

Proposal Revision

Team Adaptatime

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How Might We Statement:

How might we help Georgia Tech students manage their time more effectively?

Description/background of problem:

Time management is an important skill for academic, social and mental success. In a college environment, students are often sleep deprived and overwhelmed by their academic and extracurricular activities. With proper scheduling, this can be curbed. Georgia Tech has had public image issues with time management and stress. A prominent example of these issues is the 2001 report, in which *The Princeton Review* placed Tech among the 10 toughest colleges and universities in the United States and later reported that Tech's heavy workload led to 'overly stressed' students with 'minimal time for social functions'.^[1]

Time management is a major problem for both current and future students. While the institutional schema is something we cannot control, we can take control of our reaction to it. The "Tech lifestyle" that the *Princeton Review* mentions—the stress and minimal time for social function because of a tough workload—should be complemented by resources that mitigate its impact on students. However, the Center for Academic Success (CAS) and other resources for students do not place a strong emphasis on time management. Our experience as GT students has taught us how stressful classes and clubs can get, and that the resources provided, although helpful, are not always enough.

There is a gap in time management resources^[2] for students at Tech, and our project will fill it. Our application would mitigate the consequences of poor time management: missed deadlines, poor quality work, added stress, and sleep deprivation. These problems are likely rooted in students not having access to all the relevant information regarding their classes and tasks, and their time management systems not having a focus on Georgia Tech and its particularities. By improving these, professor-students relationships, student GPA, Georgia Tech's image, and student overall well-being should improve. Effective time management decreases stress and allows for more social interaction, which collectively lead to a better, healthier, more well-rounded student^[3]. The Institute will also benefit from increased student satisfaction and productivity, which would be beneficial in attracting future students.

Stakeholders include the Student Body at Georgia Tech (especially incoming freshmen), the Institute, and existing time management applications.

Students at the Institute are directly impacted as they struggle with time management as academic and extracurricular demands increase with each semester. This growing issue is difficult to deal with as most students do not *actively* seek to improve their time management skills. The fact that workload increases gradually leads to students not directly associating their time imbalances to a lack of time management. Additionally, humans are significantly more likely to focus on *like-the-present tasks* than *unlike-the-present tasks*.^[4] This refers to short term goals versus long term goals, a conflict that makes it more difficult to see the "bigger picture" and the higher rewards of certain activities. Freshmen are at risk of experiencing time management issues, partially due to the discrepancy between their high school and Georgia Tech's workloads. Even though the Institute has a reputation for being difficult, incoming freshmen often lack the time management skills needed to minimize stress and balance social life and academic responsibilities.

Georgia Tech has noticed issues with time management, and has taken measures to address them, such as time management workshops by the CAS. Improving time management is closely correlated to decreasing students' perceived stress.^[5] Although the issue is being addressed by the Institute, it is not its central focus.

With regard to existing solutions, the CAS has tried to provide more tools to help students manage their time. They offer "semester-at-a-glance" planning sheets that will allow students to see all the days in the semester on a single page. CAS has partnered with StudentLingo to offer an on-line workshop on "Time Management: Strategies for Success." There are also academic recovery programs (GT 2100 and Reboot) that help students develop individualized time management strategies. These are two ongoing attempts to solve the problem at Georgia

Tech. However, these do not seem to be effective as time management is consistently one of the three lowest scores for Georgia Tech students who take the Learning and Study Strategies Inventory (LASSI).^[2]

Current apps like *Plan & Remind*, *Plan It--Set Your Daily Goals*, *Plan Mate*, *Student Management HD*, and *Study Plan* are not as frequently used as they could be because they require too much data input and are not course specific. Looking at the current applications we find that another reason why students do not utilize these types of planners is because they are not individualized and do not adapt to their busy schedule. After the first year of college, students approach the assignments and workload differently; they get more used to the way work is assigned and figure out ways to study productively, whereas the application stays the same and doesn't adapt to their schedule. Therefore current solutions also pose a lost knowledge problem. The data on how challenging classes are and how much time is spent studying is not being gathered and is therefore lost.

Project Goal:

Our goal is to facilitate time management for Georgia Tech students in order to help them accomplish tasks and increase their wellness. Currently, students rely on their own skills to manage time. Though this is effective for some, many struggle to find enough time to accomplish their daily tasks. This results in consequences to the average student, notable reduced sleep. According to the University of Michigan's Health Service^[6], a college student gets only between six to seven hours, despite the recommended eight hours of sleep. Time constraints in addition to sleep deprivation contribute to stress. The Princeton Review ranked Georgia Tech among the 10 toughest colleges in the US and later reported that Tech's heavy work load led to "overly stressed students"^[11]. Georgia Tech students have difficulty finding time to balance school work with social activities and sleep^[2]. The implementation of a learning application, would help students manage their schedules and accommodate their preferred study times and social habits. Students would become more aware of their time expenditure, and identify gaps in which they could fit necessary tasks. With improved awareness, the student would be more likely to accomplish their daily goals and reduce their stress. The added time would also help balance sleep and social activities better, further reducing stress. Improved grades from increased study time and wellness are also to be expected. Finally, with a balanced lifestyle, students will experience an increase in physical and mental well-being.

External Advisors:

Dr. Carrie Shepler (Director of Freshman Chemistry)

As Director of Freshman Chemistry, Dr. Shepler has had an active role in monitoring study habits and time management skills of new students at Georgia Tech. By working with Dr. Shepler, we could possibly collect data directly from freshman students, as well as have another area which we could advertise our time management application.

Dr. Klara Grodzinsky (Department of Mathematics)

Klara Grodzinsky, similar to Dr. Shepler, is highly active in the development of time management and study habit skills of her students. Earlier, we collaborated with Dr. Klara Grodzinsky of what functions may be helpful in our application and could reach out to her in the future for collecting data directly from students.

Fiona Brantley (Associate Director of Academic Support Programs of Center of Academic Success) and Dr. Joyce Weinsheimer (Interim Director of Center of Academic Success)

The Center of Academic Success is a key external source to collect information and receive advisement about the Georgia Tech community. The Center of Academic Success offers various programs to help students do their best academically, including tutoring and time management advisement. Fiona Brantley, Associate Director of Academic Support Programs, and Dr. Joyce Weinsheimer, Interim Director, have already helped us in collecting data and have to narrow down application functions that will best benefit students at Georgia Tech in terms of time management. Fiona Brantley could also assist in the implementation of the application, advising the students who visit the Center about the application.

Dr. Tristan T. Utschig (Office of Assessment)

Dr. Utschig has helped us in collecting data through CIOS. CIOS, the Course Instructor Opinion Survey, collects data from students including time spent studying for the class and the percentage of classes attended. This data would be used in the application to make suggestions to the user of how much time they should study each week. In the future, we could continue to collect data from the Office of Assessment to continue to improve the time suggestions made by the application.

Objectives:

1. Visualize and Functionality: *Define the major and minor app functions and storyboard the pilot version of the app by the end of the semester.*

Background: In order for our application to meet the needs of the student community at Georgia Tech, we need to determine what our app needs to be able to do. This can be broken down into a list of individual functions (specific tasks the app can perform) that we will need to define and sort. These functions will be sorted by the value they add in creating a unique application tailored to meeting the time management needs of Georgia Tech students. Once we have evaluated and selected the major functions, we will storyboard the app so that we can visualize and map out the app itself. Having a well thought-out design that is both aesthetically effective and logically organized will make our second objective, the coding of the application, possible. Throughout this process, our methods will be both heavily data-driven, using information from CIOS surveys and CAS resources, and rigorously critiqued, using time management experts from around the school to assess our app design and offer feedback to improve our approach. Failure to complete this objective would leave us without a clear plan for programming and a lack of consensus about what our project needs.

Breakdown of Tasks:

- Evaluation of Application Needs:
 - Collect and analyze data to determine what application needs to be able to do
- Novel features:
 - Determine which app function will be of greatest value to the user and most critical in producing a unique and valuable product
- Remaining features:
 - Rank by importance and value to decide which additional functions will be included in pilot version of app by the matrix.
 - Categorize functions into groups such as aesthetic appeal, gamifying, getting tasks done on time, etc.
- Validating approach:
 - Seek critique from Joyce Weinsheimer and Fiona Brantley (from the CAS)
- Storyboarding:
 - Design sample interface
 - Construct visual elements of each function
 - Organize chosen functions into the interface on physical media
- Second evaluation
 - Have CAS advisors along with Klara Grodzinsky and Carrie Shepler critique final storyboard

Measures of Success/Outcomes:

- Storyboarding and app design will have been successful if our evaluations by our external advisors, especially from CAS, are both positive.
- This objective will have been completed correctly if the coding process proceeds smoothly.
- Function selection and categorization will have been successful if experimentation reveals no major holes in functionality that should have been filled with an additional function.

Anticipated Problems:

- Since we all have slightly different ideas for what we want our app to do, it may be difficult to get consensus on what our novel features will be.
- We may not be able to gather enough useful data to make an informed decision about what functions are most important for the app.
- We may get distracted from detailed characteristics rather than the core functionality.

2. Coding: *Develop a beta-test ready version of our time-management application, equipped with the major adaptive functionalities as constructed by our storyboard.*

Background: This objective is central to our project's impact. All of the preparation during the first phase leads to this objective. The preparation will leave us with a concrete set of features that we will include in our application and a clear idea of the challenges we will need to overcome during development. During coding, we will be designing the mathematical interface and algorithms that give our application its niche: the ability to adapt to the user and guide time-management decision making. Along the way, we will need to reconcile our vision of the application and technical limitations in order to create a feasible yet impact-capable solution. During this highly iterative phase, our application will start to materialize and provide us with a solid framework for our release of the application and further refining of it. With this backbone built, we will be able to continuously improve upon our application and adapt to user requirements.

Breakdown of Tasks:

- Re-evaluation of *Visualization and Functionality*:
 - Review work done in first phase in order to determine what functions and User Interface elements will be developed first.
- Back-end infrastructure:
 - Set-up server to hold data-bases on user information.
 - Develop classes for:
 - Schedule: has minutes, hours, days, weeks, months.
 - Priority: takes in user and developer inputs to assign prioritization values to tasks.
 - Build mathematical framework for adaptive algorithms, using back-end classes.
- Front-end design:
 - Set-up flexible GUI (Graphical User) interface taking design parameters from first phase.
 - Think of flexibility so that back-end redesign does not render work useless.
- Front-end and back-end final adjustments:
 - Have both efforts be combined towards having a functional application.
- Alpha-testing and debugging:
 - Have team use the application for daily tasks in order to find bugs for a month.
 - Take inputs and refine the application for further release and experimentation stages.

Measures of success:

- Coding will have been successful if we have solid back-end infrastructure set up, which allows us to receive, store and process user data.
- Coding will have been successful if an intuitive UI with as few design elements as possible is connected smoothly to our back-end processes.
- Coding will have been successful if after alpha testing we find it to work over 95% of the time without crashing and to successfully allocate tasks into possible time slots in accordance to a heuristic algorithm within the application (or definite solution to the resource allocation problem) 90% of the time.
- Coding will be successful if data gathering methods are implemented into the application, which can provide information on usage, engagement, satisfaction and usefulness.
- Coding will have been successful if our advisors and communities such as Startup Exchange consider it releasable for beta-testing.

Anticipated Problems:

- It may be difficult to create an accurate algorithm for adaptive features from translating abstract concepts such as priority and urgency into a concrete mathematical domain.
 - Alpha-testing can determine algorithm accuracy and can justify reworking the mathematical framework of the adaptive functions.
- Back-end development of core features might take longer than expected due to technical complications (i.e. solution is too resource intensive for fast schedule reorganization).
 - Three team members will have experience with Linear Programming, Stochastics and Complexity by time of coding phase, which should equip them to tackle this problem.
- Front-end design might not align well with back-end processes, which would require adapting both when combining them.
 - Have constant communication between both development units in order to ensure that there is no miscommunication on how the back-end will be tied to the user experience.
- Alpha-testing might reveal shortcomings that require a significant rehaul of either the back-end or the front-end, or both.
 - Plan to have clean code that follows best practices in order to more easily make changes, even significant ones, than if non-forward looking coding practices had been used (hard-coding, excessive use of global variables, preponderance of methods over classes).

3. Experiment: *Conduct an experiment in a GT 1000 class in Fall 2016 using our pre-tested time management application in order to see if students using the application better manage their time and gather data for further development of the platform.*

Background: In order to successfully assess our time management application we must observe the effects of using the application by freshmen. If we are not able to assess the satisfaction level of the users and how much the application is actually being used, we won't be able to know if our application is useful and whether it improves the overall well being of the user.

Breakdown of Tasks:

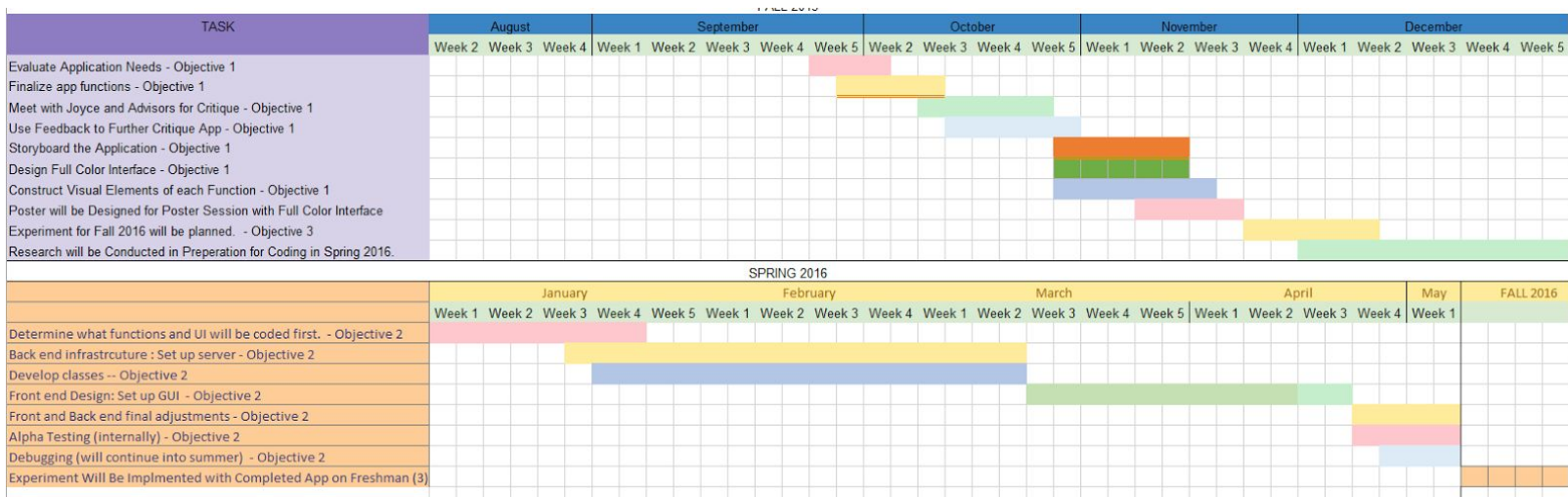
- Designing experiment:
 - Develop plan for implementation, decide on data to be collected and seek evaluation from CAS on plan for experiment.
- Approval for Testing:
 - Get approval from CAS and the Center for Academic Enrichment to pilot app in a GT 1000 class and develop a release form approving student app use and anonymous data collection.
 - Complete and submit IRB in Spring 2016 long before planned experiment start date in Fall 2016
- App Testing:
 - Randomly distribute students in GT 1000 class in two categories: test subjects and non-test (control) subjects and present the app to testing subjects to download and use over the course of the Fall 2016 semester
 - Collect data on app performance and adaptive capabilities throughout one semester, assess student use and elicit feedback about application effectiveness.
 - The feedback will include: short questions generated by app biweekly gauging user's level of use and appeal, holistic end-of-the-course evaluation completed by every test subject and challenges faced by control group, testimonials of students (testing and control combined) at the end of the Fall 2016 semester
- Moving forward:
 - Use feedback and data to fix any additional bugs in the app and debrief with advisors.
 - Make additional improvements to functionality following student recommendations and begin marketing app to campus community for general student.

Measures of Success/Outcomes

- This objective will have been successful if app is bug free after extensive testing and student use.
- The experiment will have been successful if significant data is acquired to improve the app and guide the adaptive functionality that assists other students.
- The app will have been successful if test subjects find app beneficial and show improvements in how they manage their time and if the control group faced challenges that test subjects did not because they were using the app. The independent variable is dividing test subjects from control group while the dependent variable is the progress that each group makes with or without the app respectively.

Anticipated Problems:

- IRB may have issues being approved, or take longer than expected.
 - Start the IRB process very early (Spring 2016) in order to have permission granted on time
- Permission to test in GT 1000 class may not be granted or will be difficult to acquire.
 - Ask permission from the Center for Academic Success before December, and contact various GT 1000 professors
- Data collected may not be sufficient to demonstrate improvements in test subjects' time management.
 - Evaluate experimental method and if third/confounding variable causes skewed data
- Unanticipated bugs may arise from scaling up app.
 - Fix bugs early on



Timeline:

On a macro-scale, our timeline is broken up into three main sections: Plan, Code, Experiment. This semester, our team plans to completely finish the planning process and hopefully begin the coding process towards the end of January. We first will finish planning our application (what it does, how it does it etc.). Then, we will actually code the application. This phase also includes researching the schematics of how to code specific functions and processes within the app. Lastly, we will implement our application into a controlled situation to collect data and information to better our application before the final release.

Budget:

Adaptatime Budget 2015-2016		
Item	Fall 2015	Spring 2016
Materials and Supplies		
Server: Would serve as the back end for our solution. Would host databases and website.	N/A	\$ 100.00
Domain: website for app.	N/A	\$ 20.00
M&S Total	\$ -	\$ 120.00
Services		
Coding Instruction: codecademy.com, Coursera, EdX, and StackOverflow.	\$ -	\$ -
Services Total	\$ -	\$ -
Travel		
Hackathon: PennApps would be a useful way to develop core features, meet developers and iterate with feedback from a vibrant and recognized community. These events will give exposure to the product, and facilitate strategic partnerships with companies and other universities. This would in turn potentiate the impact of our solution.	\$ -	
• Transportation		\$ 600.00
• Lodging		\$ 600.00
• Food		\$ 600.00
Travel Total	\$ -	\$ 1,800.00
Grand Total	\$ -	\$ 1,920.00

Appendix 1: References

- [1] R. Franek, "*The best southeastern colleges: 100 great schools to consider.*" New York: Random House, 2003.
- [2] Dobranski, S. Director of the Center of Academic Success at Georgia Tech. (2015, June 15) CAS [Online]. Available e-mail: shannon.dobranski@gatech.edu
- [3] H. A. R. R. Y. MILLS, N. A. T. A. L. I. E. REISS, and M. A. R. K. DOMBECK, "Time Management To Prevent Stress," *Mental Help Time Management to Prevent Stress Comments*, 2008.
- [4] Y. Tu and D. Soman, "The Categorization of Time and Its Impact on Task Initiation," *J Consum Res Journal of Consumer Research*, pp. 810–822, 2014.
- [5] Pinneker, L., Hafner, A., Stock, A., & Oberst, V. L. "How to get control of your time" Poster session presented at the 14th European Congress of Work and Organizational Psychology, 2009.
- [6] C. Tufts, "Why you shouldn't pull an all-nighter," *Why you shouldn't pull an all-nighter*, Dec-2005.