A Web-Based Platform (AgileNudge+) to Facilitate Positive Behavioral Change Through Nudge Strategies: A Mixed Methods Feasibility Study

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Abstract

Background: In today's digital age, web-based applications have become integral to daily life, driving transformative shifts in human behavior. "AgileNudge+" is a web-based solution to catalyze positive behavior change. By leveraging knowledge in behavioral economics, design, and technology, AgileNudge+ utilizes nudging interventions to facilitate long-lasting behavioral changes.?

Objective: This paper describes the design process, methodologies, and feasibility of "AgileNudge+," evaluated by testing usability, user-friendliness, and usefulness.?

Methods: Iterative processes incorporating principles from behavioral economics (nudges) and user experience design were used to design AgileNudge+. Usability testing was used to assess user experience, ease of use, and the overall usefulness of the web-based software.

Results: Qualitative findings offer a multifaceted evaluation of AgileNudge+'s impact on facilitating positive behavior change. The combination of user feedback coupled with a uniquely Agile design process was able to streamline the development of various nudges to create demand for a new healthcare model within the healthcare delivery system.

Conclusions: This paper highlights the significance of web-based solutions in fostering positive behavior change. The usability testing validates the software's user-friendliness and usefulness, shedding light on its potential impact.

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Keywords: Agile, Nudge Strategy; Nudging Interventions; Human Behavior; Software Design; Human-Computer Interaction; User Experience Design; Usability Testing.

Introduction

Successful implementation of evidence-based healthcare solutions is critical for improving the safety, quality, and cost of healthcare services leading to better health outcomes [1]. However, successful implementation requires understanding, predicting, and changing the behaviors of individual human members and the complex adaptive healthcare delivery networks. This desired behavior change can be spurred using Agile science [2-4]. Agile science is a process for knowledge discovery and acquisition that uses insights from behavioral economics, complexity science, and network science to develop context-sensitive and scalable tools, processes, and strategies to discover, implement, and diffuse evidence-based healthcare solutions within complex adaptive human networks.

Agile science focuses on the psychological, cognitive, emotional, social, and cultural factors that influence the decisions of individuals living in dynamic social organizations. Individuals in these ever-changing social structures face high levels of uncertainty and require rapid decision-making [5]. Within Agile science, behavior change interventions are informed by the Dual Process Theory's System 1/System 2 framework [6]. In this framework, System 2 is a slow and deliberate information process that consumes a high level of conscious attention and effort [6]. In contrast, System 1 is an intuitive, fast, and automatic information process that relies on heuristic shortcuts [6]. By leveraging cognitive heuristics, environmental adjustments can encourage specific choices, such as anchoring,

framing, and social proof [7]. Choice architecture is a modification of the physical, digital, and social environment where interpersonal human interactions (social interactions) or interactions with the surrounding environment occur. These environmental modifications can trigger the heuristic pathways that are used by System 1 and facilitate human behavioral changes [8]. At the same time, Agile science seeks to understand the interconnectedness of semi-autonomous human agents and their role in generating emergent behaviors of complex adaptive human social networks, such as in the case of healthcare delivery organizations [9]. Evidence-based solutions can be integrated into a complex adaptive network by studying the local and the conditional exchanges of information and resources among the human members [2]. Moreover, localization and context further necessitate iterative learning cycles, where performance feedback loops and early detection of unsuccessful solutions increase the likelihood of success.

Nudges are low cost and scalable choice architectures that leverage cognitive heuristics to deliberately modify the social, physical, or digital environment spurring behavior change without limiting choice [7,10]. Due to their low cost and scalable nature, designing, implementing, or diffusing evidence-based nudges are cost-effective processes for behavioral changes that align with individual freedom and choice [7,10]. Crafting an effective nudge requires mapping the digital, physical, and social environments, de-nudging any problem behavior(s), targeting specific cognitive heuristics, identifying any existing misaligned nudges, developing clear measurable goals with termination plans for failure, and performing rapid sprints to test the minimally viable nudge (Appendix 1). The agility portion of nudge design, implementation, and diffusion comes from running sprints, or iterative cycles of testing and modification. Agile processes allocate 90% of the time, social, financial, and emotional capital resources towards doing and testing, while only 10% of the time is allocated for planning, reflecting, and adjusting (Appendix 1). Ideal nudges are easy, attractive, social, timely, and are intentional about the messenger, incentives, norms, defaults, saliency, priming, affect, commitments and ego cognitive heuristics (Appendix 2).

Previous initiatives have focused on training dedicated professionals to become Agile change conductors capable of designing, implementing, and diffusing evidence-based nudges [11]. For example, Indiana University School of Medicine's Center for Health Innovation and Implementation Science (CHIIS) has provided a range of educational programs since its inception in 2013, including a year-long graduate certificate program. More recently, CHIIS partnered with the Indiana University School of Public Health-Bloomington to launch the Agile Nudge University to train individuals on applying Agile science to create, implement, and test nudges [11,12]. Zooming out, the U.S. General Services Administration (GSA) has trained personnel that apply behavioral science concepts, such as nudges, to evaluate current program interventions and policy decisions [13]. Unfortunately, mastery in Agile nudge design, implementation, and diffusion takes time, financial resources, and educational programs have a limited reach. To make these processes more accessible to those without extensive training in Agile science and its derivatives, we designed AgileNudge+ as a user friendly, web-based software application tailored to support healthcare system professionals who want to design, implement, and diffuse evidence-based nudges to facilitate behavioral change and improve the performance of the complex adaptive healthcare delivery organization. In this paper, we describe our mixed methods approach to designing AgileNudge+ software and testing its usability. The following work was designed to explore how AgileNudge+ helps users change their behavior by guiding them to define their ideal behavior and create nudges and sprints to reach their goals.

Methods

Design

The AgileNudge+ software is based off the Agile innovation, implementation and diffusion processes developed by scientists at CHIIS [10] (Appendix 1). The design of AgileNudge+ software was based on Agile science, emphasizing the role of iterative cycles of rapid testing and adjusting. Throughout each step of the design process, minimally viable prototypes (MVPs) were evaluated and modified; each sprint to test certain MVP had pre-defined termination plans if they were unable to meet projected goals and each MVP was independently tested within a week-long sprint. This initiative initially focused on mobile application design, eventually transitioning into the development of web-based software tailored for professionals utilizing desktop platforms. The 12-week design journey involved an exploration of pivotal stages: creation of user personas, mapping of user journeys, and generation of innovative design concepts. Comprehensive wireframes were crafted, laying the groundwork for the subsequent development of each MVP. In-depth usability testing of each MVP was then conducted to evaluate the viability and effectiveness of the various MVPs to reach a final version.

User Persona

The user persona of Phoebe was the initial step in the user-centered design methodology of AgileNudge+ (Figure 1). A persona portrays common behavioral traits among real users, acting as a theoretical MVP to help designers understand their users and creates a consistent comprehension of users within the design team [14-16]. One key advantage of using personas is their ability to assist designers in staying aligned with the fundamental goals of their target users. By prioritizing both user and product requirements, personas enable designers to concentrate on essential features and address the specific needs of their target audience [14]. Phoebe, a 33-year-old family physician and scientist, seeks to integrate Agile science into her profession to drive behavioral changes. Her persona was created from real-world insights, reflecting her goals and challenges related to Agile science or those that can be addressed using Agile Science principles.
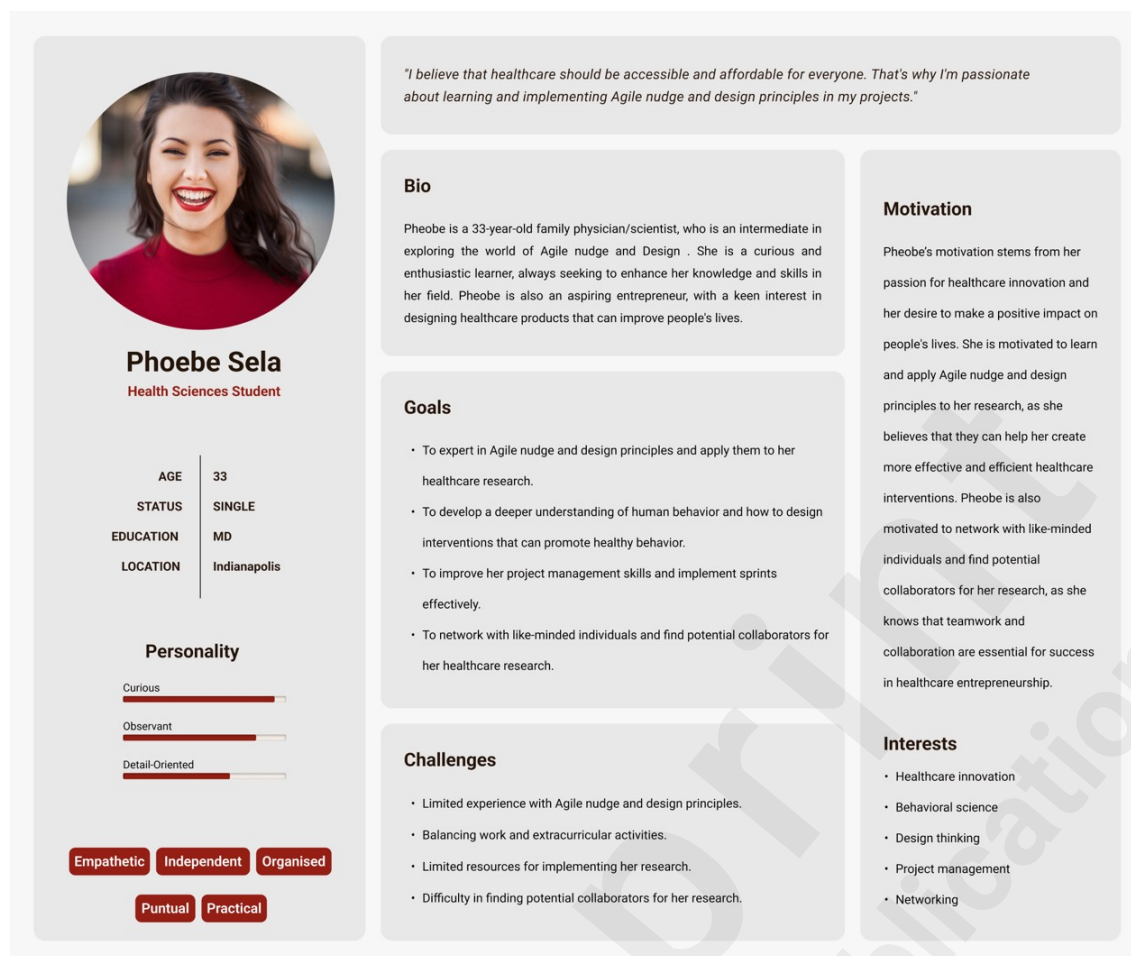
Figure 1. Phoebe Sela's Persona.

User Journey Map

Following the creation of the persona, a user journey map was developed for Phoebe (Figure 2). This map illustrates the user's interaction with the product across multiple steps, identifying areas where further user research is needed to enhance the user experience [17-19].

Creating Phoebe's user journey map began with holding meetings with stakeholders and potential users to outline their goals and pain points with existing Agile innovation, implementation, and diffusion processes developed by scientists at CHIIS (Appendix 1). Phoebe's journey further illustrates her initial aspirations in healthcare research, navigating obstacles, exploring Agile science principles, integrating software, and ultimately leading to transformative success.
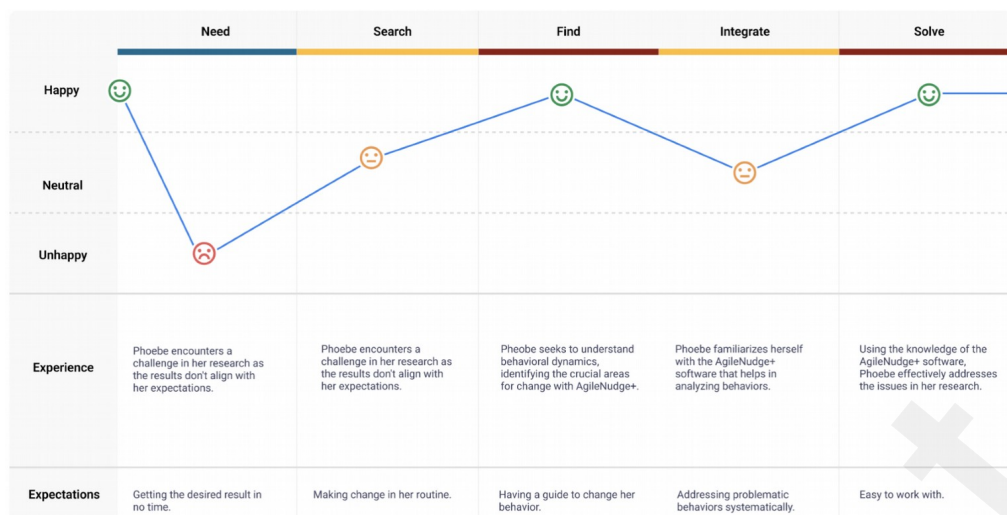
Figure 2. Phoebe Sela's Journey Map.

MoSCoW Method

The subsequent stage of the user-centered design methodology was prioritizing the needs, objectives, and satisfaction of end users, while considering their ease of understanding and task completion [20]. In alignment with this methodology, we implemented the MoSCoW method for the persona (Figure 3). The MoSCoW method categorizes requirements into 'Must have,' 'Should have,' 'Could have,' and 'Would have/Won't have.' 'Must-have' requirements are indispensable for meeting business needs and are crucial for project success. 'Should have' requirements are desirable but not critical to project success, while 'Could have' requirements are considered nice-to-haves, and 'Would have/Won't have' requirements have varying degrees of priority that may be addressed in future developmental iterations or features that the business should avoid adding to the project [21].

Figure 3. MoSCoW Prioritization chart.

Minimally Viable Prototyping

After the initial research and design phases (Textbox 1), mid-fidelity and high-fidelity MVPs were designed (Figure 4-6). In the initial mid-fidelity phase, Figma, a web-based collaborative tool for designing interfaces, was utilized to create and refine the conceptual sketches, providing an

interactive MVP for visualizing the essential elements of AgileNudge+. This phase helped to clarify the design concept, alignment with user expectations, and initial testing with stakeholders and users to ensure a user-friendly design.

The transition to the high-fidelity MVPs involved collaboration between designers and developers, characterized by seven week-long sprints for iterative testing cycles of AgileNudge+.

Textbox 1. AgileNudge+ features

Homepage: Upon signing in or signing up for their initial use of AgileNudge+, users will be seamlessly directed to the homepage. Here, they will encounter the three primary modules of the software: Behaviors, Growth, and Network. Additionally, users will be provided with a preview of significant news under the "Highlights" section, offering a concise overview of noteworthy updates and information within CHIIS (Figure 4).

Behaviors Section: In the "Behaviors" section, users embark on a transformative journey within the software, driven by a two-step process: Nudge and Sprint. Serving as the central module of the application, this section facilitates the documentation of current behavior, ideal behavior, and essential details crucial for behavioral change. Structured around key stages, users navigate through a series of carefully crafted steps:

Behavioral Snapshot: Users capture a comprehensive overview of their existing behaviors, laying the foundation for subsequent stages while recognizing and defining key stakeholders and influential messengers who may impact the user's behavior and could shape and support the behavioral change journey.

Nudge Crafting: Utilizing the cognitive bias library and nudge library to design personalized nudges aligned with behavioral goals.

Effectiveness Evaluation: Assessment of nudge impact through the EAST and MINDSPACE checklist, accompanied by personalized scores and messages (Appendix 2).

Planning for Success: Development of comprehensive termination and success plans, charting the course for sustained behavioral change.

Furthermore, the section provides guidance for designing and executing sprints, allowing users to decide between individual or group participation. Users can monitor sprint progress by providing thoughtful responses to targeted questions. Nudge blueprints and sprint blueprints are seamlessly integrated, offering structured frameworks to support users throughout their transformative journey.

Mapping the behavioral change journey: From the outset of the behavioral change journey, AgileNudge+ software offers a visual map designed to streamline the user's tracking of various components: current behavior, stakeholders, cognitive biases, associated nudges, and the desired ideal behavior, along with their interconnections. This comprehensive overview map becomes accessible to the user after the completion of each mission, serving as a visual aid to recall elements and their correlations whenever necessary (Figure 5).

Nudge Blueprint: The first three missions in the Behaviors section are focused on formulating the appropriate nudge(s). Upon the successful completion of these first three missions, AgileNudge+ offers a "Nudge blueprint" – a concise summary highlighting the most crucial questions posed and the corresponding user-provided answers. This Nudge blueprint is conveniently available for users to

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save, share, or print, serving as a valuable guide for future reference (Figure 6).

Sprint Blueprint: In the final three missions of the behavioral change journey, the last three missions aid users in crafting, monitoring, and reflecting on the sprint. Following the completion of these missions, AgileNudge+ furnishes a "Sprint blueprint" – a comprehensive summary encapsulating the pivotal questions and the user-provided answers. This Sprint blueprint is readily available for users to save, share, or print, serving as a valuable reference guide for future endeavors and sustained progress (Figure 7).

Gamified missions: To enhance user engagement and facilitate the seamless completion of questions within each mission, we have introduced a scoring system tied to the quantity of questions. At the commencement of each mission, users receive information about the number of questions involved and the potential points they can earn. A dynamic point bar at the bottom of the screen continually updates, offering a visual representation of the user's score throughout the behavioral change journey. The cumulative score for the entire journey, upon completing all six missions, reaches a maximum of 100 points. This scoring mechanism adds a gamified element, motivating users to actively participate and progress through the missions.

Growth Section: In the "Growth" section, users are afforded the opportunity to access a diverse range of sources, cultivate skills, and stay informed about significant events and bootcamps hosted by the Center for CHIIS.

Network Section: Within the "Network" section, users are empowered to actively participate by joining groups, disseminating ideas, seeking support, and flourishing within our nurturing and collaborative learning community at CHIIS.
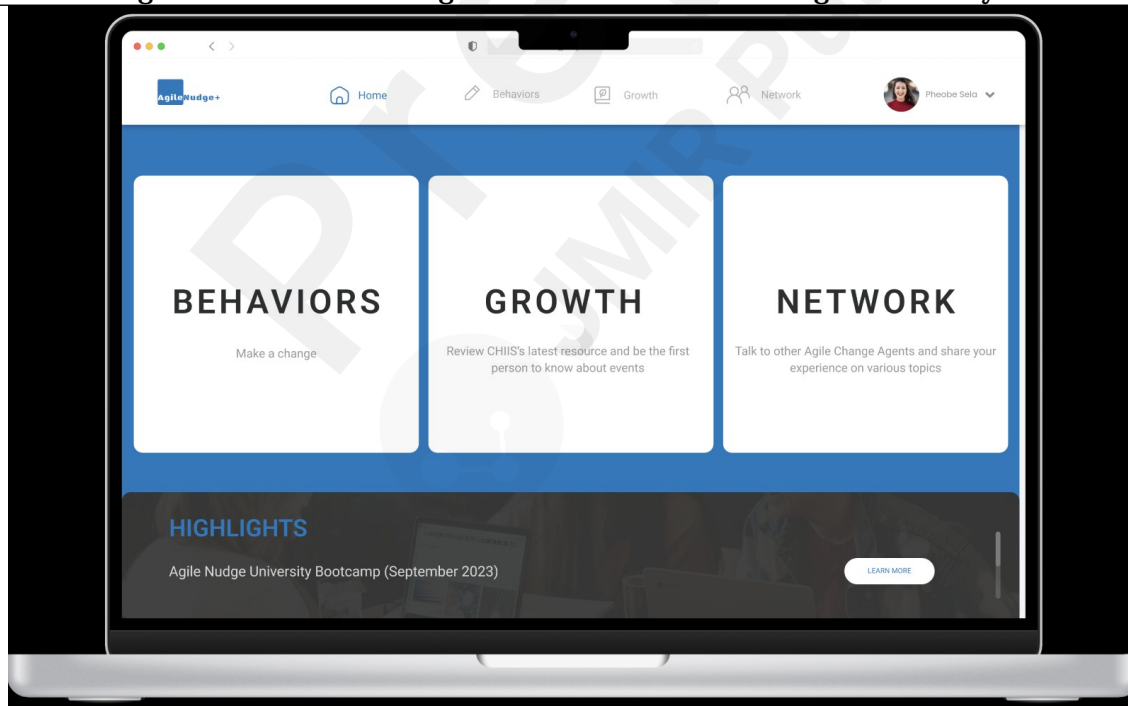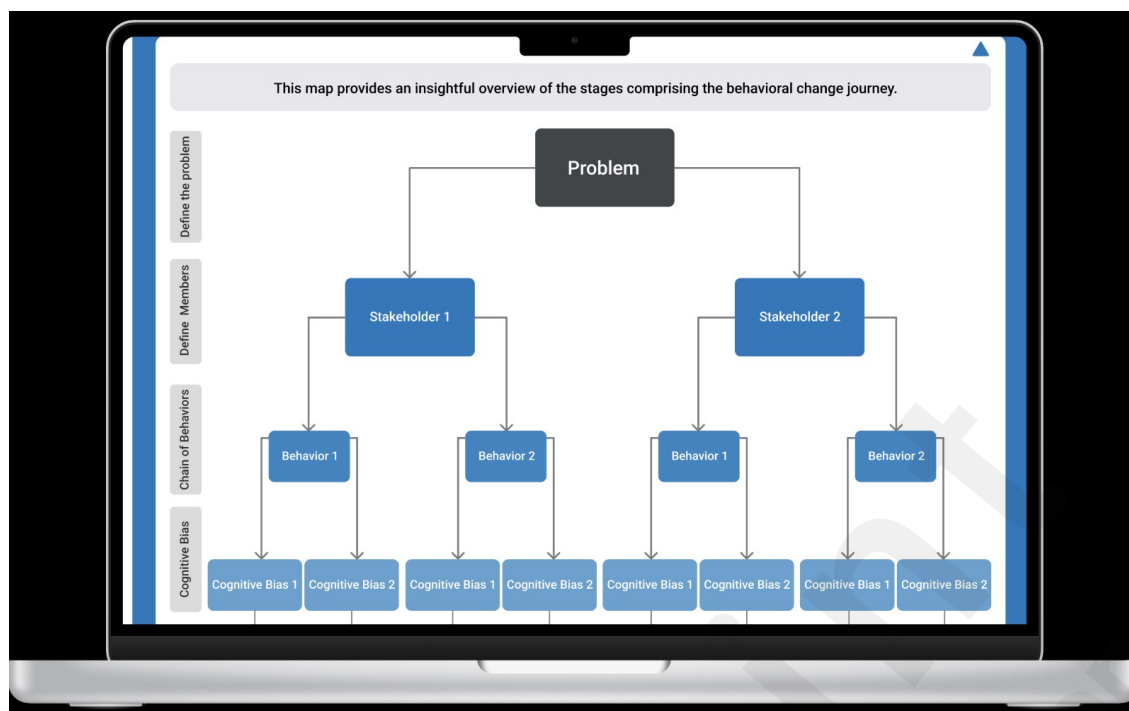

Figure 4. The AgileNudge+ Homepage.

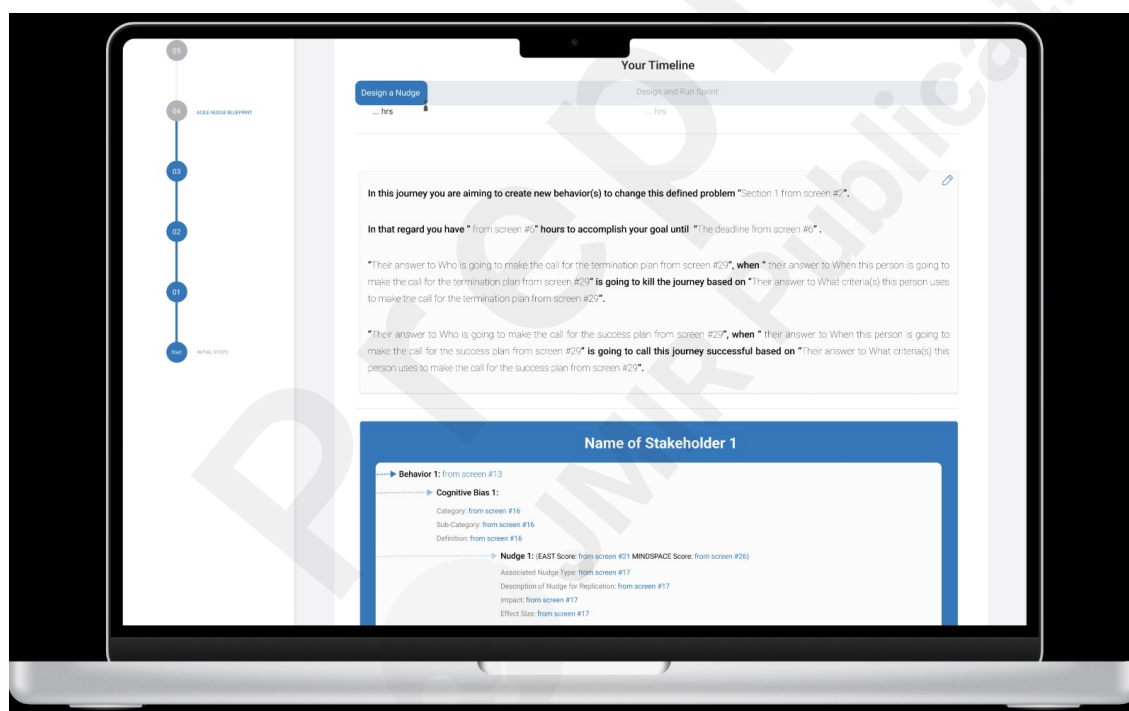Figure 5. The AgileNudge+ Behavioral change journey's generated overview map.

Figure 6. The AgileNudge+ Behavioral change journey's generated Nudge Blueprint.
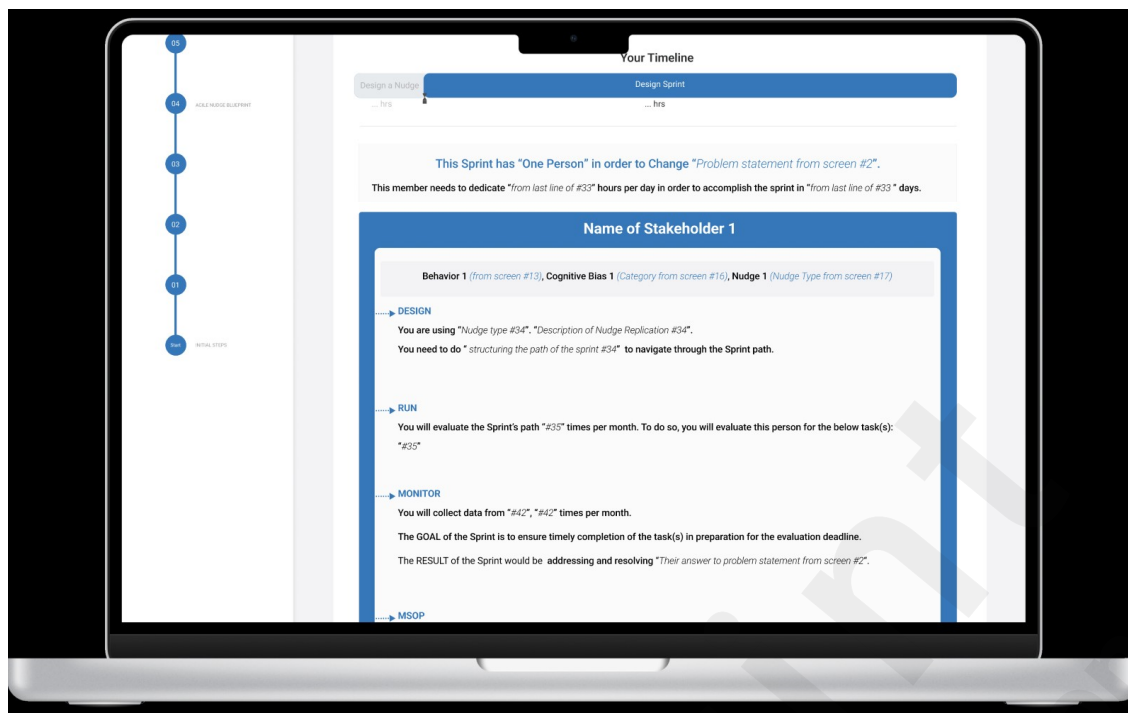
Figure 7. The AgileNudge+ Behavioral change journey's generated Sprint Blueprint.

Usability Testing

To evaluate the high-fidelity MVP, usability testing sessions were conducted. Participants were selected from the CHIIS team, and CHIIS members served as messengers to extend the recruitment outreach beyond the team from June to September 2023. Eligibility criteria included self-identification with at least a mid-level proficiency in Agile methodology, proficiency in English, basic technological knowledge, and access to the internet and zoom platform for virtual usability testing sessions.

Usability test sessions were divided into three phases. Eligible participants attended a 1-hour Zoom videoconference, facilitated by two design team members. After introductory icebreakers, one team member outlined the session's purpose and presented participants with a task: "Consider a behavior you'd like to change; now, utilize this link [sent via the chat box], and attempt to plan for this behavioral shift using the AgileNudge+ software" (Figure 8). Participants were explicitly informed that the designers could not assist or address questions during their interaction with the software, encouraging them to articulate their thoughts aloud during the process. Upon completion, the design team thanked participants and sought feedback on their overall experience, challenges, and suggestions for improvement.

The initial phase of usability testing included three sessions, where a single user from the stakeholder team interacted with the mid-fidelity MVP. Subsequently, the high-fidelity MVP underwent testing in the second phase, engaging four users, each in a separate session, to test the MVP in Figma. The final segment involved testing with a single user interacting with the iterated high-fidelity MVP, incorporating modifications based on previous feedback.
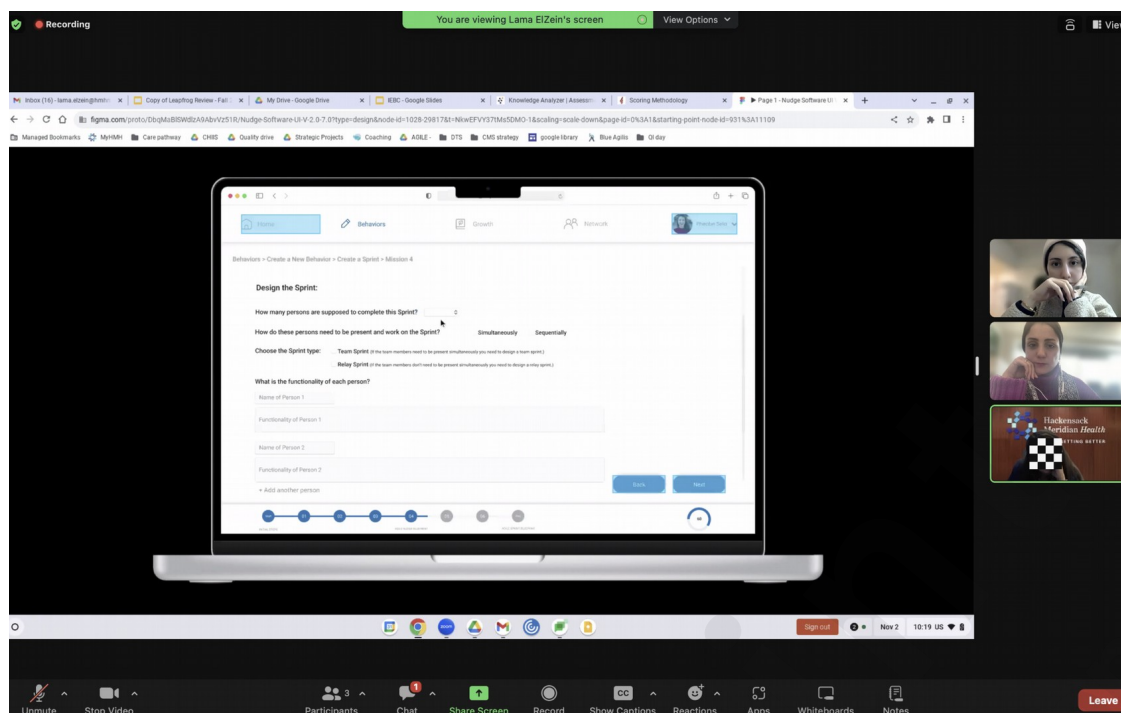
Figure 8. Virtual Usability Testing Session with a User.

Qualitative Interviews

To contextualize the quantitative metrics of usefulness acceptability, semi-structured interviews with participants were conducted following each usability testing session, centering on their interactions with AgileNudge+ (Appendix 3). The frequency of mentions, repeated themes and patterns, and a comparative analysis between the themes and frequency of challenges versus the features that users found useful and those they desired in the software were used to analyze the data from these interviews.

Results

Participants' Background Information

Eight usability test sessions were conducted with six participants. To ensure data credibility and impartiality, information from the initial three sessions involving a participant from the stakeholder team was excluded. Among the remaining five participants, four held professional degrees (MD), and one had a master's degree. To ensure a consistent level of knowledge in Agile science, all participants were selected from individuals who completed the Innovation and Implementation Science Graduate Certificate Program (IIS). This program, held by CHIIS, provides 240 training hours focusing on practicing Agile Implementation tools [11].

The synthesis of insights from usability test sessions identified six themes within user feedback: User Experience Design, Comprehensibility, Applicability, Practicality, User Interface Design, and Technical Challenges. Subsequent sections offer a detailed exploration of each theme, providing an analysis of users' motivations, challenges, and desires regarding the AgileNudge+ design.

User Experience Design

In the initial stages, the AgileNudge+ project aimed to design a mobile application. However, insights gained from the initial round of usability tests with stakeholders prompted a pivot towards a desktop-sized platform with a web-based application model to enhance the user's experience.

Furthermore, analysis of data from 5 usability test sessions with potential users highlighted

challenges related to the User Experience Design Theme. These challenges were categorized into three distinct groups: Easy to Use, Efficiency, and Accessibility.

Easy to Use: Users expressed a need for more descriptive elements within certain parts of their interaction with the software, noting uncertainty about the software's instructions. This pertained to both the language used in questions and the labels within the software.

Efficiency: Feedback indicated that the lengthy onboarding process at the beginning of the software was perceived as unnecessary. Additionally, the task steps, which required users to respond to multiple questions, were perceived as overly subdivided, posing a challenge of understanding for users.

Accessibility: Users emphasized challenges in navigating backward within a mission and pointed out difficulties in a smooth transition between missions. The reward system, based on accumulating points, was not entirely clear to users during task completion, and they struggled to understand the points earned after each mission.

Despite encountering challenges, users found motivation in the reward system, considering it a driving force during missions. Blueprints were identified as an advantage, serving as a summary of user data input and a guide for their subsequent steps. The progress bar at the bottom of each screen served as additional motivation, offering users a visual representation of their progress in each behavioral change journey. The dashboard, including a profile showcasing achievements and a calendar displaying deadlines for each behavioral change journey, was also highlighted as another motivation by users.

Beyond challenges and motivations, users expressed certain desires. They wished to gain an overview of the AgileNudge+ software before initiating its use, providing an understanding of all steps before starting the behavioral change journey and clarity on subsequent steps during the journey.

Comprehensibility

The second theme derived from the data is Comprehensibility. Throughout usability test sessions, users encountered challenges related to understanding the AgileNudge+ software. They expressed difficulty comprehending the language used in certain tasks, attributing it to unclear wording and insufficient descriptive content within the questions asked. Redundancy in some steps posed an additional challenge, making it challenging for users to comprehend and focus on the process.

Despite these challenges, users acknowledged the software's provision of additional descriptions for non-familiar words as a notable advantage of AgileNudge+. This positive aspect was perceived as having the potential to extend to all steps of AgileNudge+ software.

In addition to highlighting the disadvantages and advantages of AgileNudge+ design, users expressed a desire for additional descriptions, both for steps and messages provided by AgileNudge+ after specific tasks. They also sought a more comprehensive overview of the steps.

Applicability

The third theme derived from users' feedback is associated with the applicability of AgileNudge+'s behavioral change process to different behaviors. Users indicated that the AgileNudge+ process is applicable to their professional behaviors but may not be suitable for their personal routine behaviors. One user, in addition, mentioned that the process is most effective when they have a clear demand, and if there is no specific demand, the software is not as applicable.

In this context, users expressed a desire for additional guides during the behavioral change journey, suggesting a need for connections between the software and external resources, such as tools to create demand.

Practicality

Another prominent theme derived from frequent user feedback is Practicality, focusing on the actionability of AgileNudge+ and its feasibility for use within a given time frame without external assistance. During usability test sessions, users faced challenges related to not having the required information readily available, as requested by AgileNudge+ in some missions. They also experienced difficulties in controlling and changing certain information in real-time during tasks, along with a lack of in-time guidance for specific questions. These challenges predominantly pertained to the software's actionability rather than its user experience design and comprehensibility.

In contrast, users highlighted the advantage of having a summary of inputs, specifically the list of stakeholders, within AgileNudge+. Tasks involving this summary encouraged users to reflect deeply on their behavioral change journey, providing them with in-time information for subsequent steps and enhancing the overall practicality of AgileNudge+ during and after the use of software.

User Interface Design

The fifth thematic aspect revealed through the analysis of usability test data centers on the accessibility challenges related to the user interface of AgileNudge+. Participants faced difficulties related to vision, including concerns about font size, the small size of elements such as the process bar and point bar, and low color contrast, making text and elements challenging to discern. Moreover, identical colors for distinct call-to-actions led to user confusion during task completion. Additionally, ambiguous visual elements contributed to uncertainty regarding the features and messages associated with those elements, further increasing user confusion.

Technical Challenges

The final theme derived from the analyzed feedback is related to users' challenges with working with the MVP. Since the tested version of the AgileNudge+ software was the high-fidelity MVP in Figma, users encountered challenges related to their unfamiliarity with using Figma. It's important to note that these challenges were primarily about the users' ability to navigate and work within the Figma platform itself and did not indicate any issues with the AgileNudge+ software.

Discussion

The findings of this study reveal insights into the successful completion of complex tasks by users with guidance from a new software. Three main themes emerged from the findings: 1. Simplified Behavior Change Process, 2. Gamification for Engagement and Enjoyment, and 3. Streamlining Diverse User Activities.

Simplified Behavior Change Process

AgileNudge+ is designed for individuals seeking behavioral changes within a complex adaptive human organization, utilizing frameworks rooted in Agile science [2-4,22]. AgileNudge+ builds off decades of work in implementation science to optimize structured nudge design while overcoming past limitations in education time, finances, and accessibility [10-12]. The introduction of AgileNudge+ has proven to be transformative, positively impacting behavioral change processes by providing users with a structured and user-friendly platform. The software's incorporation of nudges, sprints, and documentation, contributes to a more systematic and effective approach to behavior modification within an Agile project management context.

Other project management strategies, such as Lean and Six Sigma, have previously been developed into software to increase the efficiency of healthcare innovations [23-25]. However, these programs do not focus specifically on the creation, implementation, and diffusion of evidence-based nudges, contrary to AgileNudge+ which has been designed based on Agile science. Agile Science stands out

from other strategies by taking into account interpersonal cognitive biases and considering the broader network into which a solution is introduced [10,26]. Despite these benefits, so far, the only attempt to develop Agile software has been at a Russian university intended for military purposes [27]. Even then, the program fails to incorporate nudge theory, making AgileNudge+ uniquely designed for increasing the adoption of evidence-based solutions within the healthcare delivery system [3,4,27]. Moreover, digital nudges have been developed within healthcare context, but no such program uses technology to facilitate the development of nudges [28-30]. However, AgileNudge+ can be used to streamline the development of a diverse array of nudges, from text reminders that improve study enrollment to storytelling to create demand for a new healthcare model within the healthcare delivery system [31,32]. Therefore, AgileNudge+ is novel in its integration of structured Agile project management strategies and its focus on maximizing the efficiency, ease, and success of nudge-related healthcare solutions.

Gamification for Engagement and Enjoyment

Following the initial three rounds of concept generation for AgileNudge+, a character was introduced to enhance the user experience by providing guidance and support during the behavioral change journey. However, the first round of usability tests revealed that the character, despite good intentions, users stated they found it distracting rather than helpful. In response to this feedback, the character was removed from the MVP, and alternative elements of gamification were explored for their effectiveness.

Gamification, a strategy rooted in motivational psychology and game mechanics [33], integrates video game elements into non-gaming systems, driving applications across various domains including productivity, finance, health, sustainability, news, user-generated content, and tutorials [34]. This approach, now offered as a service layer, employs diverse game elements such as reward systems, points, badges, levels, and leaderboards to enhance user experience and engagement [34]. Grounded in Self-Determination Theory (SDT), gamification aligns intrinsic motivation, extrinsic motivation, and amotivation with fundamental human needs—competence, autonomy, and relatedness, creating motivating experiences that sustain desired behaviors [33,35, 36]. Gamification enhances motivation and performance in technology-enhanced learning. It mirrors traditional games and is widely applied in learning, training, mental health, and behavior change [37]. The positive impact of gamification extends to emotion, fostering motivation, enthusiasm, enjoyment, satisfaction, interest, and innovation [38].

Consequently, a point system was incorporated into the AgileNudge+ concept, aiming to boost user engagement by rewarding interactions with the software. The point system itself served as a nudge, encouraging users to continue using the software with the goal of reaching 100 points. Through the second and third rounds of usability tests (five usability test sessions), the gamification strategy demonstrated its transformative impact, while seamlessly aligning with Agile science principles. Users were gently nudged toward task completion and goal achievement, significantly enhancing the overall user experience, and positioning Agile Nudge+ as a more effective and user-friendly tool with incorporating gamification.

Streamlining Diverse User Activities

The usability test sessions underscore the capability of AgileNudge+ software in streamlining user activities. Users found the software reducing their workload during each behavioral change journey by providing efficient solutions. AgileNudge+ simplifies the process for users by eliminating the need to search for external resources, such as scholarly publications and online courses. The software consolidates and documents the various steps of the behavioral change journey in one accessible place. Moreover, AgileNudge+ automates the calculation of time for designing nudges and sprinting, suggesting optimal deadlines and outlining the time needed for investing to meet these deadlines.

The Dashboard feature allows users to track their progress weekly, ensuring they adhere to meet their goals. Furthermore, users gain insights into the different roles influencing their behavioral change journey, including stakeholders, team members, and messengers, empowering them to manage their journey effectively. AgileNudge+ proves instrumental in unifying and simplifying the various tasks associated with behavioral change, enhancing overall user efficiency and experience.

Limitations

While AgileNudge+ shows promise for instigating behavioral change within an Agile framework, there remain limitations to our study.

User Proficiency and Generalizability: The research primarily targets users possessing at least an intermediate level of knowledge in Agile science. The study's findings were derived from a specific user group, professionals in the healthcare system, with a background in Agile science. Thus, the homogeneity within the testing group may limit the applicability of the existing software. Future research involving individuals with varying levels of familiarity with Agile science may reveal additional insights and challenges. Furthermore, the question of whether these results can be generalized to diverse populations or different contexts remains an open avenue for exploration.

Limited User Testing: The final iteration of AgileNudge+ was tested with a user pool of only five individuals. While the data from usability test sessions proved instrumental in adapting and improving the software, a more extensive user testing phase could yield further insights.

Prototype Mode Challenges: The software was tested in MVP mode, requiring users to navigate a web-based application (Figma), an unfamiliar platform for them. The inability to view inputs from previous missions in subsequent steps added complexity, as users had to rely on their memories. Developing fully functional software where users can input responses, upload documents, and receive output could provide additional insights while simplifying the user experience, allowing them to concentrate on the process itself.

Conclusions

In summary, AgileNudge+ is a novel step forward in promoting behavioral change using an Agile framework. Through its user-friendly features, the software systematically guides users to create, implement, and test nudges, enhancing both the effectiveness and engagement of the behavioral change journey. As a result, AgileNudge+ serves as a valuable and accessible hub that simplifies and improves the nudge creation process to facilitate meaningful, widespread, evidence-based change within the healthcare system.

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Conflicts of Interest

Dr. Boustani serves as a chief Scientific Officer and co-Founder of BlueAgilis; and the Chief Health Officer of DigiCare Realized, Inc. He has equity interest in Blue Agilis, Inc; DigiCare Realized, Inc; he sold his equity in Preferred Population Health Management LLC; and MyShift, Inc (previously known as RestUp, LLC). He serves as an advisory board member for Eli Lilly and Co,; Eisai, Inc; Merck & Co Inc; Biogen Inc; and Genentech Inc. These conflicts have been reviewed by Indiana University and have been appropriately managed to maintain objectivity.

Abbreviations

MVP: Minimally Viable prototype

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Supplementary Files

Multimedia Appendixes

Agile Nudge Cycle Guideline.
URL: http://asset.jmir.pub/assets/d117bacbad705abc0cc15eea3d752169.docx

Checklists to Evaluate a Nudge.
URL: http://asset.jmir.pub/assets/77de8a23eab148c51fd617e328b630e8.docx

Semi-Structured Interview Guide.
URL: http://asset.jmir.pub/assets/2797381c18fd51e1407f20597494d746.docx