

# State of Art

Effective time management is a growing concern in a world where personal and professional demands compete for individuals' attention.

Time management strategies generally address three aspects: structuring, protecting and adapting to changing circumstances. Structuring refers to the way people organize their activities over time, using tools such as a schedule, a planner or other devices that represent time systematically. Protection concerns setting limits on time to avoid unwanted interruptions. For example, some people say “no” to time-consuming requests from colleagues or friends, or turn off the phone during family time. Lastly, adapting time to changing circumstances means being flexible and responsive regarding time management. Furthermore, time management strategies usually examine behaviors related to these three dimensions (such as using a schedule to organize the day or taking advantage of downtime). However, they sometimes also assess people's attitudes towards their control over time.

Employers, educators, parents and politicians urge employees, students, children and citizens to adopt more efficient ways of using their time. In light of this, it is not surprising that from 1960 to 2008, the frequency of books mentioning time management increased by more than 2,700% (Books Ngram Viewer).

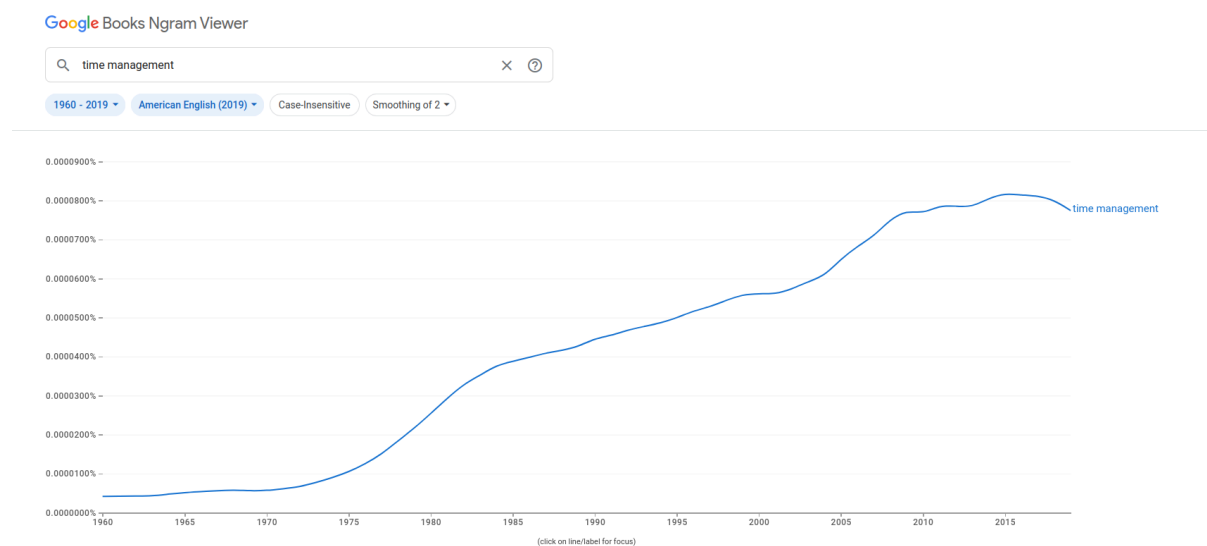


Fig1- Relative frequency of the words "time management" in relation to the total number of words in the digitized books for the selected time period

Studies show that the link between time management and work performance appears to become stronger over the years, reflecting the need to manage time in more autonomous and flexible jobs.

In a study carried out by specialists in professional software services, a group of 300 industrial employees were asked what the benefits of good time management would be and the answers led to this graph:

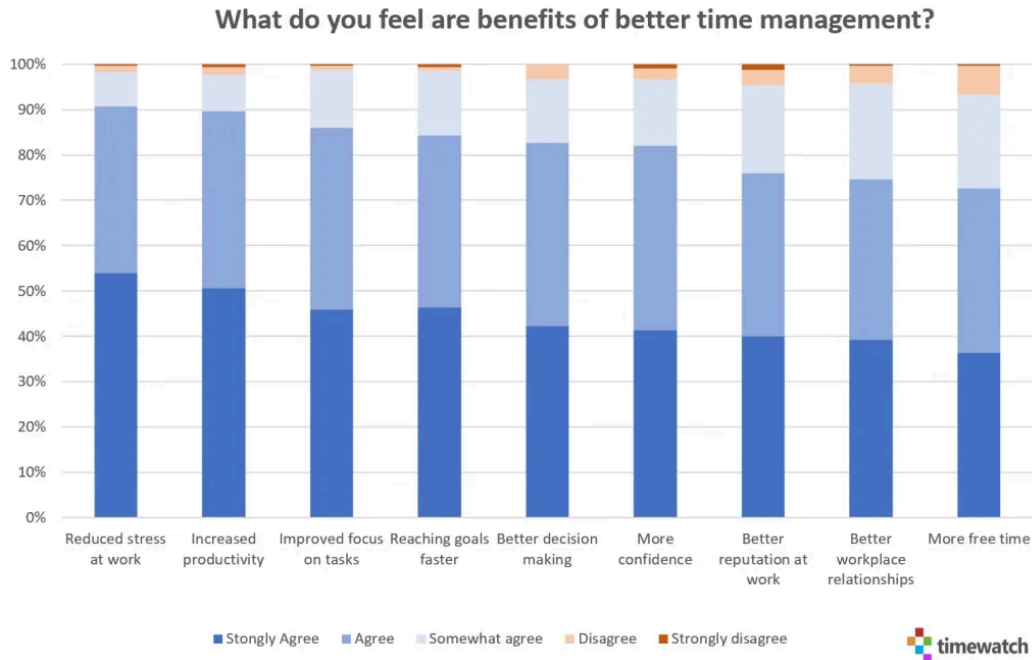


Fig 2- Bar chart showing agreement on the benefits of time management

We can then see that the vast majority of employees agree that the main benefits of good time management are reduced stress at work, an increase in productivity, and greater focus on tasks, among many other benefits.

They were also asked “If better time management saved 90 minutes a day, reduced stress and improved reputation at work, what would be the maximum time you would spend per day to achieve this gain”, to which the majority responded that they would be willing to spend between 15 to 30 minutes.

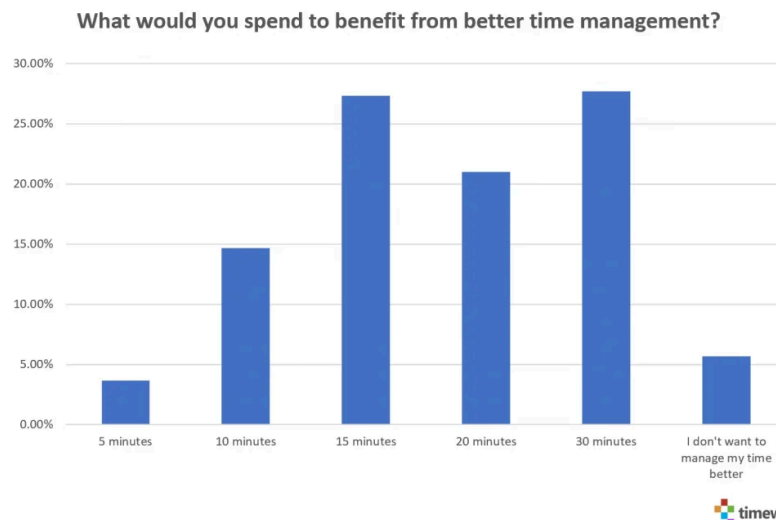


Fig 3- Bar chart showing the time employees would be willing to spend on their time management

Moving from a more global context on time management to the academic world, where our system fits, it is possible to see that existing research indicates that students who actively participate in academic activities, extracurriculars and jobs on campus tend to achieve greater success at university due to their alleged higher level of time management skills. Furthermore, it is suggested that success at university does not depend solely on students' time management behavior, but rather on their perception of control over their time, regardless of their involvement in academic and extracurricular activities.

It is also this group of people that tends to have a greater use of technologies both in their personal and academic/professional lives.

For example, in education, students and teachers can take advantage of time management tools to improve study organization, academic work deadlines, class schedules and exam revisions. This helps students to better manage their study time and achieve better academic results.

On the other hand, when we talk about health and well-being, individuals concerned about their health and well-being can use time management tools to schedule and track physical activities, meditation, adequate sleep and regular breaks during the day. This contributes to a more balanced and healthy lifestyle.

Finally, people looking to improve their productivity, set goals, develop positive habits and find a balance between personal and professional life can benefit from time management tools. These tools provide resources for planning, organizing, and self-assessment.

In this state of the art, we examine recent trends and advances in time management applications and tools, focusing on solutions that make it easier to optimize time both individually and as a group.

### **1. Calendar and Productivity Applications:**

- Popular apps like Google Calendar, Apple Calendar and Notion offer a variety of features for organizing appointments and syncing calendars across multiple devices.
- When it comes to productivity tools, there are some like Google Keep, Siri and even Alexa that set reminders, some of them customizable. Forest and Freedom are applications that allow the user to concentrate more, but it is necessary to take into account that, nowadays, most smartphones have so-called “Modes”, which allow the user to focus in different ways on events/ different occasions.
- Recently, we've seen a trend toward integrating task management and personal goal-tracking features within all of these apps, allowing users to view and manage all of their commitments and goals in one place.

### **2. Calendar Sync and Collaboration Tools:**

- Tools like Calendly, Doodle and Lettuce Meet make it easy to schedule meetings and events between multiple people, automatically synchronizing availability and eliminating the need for endless email exchanges.
- The integration of these tools with calendar applications allows for more efficient time management, especially in collaborative work environments or distributed teams.

### **3. Time and Resource Optimization Systems:**

- Some applications use advanced algorithms and heuristics to suggest ideal times for different types of activities, taking into account the user's productivity, personal preferences and time constraints. One example, Microsoft MyAnalytics, analyzes user usage patterns and suggests changes in the way they manage their time to increase their productivity.
- Recent research explores machine learning and artificial intelligence techniques to further improve the ability of these systems to predict behavior patterns and offer personalized recommendations.

#### 4. **Emerging Trends and Future Challenges:**

- We see a growing demand for apps that not only help users manage their time but also promote a proactive approach to time management, offering insights into productivity habits and suggestions for improvements.
- Future challenges include seamlessly integrating data and functionality across different applications and platforms, ensuring the privacy and security of user data, and continually adapting to changing user needs and expectations.

The table below shows some of the many systems and their functionalities. As you can see, a user who needs all the features presented to organize themselves has to use several systems.

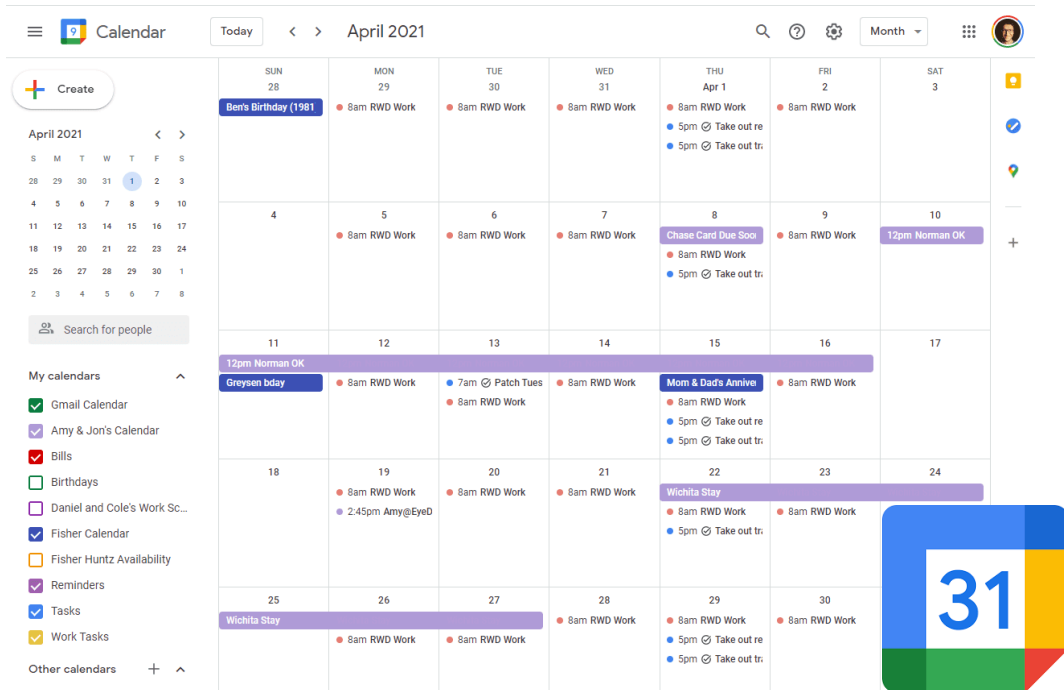
Of the 12 systems presented, half allow the scheduling of events and their subsequent visualization, only 4 allow the scheduling of events between several people and none are capable of categorizing an event automatically and intelligently (Smart Scheduling). It should be noted that the 3 features mentioned above are some of the main requirements that our system intends to apply, showing that our main objective is to ensure that the user does not need to balance several systems to achieve their objectives.

<b>App Functionality /</b>	<b>Schedul g event s</b>	<b>Schedul g auto matio n</b>	<b>Remi nder s</b>	<b>Sync betw een devic es</b>	<b>Integra tion with other apps</b>	<b>Prod uctivi ty analy sis</b>	<b>Custo mizati on</b>	<b>Helps with producti vity</b>	<b>Schedule meetings between people</b>	<b>Smart schedul g</b>
<b>Google Calendar</b>	Yes	No	Yes	Yes	No	No	No	No	No	No
<b>Apple Calendar</b>	Yes	No	Yes	Yes	Yes	No	No	No	No	No
<b>Notion</b>	No	No	No	Yes	Yes	No	Yes	No	No	No
<b>Google Keep</b>	No	No	Yes	Yes	Yes	No	Yes	No	No	No
<b>Siri/Alexa</b>	No	No	Yes	Yes	Yes	No	No	No	No	No
<b>Forest</b>	No	No	No	No	No	No	No	No	No	No
<b>Freedom</b>	No	No	Yes	No	No	No	No	No	No	No
<b>Calendly</b>	Yes	Yes	Yes	Yes	No	No	No	No	Yes	No
<b>Doodle</b>	Yes	No	No	Yes	No	No	No	No	Yes	No
<b>Lettuce Meet</b>	Yes	No	No	Yes	Yes	No	Yes	No	Yes	No
<b>Microsoft MyAnalytics</b>	No	No	Yes	Yes	No	Yes	No	Yes	No	No
<b>Calendar.AI</b>	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No

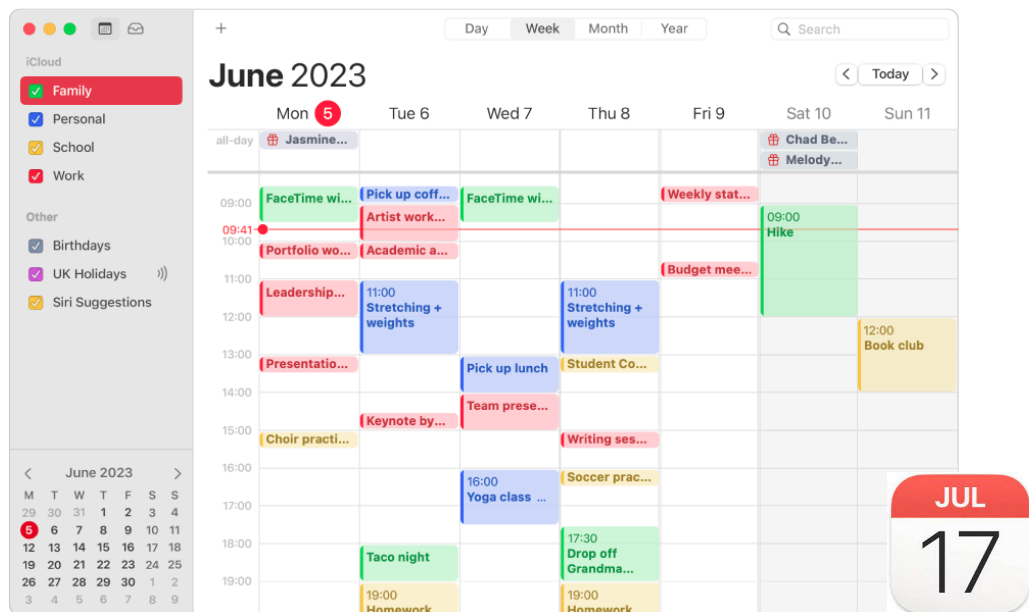
Tab 1- Table that shows whether a given functionality is present or not in the systems

Below, you can find a small summary of each system present in the previous table.

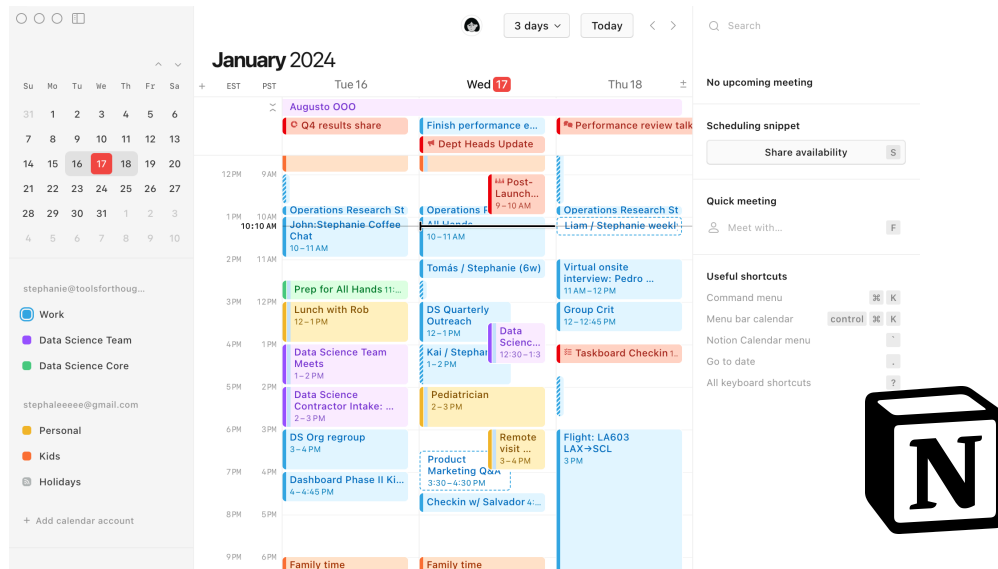
- [Google Calendar](#): Google Calendar is an online calendar application that allows users to organize and manage events. It offers scheduling features, automatic reminders and synchronization across different devices, making planning and collaboration easier.



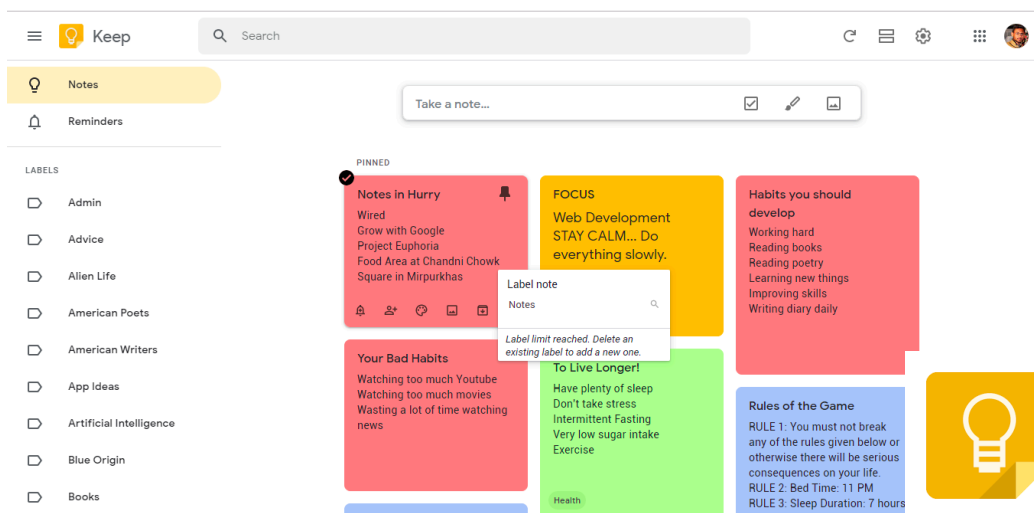
- [Apple Calendar](#): Apple Calendar is a calendar app built into Apple devices such as iPhones, iPads and Macs. It allows users to organize events, appointments and reminders intuitively, with synchronization between devices and integration with other Apple apps, such as Mail and iCloud.



- **Notion:** Notion is a versatile productivity app that combines notes, tasks, databases and project management into a single platform. Users can flexibly create and organize documents, tables, task lists and collaboration boards. Notion offers advanced customization, cross-device syncing, and real-time collaboration, adapting to individual and group needs.

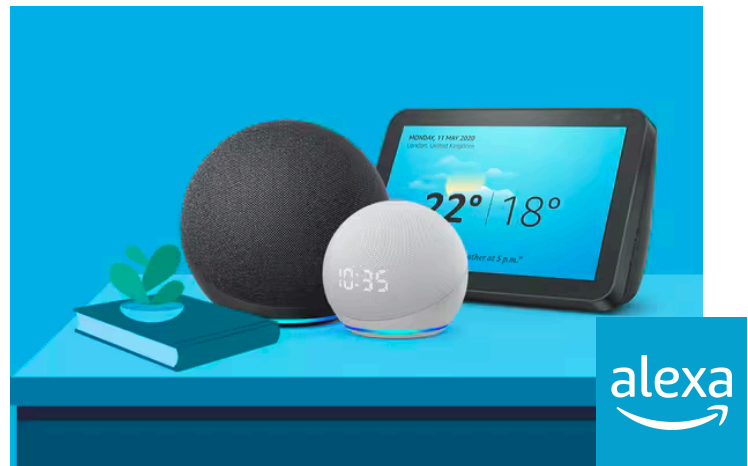


- **Google Keep:** Google Keep is a note-taking application that allows users to easily create, organize and share notes, lists and reminders. Offers simple idea capture capabilities such as text, checklists, images and audio, with real-time synchronization between devices. Keep also allows you to categorize notes by color, add labels, and set reminders based on location or time, making it easier to organize and manage information.

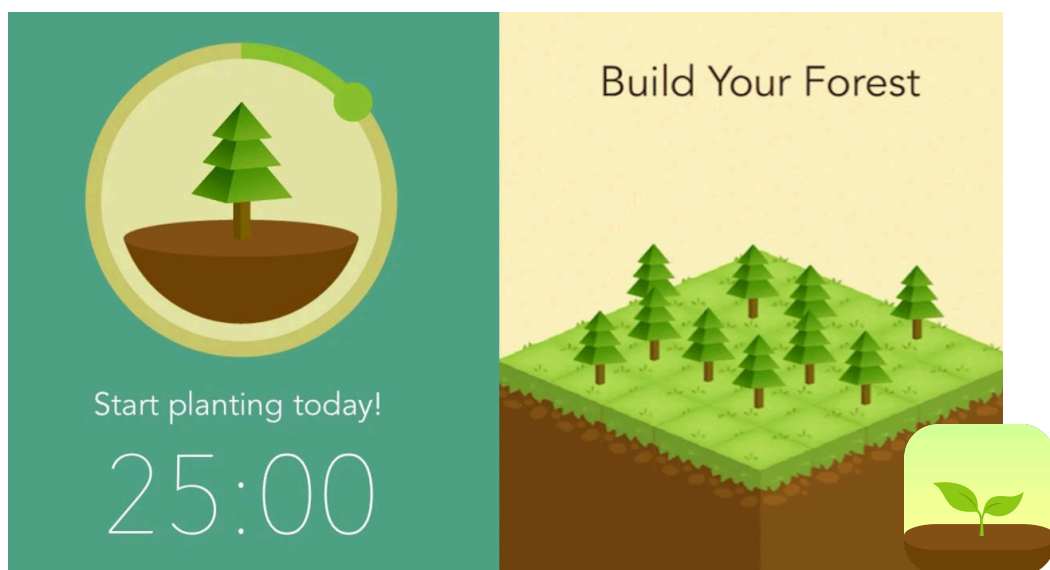




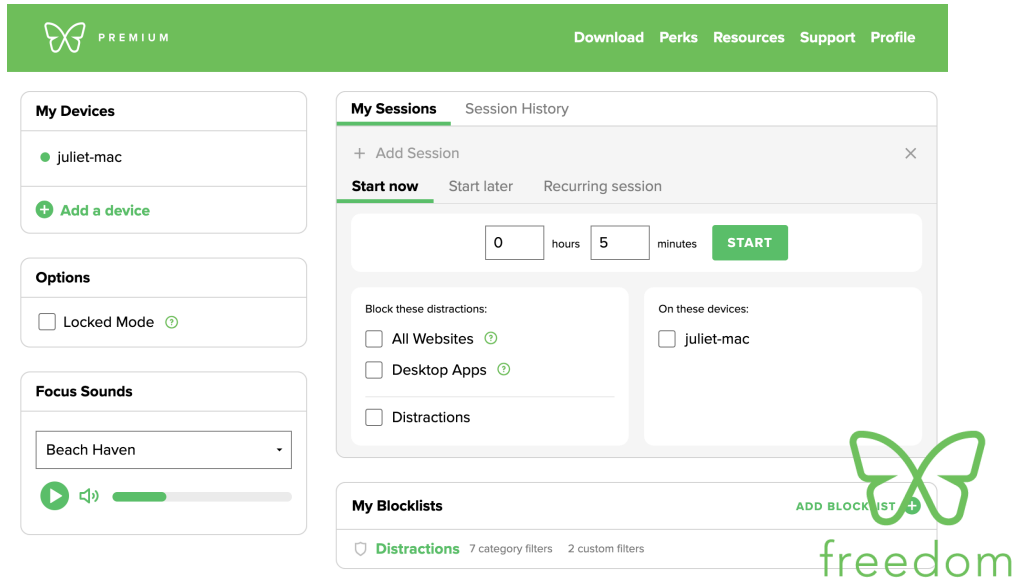
- [Siri e Alexa](#): Siri and Alexa are virtual assistants developed by Apple and Amazon, respectively. Both offer a wide range of features, including performing tasks by voice command, such as setting reminders, creating lists and even scheduling appointments. These assistants are designed to make interaction with technological devices more intuitive and efficient, allowing users to perform various activities with just voice commands.



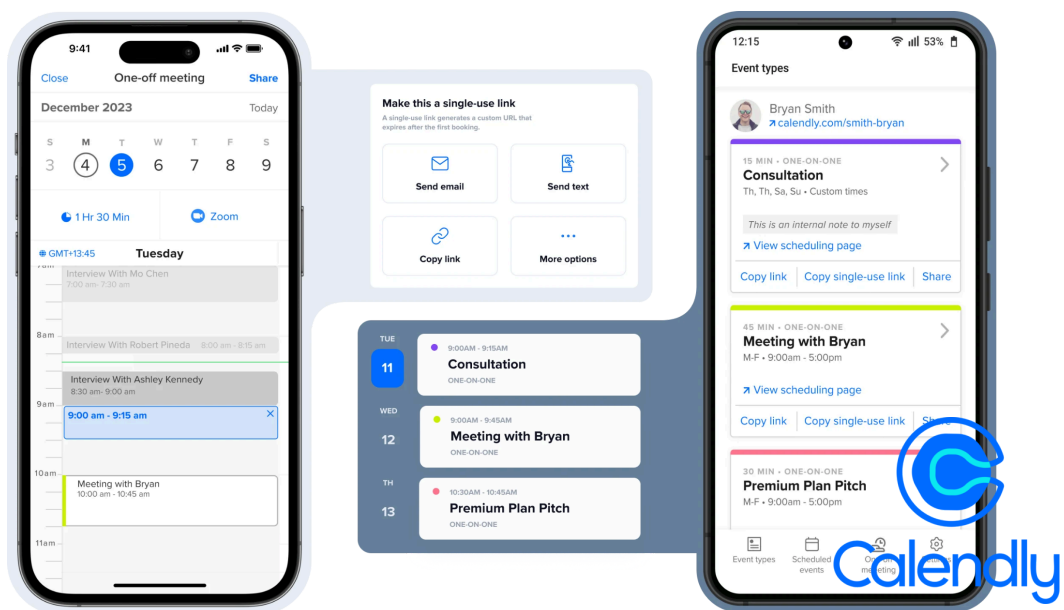
- [Forest](#): Forest is a productivity app that encourages concentration by planting virtual trees, helping users avoid distractions while working or studying. It uses a gamified approach, where the user must remain within the app so that the tree continues to grow.



- **Freedom:** Freedom is a distraction-blocking app that helps users focus on their tasks by limiting access to websites, apps and notifications that can cause distractions. Users can set specific periods during which they want to focus, temporarily blocking access to selected websites and apps. Freedom offers the flexibility to customize blocking settings and helps users increase their productivity by minimizing digital interruptions.



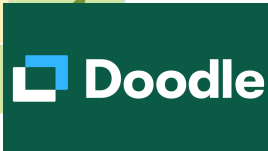
- **Calendly:** Calendly is an online scheduling app that allows users to schedule meetings, interviews and events efficiently. Users can share their available calendars and participants can select suitable times, eliminating manual scheduling work. Calendly syncs with popular calendars and sends automatic reminders, making appointment management simple. It also takes time zones into account.



- [Doodle](#): Doodle is a scheduling application that simplifies scheduling appointments and meetings, allowing users to propose different times and dates and for participants to vote on the options that best suit their schedules. With an intuitive interface, Doodle makes it easy to coordinate schedules between multiple people and helps find the best time for events, minimizing communication and planning efforts.

Table    Calendar

	Oct <b>15</b> TUE	Oct <b>16</b> WED	Oct <b>17</b> THU	Oct <b>18</b> FRI
	09:00 10:00	09:00 10:00	09:00 10:00	09:00 10:00
4 participants	✓4	✓3	✓3	✓4
<input type="text" value="Enter your name"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shannon Hills	✓			(✓)
Leonard Cooper	✓	✓	(✓)	✓
Martin Bruun	✓	(✓)	✓	



- [Lettuce Meet](#): Lettuce Meet is a meeting scheduling platform that makes it simple to coordinate schedules between multiple people. Allows users to create personalized availability polls and invite participants to vote for times that best suit their schedules. With customization features and calendar integration, Lettuce Meet makes the meeting scheduling process more efficient and collaborative.

Lettuces are now editable! [Read more on our blog.](#)


lettucemeet HOW IT WORKS

UX Rescue- Stakeholder Interviews Edit

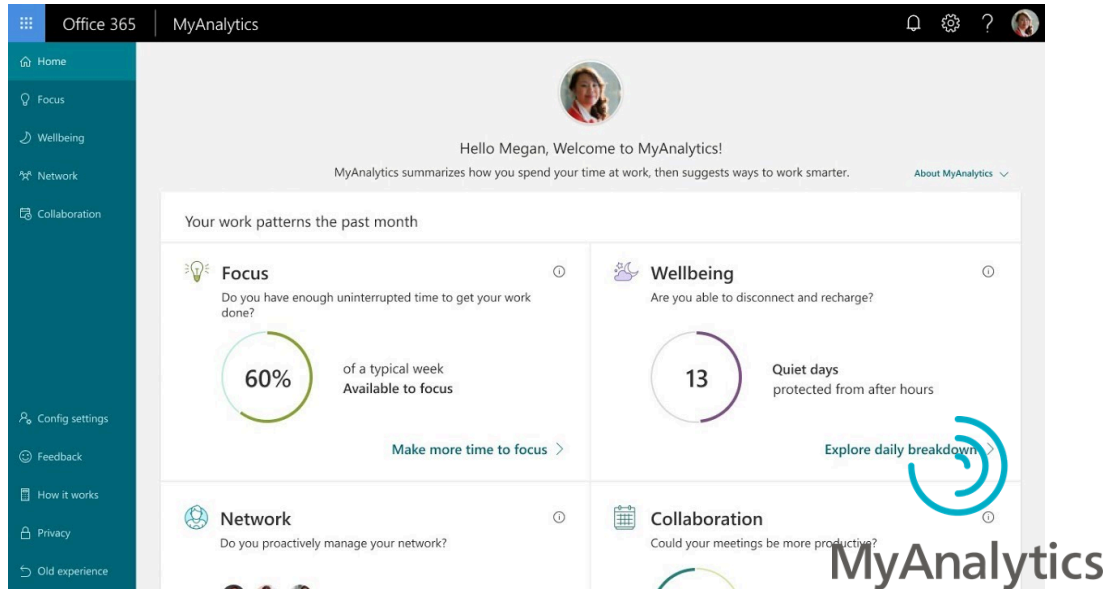
Availabilities Schedule

May 2020

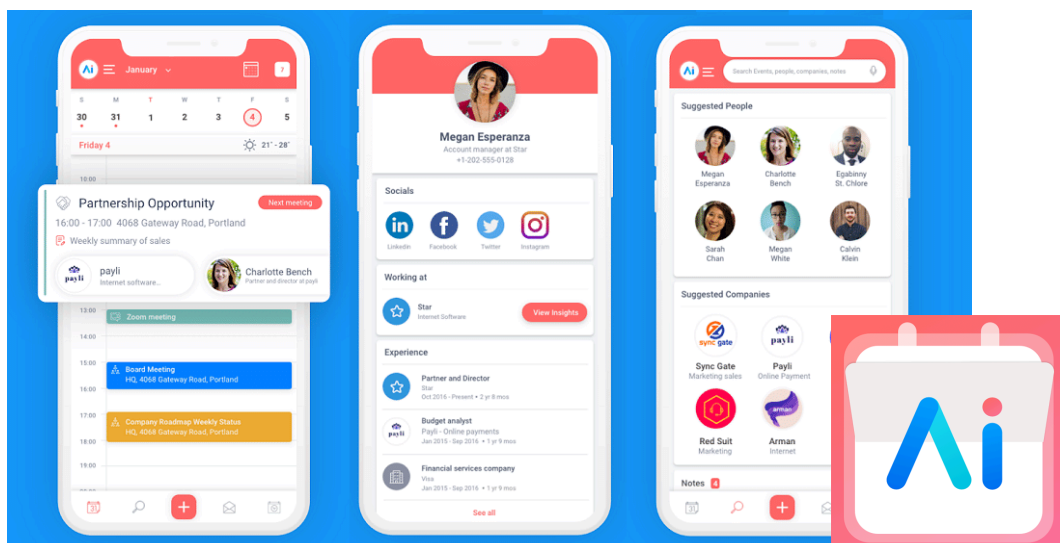
ACST	MON 25	TUE 26	WED 27	THU 28	FRI 29	SAT 30	SUN 31
6 AM							
7 AM							
8 AM							
9 AM							
10 AM							
11 AM							
12 PM							
1 PM							
2 PM							
3 PM							
4 PM							
5 PM							



- [Microsoft MyAnalytics](#): Microsoft MyAnalytics is a productivity analytics tool that provides personalized insights into how users spend their time at work. It analyzes Office 365 activity data, such as emails, meetings, and focus time, to identify patterns and offer suggestions to improve efficiency and well-being at work. With charts and metrics, MyAnalytics helps users understand their work habits and make more informed decisions to increase productivity and work-life balance.



- [Calendar.AI](#): Calendar.AI is a smart calendar mobile app that offers advanced scheduling and organization features. It integrates with popular calendar platforms such as Google Calendar and Outlook, providing detailed analytics on how users spend their time and making it easy to automatically schedule meetings by analyzing participants' calendars (analysis done in the Doodle model). With features such as reminders, notifications and contextual information about participants, Calendar.AI helps users better manage their appointments and maximize their productivity.



In short, the current state of time and calendar management applications and tools is evolving rapidly to meet increasingly complex user demands, with a growing emphasis on automation, personalization and collaboration. Future research will continue to explore new approaches and technologies to further improve the efficiency and effectiveness of these solutions.

#### **References:**

- Macan T H, Shahani C, Dipboye R L and Phillips A P 2000 College student's time management: Correlations with academic performance and stress *Journal of Educational Psychology* 82 (4) 760-768.
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- Time Management Statistics (New Research in 2022). <https://www.timewatch.com/blog/time-management-statistics-in-2022/>