

Lab 1: Descriptive Paper  
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## **1 Introduction**

Time management is defined as the practice of using one's available time in a useful and effective way (Cambridge Dictionary, n.d.). Research shows that many people struggle with time management skills. Development Academy conducted a poll and found that 82% of people struggle with time management and lack a time management system while 12.5% feel that they never have their work under control (Development Academy, 2022, as cited in Ariella, 2022).

Lack of time management is also pervasive amongst students in universities. 78% of students reported that they struggled with time management at some point during school, and 53% stated that they struggle with time management more now than in high school. Instructors have taken notice as well with 80% of instructors stating that their students struggle with time management all or most of the time (Cengage Learning Student Engagement Insights Survey, Spring 2015, as cited in College Success Plan, n.d.).

Time management is a skill that if not done well can lead to negative side effects. The most common negative side effects of poor time management for students are lack of sleep, declining academic performance, procrastination, poor diet, and an increased risk of dropping out (College Success Plan, n.d.). These effects can be further exacerbated if the student does not have a community of support. If a student feels that they are alone in their endeavors, then their struggles and the effects of poor time management can lead to burnout, feeling overwhelmed, and a lack of motivation (T. Kennedy, personal communication, Feb 13, 2024).

### **1.1 The Solution**

KnowTime will be a web-application whose goal is to help students develop long-term organizational, time management, and study skills that will help with alleviating the negative side effects students may experience from poor time management. KnowTime will accomplish this by providing students with various features that will help them with better managing their time and increasing feelings of accomplishment and motivation while completing coursework.

These features include: a customizable Pomodoro Timer, a personalized study plan, a grade tracker, a progress tracker, a task board, a calendar with reminders, and a points system. A community forum will be included as well, which will further assist students by allowing them to find relevant resources and a community of support. KnowTime will also direct students to various academic and mental health resources. The provided mental health resources can help

ease feelings of burnout and being overwhelmed while the academic resources, such as tutoring and writing resource centers, can help students accomplish their goals and learn more about the available resources on campus. With these features, KnowTime will serve as a tool that will provide students the resources they need to succeed in their studies.

## **2 KnowTime Product Description**

KnowTime will be a web application that will include many features to help students develop organizational, time management, and study skills. This web application will also provide features that will motivate and encourage students throughout their studies while also hoping to provide each student a personalized and supportive experience. KnowTime will be accessible across multiple platforms and have a responsive design to encourage consistent usage.

### **2.1 Key Product Features and Capabilities**

Various features, some of which are known to assist students in their studies, will be included in KnowTime's capabilities lineup to help students reach their goals and enhance their toolset to tackle coursework and future endeavors outside of school. These features, each of which will be described in further detail, include:

- a pomodoro timer with customizable study sessions,
- progress and task tracking,
- a grade tracker,
- a points system,
- the ability to import one's school calendar into the application,
- a calendar with reminders,
- a study plan generator,
- a community forum, and
- information on study and mental health resources.

The pomodoro timer is named after a time management method known as the pomodoro technique. This technique was created by Francesco Cirillo in the 1980's while he was a university student. To follow this technique, the student first selects a task to complete. The student then sets a 25-minute timer and works on their selected task until the timer is complete. Once the timer goes off, the student takes a 5-minute break and completes three more

“pomodoros,” or timed sessions with 5-minute breaks between them. After completing four pomodoros, the student will take a longer 15–30-minute break before starting another set of pomodoro study sessions (Scroggs, 2022). The pomodoro technique is known to improve focus, minimize distractions, increase motivation, and help prevent the onset of burnout (Alves, 2023; Scroggs, 2022). KnowTime will provide students the option to use the standard pomodoro method described or they can customize the amount of study and break time for their sessions.

Students will be able to track their tasks and course progress in the KnowTime web application through a personalized task board that will provide students information on time spent on tasks recorded by the pomodoro timer or manually entered, customizable tags to assist with organization, due dates, schedule reminders, and email notifications. Task tracking will help students build organizational skills by providing them structure. Time management skills are enhanced through task tracking as well by ensuring deadlines are met and encouraging prioritization of tasks through task visibility (Parrish, n.d.). This feature will motivate students throughout the semester as well since it is known that progress tracking encourages accountability, awareness, and confidence in students who track their progress (Li, 2017).

Grade tracking will be implemented through a graphing system to help students monitor their grades and track progress. The graph will be based on grades entered by the student and will allow students to view their grades alongside their time spent studying for each grade, which can be manually entered by the student or automatically generated through the pomodoro sessions completed through the application. Students will be able to set goals and filter the graph with course tags. These filters will allow students to drill down on a particular class to provide them more insight on their progress and to help identify areas of strength or weakness (7EDU Impact Academy, 2023), which will help with prioritizing where they need to spend time studying.

KnowTime will include a points system to gamify the study process. Points will be earned at the completion of each session, and these points can be used to unlock fun avatars. A points system will help students stay focused and motivated since the gamification of learning can incentivize learning and “...cultivate a positive attitude toward [studying]” by making learning a more enjoyable experience (Wang, 2021). Unlocking avatars will also help students foster feelings of achievement and encourage them to reach their goals (Davies, 2024).

A calendar with customized reminders will be provided to help students keep track of upcoming deadlines and exams. This will further assist students with developing time management skills since they will be able to keep track of deadlines. Students will also be able to import their Canvas and BlackBoard calendars to their KnowTime calendar.

A unique feature of KnowTime is its personalized study plan. KnowTime's study plan will be generated based on different information entered by the student such as assignment due dates, exam dates, and spans of time the student has blocked off for personal time. The study plan will also take into consideration the amount of time spent on similarly tagged tasks by using the pomodoro timer data or manually entered times and ensure that the student takes breaks between tasks to prevent burnout. After taking that information into consideration, KnowTime will create a study plan with suggested dates and times to complete tasks and take breaks. The study plan will also offer suggestions, such as what to focus on or which of KnowTime's features to use to help with areas of difficulty. These suggestions will be based on the student's recorded information. First-time users and students who choose to not enter information will receive a generic study plan. KnowTime's personalized study plan will help students by providing structure and serving as an example of what goal setting, time management, and prioritization of tasks could look like when managing different responsibilities.

To foster a sense of community and eliminate feelings of isolation, KnowTime will include a community forum to allow students to engage with other students who may have similar struggles or ask for advice. Students will have common forum capabilities, such as searching for content, reporting users, flagging content, following threads, liking and disliking posts, and creating and replying to posts. Students will also be able to add friends and direct message each other. This community forum and the friends made through the application will allow students to communicate with one another and foster an environment for peer learning, "...an education method that helps students solidify their knowledge by teaching each other" (Hansen, 2022). This is an important aspect of KnowTime's community forum since peer learning is known to help decrease feelings of anxiety and stress in students (Pointon-Hass et al., 2023). Studies have also shown that students who provide peer support are more likely to score higher on a well-being scale, which demonstrates that students on both sides of the interaction will benefit (Duggan et al., 2022). Community plays an important part in helping prevent burnout and discouragement in students.

KnowTime will provide information on available resources that can give academic and mental support to students. Students are often unaware of resources available to them from the university, so KnowTime will list various free assets that can be utilized by the student to help them throughout the semester. These resources may include counseling and accessibility services, tutoring in different subjects, and writing resource centers.

With these features, KnowTime will be able to assist students with developing long-term skills to help them while they are in school and beyond. The customizable pomodoro timer, task board, calendar, various trackers, and study plan will help students with organization, time management, and studying while the points system, community, and mental and academic resources will assist with the prevention of burnout, anxiety, and stress and foster feelings of accomplishment and motivation.

## **2.2 Major Components (Hardware/Software)**

The KnowTime web application will be developed in Visual Studio Code. Git through GitHub will be utilized for version control. Python and the Django framework will be used for the backend. PostgreSQL will be used for the database server, and Django will serve as the web server for the application. The frontend will use Bootstrap 5 as its framework and consist of languages HTML5, CSS, and JavaScript. During development, PyTest and Jest will be used as testing frameworks, and documentation will be created with Pydoc and JSDoc. KnowTime will be developed initially for use on desktop computers and laptops but will also be accessible on mobile devices. This will be ensured with Bootstrap 5 since this framework helps by making applications mobile-responsive. Docker will be utilized since it allows for portability making the end-user's operating system not as important. This will help make KnowTime accessible to a larger audience.

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The KnowTime Major Functional Component Diagram (MFCD) in [Figure 1](#) helps visualize how these hardware and software components will come together and interact with each other and with the end-users.

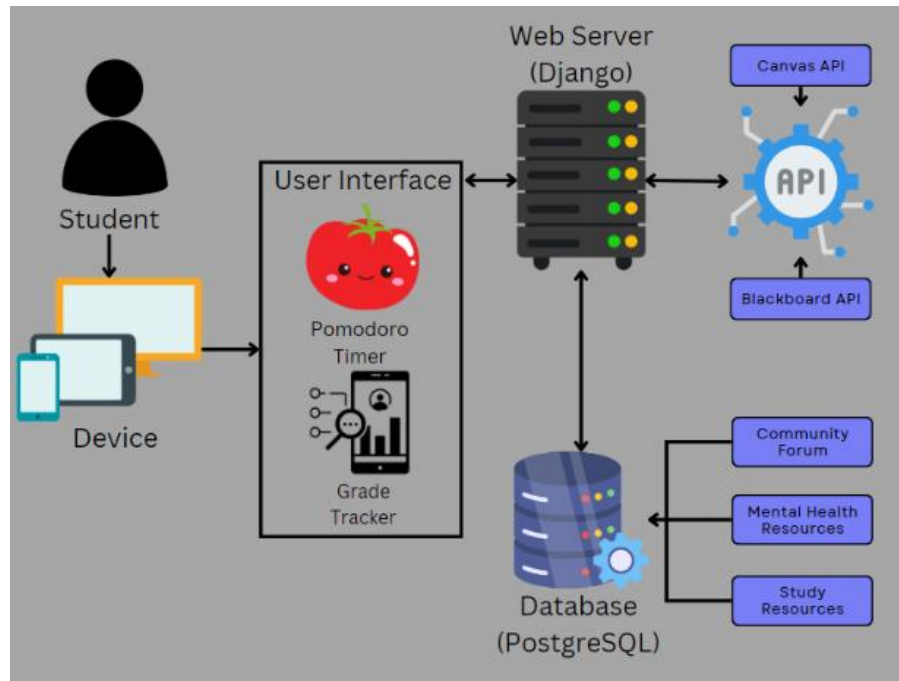


Figure 1: KnowTime MFCD

The diagram starts with the student. The student will be able to access KnowTime through various mediums and interact with the user interface. Through the user interface, the student will create an account and be able to enter information mentioned in section 2.1, such as grades, tasks, tags, and time spent studying. Student information will be stored in the database maintained through PostgreSQL along with mental health and study resources and community forum content. Data stored on the student in the database will be used to generate the personalized study plans, and these study plans flow back into the user interface. The continuous back-and-forth data flow between database and web server and web server and user interface is emphasized by the bi-directional arrows between them. This demonstrates how student data will feed into the application and database and be used to create their study plan, which goes back to the student. An API will also interact with the Django web server and either Canvas or Blackboard to import student calendars.



### 3 Identification of Case Study

KnowTime was designed with students in mind, especially those students who struggle with time management. The Introduction described the difficulties that students may experience with time management and how poor time management can negatively impact students and even increase the risk of dropping out of school (College Success Plan, n.d.). With these concerns in mind, KnowTime's features were selected to attempt to address major areas of concern that could exacerbate the negative side effects of poor time management in students. These areas of concern may include lack of structure, lack of community support, lack of knowledge about academic and mental health resources, or uncertainty on how to spend one's time or manage it. Knowtime will demonstrate to students what organization and time management might look like and help students by providing them structure and a supportive and motivational learning environment. KnowTime's purpose is to help students develop long-term organizational, time management, and study skills while providing them a community of support and motivation.

KnowTime can also be used by students in middle school or high school who need help managing their time. These students may find it difficult to allocate time between activities and their coursework efficiently. Lack of sleep, declining academic performance, procrastination, and poor diet are negative effects that are not exclusive to college students. High school and middle school students can be victims of the negative side effects of poor time management as well.

Instructors may use the application to some extent. They could share the application with students who are struggling with time management or use the community forum to communicate with students or share academic or mental health resources with students. Instructors can also share those resources with KnowTime's team to add them to the application.

Although KnowTime was designed for students and academia, anyone who has difficulty with time management can use different aspects of the application. The ability to customize tags allows for more freedom when using the task board and calendar, and the pomodoro timer can be used for any work session or for making sure that one is remembering to take breaks between whatever they need to accomplish. The community forum could also be used as a place for motivation and encouragement. Anyone who struggles with time management can benefit from using the application.

#### 4 Glossary

**Grade Tracker:** Grade tracking will be based on user-inputted grades. It will look at their grades, and the time spent studying, which may be entered by the student or automatically generated if the task was completed during a study session within the website. It will then generate a graph correlating time spent studying with the grade they received. They will also be able to filter this graph by tags. This will allow students to view a particular class to determine how they can improve. The student will set a goal for the grade and view how they are progressing over time.

**Pomodoro Timer:** The Pomodoro timer technique was created by Francesco Cirillo in the 1980s while he was a university student. To follow this technique, the student sets a timer for 25 minutes to complete a task. Once the timer goes off, the student takes a 5-minute break and then continues to work again for another 25 mins. After four sessions, the student takes a 15–30-minute break (Scroggs 2022).

**Study Plan:** A study plan will be generated based on various factors that will be entered by the student. Examples of information entered that will be considered are assignment due dates, exam dates, and times that the student has specified they are busy. Study plans also consider time spent on similarly tagged tasks and the need for breaks between tasks.

**Task:** A Task is any assignment that the student needs to complete, whether that be a homework assignment, an exam, or just making time to study or gather materials. Tasks can have multiple tags and are created by the student in the web application.

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