Addressing the Personalization Shortcoming in Digital Solutions for Task Management for ADHD Adults

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Abstract

Adults with ADHD frequently struggle with existing digital task-management tools, which often overlook differences in cognitive styles, sensory needs, and daily context. To address these limitations, we present a personalized task-management system that adapts to ADHD subtypes using AI-generated personas, subtype-specific interface layouts, and dynamic task-support features. The system combines an onboarding questionnaire, language-model–based persona generation, and tailored UI components. This includes minimal layouts for inattentive users, stimulation-rich designs for hyperactive users, and hybrid interfaces for combined-type users.

We performed a qualitative study (N = 21) that involved think-aloud protocols, prototype walkthroughs, and follow-up interviews. Quantitative ratings showed that the system was perceived as being highly effective ($M = 3.89$, $p < .001$) and positively personalized ($M = 3.74$, $p = .001$). The qualitative data revealed that breaking down tasks, using timers, and having structured reminders helped the participants to concentrate, whereas points of improvement such as real-time prioritization and interface clarity were raised. The findings show that the use of an adaptive, cognitively aligned design has the potential to significantly enhance the task-management experience of adults with ADHD. We discuss implications for dynamic context modeling, UI refinement, and long-term personalization to guide future research.

Keywords

ADHD; personalization; adaptive interfaces; task management; cognitive support; AI-generated personas; neurodiversity; user experience; productivity tools; hyperactivity; inattention; ADHD subtypes.

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1 Introduction

Attention-deficit/hyperactivity disorder (ADHD) is a complex neurodevelopmental disease that affects around 3.1% of adults around the world making it hard to function in day-to-day life. Executive functions like self-control, self-regulation and the ability to plan and prioritize. For adults this especially affects their work life making it hard to perform well. With recent advances in technology and with the advent of AI, assisting task management for people with ADHD has taken a step forward. Many solutions try to enhance experience to ease task management for ADHD but fail to provide long-term support. The main reason for this is having a generic solution and not truly personalizing for each individual.

Not all adults with ADHD are the same. The combination of various factors like the sub-type of ADHD, practice of profession, quality of life, interaction with peers and attention spans and so on is unique to a person. The current solutions do not account for all of these factors to create a truly personalized experience for the individual. Our solution aims to consider the important facts to consider both the individual and their surroundings to better understand the environment in which the individual is and use artificial intelligence methods to create an initial persona and then gradually adapt accordingly to help the individual in the long term, as shown in Figure 1.

2 Related Work

2.1 Background on ADHD

The DSM-5-TR specifies that there are three types of ADHD in adults, which are: Predominantly Inattentive, Predominantly Hyperactive-Impulsive, and Combined [10]. Hyperactivity is described in adults as inner restlessness, inability to wind down, and talkativeness, while inattention is identified as the most challenging symptom when it comes to tasks that need constant attention[7].

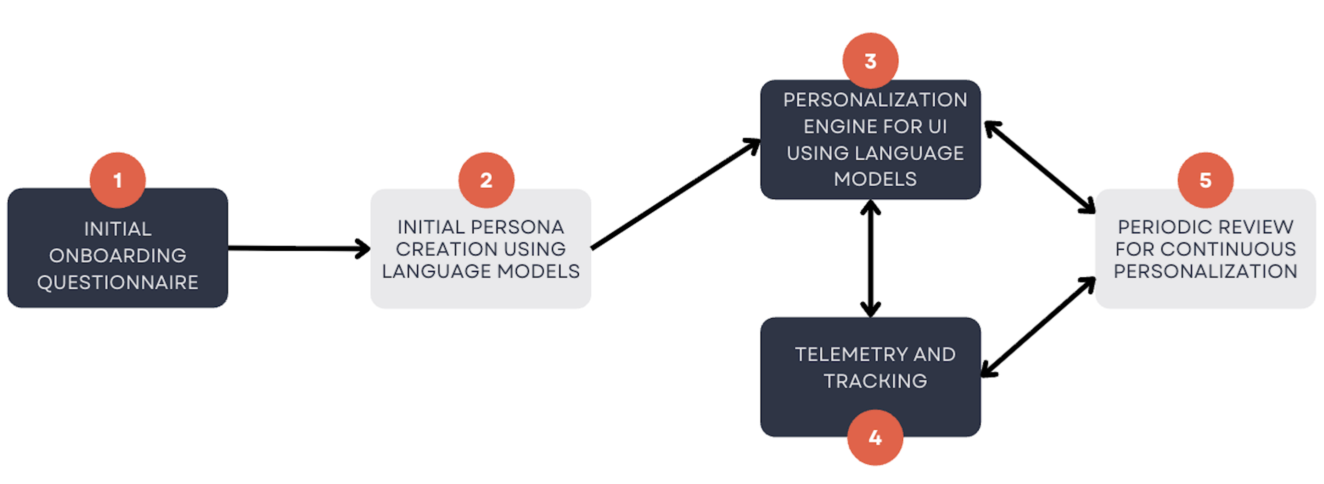

Figure 1: Design Flowchart

ADHD manifests in adults in various domains of life. In regard to employment, there can be difficulties with inconsistency in performance, which may include underachievement, as well as challenges with dealing with everyday tasks such as household chores, repairs, finances, and organizing spaces[17]. On a professional level, difficulties with executive functions such as self-control, self-regulation, planning, or prioritization when given multiple tasks in a digital setting are predominant, resulting in problems with "time blindness" and exhaustion. In relation to daily living, individuals may struggle with chronic stress stemming from responsibility fulfillment, as well as difficulties with regulating emotions, such as mood swings.

The diagnosis of adult ADHD is very difficult, as it is largely dependent on symptoms exhibited before the age of 12[10]. Despite this, there is a certain amount of debate concerning adult onset, with some scientists questioning whether it is a distinct condition. Often, diagnoses are made via comprehensive assessments, such as the use of the ASRS screening tool. The stigma attached to a diagnosis, masking, and delays are all factors that mean a significant number of adults are undiagnosed. It has high heritability, has prenatal and perinatal factors, alongside environment.

Because ADHD symptoms vary widely, one-size-fits-all productivity tools often fail, especially when they lack interactivity and personalization. Inattentive users may struggle to initiate, organize, and finish tasks, while hyperactive-impulsive users may experience restlessness and impulsive task switching and need help staying on track [10]. Recognizing these as two personas enables a dynamic task manager that provides organizational reminders for inattentive users and guided time-outs with focus-direction support for hyperactive-impulsive users.

2.2 Current Tools and Why They Are Not Personalized Enough

ADHD creates diverse daily challenges, making assistance necessary for most sufferers [12][9]. New technologies aim to boost productivity and manage schedules using functions like customizable reminders, focus modes, chunking, prioritization, and gamification [12][9].

Mobile applications have shown success in supporting individuals with ADHD [19]. Specific examples include:

- **DoBrain:** Correlates improvements in executive functions, attention, and hyperactivity-impulsivity with neurological activity changes [12].
- **ADHD Trainer** and **N-back:** Use cognitive training to manage attention and working memory [19][12].
- **Tether:** A personalized desktop assistant that provides condition-aware notifications and tracks activity for software engineers [22].
- **Finch:** A to-do list that incorporates game-based completion and emotional check-ins to boost engagement [9].

Despite these tools, adults with ADHD often find current task management software ineffective, reporting dissatisfaction and an unmet need for tools specifically designed for their individual needs [8]. Generalized tactics like alarms and timers used by software such as Tiimo, Lunatask, and TickTick address fundamental executive dysfunction issues (e.g., organization, working memory) [13]. The success of these interventions, however, varies significantly, and in some cases, can instill anxiety, underscoring the need for careful and personalized design [9].

The main problem is the **lack of personalization**, which neglects ADHD subtype, support systems, and the highly contextual nature of individual challenges [16][20][8]. For instance, interface complexity and visual noise affect users differently depending on their symptom profile, making a uniform design suboptimal [20][8].

AI-driven adaptive systems and co-design methods offer a pathway toward meaningful personalization [14][18]. These approaches enable dynamic, real-time support, such as 24/7 virtual assistants [14][18]. Neuroadaptive methods using EEG-based engagement tracking demonstrate that real-time tailoring of content is feasible [4]. While early interventions like gamified platforms focusing on working memory show promise, these cognitive gains do not always translate to sustainable real-world outcomes [3][21].

Future research must emphasize ethical transparency and diverse training data to ensure adaptive systems effectively respond to the complexity of users' lives [20][9].

2.3 Other Factors to Consider

Personalization for adults with ADHD should be understood as a means of reducing cognitive load and improving real-world usability, rather than catering to surface-level preferences. While meta-analyses indicate that computer-based interventions can be effective in the short term [5], the literature lacks clear definitions of long-term indicators of success and non-clinical requisites for sustained benefit. Reviews of AI-based ADHD diagnosis and support highlight the absence of robust longitudinal studies demonstrating long-term effectiveness or integration into everyday life [15]. Moreover, long-term adoption is undermined by non-clinical challenges, including the risk of over-reliance on software and potential deterioration of independent executive functioning [1], usability failures caused by cognitive and sensory overload in interface design [24], and insufficiently inclusive research methodologies that fail to capture real-world, long-term user needs [27]. Together, these issues indicate that current initiatives prioritize short-term symptom reduction rather than sustainable benefit.

To address these gaps, the proposed work focuses on underexplored dimensions of personalization, including Health-Related Quality of Life, users' perceived support and therapeutic alliance, and changes in peer relationships and everyday well-being. These factors will be evaluated through interviews and feedback involving not only users but also guardians or peers, where appropriate. The overarching goal is to develop a task management tool for adults with ADHD that supports long-term outcomes by adapting to both the individual and their surrounding context, enabling meaningful and sustainable personalization.

3 Methodology

3.1 System Design

The research question we have posed is: "Ultimately, how can a task management system based on AI, offer long term adaptive personalization for adults living with ADHD?" To explore this question, we addressed the issue of adaptive personalization with the design of a conceptual adaptive AI-based system that would use language models (LMs) to estimate individualization based on cognitive styles and behavioral tendencies relating to ADHD. The prototype suggest one way adaptive digital design can account for the attentional needs of neuro divergent users as can be seen in the prototype across Figure 1.

3.1.1 Understanding ADHD as a Design Foundation. The starting point of designing personalization is to understand individual differences in ADHD presentations of attention, impulsivity, and time perception. Based on the DSM-5 classification of presentations of ADHD there are essentially three primary presentations of ADHD - inattentive, hyperactive-impulsive, and combined. Each presentation is associated with different cognitive and behavioral characteristics. A review of multiple HCI studies has shown that adults with ADHD engage in a different process when interacting with a digital interaction system, i.e., adults with ADHD are generally more sensitive to cognitive overload, use rapid feedback to engage in a session with a digital interaction system, and tend to require a flexible pacing of the interaction. [25]. Thus, our design builds in a personalization that is behaviorally informed and clinically definable with UX principles that support neurodivergent interaction in focus and motivation.[11]

3.1.2 Overview of the Architecture.

The architecture we propose (as shown in Figure 1) is a five-stage adaptive pipeline:

- *Onboarding Questionnaire:* The study starts with a brief question-and-answer session to capture users' behavioral patterns and cognitive styles. A standardized questionnaire assesses attention, impulsivity, time management, and social regulation, collecting baseline data to build an initial user persona based on attention span, sensory needs, and distraction management.
- *Language Model-Based Persona Inference:* After collecting survey responses, Gemini 2.5 Pro analyzes answers against a structured ADHD phenotype knowledge base from DSM-5 and cognitive research. Using pattern matching, contextual reasoning, and linguistic analysis, it infers probable ADHD presentations, helping users understand their behaviors relative to a persona archetype without relying on the model's diagnostic labels.
- *Persona-driven user interface initialization:* For each predicted ADHD type, the system creates a tailored persona and interface. Hyperactive–impulsive users receive bright, gamified interfaces with quick feedback, while combined-type users access a flexible hybrid interface. A reasoning summary explains how responses guided these designs, ensuring transparency, clarity, and user trust in the system's recommendations. [6], [23].
- *Personalization Engine:* The personalization engine adapts the system by restructuring the interface, adjusting the tone of feedback, and modifying the timing of prompts and reminders. In the current prototype, these adaptations are demonstrated through models with semi-automatic triggering rather than real-time data, reflecting existing time constraints. This design simulates the behavior of an adaptive and personalized interface using indirect, computer-based user information derived from predefined telemetry metrics
- *Periodic review and reflection loop:* The system features a periodic review where users self-rate focus, mood, and stress, providing HRQoL and DTA insights. This data guides adjustments to persona emphasis and adaptive feedback, promoting reflection, self-awareness, and telehealth-based mental health support while safeguarding user well-being and ensuring alignment with HRQoL and DTA standards.[6], [23].

3.1.3 System Requirements.

- Functional Requirements
  - Introduce the questionnaire for the adaptive onboarding process.
  - Create subtype classification (utilizing LM) and mapping of personas.

- Demonstrate dynamic adaptability of the UI using Figma component variants.
- Show weekly reflection interface for collecting subjective data.

- Non-Functional Requirements
  - Follow principles of universal design with attention to neurodiversity (e.g., color contrast, sufficient white space, and multiple modal cues) [25]
  - Create coherence within the experience throughout adaptive transitions.[11]

3.1.4 *Design Rationale.*

Table 1 outlines important design factors for a system that supports neurodiversity, based on research about human-AI interaction, accessibility, and digital well-being. It shows how the system uses adaptive assessment, such as computational ADHD screening, persona-based LLM personalization, and simulated adaptivity to show responsiveness without exaggerating AI abilities. The table also highlights HRQoL metrics and privacy-by-design to ensure transparency, ethical standards, and long-term trust. Overall, it turns psychological principles into practical, user-focused design choices for adults with ADHD.

3.1.5 *Persona and Interface Alignment.* A different persona archetype is connected to every kind of ADHD, organized to an interface type that emphasizes signed cognitive and motivational strengths. In the prototype type is instantiated as interface types which can be switched manually to show adaptive transitions. The explanation is found in Table 2.

3.1.6 *Scope and Simulation.* The architecture is designed to support behavioral telemetry and real-time AI personalization, but these features are currently only prototyped. No telemetry is collected, and future plans include building a Retrieval-Augmented Generation (RAG) pipeline for adaptive feedback.

Adaptive behaviors are presently simulated through manual triggers and scripted UI transitions. User states are set via preprogrammed switches, not inferred from live data. Instead of dynamically changing components, we use separate, static UI screens for different personas to evaluate perceived adaptability. The user is guided to choose the appropriate landing page based on the language model's suggested persona.

Given the feasibility constraints of continuous long-term telemetry collection, our current evaluation focuses on **perceived personalization, usability, and comfort with the UI**, rather than algorithmic accuracy or real model execution. Future work will implement dynamic telemetry, RAG-based reasoning, and dynamic UI updates to fully realize the intended functionality.

3.2 Implementation

3.2.1 *On-boarding Questionnaire.*

The proposed ADHD Task Manager starts with a survey to understand users' behavior and thinking styles. This helps create initial user profiles and set up the interface based on their attention and motivation needs. The survey is conducted through Google Forms with short multiple-choice questions, keeping it easy for users and ensuring their answers are consistent. Its design is based on the DSM-5[2] Inattention and Hyperactivity-Impulsivity areas, which are summarized in Tables 4 and 5 (Appendix B). The survey includes 17 questions across six areas, with the complete question set found in Appendix C. Responses follow a standardized 5-point Likert scale or a 1-5 scale to help with data analysis and feed into the personalization process explained in Section 3.1.

3.2.2 *Language Model-Based Persona Classification.*

Following completion of the questionnaire, Gemini 2.5 Pro evaluates structured (and optional free-text) answers to determine whether they align with the DSM-5 symptom domains of hyperactivity–impulsivity and inattention [2]. If at least three pertinent items are rated "Sometimes" or higher, the system classifies users as either hyperactive or inattentive; if both criteria are met, it classifies users as Combined. Personalized notes are created by summarizing the situational context and functional impact that are captured by follow-up questions. A behavioral profile made up of symptom frequency, context, and impact notes is used to customize task-management techniques to the user's situational and attentional requirements.

3.2.3 *Persona-driven user interface initialization.*

After the responses from the language model, the user is guided to choose the right landing page to start off. After this, the user can start entering their desired tasks.

3.2.4 *Task Manager.* We used Next.js and DaisyUI components to create a prototype application. The UI[26] is adapted for different types of personas. Each person can have their screens customized according to their attention types and tasks structured by the language model in a way that maintains a balance between not too much information and not too little information.

(1) **Inattentive Type** – (Figure 3 in Appendix A): The user interface (UI) reduces cognitive load for inattentive users by displaying only Today's Task and the immediate Next Step, with simple layouts and clean spacing to lessen overwhelm. Sequential reminders, visual countdown timers, and gentle notifications are used to provide time support. In order to facilitate distraction-free concentration, Focus Mode further eliminates unnecessary components.
(2) **Hyperactive Type - (Figure 4 in Appendix A):** By displaying several task lists simultaneously for speedy capture and management, the Hyperactive UI is intended to maintain engagement and facilitate quick task switching. It provides instant motivation in line with activity-driven behavior through the use of short task cycles and gamified feedback (progress bars, streaks, confetti). Spontaneous switching is made possible by flexible scheduling, which preserves productivity continuity.
(3) **Combined Type:** The user interface for Combined-type users achieves structural and stimulating elements through customization, which allows users to switch between a simple layout for inattentive users and a dynamic layout for hyperactive users according to their present condition. Visual density and reminders are kept flexible—supporting either sequential or more spontaneous alerts. The system enables users to control their changing requirements. These occur during different tasks and sessions.

Design Element	Justification & Supporting Work
Adaptive Questionnaire	Reflects recent computational screening protocols for adult ADHD integrating behavioral signs with data-driven rationalization
Language Model Persona Builder	Allows for interpretation of contextual patterns of responses that align with trends in adaptive interfaces utilizing language models [23].
Persona-Centric UI Personalization	Translates ADHD subtype characteristics into concrete interface modifications (e.g., calm versus stimulating variability) that adhere to accessibility considerations under neurodivergent circumstances [25].
Simulated Adaptive Loop	Provides an example of conceptual adaptivity through UI variations while refraining from overstating real-time AI capabilities.
Integration of HRQoL and DTA Metrics	Goes beyond a productivity evaluation toward an assessment of trust, well-being and mutuality.

Table 1: Design elements and supporting justification.

Subtype	Persona	Design Philosophy	UI / Interaction Features
Inattentive → The Calm Organizer	A simple, low-key, and steady interface that is designed to lower cognitive load.	A focus on calmness, stability, and restoration of attention.	• Gentle color palette with plenty of whitespace • One-task focus view • Gentle, non-intrusive reminders • Limited animations
Hyperactive–Impulsive → The Energetic Achiever	A dynamic and interactive environment with short feedback loops	Channels impulsivity into structured productivity and rewards	• Vivid color palette and progress gamification • Micro-task "quick wins" • Motion feedback and streaks • Haptic/sound cues
Combined → The Adaptive Balancer	A hybrid layout that alternates between focus and energy modes when performing in a developing and stimulating environment.	Balances under- and over-stimulation, adapting to daily context.	• Dual Calm/Active modes • Adaptive brightness • Dynamic task board

Table 2: Personas and UI strategies mapped to ADHD subtypes.

(4) **Shared UI/UX Features (Figure 5 & 6 in Appendix A) :** Across all user types, the system incorporates a shared set of UI and UX features to promote usability and consistency. Focus Mode provides a distraction-free workspace with timed sessions to support sustained attention and flow. The Task Manager offers a centralized, clearly structured interface for organizing multiple task lists with intuitive navigation. Client-side browser storage enables fast, uninterrupted interactions, which is critical for maintaining momentum in ADHD users. Built with Next.js and DaisyUI, the system supports a responsive, accessible, and modular design. Consistent use of color coding, typography, spacing, and component structure reduces cognitive friction and fosters a predictable, user-friendly experience.

3.3 Evaluation

3.3.1 Study Design. Our evaluation will use an open-ended, qualitative study design. We chose this approach because our primary goal is to gather elaborate feedback on the user experience of a novel system. A qualitative design allows us to understand why and how users interact with the personalized features, focusing on their perceptions, feelings, and overall satisfaction. This is a formative evaluation, meaning its purpose is to identify strengths and weaknesses to guide future development. Therefore, we do not use a comparative baseline. Instead of comparing our system to another tool, we focus entirely on assessing the user experience with our unique design.

3.3.2 Task and Procedure. We will guide participants through a step by step process to ensure we can track their interaction with the system's core features. The procedure will be the same for all participants to ensure consistency.

Task: Participants will be asked to use the task manager to organize their personal, academic, or work-related activities for a three-day period. They will perform the following core tasks:

- Complete the initial on-boarding questionnaire.
- Review the AI-generated persona created for them.
- Explore the personalized user interface that has been designed for that persona.
- Simulate how they would check the status of tasks or mark one as complete by clicking through the pre-linked screens.

Procedure: The study was conducted in a single 45 to 60 minute session for each participant and done in the following steps:

- Introduction & Consent (5 mins):Brief the participant on the study's purpose, explain that we are evaluating the system (not them), and obtain their informed consent.
- Onboarding & Persona Creation (10 mins): The participant completes the initial questionnaire. We ask them to use a think-aloud protocol, verbalizing their thoughts while answering and reacting to the persona generated by the language model
- Task Interaction (20 mins): We present them with the scenario and ask the participant to navigate their way through the prototype to organize the given tasks. We observe how they interact with the static, personalized UI and ask them to describe what they would expect to happen at each step.
- Interview (10-20 mins): We conduct a follow-up interview to ask them about their experience.
- Debrief (5 mins): We thank the participant, answer any questions they may have, and reward them with a small token of appreciation.

3.3.3 Measurement. We measured the system's effectiveness through qualitative data collected from observations and post-study interviews. Our analysis focuses on identifying key themes related to three outcome dimensions: perceived personalization, perceived effectiveness, and user satisfaction & usability. To support systematic evaluation, the interview instrument included both Likert-scale ratings and open-ended questions targeting each construct.

Perceived Personalization. This construct evaluates whether users felt the system understood their needs and reflected their work style. The following interview questions were used:

- *P1:* Rating – "The AI-generated persona accurately reflected my typical work style and challenges." (1–5)
- *P2:* Rating – "The appearance of the user interface felt specifically tailored to my needs." (1–5)
- *P3:* "What features or parts of the UI (colors, layout, reminders) felt the most customized to you, and why?"
- *P4:* "What did the AI-generated persona miss or get wrong about your work style?"

Perceived Effectiveness. This dimension captures how well the system supported task progress, organization, and focus. The following questions were used:

- *P5:* Rating – "If I had used this system for a real project, I believe it would have helped me stay more organized." (1–5)
- *P6:* "Thinking about the task breakdown you saw, which sub-task strategy (e.g., short sprints, detailed steps, timed breaks) was the most helpful for getting things done?"
- *P7:* "Did you feel the UI gave you too much information, too little information, or just the right amount? Why?"
- *P8:* Rating – "The timer helped keep me on track." (1–5)
- *P9:* Rating – "The gamification of tasks helped my progress." (1–5)
- *P10:* Rating – "The alerts and tips helped me keep on track." (1–5)

User Satisfaction & Usability. This construct assesses ease of use, clarity, and overall experience with the prototype. The following questions supported this evaluation:

- *P11:* Rating – "I found the task manager prototype easy and intuitive to use." (1–5)
- *P12:* Rating – "I would be interested in using a fully functional version of this task manager long-term." (1–5)
- *P13:* "What part of the interface did you find most confusing or distracting?"
- *P14:* "Overall, what was your single most positive impression, and your single greatest suggestion for improvement?"

These questions collectively enabled us to capture users' subjective experiences with the system and analyze how closely the generated personas, task structures, and UI adaptations aligned with their working preferences and cognitive needs.

Data Analysis Plan - We will transcribe the audio from the think-aloud protocols and interviews. We will then perform a thematic analysis on this data to identify recurring patterns, themes, and critical insights related to our measurement goals.

3.3.4 Participants. We have 20 adult volunteers between the age of 18 and 45 years for the study.(classmates, friends, or co-workers) They are all people with multiple responsibilities and need to context-change frequently. This makes them the perfect subjects for the study. We plan to employ this method to get a better representative sample.

- Inclusion Criteria: Participants must be between the ages of 18 to 45, use a computer daily, and have some familiarity with digital task-tracking tools (e.g., Google Calendar, Reminders etc).
- Rationale: Even though it is not a clinical sample, this group serves as a reasonable approximation of our target population of students and working adults who experience ADHD-like challenges.
- Ethics: All participants provided informed consent before the study. They were be reminded that the prototype is a research tool, not a clinical intervention, and that their data will be kept anonymous.

3.4 Analysis

Our analysis followed a mixed–methods approach combining quantitative scale construction and hypothesis testing with qualitative thematic analysis. This subsection describes how each form of data was processed and analyzed.

3.4.1 Quantitative Analysis. All Likert-scale responses were first reformatted into a wide item-level dataset in which each column represented a survey item and each row corresponded to a participant. Items were grouped into three predefined constructs based on our measurement design: *Perceived Personalization*, *Perceived Effectiveness*, and *Satisfaction and Usability*. For each construct, we computed composite scale scores by averaging the relevant items. Internal reliability was assessed using Cronbach's α, resulting in acceptable reliability for Perceived Personalization (α = .81) and Perceived Effectiveness (α = .74), while Satisfaction and Usability showed low reliability (α = .10) and is interpreted with caution.

To evaluate whether participants rated the system positively, we performed hypothesis testing for each scale. We treated the neutral midpoint of the 1–5 Likert scale as the reference value ($\mu_0 = 3$) and conducted one-sample t-tests. Our hypotheses were formulated as:

- $\mathbf{H_0}$: $\mu = 3$ (participants' ratings do not differ from the neutral midpoint)
- $\mathbf{H_A}$: $\mu > 3$ (participants' ratings are significantly more positive than neutral)

For each construct, we estimated the mean, standard deviation, and corresponding one-sample t-test comparing the scale mean to the neutral midpoint. The full analysis was implemented programmatically in Python: item responses were organized into a wide-format table using pandas, scale scores were computed by averaging predefined items, internal reliability was calculated with a custom Cronbach's α function, and inferential tests were conducted using SciPy's statistical toolkit.

3.4.2 Qualitative Analysis. We analyzed the open-ended responses using a thematic coding approach. The first stage involved generating initial descriptive codes that captured the concrete ideas expressed in each response. This resulted in 28 low-level codes representing a range of participant reactions, such as comments about how well the persona matched their working style, which task features were helpful, or which parts of the interface felt unclear.

In the second stage, we examined similarities and relationships among these codes and consolidated them into broader conceptual categories. These categories reflected recurring aspects of the user experience, including personalization fit, support for task progress, clarity of the interface, the amount of information presented, and suggestions for improvement.

Finally, we synthesized these categories into a set of overarching themes that summarized the main patterns across participants' feedback. These themes described (1) how users evaluated the relevance of the persona and personalized UI, (2) which system features most strongly supported their workflow, (3) where interface clarity facilitated or hindered use, and (4) which improvements users considered most important moving forward.

This process allowed us to move from individual comments to a structured understanding of shared user experiences, complementing the quantitative findings and offering insight into why certain system features were more or less successful.

4 Results

This section reports the findings from the quantitative scale analysis and the qualitative thematic analysis. The quantitative results describe participants' ratings of perceived personalization, perceived effectiveness, and satisfaction and usability. The qualitative results summarize the themes that emerged from open–ended responses based on the coding process described in the Analysis subsection. Together, these results provide a descriptive account of users' experiences with the personalized task–manager prototype.

4.1 Quantitative Results

Table 3 presents the descriptive statistics and one-sample t-tests for each scale compared against the neutral midpoint of the 5-point Likert scale ($\mu_0 = 3$).

Participants rated the system above the midpoint on all three constructs. Perceived Personalization was significantly higher than neutral, $t(20) = 3.69$, $p = .001$, with a mean of $M = 3.74$ ($SD = 0.92$). Perceived Effectiveness also exceeded the midpoint, $t(20) = 6.16$, $p < .001$, with a mean of $M = 3.89$ ($SD = 0.66$). Satisfaction and Usability showed a similar pattern, $t(20) = 6.47$, $p < .001$, with a mean of $M = 3.93$ ($SD = 0.66$). Reliability estimates indicated strong internal consistency for Personalization ($\alpha = .81$) and Effectiveness ($\alpha = .74$), while Satisfaction and Usability showed low internal consistency ($\alpha = .10$) and should be interpreted cautiously.

Table 3: Descriptive statistics and one-sample t-tests for each scale.

Scale	Mean	SD	t(20)	p
Perceived Personalization	3.74	0.92	3.69	.001
Perceived Effectiveness	3.89	0.66	6.16	<.001
Satisfaction & Usability	3.93	0.66	6.47	<.001

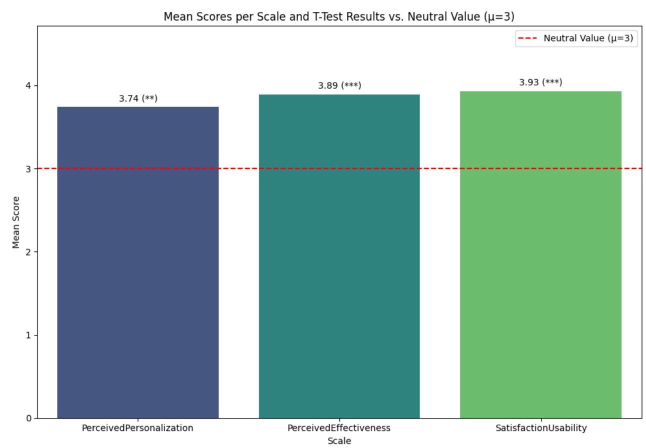

Figure 2: Distribution of scale scores for Perceived Personalization, Perceived Effectiveness, and Satisfaction & Usability.

4.2 Qualitative Results

Qualitative analysis of open-ended responses provided complementary insight into how participants experienced the system. Four themes emerged that describe the patterns present in the user feedback.

T1: Personalization Builds relevance; Participants frequently reflected on how well the AI-generated persona and adapted interface matched their actual work style. Some noted accurate representations of their habits, while others pointed out mismatches related to prioritization or workflow. Example comments included: "The persona matched some of my productivity challenges, but missed how much I rely on prioritization" and "The interface felt somewhat tailored, but not fully aligned with how I actually structure tasks."

T2: Help Focus on Task-Support Features Many responses highlighted the usefulness of structural features, such as the Pomodoro timer and task breakdowns. Participants described these elements as mechanisms that helped them stay on track or made large tasks feel more manageable. For example, a participant wrote: "The timer helped keep me on track," while another noted: "The task breakdown made big tasks feel easier to start."

T3: UI Clarity Shapes Ease of Use. Visual design aspects, including color contrast, icon clarity, and overall layout—played a meaningful role in how easy the interface was to navigate. Several participants described certain icons or elements as unclear or difficult to interpret at first, while others emphasized that the layout felt clean and straightforward. Example responses included: "Some icons were too small and unclear at first" and "The layout was clean, but the contrast could be improved."

T4: Opportunities for Improvement. Participants also identified areas for refinement and additional functionality. Suggestions commonly involved the integration of external tools, improving the color and clarity of labels, or adding features to streamline workflows. Representative comments included: "It would be great if this connected to my calendar" and "Clearer labels or tooltips would make navigation easier."

Together, these qualitative findings help explain the patterns observed in the quantitative ratings, revealing the specific aspects of personalization, task support, and clarity of the interface that shaped the' experiences of the participants with the system.

5 Discussion

The study demonstrates that the personalized task manager was effective in supporting user productivity, with Perceived Effectiveness receiving strong quantitative validation ($M = 3.89, p < .001$). This statistical success is reinforced by qualitative reports indicating that specific features, such as task breakdowns and timers, helped users overcome inertia and maintain focus. However, while Perceived Personalization was also rated positively ($M = 3.74$), it received the lowest scores of the three measures. The qualitative feedback suggests this is because the system successfully adapted to general work styles but failed to account for dynamic prioritization, indicating a need for future algorithms to consider real-time context alongside static user preferences. Artificial Intelligence The results for Satisfaction and Usability present a more complex picture of user sentiment. Although the mean rating was the highest among all categories ($M = 3.93$), the scale demonstrated low internal consistency ($\alpha = .10$), suggesting that satisfaction and usability functioned as separate experiences for users rather than a unified construct. This result implies that users were willing to overlook interface imperfections because of the high value provided by the underlying AI capabilities.

5.1 Implications for Research and Design

Based on the finding that participants valued the system's utility but struggled with its interface and prioritization logic, we offer specific recommendations for future research and system design. For the research community, we recommend a shift from static user profiling to dynamic context modeling because our data showed that while the system successfully mirrored general work styles, it failed to account for immediate user needs. Therefore, future adaptive models should incorporate real-time variables such as calendar density and deadline proximity to bridge the gap between relevance and urgency. Regarding design, we recommend prioritizing cognitive scaffolding while strictly adhering to interaction hygiene. The strong effectiveness ratings confirm that features which offload cognitive effort such as automated task breakdowns are critical for user value. However, the low consistency of our usability metrics warns that high functional utility cannot compensate for poor visual design indefinitely. Consequently, designers must treat visual clarity and ecosystem interoperability as foundational requirements to prevent friction from undermining the benefits of AI support.

5.2 Limitations

This study is subject to several limitations that contextualize the interpretation of the findings. First and most notably, the small sample size ($N = 21$) restricts the generalizability of the statistical results, meaning the positive ratings for effectiveness and personalization may not be representative of a broader or more diverse user population. Second, the study was conducted over a short duration, which introduces the possibility of a novelty effect; participants may have rated the AI features highly due to their newness rather than their sustained utility, and a longitudinal study would be required to verify if these benefits persist over time. Finally, the quantitative assessment of satisfaction and usability was constrained by low internal consistency ($\alpha = .10$), indicating that the survey instrument may need refinement to distinctively measure these two constructs rather than treating them as a composite scale in future research.

5.3 Future Scope

Looking ahead, future work would focus on improving the system's ability to adapt by integrating real-time behavioral data. This will allow the interface and task strategies to respond quickly to changes in attention, stress, and engagement. Users also pointed out the need for better workflow support. They emphasized the importance of calendar, email, and device synchronization to enhance contextual awareness and prioritize tasks. Finally, since the current evaluation was short-term and might be affected by novelty, long-term studies are needed to evaluate sustained usability, ongoing precision of personalization, and overall impact on task management and quality of life for adults with ADHD.

6 Conclusion

This project demonstrated that task management for adults with ADHD required more than just basic reminders or set productivity features. Current tools often fell short because they overlooked ADHD subtypes, individual thinking patterns, sensory needs, and daily context. Our adaptive AI-based system used an onboarding questionnaire, language-model personas, subtype-specific interfaces, and periodic reflection to offer task support that aligned better with how users actually worked. Evaluations suggested that personalized user interfaces, customized task breakdowns, and behavior-aware support enhanced perceived effectiveness and usability. They also highlighted the need for improved prioritization, clearer interfaces, and real-time adjustment. Overall, the system served as a strong foundation for a context-aware task manager that supported neuro-divergent individuals and paved the way for long-term personalized solutions for adults with ADHD.

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A Images of the Web Application's User Interface

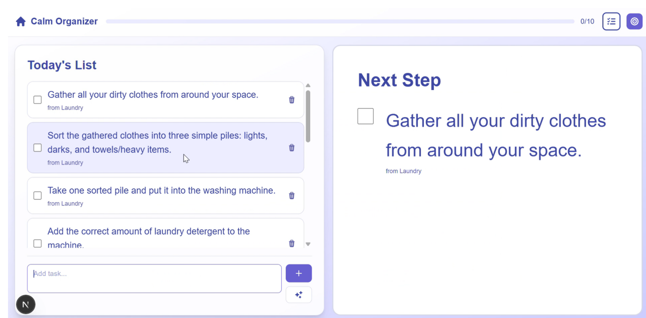


Figure 3: Inattentive UI

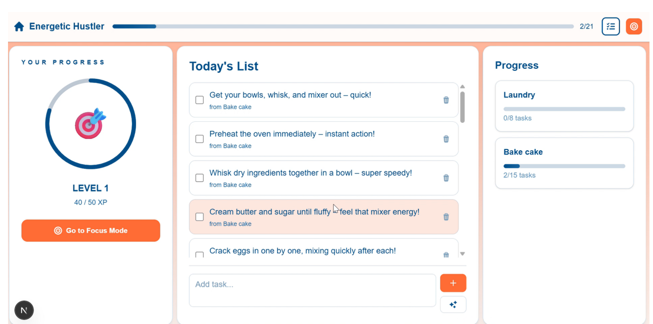


Figure 4: Hyperactive Layout

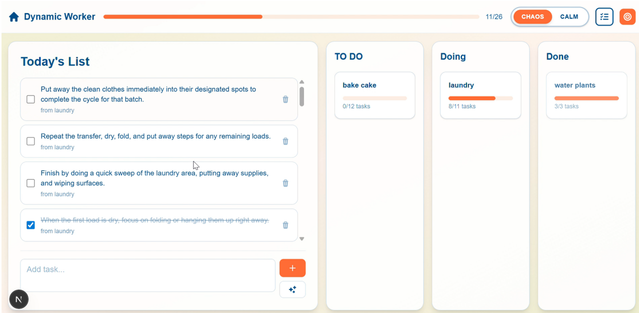
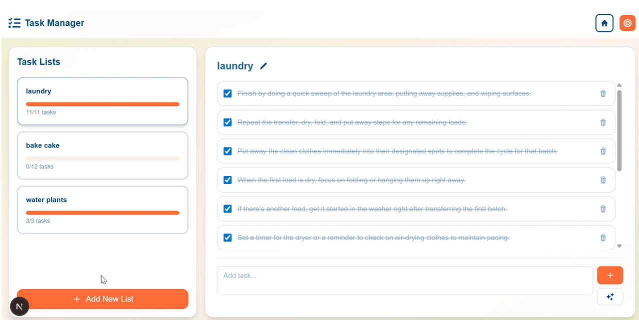


Figure 5: Combined



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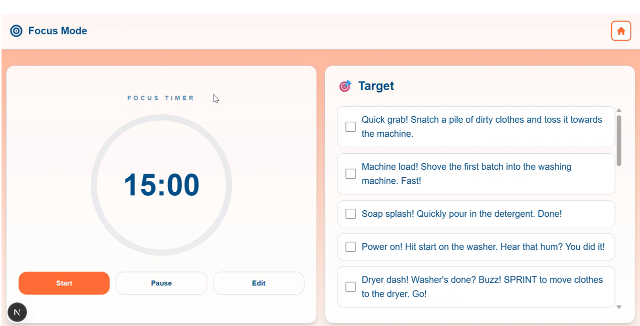

Figure 7: Enter Caption

B DSM-5 Tables

Table 4: Inattention Domain (DSM-5 Aligned Items)

DSM-5 Criteria (Grouped)	User-Friendly Question (Combined)
Fails to give close attention to details / makes careless mistakes Forgetful in daily activities	How often do you overlook details or make careless mistakes, or forget everyday responsibilities (appointments, bills, calls)?
Difficulty sustaining attention Easily distracted by extraneous stimuli Does not seem to listen when spoken to directly	How often do you lose focus, get pulled away by distractions (noise/notifications), or realize you weren't really listening when someone speaks to you?
Does not follow through on instructions / fails to finish tasks Avoids or dislikes tasks requiring sustained mental effort	How often do you delay starting demanding tasks, or start them but get sidetracked and don't finish?
Difficulty organizing tasks and activities Often loses things necessary for tasks/activities	How often do you struggle to organize/plan tasks or misplace important items (keys, phone, documents) needed to complete them?

Table 5: Hyperactivity/Impulsivity Domain (DSM-5 Aligned Items)

DSM-5 Criteria (Grouped)	User-Friendly Question (Combined)
Fidgets/taps/squirms Leaves seat when expected to remain seated Runs/climbs or feels restless (adults)	How often do you feel physically restless—fidgeting, tapping, or needing to get up/move even when you're expected to stay seated or still?
Unable to engage quietly in leisure "On the go" / driven by a motor	How often do you find it hard to relax or do quiet activities because you feel constantly "on the go" or internally driven?
Talks excessively Blurts out answers before questions finish	How often do you talk more than intended or speak impulsively (e.g., answering before someone finishes speaking)?
Difficulty waiting turn Interrupts or intrudes on others	How often do you feel impatient waiting your turn or interrupt/insert yourself into conversations or activities?

C Initial Persona Creation Questions

Focus & Attention Patterns.

(1) How often do you lose focus or get distracted during tasks requiring sustained attention?
(2) How often do you start tasks but leave them unfinished because something else catches your attention?
(3) How often do you struggle to organize tasks, schedules, or your workspace?

(4) How often do you avoid or postpone tasks requiring long periods of focus?
(5) How often do you misplace or lose important items (keys, phone, documents)?

Energy & Impulsivity Patterns.

(1) How often do you feel restless, fidgety, or "on the go"?
(2) How often do you interrupt others or speak before they finish?
(3) How often do you quickly switch tasks without finishing the previous one?

Time Management & Task Behavior.

(1) How often do you underestimate how long tasks will take (time blindness)?
(2) When you have multiple tasks, which pattern best describes you?
(3) How often do you forget appointments, deadlines, or daily responsibilities?

Social & Work Environment.

(1) Which environment best describes your daily work/study setting?
(2) How supported do you feel by the people around you when managing tasks and responsibilities?

Sensory & Distractibility Preferences.

(1) Which environment helps you focus the best?
(2) Which type of distraction disrupts you the most?

Emotional Regulation & HRQoL.

(1) How often do emotional swings (frustration, overwhelm, irritability) affect your task performance?
(2) How often does stress worsen your ability to focus or complete tasks?