FitAssist AI Trainer

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Core Competencies Demonstrated:

- **AI Product Design**: Co-designed a multi-layered AI agent ("FitAssist") that integrates LLMs (OpenAI), databases (Client DB, FAQ DB), and external APIs (Google Calendar, Edamam).
- **Ethical Risk & HITL**: Identified critical risks like "Inaccurate information" and "Hallucinations" and designed a "confidence scoring system" to escalate low-confidence answers to a human operator.
- **Data Governance & Privacy**: Specified data protection (HIPAA) as a key requirement, proposing robust security measures, data anonymization for API calls, and user transparency.
- **Sociotechnical Analysis**: Analyzed social alignment challenges beyond the technology, including "job displacement", "Overlooking Social Determinants of Health", and fairness/bias.

Problem

There is a dual problem with fitness trainers struggling to manage their business and their clients needing consistent attention and motivation. Lack of personalized attention, guidance, and motivation hinders progress and satisfaction with fitness and weight loss activities (Melton, Dail, Katula, & Mustian, 2011). Personal trainers often struggle to balance providing individualized attention with managing their business (Create PT). An innovative Artificial Intelligence (AI) agent can provide automated, personalized communication and support to keep clients motivated and on track.

Meet our client persona Bob! Bob is a physical trainer in Indiana, who has over one hundred clients. Despite his success, he struggles to check in with clients due to time constraints. He looks to automate check-ins to keep clients motivated and support their routines through messaging apps. Bob wants to automate tasks including scheduling, progress check-ins, motivational messages, meal suggestions, and provide answers to frequently asked questions (FAQ). It is crucial that the messages reflect Bob's style and are personalized to each client.

Proposed AI Agent (FitAssist)

This document proposes the development of an AI Agent named "**FitAssist**." FitAssist will assist Bob in managing his business effectively. FitAssist will assist fitness trainers by leveraging databases, APIs, and Large Language Models (LLM) such as ChatGPT for engaging and personalized client interactions. FitAssist will handle tasks such as scheduling appointments, conducting check-ins, workout recommendations, sending motivational messages, and suggesting meals. FitAssist will use multiple layers of LLM, APIs, data sources, and actions to capture, identify topics, look up relevant data, and respond to user inquiries accurately. FitAssist will utilize a confidence scoring system based on the likelihood of correct answers, if the confidence is low then the inquiry must be escalated to Bob. This combination of AI-driven communication, automated scheduling, and nutritional guidance ensures a tailored and efficient client experience. ***Refer to Figure 1 in Appendix for an example of proposed AI Agent flow.***

- **Inputs:** Text messages, Calendar (date/time), Historical messages, Workout database, Client database, FAQs, LLM Text Classifications, API Queries
- **Outputs:** Outgoing messages, Calendar updates, Updates to Client database

FitAssist Tasks

- ***Messaging:*** FitAssist will provide automated responses to FAQs to keep Bob connected with clients. The messages are personalized and tuned to mimic Bob's style using a customized foundational LLM model (OpenAI). FitAssist leverages information from multiple database (DB) sources (e.g., FAQ DB, Client DB, Workout DB). If FitAssist is unable to meet confidence thresholds on a user query, then the message is escalated to Bob. Bob also has the ability to periodically update the FAQ database. ***Refer to Figure 2 in Appendix for examples of Messaging Experience.***

- **Scheduling:** FitAssist will integrate with online calendars for scheduling and automatically update appointments. It will respond to user messages about scheduling changes and provide a link to a calendar request form. FitAssist will also send confirmations and reminders. **Refer to Figure 3 in Appendix for an example of Scheduling Experience.**
- ***Health:*** FitAssist can send health suggestions based on user weight goals and dietary restrictions. Meal recommendations will use Nutritional APIs (edamam) and client information, aligning to dietary requirements. FitAssist will recommend workouts from Bob's database, tailored to user goals and intensity, and log each session for future reference. ***Refer to Figure 4 in Appendix for examples of Health Experience.***

Direct Alignment Challenges

- ***Insufficient Training Data:*** Mirroring Bob's responses even using ChatGPT and fine tuning the model will be difficult. Hallucinations can occur, such as the FitAssist referencing unrelated information from training data (e.g., last workout, names, etc.).
- ***Inaccurate information:*** FitAssist must provide accurate information to users. Inaccurate or misleading information could lead to liability issues for Bob. A reliable answer confidence scoring algorithm must be developed to ensure that answers are correct.
- ***Contextual Understanding/Nuanced Decision Making:*** FitAssist should be able to understand the context of conversations and respond appropriately, avoiding generic or irrelevant messages. Regarding dietary suggestions, accuracy is critical to Bob. The user will have the opportunity to declare any dietary restrictions. Say, for example, the user is allergic to nuts, FitAssist must never send the user a meal that includes nuts in any way.
- ***Emotional Intelligence:*** FitAssist should recognize and respond to clients' emotions, offering support and encouragement. Positive reinforcement and celebration of client achievements are essential to boost motivation. FitAssist must avoid harsh or negative responses that could impact motivation.
- ***Machine Learning Loop:*** FitAssist should employ machine learning algorithms to continuously improve its ability to learn from user interactions and provide personalized recommendations. Recurrent Neural Networks would learn from the user's input and adjust workout recommendations over time.
- ***Client Data:*** FitAssist should be able to access and analyze client data (e.g., goals, progress, preferences) to provide highly personalized messages. The database must be accurate and up to date.
- ***Costs:*** Using FitAssist will incur a cost for Bob. This might be challenging for trainers like Bob who may not be able to afford it under their current business model. A cost analysis must be performed to determine a competitive price of the service.

Externalities Challenges

- ***Job displacement:*** With the automation of administrative tasks including scheduling and client management, this could eliminate the need for more administrative jobs within Bob's business. However, as Bob's business grows, he may need more trainers to support clients offsetting administrative labor loss.
- ***Litigation:*** FitAssist could recommend a workout that could cause harm, and Bob could be liable and potentially sued for damages. A waiver or disclosure may need to be signed ensuring that all parties agree on the risks of using this service.
- ***Better care/service:*** Bob automating his administration services and common QA will enable him to spend more face-to-face time with his clients. He would not be distracted by messages or other issues being handled by FitAssist.
- ***Clients:*** Using FitAssist may harm Bob's relationships with his clients, making them feel undervalued. Clients might also not appreciate AI tools, which could affect their motivation. Trainers must assess if clients have concerns about AI and find the right way to engage them.

Social Alignment Challenges

- ***Industry Alignment:*** Professional Group organizations like the National Strength and Conditioning Association (NSCA) could decree that their members do not use AI agents like FitAssist. FitAssist could affect other professionals in the personal trainer industry resulting in loss of jobs or loss of perceived handicraft of fitness trainers.
- ***Overlooking Social Determinants of Health:*** In making recommendations, FitAssist may overlook critical societal factors such as access to healthcare, nutritious food, and leisure time, which significantly influence public health outcomes.
- ***Fairness and Inclusivity:*** Harmful recommendations can occur based on bias concerns and lacking human understanding. Without sufficient expert oversight, FitAssist can interpret data inaccurately and recommend strenuous activities that the client could not handle due to existing conditions not in the model.
- ***Data Protection:*** Ensure compliance with relevant data privacy regulations (e.g., HIPAA in the US) to protect client information. Any information captured and used by FitAssist is protected, not available publicly, and is only used for the FitAssist's sole purpose. Clients must be provided with disclosures on how and where their data is being used.

AI Guidelines for Developers

By following these guidelines, developers can ensure that FitAssist is ethical, effective, and aligned with business goals:

- ***Bias and Fairness:*** Develop the FitAssist to avoid biases and ensure fairness in its recommendations and interactions. Continuously monitor the app's performance and update the algorithms to address any emerging biases. Regularly review the impact of recommendations on different user groups.
- ***Transparency:*** Be transparent about FitAssist 's capabilities and limitations, informing clients of the role of AI in their interactions. Provide users with documentation on how their data is being used within FitAssist.
- ***ChatGPT and Large Language Models:*** Ensure LLM models are responding appropriately in the style of the principal Bob. Periodically refine the model address changes in messaging style and tone. Additionally, new 'generic AI trainers' could be developed for clients who do not wish to be 'cloned' by FitAssist.
- ***API Integration:*** The use of APIs to enhance FitAssist's functionality should be carefully managed to ensure that data sharing does not compromise client privacy. Periodically review API agreements and ensure that APIs are using the data appropriately.
- ***Security and Privacy***: Implement robust security measures to protect FitAssist system from cyber threats, including encryption, authentication, and regular audits to ensure data integrity and confidentiality. Ensure compliance with data protection regulations including the Health Insurance Portability and Accountability Act (HIPAA). Consider anonymizing user data when using nutritional APIs to enhance privacy protection.
- ***Accessibility:*** Ensure the FitAssist is usable by clients with disabilities. Verify that all content being sent to users meets the Web Content Accessibility Guidelines (WCAG) to guarantee an accessible experience for all users.
- ***Human Oversight:*** Maintain human oversight to ensure FitAssist's responses are appropriate and aligned with ethical principles. Advise operators like Bob that they should be monitoring the messages being sent to their clients and regularly provide feedback to improve recommendations.
- ***Scalability:*** Design the FitAssist to be scalable to accommodate a growing number of clients and features. To maximize user experience, consider integration into additional message platforms (e.g., Line, WhatsApp, iMessage) or other calendar services (e.g., Outlook, iCloud).

References

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Appendix

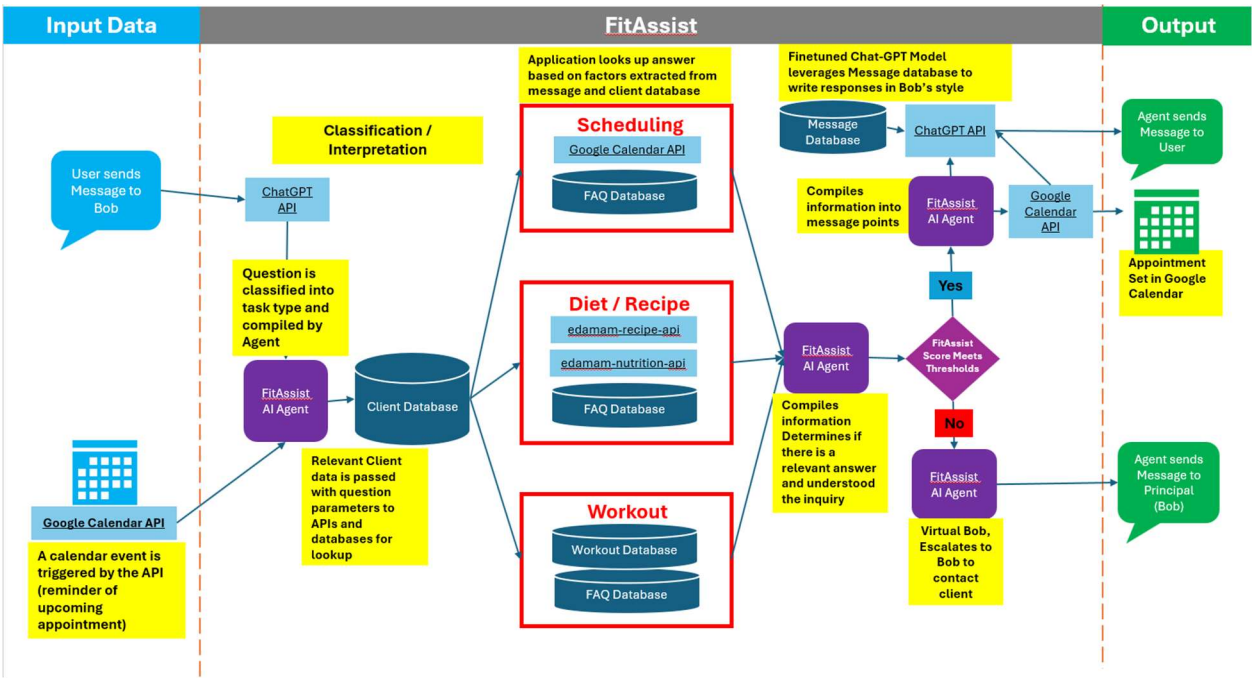

Figure 1 - FitAssist Flow

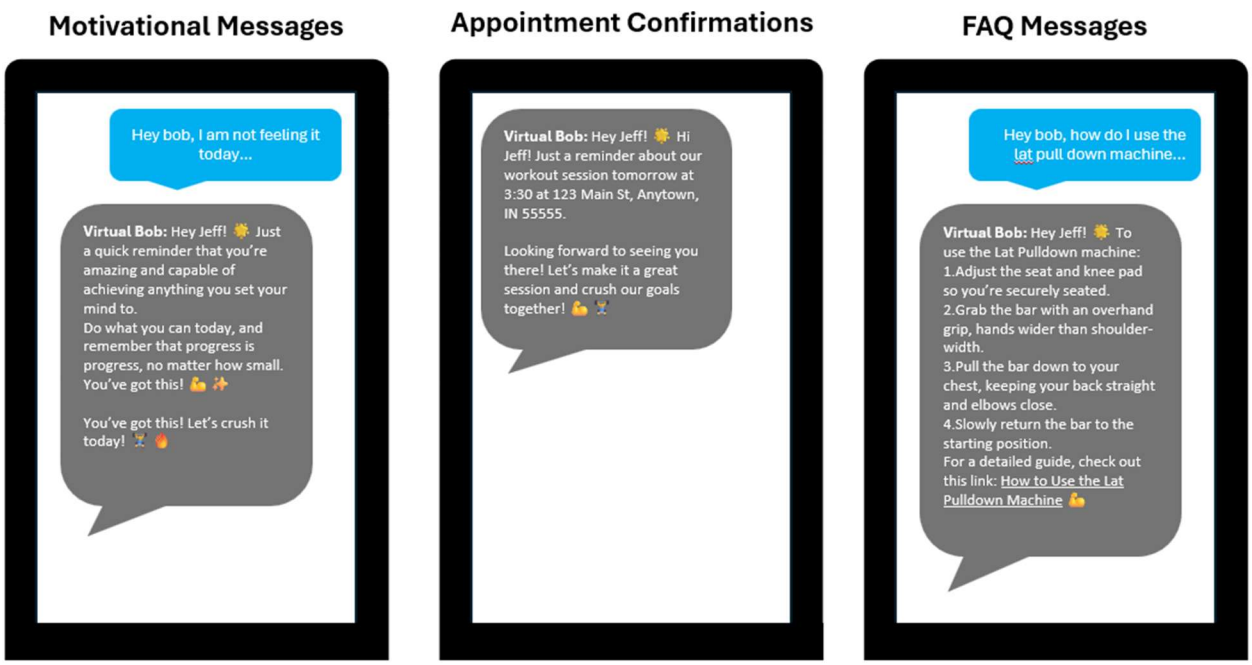

Figure 2 - Messaging Scenarios

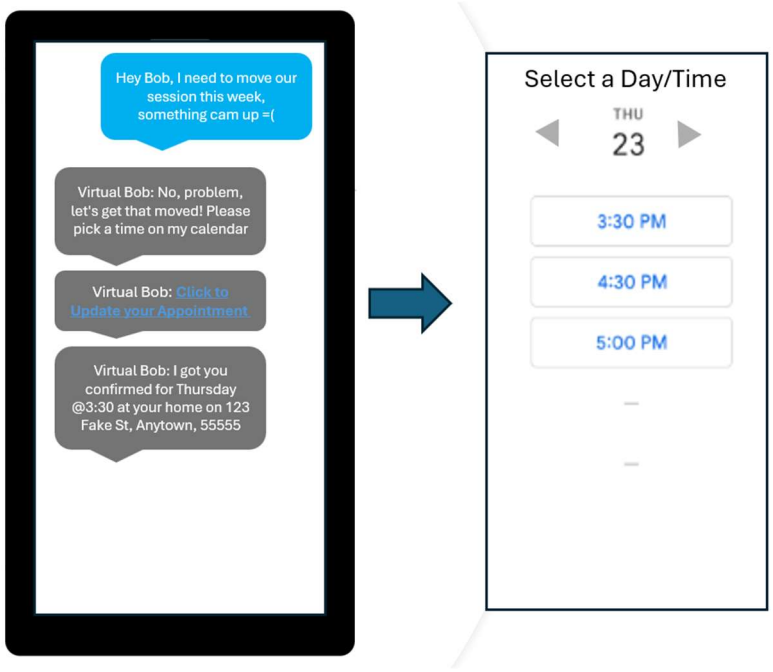

Figure 3 - Scheduling Time Picker and Confirmation

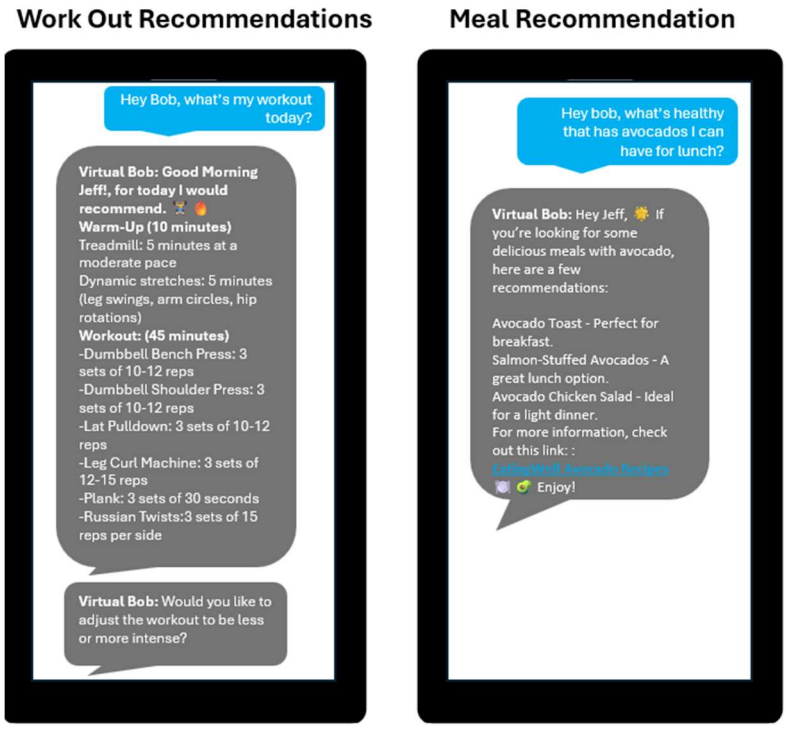

Figure 4 - Health Recommendation Scenarios