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Onboarding for AI features: Reducing friction at the first use

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Abstract
In order to highlight efficient onboarding for AI functionalities, this manuscript emphasizes friction in the first use of AI systems. Deficiencies in opacity, user control, and value proposition are challenges users face in the first use of AI. This manuscript outlines an onboarding and first use framework that addresses the challenges of opacity, trust, and friction. Integrating user centered, diminished cognitive load, and feedback systems, this manuscript proposes onboarding design friction solutions that improve interaction engagement and retention. This retention engagement friction will be the focus of the long term user satisfaction.

Keywords: AI onboarding, first use, friction reduction, user experience, transparency, trust, tutorials, real-time feedback

I. Introduction
The incorporation of AI technologies continues to increase in the daily lives of users with the deployment of features and functionalities in applications like Siri and Alexa, Netflix and Youtube, and smart devices for the home. Given the growing dependence on these systems, first-use experience becomes crucial in deciding whether or not the user will keep using the AI features, or become disengaged entirely. The first-user experience of these systems is intimidating to many, as they often do not understand any of these systems' functions.
A primary concern is the opacity of AI algorithms. Consider the case when the AI system offers a product recommendation or suggests a movie. The user is making a choice based on the recommendation but usually does not understand the logic guiding the AI system. The system does not reveal the underlying structure, which may lead to some form of uncertainty, and the user is likely to lose trust in the system. Such value proposition may not be clearly articulated, leading the user to believe that these features do not add any value and thus will not enhance their experience. If the user is not aware of the potential value, they will become disengaged.
To solve all these problems, the user needs to be onboarded. Onboarding is critical in assisting the user with their first experience of interacting with AI systems; clearly showing the user how these systems work, and how they can actually benefit from their usage.
Friction is the natural result of conflicting stances on a given matter, and fostering smooth friction helps users establish secure feelings of trust and confidence, as well as gain greater levels of technology engagement experience as is earned through well executed onboarding in initial moments of use. The onboarding AI experience is essential in achieving users open engagement, in fostering the essential emotional experience and attitudes in achieving satisfaction and acceptance in continuing use of the application. [1]
Despite the increasing levels of interaction with AI technologies, first time users still exprerience high levels of engagement friction and counter-cognition. Much of the engagement friction stems from the complex, opaque, and uncontrollable perceptions of the AI. Users experience high levels of counter-cognition regarding the systems determinism and can issues manifests as a lack of trust and reliance in the system fairness or equality.
The core of the issue is alienation. Users gain alienation primarily from current onboarding friction failing to address these central issues. The predominant onboarding strategies continue to focus on simple do this, do that primary engagement friction actions. Users are gradually developing a greater sense of determinism, or a greater sense of purpose and control over the cognitive engagement system.

A first use experience that is fully automated and lacks transparency and opportunities to build trust is detrimental to user satisfaction. Poor onboarding results in dissatisfaction as users will abandon these systems and use alternatives. The result is a continued lack of engagement and dissatisfaction with these systems [2, 3].

The need to pivot to personalized user experiences to provide more engagement as a function of onboarding is evidenced by the AI systems users abandoned. User control should also be a focus of the onboarding process, both in terms of the systems AI features and the user's k engagement with the AI.

The goal of this paper is the provision of a proposed methodology that incorporates the design of onboarding to AI systems that minimizes first use friction. The intent of the design is also the introduction of the systems AI features in a manner that is fully engaging and transparent. The onboarding process offers users the opportunity to receive understandable instructions and real-time feedback and control how and when they engage in the process, leading to augmented confidence and enhanced onboarding experiences with AI technologies.

This paper will also explore how the onboarding strategies to be detailed mitigate user onboarding frustration and friction and subsequently foster the sustainable assimilation of AI-powered technologies. Optimal onboarding is not designed to ease primary friction and friction and is not designed to provide ongoing challenges with AI systems. This paper aims to develop a comprehensive framework which balances the right and user empowerment to fulfill immediate desires of user contentment and sustainable engagement with AI technologies.

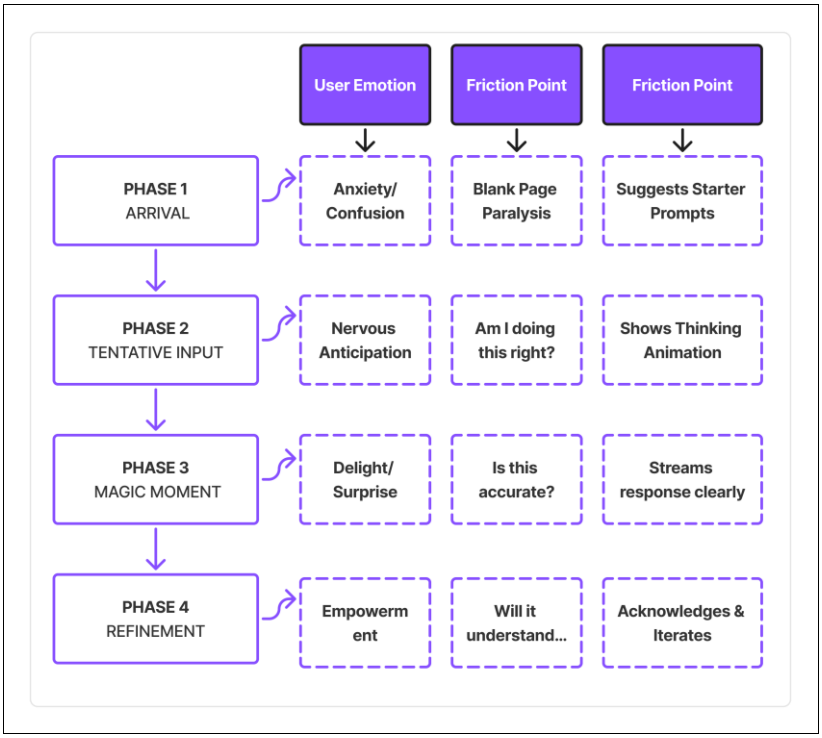

Fig 1: User Experience Journey in First-Time Interaction with AI

II. Researching Friction with First - Use of Ai Feautres

A. Starting With AI

Users often encounter unique difficulties surrounding "first-use experience" with AI systems. Users' unfamiliarity regarding the AI system integration can cause discrepancies surrounding understanding the AI-system behavior, actions, and/or capabilities. Without the sufficient knowledge of the system, users experience frustration. Due to the integrations of AI systems, users must grapple with the frustration of not understanding the actions or behaviors of the AI system within the AI system, creating a challenge for the user. The challenge of transparency surrounding the AI-system integration at the first-use level presents the most significant issues. Users often experience difficulty understanding the algorithms around the decision-making of AI. For instance, users on e-commerce websites experience frustration as the AI systems recommend products and fail to provide reasoning surrounding the recommendations. Users fail to trust the AI system, resulting in participants feeling disconnected. The lack of transparency surrounding decision-making can be detrimental to the system as users rely and trust the system to perform within controlled parameters. Users of the system often experience disengagement due to the lack of reliable transparency within the system [4].

First-time users often grapple with severe learning curves due to the intricacies of the system and the uncharted terrain posed by new technologies. Users may not comprehend the nuances of what the AI is executing. This is particularly true with machine learning or deep learning routines that involve significant opaqueness in the algorithms employed. Thus, addressing the opacity of machine learning algorithms in the system during onboarding is of utmost importance. Friction that users face during their initial encounter with the systems is obtaining AI functionality. There are several sources of friction, and they are often interconnected, presenting users with increased layers of difficulty. In combination, they target users weak in familiarity with the system.

1. Lack of Explanation for Suggestion
This is manifest in the absence of knowledge surrounding the AI's internal processes in the rationale behind its suggestion (AI, 2020). Users may become angered and possess diminished trust in the AI due to the absence of adequate justification and the AI's inability to explain its internal empathetic decision-making processes. Within the context of recommending an item in e-commerce, customers might be mystified, annoyed, and confused that the AI has suggested a product that appears not to be connected to the customers' behavior or to any of the outwardly articulated preferences, and AI's decision-making processes. This lack of understanding fosters the perception that prescriptive AI is black box. This undermines the constructive trust equilibrium and amounts to reduced engagement and trust in the AI (Wong, 2022).

2. Overexertion of Users' Cognitive Resources: Users may become overwhelmed with the volume of data that AI offers to them (Burda, 2020). With the excessive provision of areas to focus on and with choices offered, users may become paralyzed and with a resultant inability to make a decision, negatively impacting the overall experience. For instance, with UI that is highly complex and with settings/optios that are in excessive number, users become disengaged and abandon the system. The phenomenon of cognitive overload has a double effect of impacting the user's ability to make a decision and in hindering future use of the AI for interaction (Yin, 2023).

3. Trust Issues: Trust is critical in all interactions of users with AI. Many users find it difficult to use and trust an AI system because of its complexity and opaqueness. Without an understanding of decision-making, a sense of arbitrariness and unreliability of the system is created. Moreover, trust issues are compounded by users' lack of control over the AI's decision-making, which may lead to a sense of inability to modify or rectify the behavior of the AI. For example, users may question the system's fairness and accuracy and lose trust in it to the extent that they abandon the use of AI technologies when an AI system erroneously classifies data or provides a recommendation that is of no value [7].

4. Tangible Absence of Control: These types are deep learning AI systems that carry out specific tasks and as such Automation AI systems can alienate or frustrate users when they perceive that they do not have control of the system. users may feel frustration when they cannot alter specific parameters, or when they want to fine-tune the AI customization to suit their preferences. When users do not have clear control over the system, they might feel that they are disconnected from the system, which may dissuade them from engaging with the system further. User's perceived control over the system is an important determinant of their satisfaction with the systems and their adoption propensity of the tech over an extended period of time [8].

C. User Expectations and Emotional Impact
Initial interactions with AI systems are often met with a hopeful anticipation regarding the perceived ease-of-use and instant value of the technology. Novice users are, for the most part, expected to assume a passive role in these systems, and envision themselves as just recipients of the end-results, while the technology does all the necessary legwork to facilitate the achievement of their end goals. Inactive users often assume a role of system passivity, and do not anticipate any substantive engagements with the AI system. When these ideal scenarios are absent, users often disengage from the system altogether and relieve their frustration on an even more regrettable collective level by decommissioning the entire application of technology. As a result, even more reluctance to engage with the technologies shifts to the system on a broader level, and the technologies are doomed to failure. Abandonment of new systems often results in a first-use digital death, and similar scenarios act as a signal of probable system failure.

Table 1: Common Sources of Friction in First-Time AI Use

Source of Friction	Description	Example
Opacity of AI Behavior	Users don't understand how AI makes decisions.	Unclear product recommendations.
Cognitive Overload	Too much information or too many options overwhelm the user.	Overly complex user interfaces.
Trust Issues	Lack of transparency in AI decision-making.	AI incorrectly categorizes data.
Perceived Lack of Control	Users can't influence or understand AI behavior.	Inability to adjust settings.

3. Strategies for Minimizing Resistance at Initial Engagement

A. Easing User Understanding of AI Systems
A major method of cutting resistance during a user's initial engagement with an AI system is through breaking down how the user and system will interact. There is an abundance of complex algorithms, jargon and other technicalities of the system that can prove intimidating to a novice user. Simplifying the description or explanation of the AI function will make it less complex and therefore reduce the potential confusion and frustration of the user. For instance, instead of explaining the algorithms and other inner workings of the system, the AI system can use simple explanations. For example, telling the user, You will receive recommendations based on your previous selections, achieves a higher level of user understanding of AI systems without unnecessary complexity. Such a clearly articulated and even simplistic system can alleviate the user's intimidation of the technical system and assist in improving the user's experience overall. Simple explanations of an AI greatly enhance the level of intimidation that users possess and facilitate the understanding of how their actions impact the system within their overall experience [10].

B. Gradual Onboarding and Progressive Disclosure
One additional effective strategy to alleviate friction is the progressive disclosure of features. Instead of bombarding users with all their options and capabilities at the outset, progressive disclosure consists of showing only the core functionalities of the features and only releasing additional features as users become more comfortable. This technique is effective to mitigate cognitive overload, which occurs as a result of users being swamped with too much information too quickly. In the case of an AI system, a new user may

only need to be given access to a handful of basic settings to start off. Once the user becomes familiar with these and is comfortable, additional more sophisticated settings and functions can be gradually rolled out. This technique allows users to adjust and learn at their own pace. As users self-dispatch their onboarding, they are also more likely to become comfortable and more engaged, which decreases the possibility of users abandoning the system. Easing users into the experience also optimizes the onboarding process. This is the motivation behind progressive disclosure [11].

C: Interactivity and Tutorial Engagement

Engaging first-use tutorials significantly enhance the user's first experience with the system. Step-by-step tutorials increase users' technology confidence and familiarity in addition to guiding them through the system's AI features. These tutorials bring hands-on learning, and users actively engage with the system, and feedback from the system is immediate. These interactions make the experience intuitive, enjoyable, and they stay with the AI. Adding game features to tutorials, such as earning greater rewards, completing levels and challenges, further motivates users to stay with the system. Reward incentives in the onboarding process improve user engagement, and promote user involvement in the tutorial learning experience. An example is allowing users to complete tasks and, as recognition of the accomplishment, they unlock features and settings, which creates engagement. The initial friction is alleviated, and long-term engagement is promoted, with a positive onboarding experience one that is fun and interactive being a contributing factor [12]

D. Transparency and Real-Time Feedback

Another strategy that helps reduce friction is providing users with real-time feedback and transparently communicating how the AI makes decisions. When users experience AI systems, they often experience frustration due to a lack of understanding with the AI's decisions. Thus, real-time, transparent feedback is critical whenever an action is taken or a recommendation is provided. For instance, if an AI system makes a recommendation, the system should articulate the reasoning behind the suggestion. "This recommendation is made because of your previous purchases and preferences" helps users understand the system's rationale, reduce perplexity, and establish confidence. Real-time feedback helps users appreciate the AI system's purpose, and depth of value that the system contributes. The combination of transparency, real-time feedback, and clarity helps users feel less apprehensive, and more educated, thereby reducing the potential frustration stemming from their lack of familiarity with the system. [13]

E. User Control

User control principles help ease the onboarding process, as well as the total experience friction. Control here means the ability of the users to modify certain parameters of the system, such as AI settings, feature sets, or to fully disengage the system. Controlled users become more engaged, and the system, at least to some extent, will "belong" to them. Satisfaction, of course, will be higher. For example, the ability to control the degree of personalization, turn on and off certain notifications, and control the recommendations will convince the users that the AI system is tailored to their needs. The ability of users to control their experience of the system will result in greater AI systems flexibility, hence more user engagement. Also, users become more at ease and trust the system when they can influence the outcome of the AI decision. The fewer the barriers as a result of this control, the more positive the experience will become by decreasing the friction involved in the AI's decisions and the user experience will become more positive overall [14].

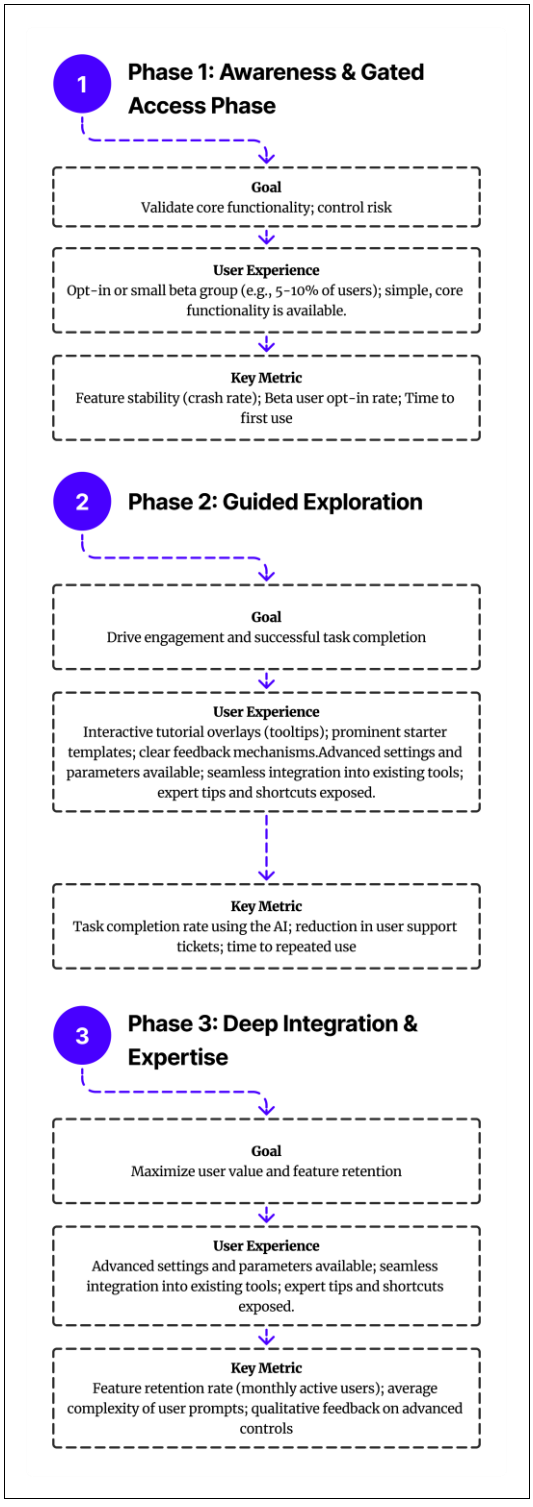

Fig 2: Gradual Onboarding Process for AI Features

This Figure illustrating a gradual onboarding process with progressive disclosure, where users first encounter simple functions and advance to more complex features as they become comfortable.

Three Stages

Table 2: Strategies for Reducing Friction at First Use of AI

Strategy	Description	Example
Simplifying AI Interactions	Provide clear and simple explanations of AI behavior.	"This recommendation is based on your preferences."
Gradual Onboarding	Introduce features step by step, revealing more advanced options as needed.	Begin with basic settings, then introduce customization.
Real-Time Feedback	Provide immediate explanations for AI decisions.	"This action was suggested based on your recent activity."
User Control	Allow users to adjust AI features or opt-out of specific functionalities.	Users can turn off notifications or adjust recommendation settings.

4. Standards for AI Functionality Onboarding

A. Tailoring Individual User Experience

Onboarding journeys that incorporate AI functionality can and should be customized to enhance individual experiences. Building personalization AI at this stage is vital since the cohort is made up of people with different needs, expertise levels, and familiarity with the technology. Tailoring onboarding to these specific attributes makes it a more relevant experience, is more likely to capture the attention of the users, and will less likely bombard them with information that is not relevant and may faciliate users quitting. This is the case for intelligent adaptive training that is able to adjust instructional styles and the presentation of content based on user experiences with AI. An intelligent adaptive training is able to provide the novice users with extensive instructional support, while the more advanced users can navigate the system with less guidance, allowing the novice users to engage with the content at a higher level, while the more advanced users are able to move quickly and engage with advanced content. Personalization during onboarding will allow users to have more control and confidence working with the AI and user-centric personalized onboarding will allow to AI system to be more usable. Artificial intelligence will be adopted more widely with user centered personalized onboarding onboarding [15].

B. Decreasing Cognitive Load

During the onboarding workflow, there is to be low cognitive load, this should be smooth where the onboarding flow is seamless, and only the key functionalities of the AI system are conveyed, and users are not overwhelmed with information. Users should get the key functionalities of the AI system on their first contact. Problems stem from users drowning in irrelevant details. To orient users to the system, features and functionalities that have high utility should be selected and tailored to the user's level. The AI should be usable right away. This streamlining increases retention and improves the experience of the users. This retention equipping the users on how to use the AI system [16].

C. Contextual Help and Support

When a user does not understand the reason why an AI made a particular recommendation, a tooltip can be displayed in the system explaining the reason for the recommendation \cite {referense}. The user understands the AI reasoning, the workflow is not disrupted, and the users obtain the assistance needed. For novice users, such assistance is particularly vital as the preferred work. The real-time help and guidance are the type of help that enhances user satisfaction, comfort with AI, and the effectiveness in system utilization is [27].

To enhance the experience of onboarding and user experience in the future, users must be involved in open, ongoing feedback. Feedback is a stride that assists developers by providing a clear view of the user need. Completing a feedback question such as, "Was this recommendation useful?" would recap the user session for the user and help the developers get system feedback quickly.

From the above, it can be inferred that the primary step towards gaining feedback that makes developers envision the system is to help users understand that their feedback will influence future system design and development. Developers are also gaining customer feedback needed to improve the system. Adaptable systems evolve in the moment. Improve continuously evolving systems in positive feedback and interaction. Building feedback oriented culture provides responsiveness to specific systems.

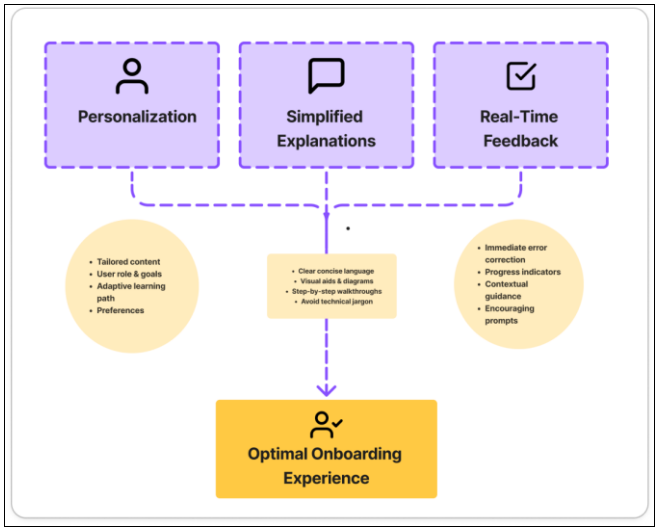

Fig 3: User-Centered Design Model for AI Onboarding

Figure illustrating a User-Centered Design Model for AI Onboarding, integrating personalization, simplified explanations, and real-time feedback to create an optimal onboarding experience.

5. Case Studies and Applications

A. Case Study 1: AI-Powered Virtual Assistants

Siri and Alexa are two examples of AI virtual assistant systems that have successfully implemented onboarding as a means of smoothing out friction during the first interaction. These systems are built to communicate with users via speech and provide a frictionless experience from the very first interaction. The onboarding of virtual assistants involves a hassle-free setup, and a short tutorial to gain

familiarity with the system's basic functions. One of the predominant characteristics of the onboarding of virtual assistants is the opacity of the systems and their decisions. Virtual assistants respond to users' questions, and during that interaction, they provide feedback for decisions they have made. For example, when Alexa finishes her tasks, she says, "Here are the results I found for you." Such opacity and automation provide users with a feedback interface to understand the system's processes. Reducing feelings of uncertainty and confusion is enhanced with these systems.

In addition, virtual assistants allow customers to decrease friction and make the system more user-friendly by personalizing setting as they see fit. Users are able to adjust the voices, make specific changes to preferences, and toggle settings, creating an assistant that is more amenable to their needs. Customization, coupled with transparent system behavior, builds trust and encourages system engagement. There have been improvements to onboarding procedures that, when combined with more effective streamlining of user interactions, the inclusion of users during real-time updates, and improvements to user feedback immediately following system interactions, have resulted in a greater adoption of AI-based assistants in routine user activities. AI assistants are now more than just voice interaction tools they serve as essential components of home automation, entertainment, and personal efficiency. This illustrates the impact of effective onboarding in sustained usage and adoption. [19]

B. Case Study 2: Personalized Recommendations in E-Commerce: The implementation of artificial intelligence to personalize recommendations in E-Commerce has been spearheaded by companies like Netflix and Amazon. These services analyze consumer and user behavior to recommend products, content, or services that will appeal to them. They explain to new users the recommendation onboarding and highlight the recommendation engine's intelligence. For instance, Amazon will put a message, "because you bought X, you may like this," alongside product recommendations. This helps the user understand the recommendations and the underlying AI reasoning.

These onboarding strategies help decrease user friction by developing trust and defining the goal of the AI. With the increased user trust and system explainability friction is lowered substantially. Transparency in these systems is particularly significant in reducing user fears, especially those who lack experience with the technology. Moreover, users' experience with the system, the personalized predictive models become ever more aligned with the users' preferences, increasing user engagement with the system. Over time, as users are exposed to systems with increasing accuracy and relevance, user satisfaction and retention increase. With seamless onboarding and frictionless AI behaviors, Amazon and Netflix have minimized friction in user experience, ensuring continued use of their service.

C. Case Study 3: Task Automation in Productivity Applications: AI-enabled task automation in productivity applications like Google Calendar and ToDOIst increases efficiency in task management activities, including scheduling, reminders, and prioritization. These applications examine the user activity patterns and predict the next needed actions. During the onboarding process, the user is guided through basic features including setting reminders, scheduling events, and receiving custom suggestions for task management. Users are informed of how and why the AI is working, e.g., "This reminder is set because you often schedule meetings at this time."

Understanding the system processes instilled confidence that the AI was working for them. Additionally, these applications often allow for the automation to be customized, maintaining control of how the AI works on their behalf. For instance, the user can determine if they want the system to schedule meetings on their behalf, or if they want to do it themselves.

This adaptability allows AI to meet the user's needs and comfort levels. Allowing users to determine the extent of their interaction with the systems mitig alienation and build engagement. Overall, user adoption and satisfaction are enhanced by the onboarding process's clear instructions, combined with fine-tuning of settings and preferences, as activated increased use of productivity.

6. Discussion

A. Key Insights from the Case Studies

The case studies analyzed provide further understanding on the impact of effective onboarding on friction reduction and enhancement of user experience with AI systems. Successful implementations demonstrated the role of effective user communication and engagement, user empowerment, and user control. For example, new AI virtual assistants like Siri and Alexa provide users with the ability to issue commands and the option to personalize settings, lessening user perplexity. Considering the communicative ability of the AI and how it reasoned its decision command, the user experience would be less troublesome to the user.

Another significant lesson learned from the studies is the impact of providing transparency in the decision making of the AI. For example, personalized recommendations from e-commerce retailers like Amazon and Netflix, prompt and explain, "Based on your preference, we suggest this item" with the intention of helping users comprehend the AI's logic to gain trust in the system. This approach to transparency demonstrated to the users that the AI understands their needs and earns user satisfaction.

Regarding task automation applications, Google Calendar and ToDOIst, the AI's task management was streamed to provide users with real time feedback on how their tasks were managed to eliminate task automation anxiety from users. This particular type of feedback provided to users illustrates how the system operates, and it gives users comfort that the decisions made by the AI system are relevant and timely. In turn, this sense of control and comprehension boosts confidence, and subsequently, users are more inclined to utilize the system for routine activities. In all case studies, presenting users with clear, actionable feedback and transparency regarding the AI systems contributed to a higher level of adoption, engagement, and trust in the systems.

B. Benefits of Reduced Friction on the First Use

There are clear user experience and adoption benefits of friction reduction in the first use of AI systems. When users quickly understand the operation of AI systems and the systems provide unambiguous feedback, users are more likely to trust the system. Higher trust directly corresponds with increased adoption, as users gain more confidence that

they can engage with the AI system without confusion and frustration. In addition, a good first-use experience fosters long-term engagement by allowing users to keep using AI features instead of dropping them due to early difficulties. Users are more likely to continue using the AI system, which is in line with the benefits of friction reduction. Perhaps the most impactful of these benefits is the increased probability of users recommending the system.

Positive first contacts with AI systems increase the odds that users will make recommendations, which in turn accelerates adoption in novel user cohorts and drives the tech deeper into users' daily lives. An ongoing user-in-tech relationship will also spring from a more favorable tech perception fueled by heightened user satisfaction. Therefore, the rewards that come from reducing friction are more profound than enhancing the first user experience, touching on expanded system trust, retention, and adoption.

C. Challenges and Limitations

Although the value of reducing friction during onboarding is undisputed, certain challenges and limits must also be weighed when employing these tactics. One of the greatest challenges is the extent to which onboarding strategies are adaptable across various AI tech and user diversity. Each onboarding process must be tailored to the AI system in question, according to its complexity versus the user's tech proficiency. Additionally, the onboarding process must be adaptable to accommodate the changing expectations of various user cohorts.

Removing any personalization on onboarding processes based on trainers' experience levels and on systems used is counterproductive to streamlining processes. Some may see systems as rudimentary if onboarding is too simple. Perceived simplicity in systems may cause loss of consumer trust if they feel systems do not have ability to perform multi-faceted and intricate processes. Crafting onboarding processes not to overwhelm users while providing systems complexity and depth is necessary.

Additionally, onboarding processes should adjust to users' emerging requirements as they gain proficiency with systems. Some users may benefit from more structured onboarding processes initially, but with time they may prefer independence and customizable solutions. Streamlining onboarding is vital, but building in flexibility is mandatory to maintain long-term user engagement.

Table 3: Summary of Key Findings from Case Studies on AI Onboarding

Case Study	Key Findings	Impact
AI-Powered Virtual Assistants	Clear voice-based commands and personalized setups reduce confusion.	Increased user satisfaction and adoption.
Personalized E-Commerce Recommendations	Transparency in AI decision-making builds trust.	Higher engagement and conversion rates.
Task Automation Apps	Real-time feedback on task scheduling improves understanding.	Enhanced user confidence and usage.

7. Conclusion

This paper has evaluated different techniques implemented to minimize user apprehension during initial engagement with AI functionalities. By concentrating on ease of use, elucidation, and user agency, these techniques worked towards achieving an onboarding design that enables psychological and behavioral onboarding ease and confidence. Primary techniques identified include ease of AI engagement through explanation, cognitive load management via stepwise onboarding, user understanding facilitation via feedback provision, empowerment and ownership facilitation via user control over AI functionalities. The examined case studies-ranging from virtual assistants, personalized recommendations in e-commerce, to automation of task management-prove that these techniques, when deployed purposely, exponentially enhance user trust, participation, and sustained engagement with AI. These techniques further the simplification, usability, and credibility of AI, facilitating continuous usage.

Future should seek to design custom onboarding experiences per user and technology type. Users engage with technology differently, and onboarding experiences will be more effective if the unique needs of user segments beginner and expert, and demographic differences are considered. Additionally, the extent to which explanatory interactivity and transparency in the AI affects user trust should be explored to understand better how these variables drive long-term usage and satisfaction. More work should be done to understand user agency and configurability within the AI to better enable users to manage how technology is used. The continual improvement of AI onboarding will ensure that AI technology is ubiquitous, user-friendly, and in demand.

References

1. Aamer T, Milani F. Improving digital onboarding processes for financial services: A multivocal literature review. Baltic Journal of Modern Computing. 2023;11(4).
2. Drozdowski P, Rathgeb C, Dantcheva A, Damer N, Busch C. Demographic bias in biometrics: A survey on an emerging challenge. IEEE Transactions on Technology and Society. 2020;1(2):89-103. DOI:10.1109/TTS.2020.2992344.
3. Karim NA, Khashan OA, Kanaker H, Abdulraheem WK, Alshinwan M, Al-Banna AK. Online banking user authentication methods: A systematic literature review. IEEE Access. 2023;12:741-757. DOI:10.1109/ACCESS.2023.3346045.
4. Ziden AA, Joo OC. Exploring digital onboarding for organizations: A concept paper. International Journal of Innovation, Creativity and Change. 2020;13(9):734-750.
5. Khare P, Srivastava S. Transforming KYC with AI: A comprehensive review of artificial intelligence-based identity verification. Journal of Emerging Technologies and Innovative Research. 2023;10(12):525-530.
6. Hassan M, Aziz LAR, Andriansyah Y. The role of artificial intelligence in modern banking: An exploration of AI-driven approaches for enhanced fraud prevention, risk management, and regulatory

compliance. Reviews of Contemporary Business Analytics. 2023;6(1):110-132.
7. HUB K. What is ID verification? 2024 Nov.
8. Islam T, Islam SM, Sarkar A, Obaidur A, Khan R, Paul R, Bari MS. Artificial intelligence in fraud detection and financial risk mitigation: Future directions and business applications. International Journal for Multidisciplinary Research. 2024.
9. Gumus C, Çekerekli S. Fraud prevention and detection systems running with digital onboarding. In: International Academic Studies in Engineering. Seruven Publishing; 2024 Jun.
10. Mondal PC, Deb R, Huda MN. Know your customer (KYC) based authentication method for financial services through the internet. In: 2016 19th International Conference on Computer and Information Technology (ICCIT); 2016. p. 535-540. IEEE.
11. Qiang W. Digital identity verification and KYC compliance in e-banking. Journal of Internet Banking and Commerce. 2024;29(5):1-4.
12. Reuters. Visa prevented $40 billion worth of fraudulent transactions in 2023 - official. Reuters. 2024 Jul 23.
13. Salmony M. Rethinking digital identity. Journal of Payments Strategy & Systems. 2018;12(1):40-57. DOI:10.69554/HGWP9250.
14. Sarridis I, Koutlis C, Papadopoulos S, Diou C. Towards fair face verification: An in-depth analysis of demographic biases. In: Joint European Conference on Machine Learning and Knowledge Discovery in Databases; 2023. p. 194-208. Cham: Springer Nature Switzerland.
15. SCSOFT. Gain a competitive advantage. 2025 Feb.
16. Shastri R, Khandelwal U. Impact of digital onboarding quality on customer satisfaction: The moderating role of perceived risk. Journal of Relationship Marketing. 2024;1-32.
17. Verma K, Kumar R, Rao AP, Ranjan R. Efficient e-KYC authentication system: Redefining customer verification in digital banking. In: 2023 9th International Conference on Signal Processing and Communication (ICSC); 2023 Dec. p. 319-324. IEEE.
18. Yucer S, Tektas F, Al Moubayed N, Breckon T. Racial bias within face recognition: A survey. ACM Computing Surveys. 2024;57(4):1-39.