created as part of an interactive mixed reality system called 'Museum Eye' as shown in figure (4). This system utilized Microsoft HoloLens as a head-mounted display to enhance visitor engagement with the showcased artifacts. The system aimed to mitigate the traditional challenges of observation and time constraints that visitors often face at the Egyptian Museum in Cairo. (Ramy Hammdy, 2017).

Figure 4: Tut Ankh Amun Museum Eye project (Ramy Hammady, 2017)

2-2-4- AVA (Autodesk Virtual Agent) is a digital avatar provided by Autodesk as shown in figure (1), for anyone who has questions, problems, or needs related to Autodesk products. (Khari Johnson, 2018).

Figure 5: Ava digital assistant for Autodesk (Mark Schnesk, 2017).

2-3- Steps of Creating a Digital Avatar.

2-3-1- Concept and Design: Character design in visual arts involves creating a character's appearance, personality, behaviour, and overall visual style. Character designers craft characters to serve as storytelling vehicles, with every aspect—shapes, colours, and details chosen for a specific purpose and these steps are:

- **Background:** the backstory, history, personality, motivations, and it's role.
- **Research:** do research beyond demographics such as age, gender, location, etc.
- **Collect reference:** collecting reference images for inspiration is essential, even if it's fantasy.(Johnny Levanier, 2020).
- **Conceptualization:** begins by gathering sufficient information about the character, followed by the creation of preliminary concept sketches. (Brighid Flynn, 2021).
- **Colour palette:** By using colour theory, you can choose colours for characters effectively and evoke emotions in the audience.(Kyle DeGuzman, 2021)

2-3-2- Modelling and sculpting: The next step is to create a 3D model of the avatar.

- **Blocking:** Artists establish the core structure of a character model, focusing on the fundamental shape of the face and body. They begin by using basic shapes such as spheres, cubes, and cylinders, as shown in figure (6). gradually incorporating essential anatomical features like skeletons, muscles, and fat as shown in figure (7). (Kevuru Games, 2021).

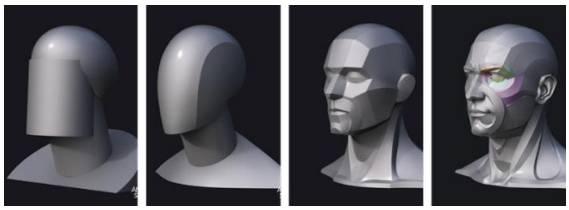


Figure 6: Blocking step in modeling and sculpting. (Anatomy for sculptures, 2013)

Figure 7: head anatomy structure. (Anatomy of Facial Expression, 2018).

- **Sculpting likeness**: Artists start with rough shapes and gradually refine them. Pay close attention to the specific features that define the likeness, such as the shape of the eyes, nose, mouth, and overall facial structure.(Ivan Ho, 2024).
- **Displacement:** refers to a technique used to add intricate details such as pores, wrinkles, and skin imperfections, and then transferring this information onto a lower-resolution model using a displacement map as shown in figure (8).(Denys Kliuch, 2023).

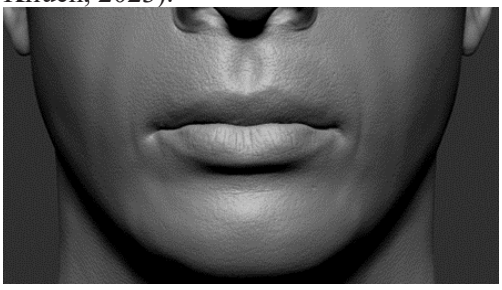


Figure 8: Head displacement with skin texture.(Haydi, 2022)

2-3-3- Retopology The process of reducing high-resolution models into a smaller size suitable for animation and rigging as shown in figure (9). (Josh Petty,2024).

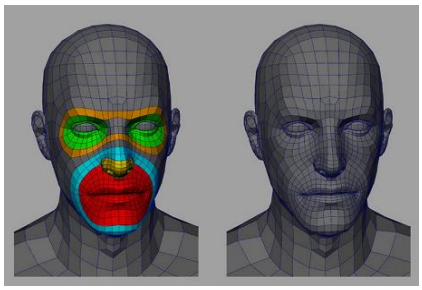


Figure 9: Head retopology. (cmuanimation.weebly, 2017).

2-3-4- UV: UV mapping is the 3D modelling process of projecting a 2D image onto a 3D model's surface. The term "UV" refers to the bidimensional (2D) nature of the process: the letters "U" and "V" denote the axes of the 2D texture because "X", "Y" and "Z" are already used to denote the axes of the 3D model as shown in figure (10).(Bruno Deschatelets, 2016).

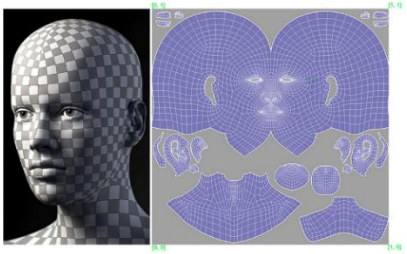


Figure 10: UV Mapping. (Superyai Chak, 2016)

2-3-5- Texturing: Once the basic model is created, textures are applied to give the avatar its visual details, such as skin, hair, clothing patterns, and colours as shown in figure (11). (Sefki Ibrahim, 2020).

Figure 11: Different skin colors textures. (New Face Magazine, 2022).

Begin with a base layer that has the material properties you want, then add additional layers to modify colour, roughness, metallic properties as shown in figure (12), and more. Keep adjusting these layers until you achieve the desired level of realism. (Assist innovation minds, 2020).

Figure 12: UV wrapped texture maps.

- **Colour Zones of the Face** The complexion of a light-skinned face is divided into three zones. The forehead is a whitish or golden colour. From the forehead to the bottom of the nose is reddish. The zone from the nose to the chin tends toward a bluish, greenish, or greyish colour.
    - **Forehead (yellowish):** The forehead is relatively smooth and has less vascularity (fewer blood vessels near the surface), which makes it appear lighter or more golden.
    - **Mid-face (Reddish):** The area from the forehead to the nose is rich in blood vessels, especially around the cheeks and nose. This higher vascularity gives the skin a reddish or pinkish hue.
    - **Lower Face (Bluish, Greenish, or Greyish):** The lower part of the face has more shadowing, especially around the mouth and jawline, due to bone structure and soft tissue volume as shown in figure (13).

  Understanding these zones is crucial for artists, especially in realistic and stylized work Helps create natural-looking skin by varying hues subtly

across the face, Supports the accurate portrayal of subsurface scattering in the skin and Highlights expressions by accentuating zones with contrasting colors (James Gurney, 2008).

Figure 13: Color zone of the face. (James Gurney, 2008).

2-3-6- Hair is aiming for realistic-looking hair for applications, there are two options: polygonal hair created of hair strips (cards) and strand-based hair. Even with the new tech advances, strand-based hair still is very taxing on real-time rendering as shown in figure (14). (Maria Zatorska, 2021)

Figure 14: Example of the Hair model made of Hair Cards and Final Render (Real Time Hair,2018).

2-3-7- Shading is often used to determine the appearance of an object based on its interaction with light sources, its surface properties (such as reflectivity and roughness), and the observer's viewpoint. It helps create the illusion of depth, highlights, shadows, and subtle variations in color and texture, thereby enhancing the overall visual quality and realism of the rendered image as shown in figure (15).(Henning Sanden, 2023)

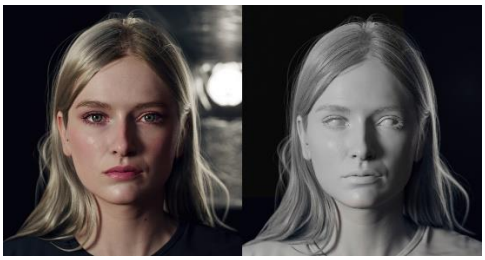


Figure 15: Shading recreation of Camille Emilie Razat, a French actress(Hadi Karimi, 2023).

2-3-8- Rigging involves constructing a skeleton for a 3D model as shown in figure (16), which serves as a puppet-like structure for animation control. It adds control to the digital model, as described by Brian Green, Pixar's rigging technical director.

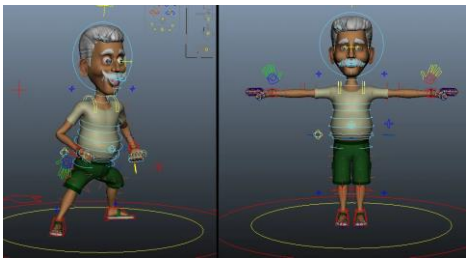


Figure 16: Rigging character.(AAA Game Art Studio, 2023)

2-3-9- Animation is the process of creating moving three-dimensional images in a digital context as shown in figure (17). These visuals are made using 3D software, allowing animators to create computerized objects that look 3D even though they’re on a 2D surface. Through visual effects and precise timing, animators can make anything look like it’s moving through a three-dimensional space.(Snezhana Golubeva, 2023).

Figure 17: Head animation.(Character 4 Creator, 2018)

Photorealism is essential to overcome the uncanny valley effect*, pushing the boundaries of realism by modeling internal organs and adapting characters to different scenarios. Natural language processing, combined with AI, enables digital humans to engage in independent learning, generate responses, and interact with users through real-time synchronization of mouth movements and voice, streamlining animation creation processes. These technologies collectively play a significant role in the development and utilization of digital humans in various fields.

2-4- Future of Digital Avatar:

The future holds digital avatars that are much more interesting than a profile picture. They are virtual 3D models, perfect renditions of an existing human or a digitally created human.

Soon, avatars will allow humans to explore places otherwise too difficult, or impossible to reach, and enable us to experience it as if we were there ourselves. This is already possible with the likes of deep-sea exploration, or robotics sent into space. But we can hugely improve this technology and the agency that humans have over it. (Iva Filipović, 2024).

3- The Use of Digital Avatar as a Guiding Agent in Different Fields.

3-1- Customer Service and Support Apps:
The avatar can assist users in resolving issues or answering common questions, acting as a virtual support agent.
Example: UneeQ's digital human "Sophie" as shown in figure (18), helps companies provide 24/7 customer support by answering questions, assisting with product inquiries, and guiding customers through the purchasing process. She offers a human-like interface that improves customer engagement. (Uneeq, 2023)

Figure 18: Sophie the digital avatar. (Deloitte Nederland, 2021)

3-2- Healthcare: For health and wellness apps, an avatar can remind users to take medications, provide health tips, or assist in tracking fitness goals.
Example: Soul Machines' digital assistant "Florence" as shown in figure (19), helps users quit smoking, improve mental health, and adhere to COVID-19 guidelines by providing health tips and reminders. She also assists in medication adherence by reminding patients to take their prescriptions. (Phil Taylor, 2022).

Figure 19: Florence digital avatar. (Ben Wodecki, Jr, 2024).

3-3- Education:
Provide personalized tutoring, answering questions, and guiding students through lessons interactively.
Example: Asia**,** an AI-powered teaching assistant developed by Oterman institute as shown in figure (20).
was designed to assist students in an online graduate-level computer science course. Jill answered students' questions on discussion

* The **uncanny valley effect** refers to the discomfort or unease that people feel when encountering a human-like object or character that looks almost, but not quite, human. This phenomenon is particularly relevant in robotics, computer graphics, and artificial intelligence.

forums, providing responses related to course materials, deadlines, assignments, and general queries.(HR Asia, 2023).

Figure 20: Asia digital avatar. (HR Asia, 2023).

3-4- Retail and E-Commerce

Digital assistants can help customers find products, recommend items, and personalized help.

Example: H&M uses a digital assistant to help customers find the right outfit by making fashion recommendations based on user preferences as shown in figure (21). She provides styling advice and guides users through their shopping journey, creating a personalized experience. (Janelle Okwodu, 2021)

Figure 21: H&M digital avatar. (Janelle Okwodu, 2021)

3-5- Banking and Finance

Help customers manage their accounts, make transactions, or get personalized financial advice.

Example: "Jamie," from ANZ(Australia and New Zealand Banking Group) a digital avatar assistant as shown in figure (22), to help customers with common banking queries. (RNZ, 2018)

Figure 22: Jamie digital avatar. (RNZ, 2018)

3-6-Hospitality and Tourism

Assist guests with bookings, local recommendations, or personalized services at hotels.

Example: Hilton uses a digital concierge named Connie to assist guests by providing information about hotel amenities, nearby attractions, and dining options. Connie creates a personalized guest experience by responding to individual preferences, sorts, or travel agencies. (Nancy Trejos, 2016)

3-7- Entertainment

Digital humans can act as hosts for virtual events, live streams, or media platforms, providing entertainment and interacting with users.

Example: Lil Miquela, a virtual influencer created by **Brud**, interacts with fans on social media as shown in figure (23), endorses brands, and releases music. As a digital human assistant, she creates a unique blend of entertainment and advertising, engaging users in a new way. (Riti Krishnan, 2023).

Figure 23: Lil Miquela digital avatar. (Riti Krishnan, 2023)

4- The Advantages of Using a Digital Avatar as a Guiding Agent to Enhance User Experience:

4-1- Enhance User experience:

User experience (UX) refers to how users interact with and feel about virtual avatars as guiding agents. It focuses on critical aspects such as interactivity, personalization, emotional connection, and ease of use. A well-designed avatar UX provides a seamless, immersive, and intuitive experience that allows users to engage deeply and feel connected to the digital world.

Avatars enhance the user experience by offering a human-like, conversational interface* that feels more engaging than standard text or button-driven interfaces. They enable users to ask questions, receive immediate responses, and interact naturally, making applications more intuitive and user-friendly. Additionally, avatars can provide personalized suggestions based on user behaviour, preferences, or input, tailoring the experience to individual needs and increasing overall satisfaction. (Danny Stefanic,2024).

4-2- Trust

Ensure that the digital human provides accurate and reliable information across all interactions, consistently fulfilling its role without errors also implement strong data protection measures, ensuring users' personal information is securely handled. Be transparent about how data is collected, stored, and used.

4-3- Personalization: The extent to which users can customize and control the avatar's appearance, behavior, and emotional expression.

4-4- Immersion:

How convincingly the avatar reflects the user's identity or desired role in digital environments, especially in virtual or augmented realities.(Richard Bowdler, 2024).

4-5- Empathy and Engagement:

The degree to which the avatar can represent emotions, or empathy leads to stronger user attachment and engagement.

- **Building a Connection:** A well-designed avatar can create an emotional connection with users, fostering trust and a sense of familiarity. This makes users more likely to return to the app and engage with its features over time.
- **Relieving Frustration:** If users encounter issues or challenges, the avatar can provide calming reassurance or problem-solving advice, reducing frustration and improving the overall user experience. (Julia Rose,2024)

4-6- Consistency:

The ability of the avatar to provide a seamless experience across various platforms and devices.

4-7- Usability

- **Simple and Intuitive Design:** The avatar must be designed with an easy-to-use interface. Its appearance, voice, and interaction model should be non-intrusive and align with the purpose.
- **Low Cognitive Load:** The avatar should not overwhelm users with too much information or complexity. It should guide them step-by-step, ensuring they don't feel lost or confused during interactions. (Dave AI,2024).
- **Accessibility Features**: The avatar should accommodate users with various needs, such as offering voice interactions, visual cues, or touch-based commands for differently abled users.

* A conversational interface refers to a user interface that enables interaction between a human and a computer system using natural language, typically through text or voice. This type of interface is designed to simulate a conversation, making the interaction feel intuitive and human-like.

Natural Language Processing (NLP): It uses AI technologies to understand, process, and generate responses in a way that mimics human communication.

- **Speed and Responsiveness:** The avatar must respond quickly to user queries and interactions to maintain user engagement. Lagging or slow responses can lead to frustration and decreased usability. (Andrew Tan,2024)

4-8- Improved Navigation and Accessibility

- **Real-Time Assistance**: The avatar can help users navigate complex problems or offer real-time suggestions and shortcuts, reducing friction in the user journey.
- **Voice Interaction:** For users who prefer /hands-free control or those with disabilities, the avatar can allow voice-activated commands. This is especially helpful in apps where users need guidance without manually searching for options.
- **Visual and Audio Cues**: The avatar can provide guidance both through visual animations and audio feedback, helping users who may have difficulty reading or interpreting text-based instructions.
- **Inclusivity:** The degree to which the avatar experience accommodates diverse user needs, identities, and abilities, enhancing accessibility and representation. (iNextLabs ,2023).

4-9- Multilingual Support

- **Language Customization:** A digital avatar can easily switch between different languages, providing assistance in the user's preferred language, which is particularly valuable for global audiences.
- **Cultural Sensitivity:** The avatar's dialogue and mannerisms can be culturally adapted to make users feel more comfortable, increasing the app's appeal to diverse groups of users.

These factors combined create a more engaging, efficient, and satisfying experience for users interacting with a digital avatar as a guide. (Guildhawk, 2024).

4-10- Cost-Effective Solution:

Offering businesses reduced expenses, scalability, and 24/7 availability without the need for human shifts. Avatars eliminate ongoing training costs, as they perform consistently once programmed. Reducing errors and inefficiencies and require only a one-time development investment with minimal maintenance costs. (Andrew Tan, 2024).

Figure 24: Summary for advantages of using digital avatar as a guiding agent.

5- Design Challenges in Using Digital Avatars as Guiding Agents to Enhance User Experience.

- **Lip-Sync Inaccuracies and Blend Shape Desynchronization:** Achieving precise lip synchronization is crucial for creating believable digital avatars. However, developers often encounter desynchronization between facial animations and audio, leading to unnatural movements.(shaunjohnski,2023).
- **Lighting Inconsistencies Affecting Realism:** Proper lighting is essential for rendering avatars that appear natural and immersive. Inconsistent or poor lighting can lead to harsh shadows and unrealistic appearances, breaking the user's sense of presence. (Lele chen,2021).
- **Voice Cloning and Personalization:** Avatar voice personalization is enhanced for user engagement, but challenges are introduced regarding voice cloning and synchronization (Voice copying and matching). Capabilities such as voice cloning and lip-syncing are offered by tools like Talking Avatar AI, enabling avatars to be made to speak with different voices. However, matching the cloned voice accurately with the avatar's facial expressions and movements continues to be considered a complex task. (Toolify.ai,2025)

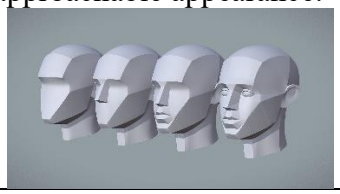
6- Digital Avatar Case Study:

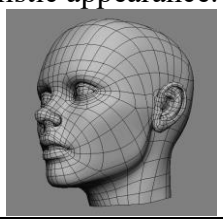
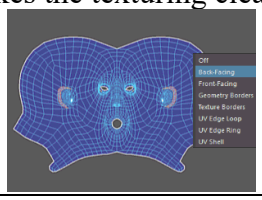
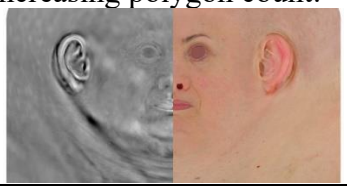
ANZ (Australia and New Zealand Banking Group) introduced "Jamie," a digital avatar assistant, to help customers with common banking queries. Jamie is a highly interactive, AI-powered avatar designed to guide customers through tasks like finding the right credit card, loan application details, and other banking services. This case study explores how Jamie enhanced customer service, increased engagement, and improved overall user satisfaction.

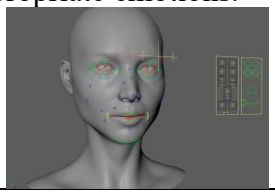
7- Reason for Choosing this Case:

The ANZ "Jamie" case was chosen because it represents a real-world application of a digital avatar in a high-stakes industry, showcasing how AI-powered assistants can improve customer experience. Jamie's ability to guide users through complex banking tasks like credit card selection and loan applications demonstrates the practical value of avatars in enhancing interactivity, user satisfaction, and engagement. Its measurable impact, advanced technology use, and role in a trusted financial environment make it an ideal example for studying digital avatar effectiveness.

Table 1: Analytic Digital avatar Jamie," digital assistant, to help customers with common banking.

Jamie The Digital Avatar Assistant.		
First: General data analysis.		
1	**Name**	Jamie
2	**Type**	Bank Digital Avatar.
3	**Released Company**	ANZ (Australia and New Zealand Banking Group)
4	**Date of release**	March 2020.
5	**Country**	New Zealand.
6	**How Jamie Worked:**	**Conversational Interface:** Users could ask Jamie questions just as they would with a real bank teller. The AI behind Jamie analyzed the questions and responded with relevant answers or guided users to the right banking products or services. **Visual and Vocal Interaction:** Jamie was presented as a 3D avatar with lifelike facial expressions and speech. This created a more human-like interaction, making the experience more engaging for users. **Real-Time Navigation Support:** If a user needed help filling out a form, Jamie could walk them through it in real time, providing explanations for each field and offering tips to avoid common errors.
7	**Background story of the character**	Revolves around the need to improve customer service and provide a more interactive, efficient, and human-like experience for users seeking support. ANZ introduced Jamie as part of their broader digital transformation strategy, which aimed to make banking services more accessible, user-friendly, and available around the clock.
Jamie character design and 3D creation		
8	**3D Modeling**	A realistic, human-like character that could engage users with a friendly and approachable appearance. 
9	**Anatomy**	Using a clear anatomy that makes the face looks very

		realistic with a good study for head skeleton and head muscles while face talking and facial expressions. 
10	**Retopology**	Clean and optimized topology (the arrangement of polygons) is essential for smooth animation and rigging. The model was likely optimized to ensure that it could be animated efficiently while maintaining a realistic appearance. 
11	**UV Map**	Uv map is clean which makes the texturing clean. 
12	**Skin Texturing:**	skin would have been textured with high-resolution Details like skin pores, subtle blemishes, and smoothness were added using techniques such as normal maps and displacement maps, which give depth and detail without increasing polygon count. 
13	**Clothing and Hair:**	include fabric details like patterns, folds, and stitching,

		enhancing realism. For hair, a combination of textured polygons or hair particle systems may have been used to create realistic hair strands and movement, also choosing a simple hair styling that can represent a banker. 
14	**Material Shading**	Proper material shading was applied to make different surfaces (e.g., skin, fabric, eyes) behave realistically under light. Subsurface scattering would be used on skin textures to replicate the way light penetrates the skin, giving it a soft, realistic glow.
15	**Facial Rigging:**	involved adding a more complex system of bones or blend shapes to allow for a wide range of expressions. Blend shapes (or morph targets) were used to allow different parts of the face (eyebrows, mouth, eyes) to move independently, creating emotions like happiness, sadness, or curiosity. Fine control over lips, eyelids, and muscles around the mouth ensured that Jamie could speak convincingly and show appropriate emotions. 
16	**Animation**	Motion Capture technology (MoCap) may have been

		used to create realistic animations for Jamie's body language and facial movements. Actors wearing motion capture suits would perform actions, which are then mapped onto Jamie's 3D rig. For facial capture, markers or cameras track the subtle movements of the actor's face, translating them into real-time expressions for Jamie.
17	**Effectiveness of Jamie**	**Enhance customer experience:** Provide a more engaging and interactive customer service agent to replace traditional FAQs or text chatbots. **Reduce call center load:** Decrease the volume of basic queries that require human customer service agents, allowing staff to focus on more complex issues. **Increase efficiency:** Offer 24/7 support for customers, enabling faster resolution of common queries and helping customers navigate complex banking products.
18	**Enhanced User Experience:**	The avatar provides a human-like, conversational interaction that feels more engaging than standard text or button-driven interfaces. • **Trusted:** Provides accurate and reliable information across the bank customers and safe from being hacked. • **Personalized:** Not personalized, users can't customize and control the avatar's appearance, behavior, and emotional expression. It would provide a more positive user experience if it is personalized. • **Consistent experience:** provide a seamless experience across various platforms and devices. which can be used on mobiles and tablets, and through websites. • **Usable:** The avatar looks realistic with a good voice and good hair, cloth and interaction and align with the purpose, also responds quickly.

6- Survey on How Digital Avatars as a Guiding Agent Can Enhance User Experience.

A survey designed to gather feedback on the A survey was conducted to assess the effectiveness of digital avatars as guiding agents for enhancing user experience. It focused on key areas such as usability, engagement, personalization, and overall satisfaction. The survey targeted a diverse group of 50 participants, with 40% male and 60% female respondents, mostly under 39 years old (84.5%), from various educational and regional backgrounds. Data was collected through an 11-question structured questionnaire administered via Google Forms and distributed on platforms such as Facebook and WhatsApp. The survey explored user interactions, preferences, and experiences with digital avatars.

A digital avatar example was provided for participants to try before completing the survey; it can be accessed at the following link: https://sophie.digitalhumans.com/.

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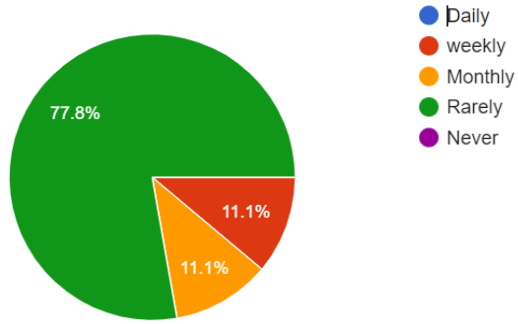
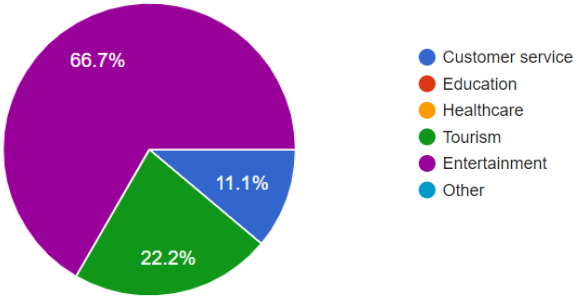
1- How frequently do you interact with digital avatars or virtual assistants?



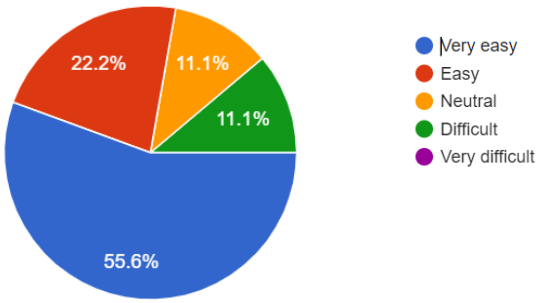
- 77.8% of respondents reported infrequent interaction with digital avatars or virtual assistants. That means they are still not widely used or trusted by most people.

2- In which contexts have you used a digital avatar?



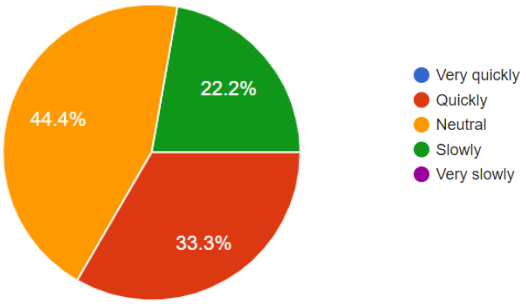
- 66.7% of respondents have used digital avatars primarily in entertainment contexts, highlighting its strongest adoption in media-related activities.

3- How easy was it to interact with the digital avatar?



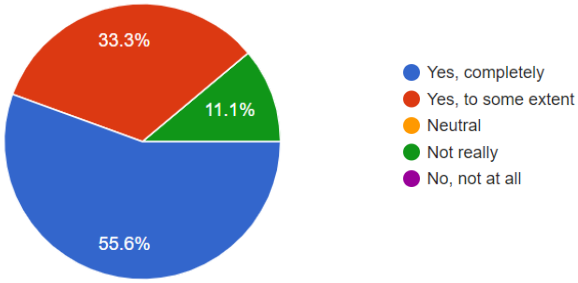
- 55.6% of people found it very easy to interact with the digital avatar.

4- How quickly did the avatar respond to your requests or questions?



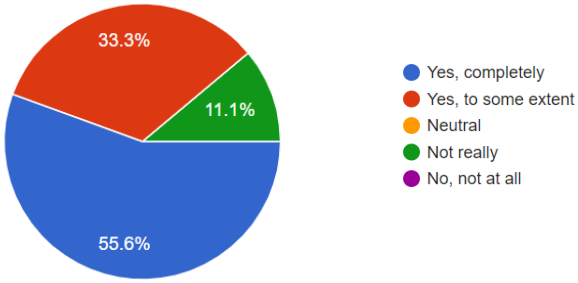
- 44.4% felt neutral about its response speed, suggesting the interaction was smooth but response time could be improved.

5- How engaging was your interaction with the digital avatar?



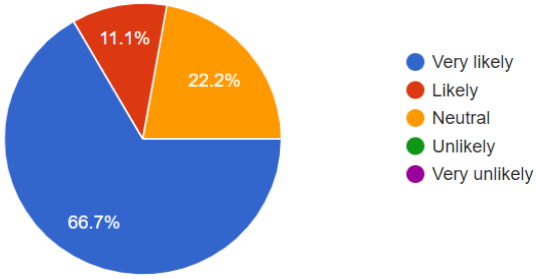
- 55.6% of respondents found their interaction with the digital avatar completely engaging, indicating a strong level of user involvement and interest.

6- Did the avatar effectively guide you through your tasks or solve your problem?



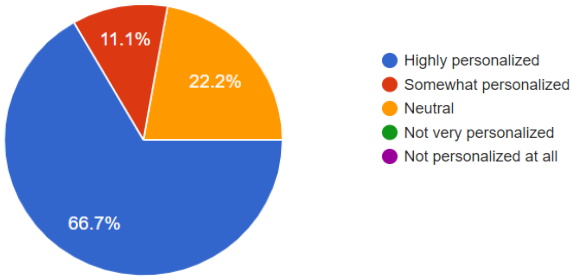
- 55.6% of respondents felt the avatar completely guided them through their tasks or solved their problems, demonstrating its effectiveness as a digital assistant.

7- How likely are you to use a digital avatar again based on this experience?



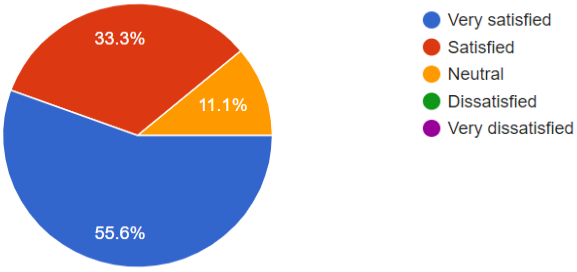
- 66.7% of respondents are very likely to use a digital avatar again based on their experience, reflecting a positive overall impression and willingness to engage with this technology in the future.

8- To what extent did the avatar personalize the experience for you?



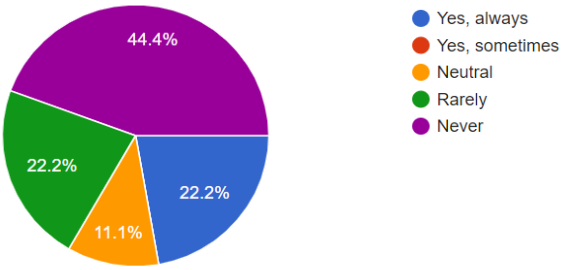
- 66.7% of respondents found the avatar experience to be highly personalized, highlighting its ability to tailor interactions to individual users effectively.

9- How satisfied were you with the customization options for the avatar's appearance or behavior?



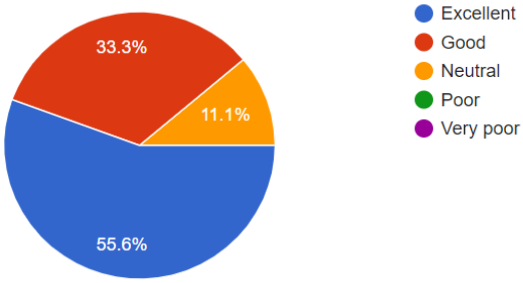
- 55.6% of respondents were very satisfied with the customization options for the avatar's appearance and behavior, indicating a positive user experience in personalization features.

10- Did the avatar recognize and respond to your emotions appropriately?



- 44.4% of respondents felt the avatar never recognized or responded to their emotions appropriately, indicating a significant area for improvement in emotional responsiveness.

11- How would you rate the effectiveness of the digital avatar in guiding you through tasks or providing information?



- 55.6% of respondents rated the digital avatar's effectiveness in guiding them through tasks or providing information as excellent, reflecting a high level of user satisfaction.

6-1- Survey results:

The survey results indicate that users rarely used digital avatars as guiding agents, among those who did most interacted with avatars for entertainment purposes, followed by tourism and customer service. Most users found the avatars very easy to use, though many described their responses as neutral. Despite this, users found the interactions fully engaging and considered the avatars effective in guiding them and solving problems. Most participants expressed a willingness to use digital avatars again, with over 60% reporting a personalized experience. Additionally, users were generally satisfied with

the customization options for the avatar's appearance and behavior. However, many noted that the avatars did not recognize or respond to emotions appropriately. Overall, users were satisfied with the performance of digital avatars as guiding agents for completing tasks and delivering information.

6-2- User Feedback:

What did you like most?
Most users appreciated that the avatar was interactive and could answer all questions.
What improvements would you suggest?
Users suggested enhancing the avatar's ability to understand emotions and frustration, as well as improving its facial expressions.
Would you prefer interacting with a digital avatar over a human agent for simple tasks? Why or why not?
Most users said yes, as the experience was impressive, and they would like to repeat it.

7- Conclusion:

Digital avatars offer a seamless, interactive experience by solving problems and engaging with users in a highly realistic manner. They can be easily created and customized to serve as digital assistant avatars, capable of providing trusted information and personalized experiences. These avatars ensure smooth functionality across various platforms and devices, including mobile phones, tablets, and websites. With realistic appearances, quality voice output, and effective interactions, they align well with their intended purpose and respond promptly. Thus, digital avatars can effectively function as guiding agents, although designers should focus on creating avatars with visually appealing and relatable appearances that resonate with the target audience. High-quality voice output and natural conversational abilities are critical for building trust and fostering effective communication. Additionally, avatars must be responsive, intuitive, and aligned with the brand's identity and goals to enhance their usability and effectiveness.

This research emphasizes that the success of digital avatars lies in adhering to key principles such as simplicity, intuitive design, personalization, and consistency. These factors not only improve task efficiency but also contribute to a sense of security and comfort for users, ultimately enriching their overall experience.

Designers should focus on creating digital avatars that are visually relatable and emotionally engaging to establish strong user connections. Incorporating advanced AI technologies and natural language processing can significantly improve conversational abilities, making interactions more human-like and intuitive. To ensure inclusivity, avatars must be designed to accommodate diverse user needs, including those with disabilities. Maintaining consistency with the brand's identity and objectives is essential for fostering trust and coherence. Regularly integrating user feedback into the design process helps refine avatar functionalities to meet evolving expectations. Furthermore, optimizing avatars for seamless performance across various devices and operating systems enhances accessibility and satisfaction. By addressing these areas, organizations can maximize the potential of digital avatars as guiding agents, ultimately providing an enriched and efficient user experience.

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