'Stick to' Three: Fostering Awareness, Intentions, and Reflections on the Top Daily Tasks

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Abstract

Knowledge workers face increasing challenges in managing numerous digital tasks, often leading to long task lists that distract from completing the most important ones. We present *AIRbar*, a task management tool designed to enhance *A*wareness, *I*ntention, and *R*etrospection (*AIR*) in daily task management. *AIRbar* prompts workers to prioritize a maximum of three daily tasks, displays them in an always-on glanceable widget, and facilitates end-of-day reflection to improve task completion and self-awareness. In a 4-week field study with 35 participants, we found that *AIRbar* increased task completion rates, improved focus and motivation, and positively influenced perceptions of work processes. These findings suggest that limiting the number of tasks and ensuring continuous visibility of priorities can address key challenges in modern task management, providing actionable insights for designing future task management systems.

CCS Concepts

• **Human-centered computing** → **HCI design and evaluation methods**; **Empirical studies in HCI**.

Keywords

Task Management, Daily Planning, Prioritization, Workplace Productivity, Self-Reflection, Interruptions, Focus, Awareness, Intentions, Knowledge Work, Digital Tools, Field Study

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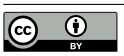

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1 Introduction

Modern knowledge work is characterized by multi-tasking, context switching, and collaboration in multiple constellations. As such, effective and successful knowledge work is contingent upon effective and successful management of tasks. Task management is a critical knowledge work skill in and of itself and comes with its own set of difficulties [2, 17]. It entails not only keeping track of the status of the myriad of activities on which one is working, but also engaging with this information for the purposes of prioritizing, making decisions, and scaffolding work with the intention that the most important goals are accomplished [11, 18, 33]. This notion is reflected in an important insight drawn by Belotti and her colleagues in 2004 which is still relevant today:

> "*[...] the problem with task management is not failure to prioritize well. We would argue rather that it is the effort that must go into making sure that the important tasks get done, even if the unexpected occurs, that is the real challenge.*" [7]

This insight points out two key factors affecting the success of task management - the need to keep sight of what is most important, and the need to minimize the effort necessary to specify and maintain attention on these most important goals. Although a wealth of tools designed for task management are available [1, 8, 9, 42, 51], they often fall short in addressing both of these factors that Bellotti et al. identify as crucial, resulting in lengthy and overwhelming task lists, or requiring a lot of effort to setup or to maintain focus.

This gap is especially pronounced for knowledge workers–individuals whose primary responsibilities involve non-routine cognitive tasks typically performed at a computer–who must independently manage their workflows and attention amid competing demands. While some existing tools offer partial support, few are specifically designed to help knowledge workers prioritize and plan a limited number of tasks, stay aware of them as unplanned requests emerge, and continuously improve their time management skills and planning strategies.

In this paper, we tackle this challenge, aiming to improve a knowledge worker's ability to complete tasks they deem as most important in a given day. We present and evaluate a software tool, *AIRbar*, which incorporates three design concepts to achieve this goal. First, *AIRbar* encourages the knowledge worker to define a maximum of three tasks at the beginning of their workday that are a priority to work on for that day. Second, *AIRbar* provides a glanceable Task Widget that is always visible on the knowledge worker's screen and allows the worker to track time spent working on the task. Third, *AIRbar* prompts the worker to reflect on their daily task progress at the end of the day to foster self-awareness and help the worker improve on task completion. While *AIRbar* supports task management, it is not intended to fully replace the one or more task management tools a knowledge worker already uses. Instead, it complements them, enabling workers to focus on completing the most important tasks each day.

To study whether this combination of design concepts can improve knowledge workers' ability to complete the most important tasks, we conducted a four-week field study with 35 participants who used *AIRbar* in their real-world work during three of the four weeks. During the first week of the study, a participant used a limited feature set from *AIRbar* to plan their top tasks of the day and briefly review their progress at the end of the day. In the next two weeks, all features of *AIRbar* were available to a participant. In the last week, *AIRbar* was disabled to gauge how participants felt about returning to work without the features. Over the four weeks, we collected quantitative and qualitative data through one-time surveys, end-of-workday and end-of-workweek surveys, interviews, as well as automatically collected task- and *AIRbar* usage data.

In conducting our study, we aimed to explore the effects of *AIRbar* on many aspects of work. At the most basic level we were curious to discover whether it increased productivity overall in terms of task completion. We were also interested in understanding how its use would affect individuals' work processes in regard to time and task management. Moreover, we wanted to investigate the less tangible effects as well, including how it changed workers' perception of their tasks, productivity, and work performance, and how it shaped their experience of their work in regard to qualities such as stress, satisfaction, motivation, and distraction.

Our findings suggest that the *AIRbar* approach is highly promising in regard to all of these areas of interest. Notably, the use of *AIRbar* increased participants' rate of task completion, and participants felt that they were more motivated and focused as a direct result of the prioritization and visibility features. Participants also discussed the tool's positive impact on their feelings of commitment to and satisfaction with their work. This suggests that beyond supporting productivity, *AIRbar* fostered a sense of control and clarity in participants' workdays. These benefits were largely driven by two key design decisions: limiting the daily task list to just three tasks and visualizing them in an always-on, glanceable widget. However, our study also revealed that the tool's simplicity made it inadequate in certain circumstances, and that some of its features were beneficial for some participants but problematic for others, suggesting potential areas for improvement and further research.

This paper makes three contributions. First, it introduces *AIRbar*, a novel tool designed to augment task management through features that support daily task prioritization, persistent visibility of goals, and end-of-day reflection. Unlike some existing tools which may share individual features, *AIRbar* uniquely integrates all three in a streamlined and minimal design for everyday use. Second, it demonstrates the largely positive effects that *AIRbar* had on task focus, commitment, and task completion among knowledge workers, highlighting its ability to help users set clear intentions, stay on track, and reflect and adjust their work patterns. Third, it outlines three key design implications for future task management systems: (i) balancing personalization with simplicity, (ii) supporting flexibility in dynamic work environments, and (iii) providing guidance in task prioritization and definition.

2 Related Work

The field of personal task management (PTM) considers the process of prioritizing and organizing both personal and professional tasks, including task identification, recording, and list maintenance [11, 27, 28, 42]. However, managing tasks effectively remains a persistent challenge for many knowledge workers due to estimation biases and the planning challenges that lead to overly optimistic schedules and incomplete tasks [2, 17]. To accommodate the diverse ways in which individuals approach their tasks, a variety of digital tools have been developed, with reports indicating that knowledge workers often use approximately nine tools simultaneously [29]. These range from traditional sticky notes to sophisticated project management software [30]. However, studies reveal persistent gaps in existing PTM tools, particularly in addressing temporary, lightweight storage and reminders. This leads many users to revert to using "information scraps" such as post-it notes and digital text files alongside their PTM tools [10]. While various design concepts have been proposed to address task management challenges [1, 8, 9, 42, 51], knowledge workers still struggle to make meaningful progress on tasks critical to their work [2, 34]. Bernstein et al. [10] describe how knowledge workers often rely on informal, fragmented task representations, so-called *information scraps*, to manage their work. Their findings highlight the need for tools that support lightweight, flexible practices without imposing rigid structures. Blandford and Green [11] emphasized that individuals manage their time using an ensemble of tools, i.e., paper, digital, and shared systems, each serving different needs. Rather than seeking to replace existing practices, they argue for designs that support fluidity and integration across tools.

Building on these ideas, Hu et al. [30] recently proposed six dimensions–communicability, structure, portability, adaptability, physicality, and visualizability–that characterize the effectiveness of PTM tools. These dimensions echo earlier concerns about cognitive load and tool flexibility, and highlight the continuing importance of designing tools that accommodate diverse and evolving practices.

Recognizing these ongoing challenges in personal task management and drawing on prior work that emphasizes flexibility, cognitive simplicity, and cross-tool integration [10, 11], we developed *AIRbar* by integrating three core design concepts: (1) intentions and prioritization, (2) awareness, and (3) retrospection. Rather than serving as a comprehensive task management system, *AIRbar* complements existing tools by encouraging users to identify and focus on a small number of meaningful daily tasks. Each morning, users define a maximum of three tasks, which stay continuously visible

throughout the workday to keep priorities top of mind. At the end of the day, users reflect on their task progress, encouraging better time management and planning over time. While individually, each of these three design elements have appeared in prior tools, their integration into a lightweight, self-contained system tailored for individual knowledge workers is, to our knowledge, novel. Unlike tools which focus on time tracking or team work, such as Clockify[1], Asana[2], or ClickUp[3], and tools that assist with task planning, such as Akiflow[4] and Sunsama[5], *AIRbar* supports self-improvement on daily task focus through a minimal and personal workflow.

2.1 Task Setting and Prioritization

Specific and concrete task planning can help individuals manage their tasks more efficiently and free cognitive resources for other activities [44]. In an experimental study, Rogers et al. [53] found that prompting individuals to schedule and make detailed plans significantly increased the likelihood of task completion. Similarly, Skousen et al. [54] found, through a grounded theory study of real-world practices, that structured task planning supports knowledge workers in managing interruptions and maintaining focus. Despite these benefits, consistently following through on planned tasks remains challenging for many individuals, not because they fail to prioritize well, but because of the sustained effort required to ensure that priorities are met amidst competing demands and distractions [7]. Another common issue is the planning fallacy, where individuals underestimate the time required to complete tasks, leading to overly optimistic schedules [16]. For example, Claessens et al. [19] observed that 27% of planned work remained unfinished in a study of R&D engineers, while Ahmetoglu et al. [3] reported that academics left 34% of their tasks incomplete by the end of the day. Such incomplete tasks can contribute to feelings of stress and being overwhelmed [3].

To address these challenges, individuals commonly apply task prioritization to focus on their most important tasks. However, prioritization alone can fall short in practice if it is not accompanied by mechanisms that support follow-through [7]. For instance, long and unwieldy task lists may still leave users feeling overwhelmed, while poorly integrated prioritization tools can make task management feel cumbersome rather than intuitive.

Recent research highlights the importance of designing tools that reduce the cognitive burden of planning while promoting active engagement in forming short-term plans [7, 52]. For example, TaskVista leverages lightweight interaction and visualizations to simplify task management [7], while SelfPlanner integrates tasks into calendar systems to promote structured scheduling [52]. These systems often rely on detailed upfront planning or aim to comprehensively manage all tasks, making lightweight, in-the-moment prioritization less feasible.

Other approaches, such as Pomodoro timers or TimeToFocus [12], support task engagement by pacing work, encouraging breaks, or highlighting off-task time, but do not explicitly scaffold prioritization or reflection. While *AIRbar* also incorporates the benefits of time tracking, it extends to the planning and progression of the key priorities for the workday. By limiting the maximum number of tasks that can be defined, *AIRbar* aims to avoid overwhelming users with extensive to-do lists and instead encourages them to engage meaningfully and in a focused manner with their highest-priority tasks.

2.2 Task Awareness

As prioritization alone does not sufficiently support individuals to complete important tasks, research has considered mechanisms to keep individuals *aware* of tasks as they work. These mechanisms are often inspired by traditional paper-based memory aids, such as sticky notes, which serve as lightweight and effective prompts for task recall. Brewer et al. [15] found that when strategically placed, sticky notes can prompt memory at critical moments, emphasizing their value in supporting task awareness. Similarly, ambient displays offer a modern alternative by providing non-intrusive, glanceable prompts that support prospective memory [50], allowing users to stay informed without disrupting their current activities.

Several systems have been developed to improve task awareness through glanceable displays. Bellotti et al. [7] introduced TaskVista, a lightweight system designed to be 'instantly on' and 'in-the-way' to highlight top-priority tasks. TaskVista organizes tasks in a folder-like structure from which users can select tasks to focus on. However, it lacks support for prioritization, reflection, and time tracking, limiting its ability to guide users toward completing the most relevant tasks effectively. Other tools, such as ARENO [31] and TaskAmbient [32], leverage digital sticky notes to provide ambient task reminders. ARENO integrates paper-based reminders into desktop applications, while TaskAmbient uses a secondary screen, such as a tablet, to display task details. While effective, these tools rely on separate hardware setups or additional screens, which can be impractical in mobile or privacy-sensitive environments. Moreover, they often focus on visualizing all to-dos rather than highlighting a small, actionable set of prioritized tasks. ProactiveTasks, another system, explores the anatomy of short user interactions on mobile devices, categorizing interactions into 'glance', 'review', and 'engage' [4]. By proactively suggesting short tasks on the lock screen, ProactiveTasks aims to streamline mobile device use and engage users in quick, actionable tasks. This concept underscores the importance of commitment and engagement in task management, especially in contexts requiring limited attention spans.

Building on these insights, particularly the value of lightweight, glanceable prompts to support prospective memory and reduce cognitive overhead, *AIRbar* provides an always-on, glanceable Task Widget to promote task awareness and completion. Whereas many existing tools either visualize full task lists or rely on secondary displays, *AIRbar* takes a deliberately minimal approach: it persistently surfaces only the user's top three tasks within the primary workspace. The widget is lightweight yet actionable, allowing users to view, switch between, and check off tasks without leaving their current context.

2.3 Retrospection and Reflection

Retrospection and self-reflection are powerful mechanisms for improving personal task management. By examining how time is

[1]https://clockify.me
[2]https://asana.com
[3]https://clickup.com
[4]https://akiflow.com
[5]https://sunsama.com

spent and analyzing task behaviors, individuals can gain valuable insights to refine their work habits.

Several tools have been designed to support retrospection by monitoring and visualizing user behavior. For example, Whittaker et al. [61] developed meTime, an application that provides real-time insights into time spent on different applications. This resulted in increased awareness, helping users to improve their focus and reduce time wasted on distractions. Similarly, time-tracking tools like RescueTime [21, 36] provide visualizations into overall time spent on applications and websites. More specifically to task management, a study by Haraty et al. showed that presenting information such as task completion frequency and time allocation fosters positive changes regarding PTM [26]. While such tools provide valuable insights, they often fail to present them in an actionable way that offers personalized guidance [20, 47], thereby limiting their ability to drive meaningful improvements in task and time management.

Thus, another set of approaches aims at creating personalized and actionable insights in work settings through periodic self-reflection [39, 47, 58]. For example, Meyer et al. [48] found that daily self-reflection by software developers helped improve their productivity and work habits. In the area of time management, reflecting on time taken to complete previous tasks has been shown to improve duration estimates for similar tasks [40, 55, 56]. Similarly, Guillou et al. [24] found that reflecting on time allocation helped some knowledge workers enhance their awareness and perception of work. However, they also noted that not all individuals benefit equally, suggesting the need for tailored and guided reflection mechanisms. More recent approaches include TaskScape, a system that promotes awareness of task planning, completion, and emotional responses to work [59]. Likewise, SwitchBot, a conversational agent, encourages users to detach from work by planning and reviewing daily task lists [63], resulting in increased perceived productivity and better planning skills.

Building on this prior work, *AIRbar* takes an integrated approach by combining retrospection with guidance. At the end of each workday, it provides users with visual and textual insights into task progress, including time spent, task switches, and completion patterns. A key component is a horizontal bar visualization of the workday that maps time blocks to task activity, offering an overview of how time was distributed. This design responds to a documented gap noted in prior work [1], which found that few tools on the market provide individual-level, actionable feedback on time spent.

In contrast, *AIRbar* tightly couples its visual feedback with daily prioritization and reflection prompts, helping users make sense of their time use in the context of their own goals. Users are also encouraged to reflect on what supported or hindered their task completion by writing brief statements, scaffolding awareness and self-regulation over time.

3 Approach

The goal of the *AIRbar* approach is to help knowledge workers focus on and complete their most important tasks each day while minimizing the effort necessary to specify and maintain attention on these tasks. To achieve this, we combined three design concepts: (C1: Intentions) a *Daily Task Planner* to prompt for the top three tasks, (C2: Awareness) an always-on, glanceable *Task Widget*, and (C3: Retrospection) an end-of-day *Retrospection* and self-reflection. *AIRbar* is not designed to replace task management tools. Instead, it complements the tools knowledge workers already use, aiming to help them stay focused on completing their most important tasks each day. The design of the approach was based on a literature review, as well as feedback from piloting an initial prototype with 9 participants (see Section 4.2). To evaluate our approach, we implemented *AIRbar* as a cross-platform application for macOS and Windows. To preserve users' privacy, all user data is stored locally only. The supplementary material [57] includes a video demonstration of *AIRbar*, along with additional screenshots that highlight minor features of the application.

3.1 C1 Intentions: Daily Task Planner for Top Three Tasks

Many existing applications focus on comprehensive task management solutions, encouraging users to maintain and keep track of *all* their tasks, potentially across multiple task lists and thereby often overwhelming users [3, 30]. Contrary to these, *AIRbar* promotes prioritization and focus for daily task management. In particular, *AIRbar* prompts users in the morning to specify a *maximum of three* most important tasks for the workday. By nudging users at the beginning of the day, *AIRbar* tries to foster users to reflect on, define, and prioritize their intentions for the day. By limiting the tasks to three, it further aims to encourage users to set realistic and manageable expectations, increase task commitment and completion, and prevent feelings of being overwhelmed that can arise when working with an ever-growing list [3].

To achieve this, *AIRbar* has a *Daily Task Planner* that is automatically opened at the beginning of the user's workday, as defined by the user in the application settings. As illustrated in Figure 1, the Daily Task Planner prompts the user to define one to three tasks, specifying a mandatory task title, optional task description (that may include subtasks), and a (customizable, but preset) color. As with most other personal task management systems, the user is free to define any kind and granularity of task according to their own preferences. If the user has any unfinished tasks from the previous day, these are shown below the tasks for the current day. The user can select an unfinished task to carry it over to the current day, allowing them to easily add, adapt, and continue unfinished tasks. To support changing priorities [49], the planner can be opened at any given time of the day to add and update the top three tasks.

3.2 C2 Awareness: Always-on, glanceable Task Widget

Inspired by the practice of using post-it notes on monitors to track tasks [10], *AIRbar* introduces an always-on glanceable widget to enhance awareness and promote completion of prioritized tasks. The *Task Widget* is designed to strike a balance between visibility and minimalism, offering enough information without cluttering the workspace, drawing on previous research [7, 36, 61]. The widget also motivates task progress by allowing users to track time spent on tasks and check off completed ones, as shown in Figure 2.

To achieve this, the Task Widget always remains in front of other windows on the user's screen and cannot be closed, yet it is intentionally minimal to blend into the screen to not distract the user.

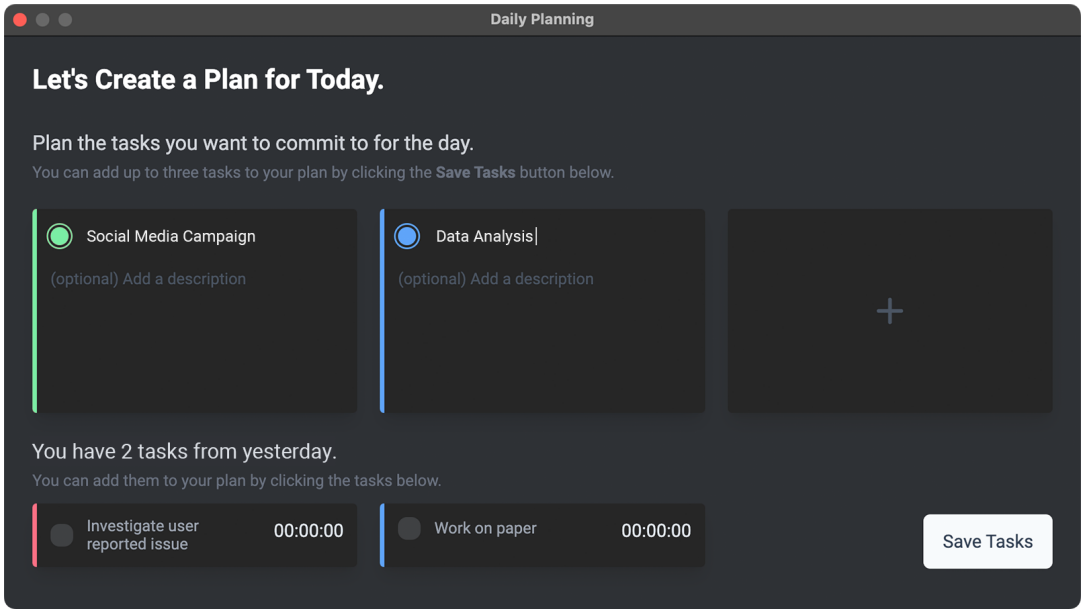

Figure 1: Daily Task Planner, where the user is able to define up to three tasks by specifying title, description, and color.

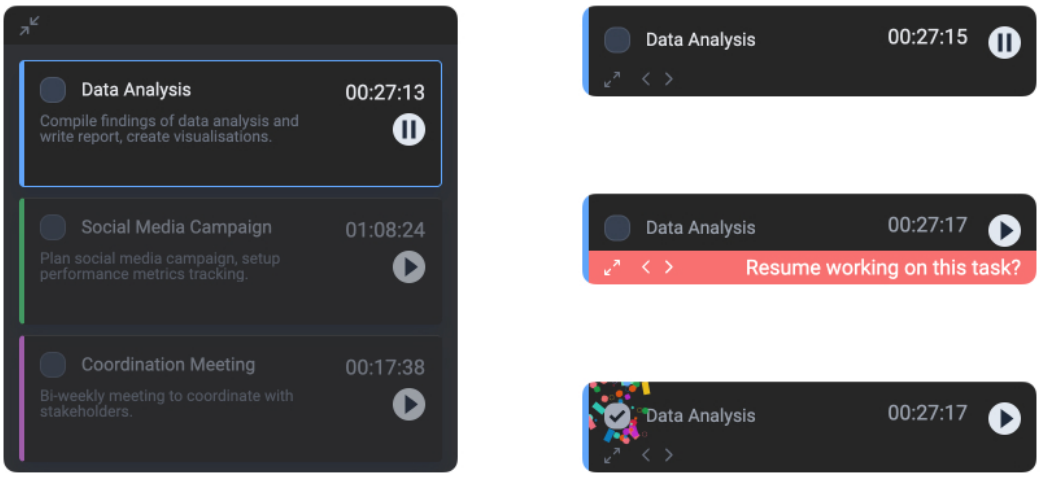

Figure 2: Always-on, glanceable Task Widget showing all tasks (left), or minimized to one task (right top), with a reminder to resume work (right middle) and an animation when checking off the task (right bottom).

Unlike system tray (Windows) or menu bar (macOS) integrations, the Task Widget operates as a separate window to ensure that it is visible and prominent. It can be expanded to show all three tasks (Figure 2, left) or minimized to display only one (Figure 2, right). The Task Widget provides task details and supports interactions such as switching between tasks, marking them as completed, and tracking time without the need to open another window.

3.3 C3 Retrospection: End-of-Day Retrospection and Self-Reflection

To encourage self-reflection and help users improve task completion of high priority tasks, *AIRbar* includes a *Retrospection*, motivated by prior research [21, 47]. In the evening, *AIRbar* provides personalized insights into the day's work and tasks, and prompts users to reflect on their task progress. This reflection and the insights are designed to enact the self-improvement hypothesis [35], by helping users identify factors and barriers affecting task completion and improve task management for subsequent days.

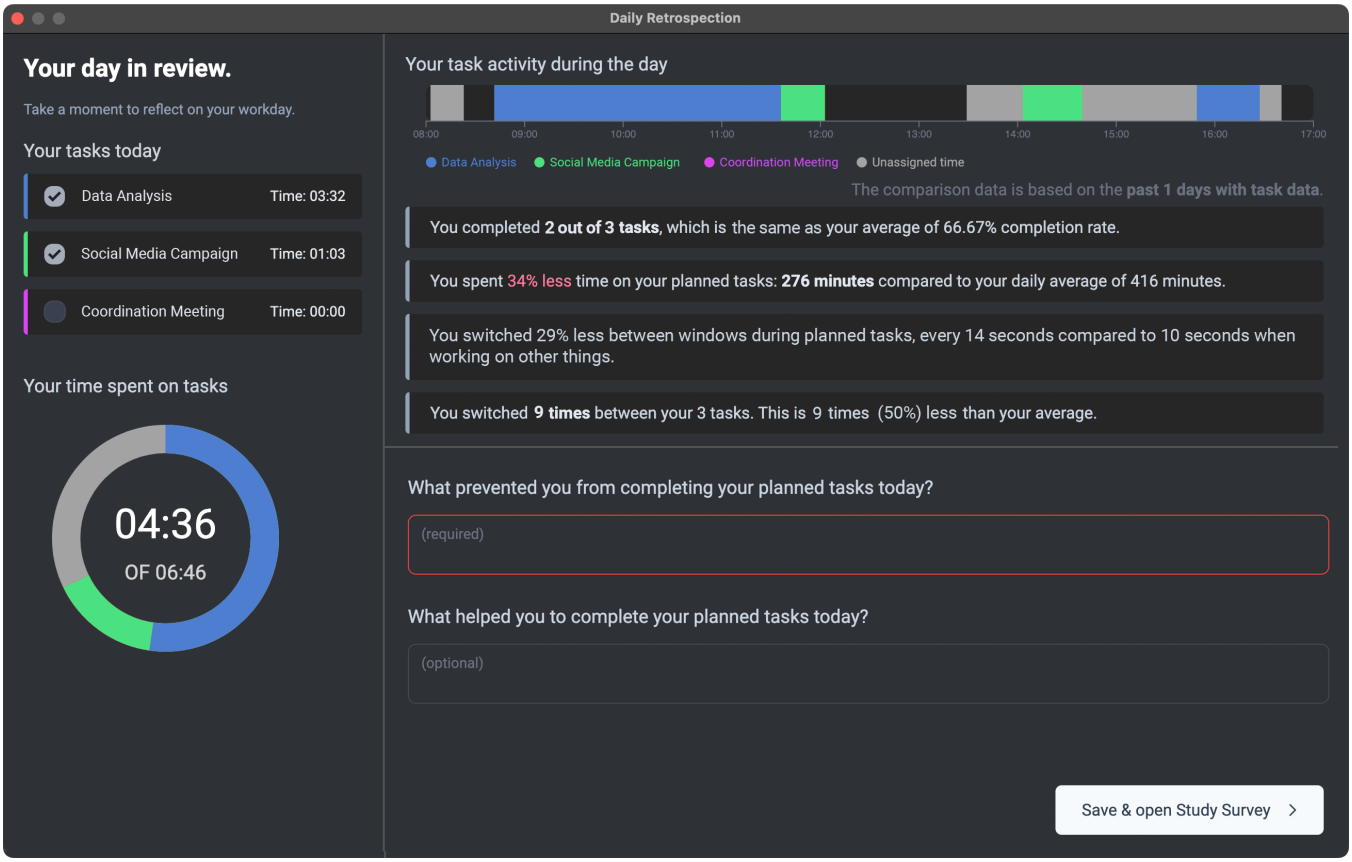

Figure 3: Retrospection allowing users to tick off completed tasks and see an overview of time spent on the left, as well as providing a task timeline, textual insights, and a self-reflection on task completion on the right.

To achieve this, *AIRbar* automatically opens a retrospection window at the user's specified end-of-workday time, providing a consistent opportunity for self-reflection without relying solely on the user's initiative. As shown in Figure 3, the Retrospection includes two visualizations, a pie chart and a timeline, to provide insights on the time spent working on the planned tasks (reusing the task colors), on computer work that was not assigned to a planned task (gray), on time away from the computer (black), and on switches between these tasks. Data on task work is available whenever users tracked the time in the Task Widget. To further increase self-awareness of the user's task behavior and work fragmentation, the Retrospection provides several textual insights related to the user's manually tracked task switches, task completion, time spent on tasks also compared to prior workdays, and the user's window switches. Finally, the Retrospection explicitly encourages self-reflection by asking the user to write a short statement on what helped them to complete their tasks as well as what prevented them from completing a task, if any task was not completed. To provide flexibility and accommodate for changing work schedules, users can choose to start the Retrospection immediately or postpone it.

4 Method

To evaluate whether the combination of the three design concepts focused on intentions, awareness, and retrospection improves a knowledge worker's ability to complete the most important tasks, we conducted a field experiment with 35 participants who used *AIRbar* in their professional work over a three-week period. We collected data using a mixed methods approach, collecting quantitative and qualitative data through one-time, end-of-workday and end-of-workweek surveys and interviews throughout the study.

4.1 Procedure

The field experiment lasted four weeks in total, and is summarized in Figure 4. To examine the impact of *AIRbar* on participants' work and task completion, the intervention phase of the study was divided into two phases. During the one-week Intention Phase, participants used the application with a limited feature set consisting of the Daily Task Planner that prompted them to plan their top three tasks for the day and an End-of-Day Review that encouraged them to briefly reflect on their task progress and completion in the evening. In a subsequent two-week long AIR-Phase, all features of *AIRbar* were enabled, including the Task Widget and the Retrospection. Finally, in a one-week Post-Intervention Phase the *AIRbar* was

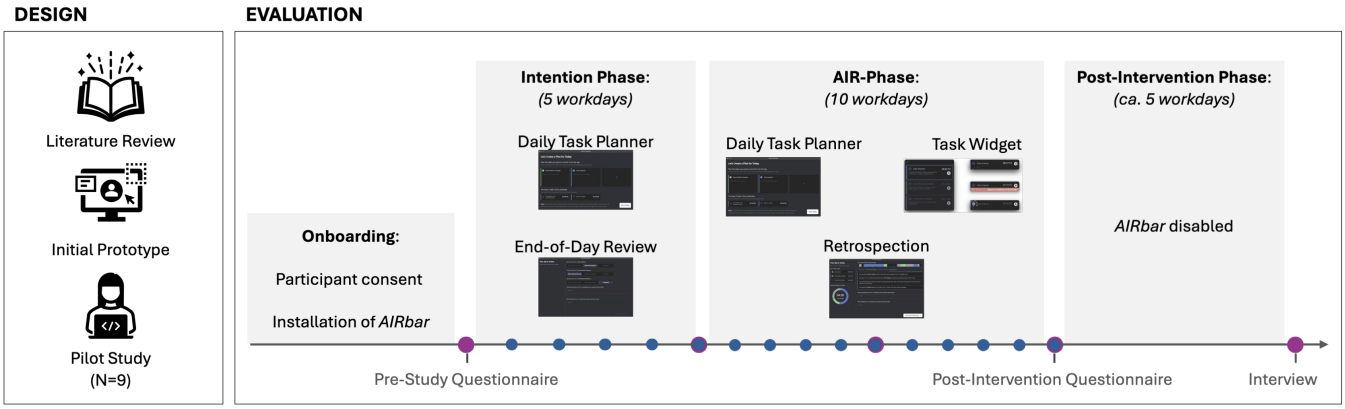

Figure 4: Overview of the study procedure (●: End-of-Day (EOD) Survey, ●: End-of-Week (EOW) Survey).

disabled to gauge how participants felt about returning to working without it. At the end of each week, participants answered the end-of-week (EOW) survey which consisted of a single question on their overall task completion during the past work week (5 workdays). During both intervention phases (Intention Phase and AIR-Phase), participants reported their progress on their planned tasks, and self-reported their perception of five work-related factors, including their ability to focus, productivity, and stress in an end-of-day (EOD) survey. The study was approved by our institutional ethics board.

Recruiting. We recruited participants through our professional and personal networks. This involved creating a study website that was shared on LinkedIn, distributed through internal newsletters at two academic institutions, and sent through personal invitations. To be eligible, people needed to identify as professional computer-based knowledge workers who work at least 24 hours a week (~3 days), be able to install *AIRbar* on their work device, have some degree of autonomy over how they plan their tasks and structure their workday, and be at least 18 years old.

Onboarding. Eligible participants received an email invitation for the study onboarding, which included a link to the Pre-Intervention Survey. This included questions on participants' demographics and current task management practices. It also provided a brief summary of the study procedure and objectives, instructions for installing *AIRbar*, and requested participant consent.

Intention Phase. After installing *AIRbar* on their work machines, participants immediately started the Intention Phase. In this phase, participants could use the Daily Task Planner in the morning to specify up to three tasks for the day. We also added a End-of-Day Review at the end of each workday to collect data on participant's progress on the specified tasks without any visual or textual insights. When closing the review, a short EOD survey was triggered that participants were asked to complete. After five completed workdays, the application automatically switched to the AIR-Phase. A completed workday is defined as a day when the participant planned at least one task using the Daily Task Planner. Note, we did not count the very first day as a completed workday and discarded data from it to reduce novelty effects and because the participant might not have used it for the full day.

***AIR*-Phase.** In the AIR-Phase, all *AIRbar* features were enabled. As in the previous phase, participants were able to plan their work in the morning using the *Daily Task Planner*. During their workday, participants saw the Task Widget, a reminder of the tasks participants had committed to, and were provided with visual and textual insights from their workday through the Retrospection. After closing the Retrospection, participants were asked to answer the same EOD survey as in the previous phase. After completing 10 workdays, the application automatically switched to the next phase, and participants received an email asking them to complete a Post-Intervention Survey, which also prompted them to export the data that *AIRbar* collected, and securely share it with us through an online shared drive.

Post-Intervention Phase. During this phase, all *AIRbar* features were completely disabled and participants were no longer asked to complete the EOD survey. After one work week, participants received an email prompting them to complete a short Post-Study Survey that included the EOW Survey one final time and gave participants the option to either re-enable or uninstall the application. Finally, some participants were asked to take part in a short semi-structured interview. We selected interviewees either randomly or whenever we wanted to explore certain responses in the post-intervention survey in more depth. We conducted interviews until a convergence of responses was reached, which happened after a total of 17 interview participants (approximately half of the total study population). At the conclusion of the study, participants received a 30 USD gift certificate for an online shop, regardless of their interview participation.

4.2 Pilot

We piloted our study and an initial prototype of *AIRbar* with 9 participants (3 identified as female, 6 as male) for an average of 12 (±1.86, min=10, max=15) workdays. Seven participants were PhD students and two were professional knowledge workers. Although participants were generally satisfied with the approach and study, we made several refinements: in the application, we added a reminder to reduce the chances of forgetting to restart time tracking after resuming work on the computer (see Figure 1). We also simplified the Retrospection by reducing the amount of information

displayed and added textual insights for users who prefer them over visual insights. The application was further updated to switch study phases automatically after a predetermined number of workdays, eliminating the need for manual switching by participants. To better address our research questions, we incorporated additional EOD survey questions and refined the one-time surveys and interview prompts.

4.3 Participants

For the field experiment, We recruited 39 eligible knowledge workers, whom we defined as individuals whose primary job responsibilities involve non-routine, cognitive tasks performed primarily at a computer. Four participants dropped out, citing study-unrelated health reasons and switching computers, and one person could no longer be reached. Thirty-five participants (18 identified as female, 17 as male, 0 as non-binary) completed the study. They were on average 32 (±7.5, min=21, max=48) years old at the time of the study. Participants were recruited from Switzerland (20), Canada (7), Brazil (4), Austria (1), USA (1), New Zealand (1) and China (1). We allowed for a broad definition of computer-based knowledge workers, resulting in various industries, including information technology, education, engineering, and business & finance, with an average of 7.7 (±6.2, min=1, max=20) years of professional experience. Twenty-six identified as individual contributors (working on specific tasks without any managerial duties) and 9 as team leads or managers. They reported working an average of 38 hours (±6.6) per week, of which an average of 34 (±8.3) were at their computer.

Participants reported having varying degrees of experience and familiarity with task management. Their descriptions of their practices ranged from 'chaotic' and 'spontaneous', 'occasionally jotting down tasks on random pieces of paper', to being highly organized, with some participants stating that they had used project management tools for several years. Participants also reported using a wide variety of tools, including calendars (10/35), physical or digital notes (13x), task management apps (4x), and project management tools (2x).

4.4 Data Collection

Throughout the study, we collected qualitative and quantitative data via three one-time surveys, end-of-day and end-of-week surveys, a semi-structured interview with a subset of participants, as well as automatically collected task- and *AIRbar* usage data. Participants contributed task-related and usage data on a total of 539 workdays, with an average of 15.85 (±0.70, min=12, max=16) days per participant. The one-time surveys, EOD and EOW surveys, and interview protocol can be found in the supplementary material [57].

One-time Surveys. The *Pre-Intervention Survey* gathered information on participants' demographics, their current task management and planning practices, including their implementation and satisfaction with these practices. Additionally, participants were asked to complete the questions of the EOW Survey. The *Post-Intervention Survey* consisted of open- and closed-ended questions addressing the overall usefulness and impact of *AIRbar*, and specific questions regarding the three main concepts. Finally, the *Post-Study Survey* prompted participants to complete one last EOW Survey, asked them whether they wished to continue using *AIRbar* as-is and invited them to share any additional feedback on the study or *AIRbar*.

Interview. Two authors conducted 17 semi-structured interviews to understand participants' perception of and potential improvements for *AIRbar*, explore how they used the three main components, how they integrated *AIRbar* into their existing workflows, and how it affected their task completion and overall work. The interviews were held in English (16) or German (1), took an average of 28.7 minutes, and were audio-recorded and transcribed using Microsoft Teams.

Reflection on Task Completion. On days when participants defined one or more tasks in the morning, either the End-of-Day Review or Retrospection asked participants to report on their task progress (i.e. started, progressed, or completed), as well as to reflect on factors that helped them complete their tasks (question was only shown if at least one task was completed) and what prevented them from completing tasks (question was only shown if not all tasks were marked as completed). Note that task progress during the AIR-Phase was also inferred via the Task Widget.

End-of-Workday (EOD) Surveys. After closing the End-of-Day Review or Retrospection, an online EOD survey opened, prompting participants to share their perspectives regarding their progress, attention to tasks and distractability (inspired by BAARS-IV 2 [6]), perceptions of productivity (inspired by [43, 46]), time well-spent (inspired by [25]), and stress (inspired by SNRS-11 [41]). The six questions used 5-point Likert scales, and can be found in the supplementary material [57].

End-of-Week (EOW) Surveys. The EOW survey included a single question asking participants to assess whether they were able to complete their most important tasks over the past five workdays, using a 5-point Likert-scale. This survey was administered five times throughout the study: before onboarding, after the Intention Phase, after the first week of the AIR-Phase, after the second week of the AIR-Phase, and after the conclusion of the study. To reduce the number of surveys participants had to complete, the question was embedded in the EOD survey and the one-time surveys.

Task Data. *AIRbar* captured the tasks that participants defined in the morning, their self-reported status (started, progressed, completed), and the time spent working on tasks during the AIR-Phase.

4.5 Data Analysis

Qualitative Analysis. Our research materials included interview transcripts and qualitative responses to open-ended questions from three surveys: pre-study, post-intervention, and post-study. We conducted a thematic analysis [13], chosen for its flexibility in identifying and reporting patterns within qualitative data, particularly in exploring the narratives around our three design concepts. Two authors independently coded three interview transcripts, comparing and discussing the codes to create the initial codebook. This codebook was then used to iteratively code the remaining interviews and survey responses, focusing on how the data aligned with the design concepts. The coding process involved the first author, who conducted most of the interviews, and two other team members, ensuring a thorough review and refinement of the codes and themes. In total, 63 distinct codes were generated. Our analysis

involved familiarization with the data, initial coding, identifying potential themes, and reviewing and refining these themes.

In reporting our qualitative findings, we focus on insights derived from the interviews, as these provided the most in-depth exploration of participants' experiences. Although our analysis was mainly based on interview data, the surveys also included a small number of open-ended questions. When relevant, we incorporated quotes from these survey responses into our qualitative analysis.

Quantitative Analysis. For the analysis on task completion, we removed all days for which participants filled out the tasks in the morning but not the end-of-day review. To compare survey responses between Intention Phase and the AIR-Phase, as well as between pre- and post-study, we first assessed normality using the Shapiro-Wilk test and homogeneity of variances using Levene's test. When both tests were non-significant, paired t-tests were conducted. In cases where only one or no side was normally distributed, the Wilcoxon signed-rank test was used. Effect sizes were calculated using Cohen's d for significant differences, or rank-biserial correlation for not normally distributed data accordingly. Additionally, linear mixed models were applied to analyze the survey data. The alpha level was set to 0.05 for all tests.

5 Results

The quantitative and qualitative data analysis provides evidence that the combination of the three design concepts in *AIRbar* significantly improved participants' ability to complete their most important tasks, increased satisfaction with their task management, and enhanced participants' perceived focus.

Based on the quantitative data, a Wilcoxon signed-rank test comparing the number of completed tasks during the Intention Phase and AIR-Phase that included the Task Widget (see Figure 5) showed a *statistically significant increase in task completion rate* (n=34, W=180.5, p<0.047, $M_{intention}$=1.17, M_{AIR}=1.49) with a small effect size (r=0.29). Similarly, an analysis of participants' satisfaction with their task management before and after the intervention using a Wilcoxon signed-rank test showed a *statistically significant increase in satisfaction* with a small effect size (n=34, W=42.0. p<0.0026, r=0.17, M_{pre}=3.15, M_{post}=3.64). Further analyses using linear mixed models showed that participants' prior familiarity with task management, including their self-reported level of organization, consistency in planning routines, task forgetfulness, and satisfaction with existing task management methods, had no significant impact on the increase in task completion rate and satisfaction.

In addition, the majority of survey participants responded positively in their ratings on the design concepts. Figure 6 visualizes participants' ratings on a subset of the questions that we asked in the Post-Intervention Survey to quantify the impact of the three design concepts that we implemented with *AIRbar*. Overall, these quantitative findings reinforce the qualitative insights from the post-study interviews and surveys that evaluated the overall impact of *AIRbar*. In the following, we will present the main themes from our analysis, categorized by our three design concepts.

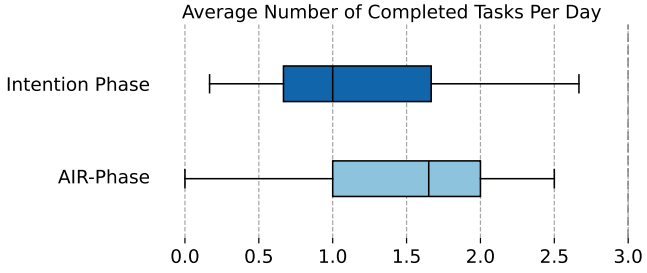

Figure 5: Average number of self-reported completed tasks per day per participant during the Intention Phase and the AIR-Phase.

5.1 Design Concept C1 Intentions: Daily Task Planner for Top Three Tasks

Morning Prompt Fosters Structure and Focus. The *Daily Task Planner* of *AIRbar* that automatically opened at the start of the workday helped participants consciously structure their workday by prompting them to plan their tasks *before* diving into routine activities like checking emails, procrastinating, or struggling to decide how to start. By defining their tasks first, participants (11/17)[6] experienced a smoother transition into their work, avoided aimless activities and started work on their key tasks more quickly. Participant P1 highlighted this shift, stating:

> "*[Previously] I started and then scroll[ed] through my emails, like what's going on, but with the AIRbar, I went straight into thinking what tasks do I have to get done today and then writing them down before doing any other like admin task or anything else. So in a sense, it structured my day a little bit more [...] it forced me to actually start doing my work instead of procrastinating and playing around.*" - P1

Starting work by defining a focus for and visualizing their day marked a transition from unstructured and spontaneous task management to a more deliberate and organized approach. P7 stated, *"Planning it explicitly. Planning at the beginning of the day. I think that helps a little bit in terms of just getting better clarity of what I wanted to do."*

Before using *AIRbar*, some participants (4/17) described their planning as reactive, driven by available time slots and filling calendar gaps without a clear strategy. *AIRbar*'s prompt encouraged a purposeful mindset and intentional goals. Writing down tasks also helped participants maintain clarity (3/17), reducing the mental load of tracking to-dos throughout the day. It provided direction and a sense of commitment, making participants feel more organized and less overwhelmed. As P17 explained, writing tasks down offered a sense of relief:

> "*In the morning I think, OK, today I want to complete this task and it was just a matter of actually writing it down [...] like physically doing something about it, like some kind of concrete implementation rather than just thinking, you know, today I have to finish this task. [It] was nice because then it took the pressure off me of having to always think, you know, what I have to complete today because I have it written down and I'm not going to forget.*" - P17

[6]This number primarily reflects insights from the interviews; survey data included some open-ended responses, which were incorporated when relevant.

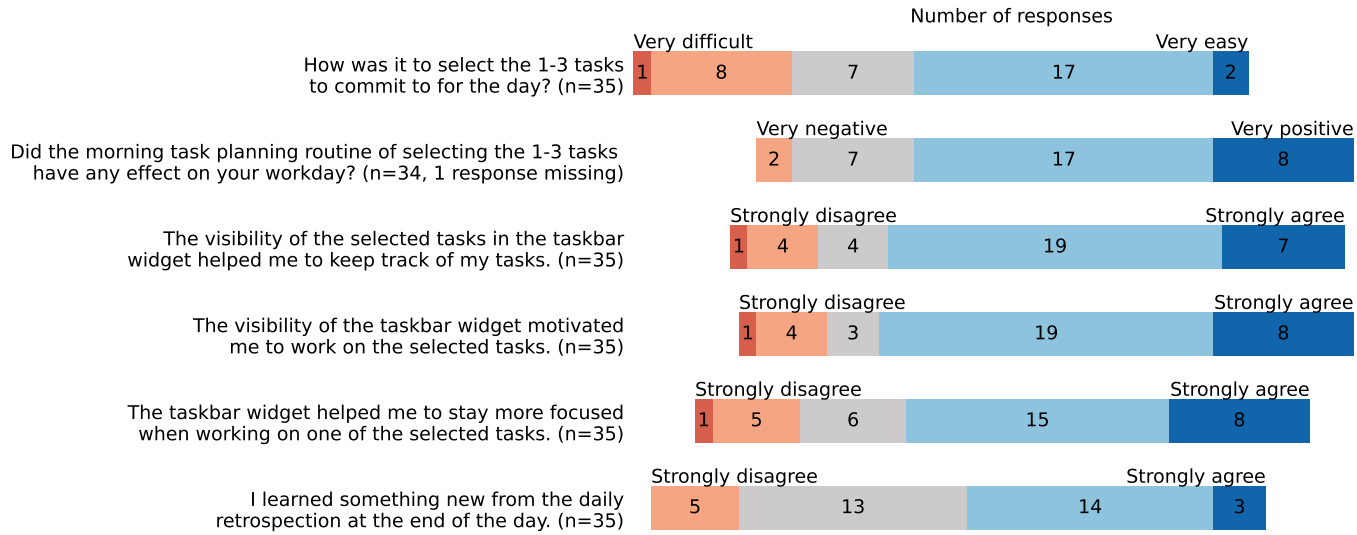

Figure 6: Participants' ratings on a subset of the Post-Intervention Survey questions. The labels of the lowest and highest items in the Likert scale are visualized, even when they were not selected by a participant (e.g., no participant selected "very negative" in rating 2).

Limit of Three Tasks Fosters Prioritization and Focus. Limiting the maximum number of tasks that can be planned to just three prompted participants to reflect on their priorities and focus on what was truly important and achievable (6/17). This limitation helped them set clear intentions and align their efforts with meaningful goals rather than simply reacting to the demands of their workload. As P17 noted,

> "*It forced you to kind of think about what you really need to do and also the fact that there are only three tasks really forces you to prioritize and think in a realistic way. What can I accomplish today?*" - P17

The three task limit also fostered a stronger sense of commitment to completing these tasks (8/17). P5 explained how this constraint helped them maintain focus:

> "*To keep it simple, just to these three tasks [...] I was much more committed to stick to these tasks that I set as a goal. I was less distracted by myself. It was very helpful to have this focus for a day on these three tasks.*" - P5

The notion of planning as a form of commitment was echoed by several participants (8/17), who noted that writing down tasks added accountability to their daily routine. As P8 explained,

> "*The main difference [in regards to working without AIRbar] is just writing it down and sort of like committing to it basically.*" - P8

Throughout the study, participants evolved their goal-setting approach. Some participants initially struggled to determine the right scope and size for tasks (2/17), a challenge that was also evident in their self-reflections during the EOD surveys, where participants reflected on what kept them from completing their tasks. Several participants (7/17) described how they gradually developed an understanding of which task definitions, scopes, and structures made the most sense for them. This resulted in smaller, clearer and more attainable tasks, often by breaking them down from larger goals into more manageable parts (8/17).

Some participants initially found the three task limit too restrictive, especially when deciding whether meetings should count as tasks (5/17). This sentiment is also reflected in Figure 6, where participants rated the difficulty of selecting only one to three tasks. However, several participants realized over time that defining fewer tasks made sense and led to a greater sense of accomplishment. As one participant reflected,

> "*It's also good that you can only assign three tasks and not more, because otherwise, I would just attempt to add all the tasks I would like to achieve, but that is not really realistic.*" - P5

Interestingly, two participants even noted how the limit made them realize that planning for more tasks would set them up for failure, as it was unrealistic for them to accomplish more within a day. In the end, only one participant strongly felt that there should be an option to define more than three tasks, while the majority found that focusing on fewer, well-chosen tasks was ultimately more beneficial.

Checking Off Tasks as a Reward. The act of checking off tasks in *AIRbar* was frequently described as rewarding and motivating (8/17), confirming previous work [42]. P1 explained how this sense of reward influenced their behavior:

> "*So I have an hour before the end of my work day, but then it made me push towards like I want to finish this task cause I want to check this box off being done. [...] At the end of the day when I can check off all my big tasks, I feel accomplished.*" - P1

This feeling of accomplishment often motivated participants P4 and P15 to continue working, even slightly extending their work hours to achieve the satisfaction of marking a task as complete.

Influencing Factors on the Tool's Perceived Usefulness. The benefits that participants experienced using *AIRbar* varied depending on factors such as work environment, phase of work, location, and existing task management practices. Participants (5/17)

reported that the tool's effectiveness often hinged on their work setting; for instance, those working in office environments frequently faced unforeseen interruptions, such as sudden meetings, which reduced the value of the task planning support, as the unpredictability made it harder to fulfill their three tasks:

> "*I'm currently working as a post doc, so I get a lot of sudden meetings as well. If a student comes [to] ask for help, then I get into in-person meetings a lot. I mean, they are also part of my job, but I do not put them on priority and cannot plan them ahead.*" - P6

Similarly, participants noted that *AIRbar* was less beneficial on days when their schedules were largely pre-determined, such as when traveling for work. Additionally, its usefulness was diminished during hectic or unstructured phases of work, especially when waiting on input from others or when intense collaboration was required. In these scenarios, participants struggled to define three main goals for the day, as their schedules were dominated by meetings, talks, or tasks that could not be controlled by them or planned in advance. These challenges were also highlighted in participants' self-reflection during the EOD surveys, where unforeseen tasks, interruptions from meetings or talks, and personal well-being were frequently cited as the main factors preventing them from accomplishing their planned tasks.

5.2 Design Concept C2 Awareness: Always-on, Glanceable Task Widget

Enhancing Focus and Task Commitment Through Constant Visibility. The finding on the significant increase in task completion rate (see beginning of section 5) is further reinforced by qualitative insights from the post-study interviews, where participants discussed how the visibility of their three planned tasks acted as a motivating factor.

The constant visibility of tasks in the Task Widget helped participants (8/17) maintain awareness of their intentions committed to in the morning planning, while also increasing focus, accountability, and motivation (12/17), as further reflected in the post-intervention survey ratings (see Figure 6). P4 shared,

> "*[...] seeing all of the tasks at once makes it clearer what you still have to do for the day.*" - P4

Participants often noted that without such reminders, they would lose track of their original plans when interruptions such as unexpected requests arose. P5 explained,

> "*It was good that I could check what my goals are for today. [...] I sometimes forgot them and got lost in other things. But I could always go back and see what I should be working on.*" - P5

Similarly, P31 described the Task Widget as a persistent reminder of the commitments:

> "*Having the tasks front-and-center reminded me of what I set out to do that day [...] and not get sidetracked by other tasks that popped up throughout the day.*" - P31

Beyond external interruptions, the widget also helped with internally-driven distractions, such as drifting into unrelated activities or procrastination. P9 detailed this effect, stating,

> "*I am a person with a very short attention span, so I easily get distracted. [...] Just by having this floating window that reminds me, it significantly reduces the time I get distracted.*" - P9

P12 echoed this:

> "*I always had it in my view, and when I started working on something else [...] I would see it and think, hey, I should actually focus on these three things.*" - P12

The visibility also reinforced commitment, motivating participants (5/17) to stick with their tasks, even those they typically found difficult, unappealing, or easy to procrastinate on. As P17 described it:

> "*This really motivated me to try a little bit longer before, let's say, giving up and continuing at another time. At times, that was helpful because I actually managed to crack the program or fix a bug I had. [...] Without this, I would feel a lot more OK with just switching and working on another task. But when I knew and saw that I set this specific task for the day, there's a bit of commitment there, which kind of makes you feel like you should continue working on this task.*" - P17

This increased awareness supported better focus and a disciplined work rhythm. P3 noted:

> "*The self-monitoring component in the background is important and valuable [...] it helps me get back to what I should be doing and practice awareness.*" - P3

The persistent widget also aided task transitions. With *AIRbar* automatically displaying the next task, participants (5/17) were less likely to get sidetracked and were able to maintain a smoother workflow throughout the day (5/17). The constant presence kept participants aware of their daily objectives, fostering continuity and focus.

Tracking Time as a Double-Edged Sword. The time-tracking feature in the *Task Widget* of *AIRbar* received mixed reactions from participants. For some, the timer created a subtle but effective form of pressure that helped them stay focused and motivated. The counting-up feature served as a visual representation of their commitment, enhancing their sense of time spent on each task and supporting them in managing their work more effectively. A few participants (3/17) noted that pressing the timer felt like an act of commitment, reinforcing their goal. P7 highlighted how the timer helped maintain accountability:

> "*Pressing play and pause was helpful in that respect because it's a better way to be accountable. [...] If you're, I don't know, going watching YouTube or using your phone, then you really feel like—it's not guilty, but sort of guilty in terms of seeing the time increments but not actually spending time doing that thing. [...] It keeps you on track that way, I think.*" - P7

P27 explained that the visual feedback of time already invested made them want to do more. Others found that the tracking helped them maintain a better sense of time overall, allowing them to estimate their work and task duration more accurately and stay on track with their schedules.

However, this balance of pressure and motivation was not consistent across all participants. While a moderate level of pressure motivated some to focus and commit to their tasks (7/17), for others (3/17), the timer introduced too much stress. Instead of providing a helpful nudge, the constant visibility of time passing felt overwhelming, creating a sense of urgency that was counterproductive. For some participants the timer made them feel as though someone was looking over their shoulder, causing anxiety and even distracting them from their work. As P6 summarized:

> "*On good days it helps to stay motivated, on bad days it adds stress.*" - P6

Furthermore, the time tracking surfaced a misalignment between perceived and recorded time for some participants, leading to feelings of inefficiency and added frustration, as participants felt they were not progressing as much as they thought. For example, P1 shared:

> "*I just don't like seeing this timer going off on me, and then my perception of time might be so wrong that I feel like, oh, I've worked an hour on this, and actually, it's like 20 minutes. I get frustrated because I feel like I've worked longer on it than it actually is.*" - P1

For some, this heightened sense of urgency led to avoidance behaviors, such as hiding or not using the timer, to reduce stress and allow them to focus solely on their tasks.

Meanwhile, a few participants felt the timer had little or no impact on their productivity or motivation. For some, it was simply an interesting feature but did not significantly affect their work habits.

Despite participants' mixed feelings around the Task Widget and its time tracking, self-reported stress levels from the EOD surveys remained relatively stable during both phases of the study. Performing a paired t-test between the average scores of the daily self-reports in the intention phase and the AIR-phase revealed no statistically significant difference for stress (n=35, t(34)=-0.97, p=0.34, $M_{intention}$=3.81, M_{AIR}=3.88).

5.3 Design Concept C3 Retrospection: End-of-Day Retrospection and Self-Reflection

Reflecting May Lead to Adjustments of Next Workday. The End-of-Day *Retrospection* provided participants with an opportunity to review their task completion and perceived productivity. Many participants found this reflection helpful, as it encouraged a deeper consideration of their daily achievements and challenges, which they typically did not engage in (4/17). Through this reflection, participants gained insights into how they distributed their time and which tasks were more time-consuming or stressful. As P1 described,

> "*Looking at it, I realized Task A took me so much longer than I anticipated. That's why I may have not finished the rest of the tasks. It made me more aware of where I might be losing time or where things were tougher than expected.*" - P1

Reflecting at the end of the day often led to adjustments in their subsequent planning, such as defining smaller, more manageable tasks or scheduling breaks more effectively (11/17).

Participants also used the Retrospection to better understand their work patterns. Some realized that tasks they typically disliked did not take as long as they had initially thought (2/17), making them feel less intimidated by them. Others identified patterns in their productivity, such as being more focused in the mornings than afternoons (6/17):

> "*I realized that in the mornings I can get tasks done quicker using less time, whereas in the afternoon I tend to stretch out my tasks longer.*" - P1

Reflecting on both successful and unproductive days provided motivation and a clearer sense of direction for the next day. For instance, successful days reinforced a sense of accomplishment, while less productive days prompted participants to adjust their approach, fostering a learning mindset rather than discouragement. P15 explained,

> "*It was good to reflect on my goals and to think about the reasons why I might not have finished the tasks. It gave me insight into what I could do better the next day.*" - P15

Similarly, P20 mentioned that reflecting on an unproductive day did not discourage them but instead gave them a renewed purpose for the following day.

For some participants, the EOD survey questions—even if they were part of the study instead of *AIRbar* itself— fostered valuable insights on task completion, stress levels, and emotional state, helping them understand the connection between their work and their well-being (5/17). P10 noted,

> "*I found it interesting to reflect on my stress level in relation to the tasks that were completed and not completed. It was interesting to see how my stress, or lack thereof, influenced my task completion.*" - P10

By relating their productivity to their emotional state, participants could better justify and understand why certain tasks were not completed. As P13 noted,

> "*If it were only uncompleted tasks for some time, I would question myself: am I doing something wrong? [...] For self-reflection, it was definitely helpful.*" - P13

However, a small number of participants expressed ambivalence towards the *Retrospection* process, feeling that it sometimes assigned unnecessary blame or failed to add reflective value to their work process, such as P7:

> "*I didn't really find the retrospection section helpful at all. It felt like my parent asking why I didn't get something done [...] it didn't feel reflective.*" - P7

Quantitative data from pre- and post-study surveys further shows that participants' perceptions of the Retrospection's usefulness also varied based on prior experiences. We employed a linear mixed-effects model to examine the relationship between how participants' ratings of the statement *'I learned something new from the daily retrospection at the end of the day'* and their initial levels of satisfaction with personal task management and organization prior to the study, modeling participants as a random effect. Results indicate that both general satisfaction (B=-0.502, SE=0.201, Z=-2.502, p=0.012) and organization (B=-0.506, SE=0.210, Z=-2.416, p=0.016) were *significant* negative predictors. This suggests that participants with lower general satisfaction and lower organization prior to the study learned more from the Retrospection.

Individual Preferences Regarding the Timing of Reflections. As mentioned by a few (3/17) participants, the Retrospection marked a clear signal to end their workday and transition to personal time, with P1 describing it as a rewarding reminder to stop working and recharge for the next day:

> "*It was kind of rewarding at the end of the day where it pops up and you're like, oh, my workday is over. [...] It's like the tool's reminding me that your workday is technically over, and I should really stop working and then focus fresh tomorrow.*" - P1

However, others (7/17) mentioned that the timing was sometimes not suitable, particularly when they were already eager to leave, as noted by P5. Suggestions for improvement included integrating Retrospection into morning planning or aligning it with end-of-day task planning for the next workday to directly apply the insights.

Some participants (3/17) also felt that the reflections were too frequent, preferring a weekly or more flexible approach to better understand longer-term patterns and trends instead focusing on daily

fluctuations. Finally, retrospection was especially valued on more chaotic or unstructured days (3/17), as it helped them understand what did not work and why certain tasks were not completed.

6 Discussion

This section connects the design concepts to our key outcomes and situates the use of task management tools within the broader ecology of work, as highlighted by Greenbaum [23] and Fox [22]. We discuss how tools such as *AIRbar* can help users navigate the unpredictability and complexity of knowledge work, going beyond promoting task completion to also supporting more realistic, meaningful and satisfying approaches to task planning. Finally, we reflect on the limitations of our study.

6.1 Relating the Design Concepts and Key Outcomes

The work presented in this paper integrates three design concepts that have each, individually, been shown to support task management and completion [7, 14, 32, 38, 47, 50, 52]. Our findings suggest that their combined implementation in *AIRbar* enhances the likelihood that "the important tasks get done" [7], while also reducing the effort required to do so. Concept 1, the Daily Task Planner, prompted participants to prioritize three key tasks, fostering a deliberate approach to their workday with clear intentions and planning for realistic outcomes by recalibrating expectations. This enforced limitation on few tasks aligns with prior research on the benefits of structured task management [42, 44] while also reinforcing the importance of manageable task lists for enhancing focus and avoiding overwhelm [7]. Concept 2, the always-on, glanceable Task Widget, enhanced task commitment and focus for participants, consistent with the literature on similar always-on displays that visualize time use information (instead of tasks) to minimize distractions [36, 61]. Lastly, Concept 3, the end-of-day Retrospection, enhanced productivity by enabling participants to reflect on task progress and refine future plans, echoing prior work on the value of retrospection and self-reflection in promoting awareness and behavior change [21, 47, 48, 61].

The largely positive responses from our participants, including 17 who explicitly expressed a desire to continue using the prototype and who opted not to uninstall it, further highlight *AIRbar*'s impact. At the same time, participants' feedback on their use of *AIRbar* suggests that the approach may be particularly beneficial for knowledge workers who have sufficient agency over how they organize their work and are generally inclined to plan and structure their workdays, but either tend to be too optimistic about what they can realistically accomplish or struggle with task prioritization.

6.2 Supporting Unpredictability in Knowledge Work

Knowledge work is inherently dynamic and subject to disruptions from various sources, including unplanned interruptions, resource limitations, or unexpected tasks, as also experienced by our participants. This inherent unpredictability highlights the necessity for tools that enable continuous and flexible adaptation of plans, including the revision of task lists, and realignment of priorities in response to changing conditions. Prior studies confirm these challenges persist with task management systems, emphasizing the need to balance guidance with adaptability [31, 32].

The combination of the three design concepts proved especially effective in helping users navigate the unpredictability of knowledge work. First, the constraint of selecting no more than three tasks encourages users to engage in reflective prioritization at the beginning of the day. This prompts users to align their task goals with the realistic constraints of their work context, characterized by frequent interruptions and competing demands. Rather than overestimating their capacity, participants reported setting more achievable goals, leading to improved alignment between intentions and actual outcomes as well as less frustration about missed goals. Second, the always-on, glanceable task widget played a key role in maintaining task salience throughout the workday. By keeping users' key tasks visually present–even during interruptions from colleagues or unexpected requests–the widget encourages just-in-time decision-making. Participants used their increased awareness to assess whether to accommodate ad-hoc demands or to defer them in favor of preserving focus on higher-priority tasks. Third, the end-of-day retrospection supports awareness and refinement of task management practices in light of unpredictability. By reviewing the outcomes of their day, participants were able to reassess their planning strategies, identify misalignments between plans and realities, and iteratively refine their expectations for future days. This reflective loop fosters a more adaptive and user-centered approach to managing daily workflows.

Rather than attempting to eliminate unpredictability, we argue for a shift in how task management systems conceptualize user time and attention. Many existing systems implicitly assume that users can plan and execute tasks under stable, self-controlled conditions. However, our findings highlight that this assumption rarely holds in knowledge work, which is shaped by interruptions, shifting demands, and resource constraints. Instead of treating disruptions as exceptions, our design embraces them as a core condition of everyday work. By supporting reflection, prioritization, and ongoing adjustment, the system helps users regain a sense of agency not by enforcing control, but by fostering intentionality in the face of unpredictability.

6.3 Assistive Support for Guiding Task Definition, Prioritization & Commitment

The findings indicate that while most participants employed some form of task management prior to the study, many faced challenges in defining and prioritizing tasks in a structured manner. Poorly scoped or vague tasks often led to missed goals, unnecessary stress, or difficulty tracking progress, especially in the context of unpredictable workdays. Although *AIRbar* encouraged users to experiment and refine their approach over time, this learning process was largely self-directed. Participants reported gradually learning how to scope and size their tasks to suit their needs, continuously refining their strategies through experience. This aligns with prior research suggesting that task management skills often develop through trial and error rather than through formal guidance [7]. *AIRbar* offered a degree of support by limiting the number of daily tasks that participants seriously committed to each day, indirectly promoting focus on what was both important and achievable.

However, this form of guidance was passive, depending heavily on participants' initiative to adapt and improve their practices. Consequently, some participants initially struggled with task definition, often underestimating the complexity or time requirements–a pattern consistent with the well-documented 'planning fallacy' [16].

These challenges highlight opportunities to enhance tools like *AIRbar* with more active and adaptive support. For example, future iterations could incorporate assistive technologies that offer real-time guidance during task planning. Such a "task coach" could take the form of a conversational agent or embedded interface element that provides personalized feedback–drawing on users' historical patterns of task planning, completion, and switching behavior. This coach could suggest adjustments to task scope, warn against common pitfalls, or offer templates for breaking down complex goals into manageable steps. Moreover, such guidance could be contextualized to users' daily schedules–for instance, nudging them to define tasks that realistically fit into their available work hours or around scheduled meetings. Personalization could extend even further by adapting to individual differences in personality traits, such as conscientiousness and self-regulation [60], as well as behavioral tendencies like circadian preferences [62] or task management styles (e.g., favoring short high-priority tasks versus filling the entire workday with activity). By embedding assistive support into the planning moment itself, such tools could help users not only plan better but also build lasting strategies for self-management, especially in work environments where structure and predictability are scarce.

6.4 Balancing Simplicity and Comprehensiveness: Adapting to User Preferences and Context

Mixed responses to some of *AIRbar*'s features highlight the importance of personalization in task management systems. While many participants appreciated *AIRbar*'s simplicity, others expressed a desire for more customization options. For instance, the task timer helped some users stay committed and accountable, but others found it stressful and demotivating. Similarly, the Retrospection feature provided valuable insights for some, while others found it intrusive or poorly timed, suggesting it could be more effective if adapted to individual preferences.

While some participants proposed enhancements that would turn *AIRbar* into a more comprehensive task management system, such as increasing the number of tasks or integrating with calendars, others valued its minimalist design, which allowed them to stay focused on top priorities without the additional distractions introduced from complex task lists. Striking a balance between simplicity and comprehensive support remains a persistent design challenge. Prior research has cautioned that overly feature-rich systems can lead to decision fatigue, reduced adoption, and decreased overall effectiveness [7, 10, 30, 37, 61].

Given that customization options in general-purpose software are often underutilized [5], future iterations of *AIRbar* or similar tools could benefit from a modular approach to personalization. Rather than relying solely on manual configuration, the system could learn users' preferences over time and dynamically adapt its functionality, based on actual feature usage, lightweight self-reports or contextual cues. Participants described several contextual factors that influenced the usefulness of *AIRbar*, such as the phase of a project, work location, or broader work environment. These could serve as inputs for tailoring the available feature set to better match users' needs in different situations. Similarly, users who do not want to actively engage with manual time tracking for committing to a task might benefit from a system that semi-automatically tracks time spent on a task based on interaction patterns or task transitions. This kind of adaptive behavior could maintain the benefits of time awareness and accountability without adding friction for users who prefer minimal intervention.

6.5 Threats and Limitations

The primary aim of our study was to better understand and report the experiences of knowledge workers using *AIRbar*, rather than to achieve generalizability. Our findings provide insights into user behavior rather than broad, general conclusions, aligning with the principles of qualitative research, which emphasize depth of understanding over representativeness. This approach allows us to explore the nuances of individual experiences without making claims about long-term impacts or universal applicability. While our sample included 35 participants from diverse backgrounds, jobs, and countries, the intention was to capture a variety of perspectives rather than create a representative sample of all knowledge workers. Moreover, the duration of the study (three weeks of intervention) and the specific contexts of participation (e.g., periods of quiet or busy work, project start or end phases) may have influenced the experiences reported.

In our findings, we sometimes report the number of participants who made specific statements, and other times we focus on the themes without quantifying responses. This approach aligns with qualitative research principles, where the emphasis is on understanding the depth and context of experiences rather than numerical representation. Reporting specific numbers can create a false sense of generalizability, as it may imply broader applicability than is warranted given the exploratory and context-dependent nature of qualitative data [45]. Therefore, we prioritized the emergence of themes across the full dataset over precise counts of participant responses. However, the diversity of work contexts among participants—ranging across various industries and roles—led to different experiences with the tool. This diversity adds richness to our findings, yet it also means that the results may be influenced by individual work environments that were not controlled for, potentially affecting the consistency of the outcomes. For instance, specific work settings, such as high-interruption office environments or remote work with flexible schedules, could impact how participants used and perceived *AIRbar*.

While our analysis of the Task Widget—a key feature of the *AIRbar*—was grounded in quantitative and qualitative data collected during the *Intention* and *AIR*-phases, our overall understanding of *AIRbar*'s impact is primarily derived from qualitative feedback gathered through surveys and interviews. This reliance on self-reported data limits our ability to comprehensively compare the effects of using *AIRbar* to periods without the intervention. Future work could study whether the benefits of key design decisions–such as limiting the number of tasks, maintaining visibility of priorities,

and fostering reflection–persist over longer periods beyond the scope of a study and for which types of work, work environments and worker personalities the approach is most effective.

7 Conclusion

To better support knowledge workers in completing the tasks they deem important in a given day, we developed *AIRbar*, a software that combines three design concepts to support increased Awareness, Intention, and Retrospection. To evaluate *AIRbar*, we deployed it during a 4-week field study with 35 professional knowledge workers, who used it to complement their existing task management practices. Our findings show that prompting participants to plan three tasks each morning helped them set achievable goals and intentions, leading to better follow-through, even amid unexpected disruptions. The always-on task widget significantly enhanced focus and task commitment, keeping their priorities front and center throughout the day. The end-of-day reflection offered valuable insights into time-consuming tasks, enabling participants to make adjustments to their work patterns and improve their planning for the following day.

Our study also highlighted the need for balancing structure and flexibility in task management tools, offering guidance in task prioritization, and allowing for personalization to suit diverse user needs. Future iterations of such tools should consider these aspects to support effective task management and enhance the completion of daily priorities within dynamic work environments.

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References

[1] Yoana Ahmetoglu, Duncan Brumby, and Anna Cox. 2024. Bridging the Gap Between Time Management Research and Task Management App Design: A Study on the Integration of Planning Fallacy Mitigation Strategies. In *Proceedings of the 3rd Annual Meeting of the Symposium on Human-Computer Interaction for Work* (Newcastle upon Tyne, United Kingdom) *(CHIWORK '24)*. Association for Computing Machinery, New York, NY, USA, Article 12, 14 pages. https://doi.org/10.1145/3663384.3663404

[2] Yoana Ahmetoglu, Duncan P. Brumby, and Anna L. Cox. 2021. Disengaged From Planning During the Lockdown? An Interview Study in an Academic Setting. *IEEE Pervasive Computing* 20, 4 (Oct. 2021), 18–25. https://doi.org/10.1109/MPRV.2021.3118900

[3] Yoana Ahmetoglu, Duncan P. Brumby, and Anna L. Cox. 2021. To Plan or Not to Plan? A Mixed-Methods Diary Study Examining When, How and Why Knowledge Work Planning is Inaccurate. *Proceedings of the ACM on Human-Computer Interaction* 4, CSCW3 (2021). https://doi.org/10.1145/3432921

[4] Nikola Banovic, Christina Brant, Jennifer Mankoff, and Anind Dey. 2014. ProactiveTasks: the short of mobile device use sessions. In *Proceedings of the 16th international conference on Human-computer interaction with mobile devices & services*. 243–252.

[5] Nikola Banovic, Fanny Chevalier, Tovi Grossman, and George Fitzmaurice. 2012. Triggering triggers and burying barriers to customizing software. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Austin, Texas, USA) *(CHI '12)*. Association for Computing Machinery, New York, NY, USA, 2717–2726. https://doi.org/10.1145/2207676.2208666

[6] Russel A. Barkley. 2011. *Barkley Adult ADHD Rating Scale-IV (BAARS-IV)*. The Guilford Press, New York, NY, USA.

[7] Victoria Bellotti, Brinda Dalal, Nathaniel Good, Peter Flynn, Daniel G. Bobrow, and Nicolas Ducheneaut. 2004. What a to-do: studies of task management towards the design of a personal task list manager. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Vienna, Austria) *(CHI '04)*. Association for Computing Machinery, New York, NY, USA, 735–742. https://doi.org/10.1145/985692.985785

[8] Victoria Bellotti, Nicolas Ducheneaut, Mark Howard, and Ian Smith. 2002. Taskmaster: Recasting email as task management.

[9] Victoria Bellotti, Nicolas Ducheneaut, Mark Howard, and Ian Smith. 2003. Taking email to task: the design and evaluation of a task management centered email tool. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Ft. Lauderdale, Florida, USA) *(CHI '03)*. Association for Computing Machinery, New York, NY, USA, 345–352. https://doi.org/10.1145/642611.642672

[10] Michael Bernstein, Max Van Kleek, David Karger, and m.c. schraefel. 2008. Information scraps: How and why information eludes our personal information management tools. *ACM Trans. Inf. Syst.* 26, 4, Article 24 (Oct. 2008), 46 pages. https://doi.org/10.1145/1402256.1402263

[11] Ann Blandford and Thomas R. G. Green. 2001. Group and Individual Time Management Tools: What You Get is Not What You Need. *Personal and Ubiquitous Computing* 5, 4 (2001), 213–230. https://doi.org/10.1007/PL00000020

[12] Judith Borghouts, Duncan Brumby, and Anna Cox. 2020. TimeToFocus: Feedback on Interruption Durations Discourages Distractions and Shortens Interruptions. *ACM Transactions on Computer-Human Interaction* 27 (05 2020). https://doi.org/10.1145/3396044

[13] Virginia Braun and Victoria Clarke. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology* 3, 2 (2006), 77–101. https://doi.org/10.1191/1478088706qp063oa

[14] Johanna Brewer. [n. d.]. Factors in Designing Effective Ambient Displays.

[15] Robin N. Brewer, Meredith R. Morris, and Sian E. Lindley. 2017. How to Remember What to Remember: Exploring Possibilities for Digital Reminder Systems. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies* 1, 3 (2017), 1–20. https://doi.org/10.1145/3130903

[16] Roger Buehler and Dale Griffin. 2015. *The psychology of planning in organizations: Research and applications*. Routledge/Taylor & Francis Group. 31–57 pages.

[17] Roger Buehler, Dale W. Griffin, and Michael Ross. 1994. Exploring the "planning fallacy": Why people underestimate their task completion times. *Journal of Personality and Social Psychology* 67 (1994), 366–381. https://api.semanticscholar.org/CorpusID:4222578

[18] Christopher Campbell and Paul Maglio. 2003. Supporting notable information in office work. In *CHI '03 Extended Abstracts on Human Factors in Computing Systems* (Ft. Lauderdale, Florida, USA) *(CHI EA '03)*. Association for Computing Machinery, New York, NY, USA, 902–903. https://doi.org/10.1145/765891.766061

[19] Brigitte J. C. Claessens, Wendelien Van Eerde, Christel G. Rutte, and Robert A. Roe. 2010. Things to Do Today: A Daily Diary Study on Task Completion at Work. *Applied Psychology* 59, 2 (2010), 273–295. https://doi.org/10.1111/j.1464-0597.2009.00390.x

[20] Emily I. M. Collins, Anna L. Cox, Jon Bird, and Cassie Cornish-Tresstail. 2014. Barriers to engagement with a personal informatics productivity tool. In *Proceedings of the 26th Australian Computer-Human Interaction Conference on Designing Futures: the Future of Design* (New York, NY, USA) *(OzCHI '14)*. Association for Computing Machinery, 370–379. https://doi.org/10.1145/2686612.2686668

[21] Emily I. M. Collins, Anna L. Cox, Jon Bird, and Daniel Harrison. 2014. Social networking use and RescueTime: the issue of engagement. In *Proceedings of the 2014 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Publication* (Seattle, Washington) *(UbiComp '14 Adjunct)*. Association for Computing Machinery, New York, NY, USA, 687–690. https://doi.org/10.1145/2638728.2641322

[22] Sarah E. Fox and Samantha Shorey. 2024. *Artfully Integrating AI: Proceeding Responsibly With Worker-Centered Best Practices*. Springer International Publishing, 67–84. https://doi.org/10.1007/978-3-031-66528-8_4

[23] Joan Greenbaum. 1996. Back to labor: returning to labor process discussions in the study of work. In *Proceedings of the 1996 ACM Conference on Computer Supported Cooperative Work (CSCW '96)*. Association for Computing Machinery, 229–237. https://doi.org/10.1145/240080.240259

[24] Hayley Guillou, Kevin Chow, Thomas Fritz, and Joanna McGrenere. [n. d.]. Is Your Time Well Spent? Reflecting on Knowledge Work More Holistically. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems* (Honolulu HI USA, 2020-04-21). ACM, 1–9. https://doi.org/10.1145/3313831.3376586

[25] Hayley Guillou, Kevin Chow, Thomas Fritz, and Joanna McGrenere. 2020. Is your time well spent? reflecting on knowledge work more holistically. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*. 1–9.

[26] Mona Haraty, Joanna McGrenere, and Charlotte Tang. 2015. How and why personal task management behaviors change over time. In *Proceedings of the 41st Graphics Interface Conference* (CAN) *(GI '15)*. Canadian Information Processing Society, 147–154.

[27] Mona Haraty, Joanna McGrenere, and Charlotte Tang. 2016. How personal task management differs across individuals. *International Journal of Human-Computer Studies* 88, C (2016), 13–37. https://doi.org/10.1016/j.ijhcs.2015.11.006

[28] Mona Haraty, Diane Tam, Shathel Haddad, Joanna McGrenere, and Charlotte Tang. 2012. Individual differences in personal task management: a field study in an academic setting. In *Proceedings of Graphics Interface 2012* (Toronto, Ontario, Canada) *(GI '12)*. Canadian Information Processing Society, CAN, 35–44.

[29] Donghan Hu, Md Momen Bhuiyan, Sol Lim, Jason Wiese, and Sang Won Lee. 2024. Unpacking Task Management Tools, Values, and Worker Dynamics. In *Proceedings of the 3rd Annual Meeting of the Symposium on Human-Computer Interaction for Work* (Newcastle upon Tyne, United Kingdom) *(CHIWORK '24)*. Association for Computing Machinery, New York, NY, USA, Article 13, 16 pages. https://doi.org/10.1145/3663384.3663402

[30] Donghan Hu, Md Momen Bhuiyan, Sol Lim, Jason Wiese, and Sang Won Lee. 2024. Unpacking Task Management Tools, Values, and Worker Dynamics. In *Proceedings of the 3rd Annual Meeting of the Symposium on Human-Computer Interaction for Work* (Newcastle upon Tyne, United Kingdom) *(CHIWORK '24)*. Association for Computing Machinery, New York, NY, USA, Article 13, 16 pages. https://doi.org/10.1145/3663384.3663402

[31] Adriana Ispas, Sarah Schöni, and Moira C. Norrie. 2012. ARENO: ambient reminder notes. In *Proceedings of the 24th Australian Computer-Human Interaction Conference* (Melbourne Australia). ACM, 253–262. https://doi.org/10.1145/2414536.2414580

[32] Sheriff Jolaoso and Manuel A. Perez-Quinones. 2015. TaskAmbient: A Study in Personal Task Management Visualization. In *Proceedings of the 33rd Annual ACM Conference Extended Abstracts on Human Factors in Computing Systems* (Seoul Republic of Korea). ACM, 1797–1802. https://doi.org/10.1145/2702613.2732890

[33] Stephen R. Jones and Peter J. Thomas. 1997. Empirical assessment of individuals' 'personal information management systems'. *Behaviour & Information Technology* 16, 3 (1997), 158–160. https://doi.org/10.1080/014492997119888

[34] Amirrudin Kamsin, Ann Blandford, and Anna L. Cox. 2012. Personal task management: my tools fall apart when I'm very busy!. In *CHI '12 Extended Abstracts on Human Factors in Computing Systems* (New York, NY, USA) *(CHI EA '12)*. Association for Computing Machinery, 1369–1374. https://doi.org/10.1145/2212776.2212457

[35] Elisabeth T. Kersten-van Dijk, Joyce H. D. M. Westerink, Femke Beute, and Wijnand A. IJsselsteijn. 2017. Personal Informatics, Self-Insight, and Behavior Change: A Critical Review of Current Literature. 32, 5 (2017), 268–296. https://doi.org/10.1080/07370024.2016.1276456

[36] Young-Ho Kim, Jae Ho Jeon, Eun Kyoung Choe, Bongshin Lee, KwonHyun Kim, and Jinwook Seo. 2016. TimeAware: Leveraging Framing Effects to Enhance Personal Productivity. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems* (San Jose, California, USA) *(CHI '16)*. Association for Computing Machinery, New York, NY, USA, 272–283. https://doi.org/10.1145/2858036.2858428

[37] Young-Ho Kim, Jae Ho Jeon, Bongshin Lee, Eun Kyoung Choe, and Jinwook Seo. 2017. OmniTrack: A Flexible Self-Tracking Approach Leveraging Semi-Automated Tracking. 1, 3 (2017), 67:1–67:28. https://doi.org/10.1145/3130930

[38] Rafal Kocielnik, Daniel Avrahami, Jennifer Marlow, Di Lu, and Gary Hsieh. [n. d.]. Designing for Workplace Reflection: A Chat and Voice-Based Conversational Agent. In *Proceedings of the 2018 Designing Interactive Systems Conference* (Hong Kong China, 2018-06-08). ACM, 881–894. https://doi.org/10.1145/3196709.3196784

[39] Rafal Kocielnik, Daniel Avrahami, Jennifer Marlow, Di Lu, and Gary Hsieh. 2018. Designing for Workplace Reflection: A Chat and Voice-Based Conversational Agent. In *Proceedings of the 2018 Designing Interactive Systems Conference* (Hong Kong, China) *(DIS '18)*. Association for Computing Machinery, New York, NY, USA, 881–894. https://doi.org/10.1145/3196709.3196784

[40] Cornelius J. König, Angela Wirz, Kathrin E. Thomas, and Rahel-Zoë Weidmann. 2015. The Effects of Previous Misestimation of Task Duration on Estimating Future Task Duration. *Current Psychology* 34 (2015), 1–13. https://doi.org/10.1007/s12144-014-9236-3

[41] Brynn M. LiaBraaten, Nina Linneman, Michelle L. Czarnecki, W. Hobart Davies, Liyun Zhang, Pippa M. Simpson, Kristen E. Jastrowski Mano, Steven J. Weisman, and Keri R. Hainsworth. 2023. Stress Numerical Rating Scale-11: Validation in Pediatric Inpatient and Outpatient Pain Settings. *Pain management nursing* 24, 4 (2023), 7–12.

[42] John R. Lund and Jason Wiese. 2021. Less is More: Exploring Support for Time Management Planning. In *Designing Interactive Systems Conference 2021* (New York, NY, USA) *(DIS '21)*. Association for Computing Machinery, 392–405. https://doi.org/10.1145/3461778.3462133

[43] Gloria Mark, Shamsi T. Iqbal, Mary Czerwinski, Paul Johns, and Akane Sano. 2016. Neurotics can't focus: An in situ study of online multitasking in the workplace. In *Proceedings of the 2016 CHI conference on human factors in computing systems*. 1739–1744.

[44] E. J. Masicampo and Roy F. Baumeister. 2011. Consider it done! Plan making can eliminate the cognitive effects of unfulfilled goals. *Journal of Personality and Social Psychology* 101, 4 (2011), 667–683. https://doi.org/10.1037/a0024192

[45] Joseph A Maxwell. 2010. Using numbers in qualitative research. *Qualitative inquiry* 16, 6 (2010), 475–482.

[46] André N. Meyer, Laura E. Barton, Gail C. Murphy, Thomas Zimmermann, and Thomas Fritz. 2017. The Work Life of Developers: Activities, Switches and Perceived Productivity. *IEEE Transactions on Software Engineering* 43, 12 (2017), 1178–1193. https://doi.org/10.1109/TSE.2017.2656886

[47] Andre N. Meyer, Gail C. Murphy, Thomas Zimmermann, and Thomas Fritz. 2017. Design Recommendations for Self-Monitoring in the Workplace: Studies in Software Development. *Proceedings of the ACM on Human-Computer Interaction* 1 (2017), 1–24. Issue CSCW. https://doi.org/10.1145/3134714

[48] André N. Meyer, Gail C. Murphy, Thomas Zimmermann, and Thomas Fritz. 2021. Enabling Good Work Habits in Software Developers through Reflective Goal-Setting. *IEEE Transactions on Software Engineering* 47, 9 (2021), 1872–1885. https://doi.org/10.1109/TSE.2019.2938525

[49] Zeynep Ozturk Yurt, Rik Eshuis, Anna Wilbik, and Irene Vanderfeesten. 2022. Guiding knowledge workers under dynamic contexts. In *International Conference on Advanced Information Systems Engineering*. Springer, 218–234.

[50] Zachary Pousman and John Stasko. 2006. A taxonomy of ambient information systems: four patterns of design. In *Proceedings of the working conference on Advanced visual interfaces* (New York, NY, USA) *(AVI '06)*. Association for Computing Machinery, 67–74. https://doi.org/10.1145/1133265.1133277

[51] Tye Rattenbury and John Canny. 2007. CAAD: an automatic task support system. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (New York, NY, USA) *(CHI '07)*. Association for Computing Machinery, 687–696. https://doi.org/10.1145/1240624.1240731

[52] Ioannis Refanidis and Anastasios Alexiadis. 2011. Deployment and evaluation of selfplanner, an automated individual task management system. *Computational intelligence* 27, 1 (2011), 41–59.

[53] Todd Rogers, Katherine L. Milkman, Leslie K. John, and Michael I. Norton. 2015. Beyond good intentions: Prompting people to make plans improves follow-through on important tasks. *Behavioral Science & Policy* 1, 2 (2015), 33–41. https://doi.org/10.1353/bsp.2015.0011

[54] Tanner Skousen, Justin Ames, and James Gaskin. 2021. Task adherence: an agentic perspective on task-focused dedication in an interrupting work environment. *Journal of Organizational Effectiveness: People and Performance* 8, 3 (2021), 300–322.

[55] Kevin E. Thomas, Simon J. Handley, and Stephen E. Newstead. 2004. The effects of prior experience on estimating the duration of simple tasks. *Cahiers de Psychologie Cognitive/Current Psychology of Cognition* 22, 1 (2004), 83–100.

[56] Kevin E. Thomas, Simon J. Handley, and Stephen E. Newstead. 2007. The role of prior task experience in temporal misestimation. *Quarterly Journal of Experimental Psychology* 60, 2 (2007), 230–240. https://doi.org/10.1080/17470210600785091

[57] Link to Supplementary Material. 2025. https://doi.org/10.5281/zenodo.15259660.

[58] Cheryl J. Travers. 2022. Reflective Goal Setting: An Applied Approach to Personal and Leadership Development. (2022). https://doi.org/10.1007/978-3-030-99228-6

[59] Marx Boyuan Wang and Sang Won Lee. 2022. TaskScape: Fostering Holistic View on To-do List With Tracking Plan and Emotion. In *Adjunct Proceedings of the 35th Annual ACM Symposium on User Interface Software and Technology*. 1–4.

[60] Wilken Wehrt, Anne Casper, and Sabine Sonnentag. 2022. More than a muscle: How self-control motivation, depletion, and self-regulation strategies impact task performance. *Journal of Organizational Behavior* 43, 8 (2022), 1358–1376. https://doi.org/10.1002/job.2644

[61] Steve Whittaker, Vaiva Kalnikaite, Victoria Hollis, and Andrew Guydish. 2016. 'Don't Waste My Time': Use of Time Information Improves Focus. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems* (San Jose California USA). ACM, 1729–1738. https://doi.org/10.1145/2858036.2858193

[62] Mareike B. Wieth and Rose T. Zacks. 2011. Time of Day Effects on Problem Solving: When the Non-Optimal is Optimal. *Thinking and Reasoning* 17, 4 (2011), 387–401. https://doi.org/10.1080/13546783.2011.625663

[63] Alex Williams, Harmanpreet Kaur, Gloria Mark, Anne Loomis Thompson, Shamsi Iqbal, and Jaime Teevan. 2018. Supporting Workplace Detachment and Reattachment with Conversational Intelligence. In *2018 ACM Conference on Human Factors in Computing Systems (CHI '18)*. ACM. https://www.microsoft.com/en-us/research/publication/supporting-workplace-detachment-and-reattachment-with-conversational-intelligence-2/