**Overview.** The primary aim of this project is to offer an easy to use mobile application to facilitate important academic and time management skills found to be necessary for college level students. This project also utilizes a rewards system to incentivize the user to follow the suggestions of the application. This tool aims to assists users with their academic responsibilities and develop beneficial skills for carrying out their academic assignments. The main functions of this application is to track and log all academic responsibilities for a user and to also prompt the user begin work on these task at certain critical times that maximize the user's productivity. The user is rewarded depending on how closely they followed the instructions and gain diminishing rewards the longer they postpone these tasks. Lastly this application will also use a map interface to not only provide directions to designated building s for the users class, but also track the user's attendance and reward the user for proper attendance.

**Keywords: Time management, Student, Mobile Application, Study Tool**

**Subtopic: Information Technologies**

**Intellectual Merit.** This Small Business Innovation Research Phase I project is designed with an adjustable algorithm so that all students, no matter their existing study or time management skills, will be able to utilize this project fully. It aims to

accomplished an effective assisting tool that encompasses many aspects of college level student’s lives by tailoring to the needs of the student in their academic career. Since many students arrive at college with limited experience managing themselves completely on their own, the rigorous nature of college academics can often be very stressful and strenuous for a student to manage. However, now the only tools that exist to solve these issues tackle only single aspects of the many factors that affect students, such as smart calendars or applications that track deadlines that need manual control by the user. This project intends to remove that manual control to refrain from creating additional responsibilities for the student to manage.

**Broader Impacts.** The intent for this project is a high level of functionality for all users and practical flexibility so that any level of student can use this tool if they wishes to improve their academic effectiveness.This project will help students make time for extracurricular activities, research opportunities, or even internships. This project seeks to eliminate that obstacle for students and facilitate health study habits that will aid in their academic careers and beyond. This project aims to address the challenges college students face by providing a smart time management to help balance their academic responsibilities and social obligations to create a productive work-life balance.

**Elevator Pitch**

For most students, college is the first time they are put in charge of every aspect of their own lives. Students are responsible for balancing social life with academics and extracurricular activities. Failing to balance their time can negatively impact their academics and cause them to hastily complete assignments and lower the quality of their works. It’s been found that students who rush to complete their assignments are less likely to retain any of the valuable knowledge gained from studying and homework. All types of students can benefit and learn from better time management over their academic duties. This project aims to address the challenges college students face by providing a smart time management to help balance their academic responsibilities and social obligations to create a productive work-life balance.

College students often find themselves not having enough time to complete their assignments and end up exhausting themselves in order to finish all of their work on time. The goal of this project is to eliminate or reduce the struggle students face by offering a time management tool. This tool handles scheduling multiple times for a student to work on each assignment over a set time to avoid overworking and reduce stress. The tool will use proven algorithms to properly space out the work and accommodate each student’s preferred study habits. The tool can respond accordingly to the type of assignment such as reading assignments, math sets, or preparing for presentations. Users are only required to input the type of assignment and their deadlines and this tool’s algorithms schedules times for every assignment around the user’s schedule. Where most available products require the user to manually input their work times, this tool does everything automatically.

This program is designed with an adjustable algorithm so that all students, no matter their existing time management skills, can excel academically and learn to balance their academics and social lives. Using many recent research studies about proper study habits and the effects they have on the students, this tool’s scheduling algorithm can make sure the student uses their time appropriately. The scheduling algorithm will be able to adjust its scheduling based on the difficulty setting the user set for each assignment to ensure that the user only spends the minimum time necessary to complete the assignment. Upon completion of each assignment, the tool will award points in order to incentivize the user to continue to use the tool. The harder the student works, the more points they receive and can use the points to take extra student breaks and other similar rewards. This project pushes the boundaries of all current student help tools by utilizing an adjustable algorithm that automatically plans out a student’s academic responsibilities and teaches the student how to balance their academic career with the rest of their lives.

**The Commercial Opportunity**

The market for time management applications is a quickly growing and nearly every large name technology company has tried its hand at developing one, such as Google and their new project ‘Goals’. Many of these programs and applications try to tackle the issue of time management and teaching people how to better manage their time. The struggle of organizing and executing the countless task that most average young adults face in their day-to-day lives take a heavy toll the human body and mind. These tools attempt to reduce this overwhelming responsibility of a person by establishing simple and easy methods for people to update and keep track of their schedules.

It has only been in the past three years that companies have strived to produce automated scheduling applications to further assist their users by updating and scheduling a task for the user. This push for the use of automation has been the primary driving force in the market of these time management tools. The economic potential for such applications is rich because automated time management tools can remove the necessity for an individual to constantly be micromanaging every aspect of own lives. Therefore, automated time management tools can directly influence the amount of work that someone is able to achieve without risk of exhaustion or high stress. However, the market has tended to focus on general purpose time management tools that do not cater to any selective group of people, and any specialized time management applications could be an exceptionally sound investment as long as there is a large enough demand within the subgroup.

The desired customers for this project are college level students that are in need of assistance with managing their academic assignments. Far too many students arrive at college without any experience in properly managing their time and would greatly benefit from and automated time management tools designed for students. The target customer can fall under two categories. The first category being students who procrastinate their work and attempts to complete all of their work immediately prior to the deadline and end up stressed and overwhelmed. The second category being students who spend a majority of their time with their academic work and neglect their social lives and personal health. The chosen method for distributing this project to our targeted customers is through the Google Play store that only requires a one-time payment of $25 and the application will be available for purchase. It is understood that college level student have access to and regularly use smartphones, that being the only requirement necessary to use this application. This application is expected to be sold for $5.99 in which Google Play charges a 30% transaction fee and leaving $4.20 in profit for every individual who purchases the app. Each sale is true profit as there are software licenses or hardware purchases that need to be made in the production of this project.

Utilizing automated processes to aid with time management is a new concept for time management applications that only a few companies have been able to develop and publish to the public. As this project intends to solely focus on time management for students, it contrasts with the currently available products that only offer general-purpose time management assistance. This contrast gives this project a lot more visibility as well as stand out for the target customer. This also means that this project can outperform the general purpose time management applications within certain criteria that appeal to students to ensure that they prefer this specialized application. By the time this product would be able to reach the market more time management applications outfitted for specific subgroups are very likely to appear. Although these products are not likely to focus on students, there are major concerns if these products would surpass our own product in assisting students and this product becomes obsolete. The technology itself could very well progress further than expected during this time that complicates how practical this product will be at that time.

As with any new innovation, necessary risk are taken for such an innovation to succeed and progress the current thinking in the field. This project targets college level student in need of assistance with balancing their academic responsibilities and is a very small market to rely on completely. There is little to fall back on if students decide that they don't want to use this tool or any tool as they are the only customers that benefit from this student-focused design. This tool's design is to assist a student properly manage their time, but with this, we risk student becoming dependent on this application when it only intends to help and teach the student how to better manage their time.

This application will market itself as a partially automated time management tool for college level students. The unique scheduling algorithm that takes into account what type of assignment and how best to spread out the work for that assignment will be the key feature being advertised. A specialized application designed around a specific type of user, in this case, a student, can do exceptionally well in the current market as few other time management applications that focus on a specific type of person are available. Reaching the target customer will occur by creating testing groups made up of volunteer students. After initial testing, this project will advertise on a singular college campus and reach out to students. Students will initially be given trial periods so that they can test the application for themselves. After the trial period, users can choose to buy the full application. The trial period aims to illustrate the effectiveness of the application and encourage the student to purchase the full version. This product will be easily distributed using Google Play to host the application and make it available for all to purchase.

**Societal Impact**

The goal of this project is to reduce the struggle students face by offering a time management tool. College students often find themselves not having enough time to complete their assignments and end up exhausting themselves just to finish all of their work on time. Using many recent research studies about proper study habits and the effects they have on the students, this tool’s scheduling algorithm can make sure the student uses their time appropriately. This project aims to address the challenges college students face by providing a smart time management to help balance their academic responsibilities and social obligations to create a productive work-life balance.

College can be extremely strenuous and overwhelming for many students as it is their first opportunity to live on their own and without constant supervision. However, this comes along with many consequences for those who are unable to properly manage their newfound freedom. These students easily find themselves demoralized and lose focus on their classwork. College tuition is by no means cheap, and for students to cripple themselves academically because they lack organizational skills is a waste of their tuition. This project can help students that struggle with time management get the most out of their education and engage in the college experience. However, this time management application is not intended to be just automated secretary and is designed to teach the user effective study habits and avoid the student becoming dependent on the application entirely.

If this project becomes successful and widely used it would impact society in developing young adults with stronger educations and improved organizational skills. The students who benefit from this time managements application will become more efficient students that retain more information from each assignment and learn how to prevent themselves from becoming overwhelmed by their school work. While the focus of this application is to assist individuals who lack experience in time management, such as new students who just graduated from high school, this application can help every student be that much more prepared and organized in their academic careers.

Preparing students to lead successful and constructive careers is the key purpose for most every college. Colleges are thus responsible for the mental and physical health of the student and ensuring they can be effective members of society. For students who sacrifice sleeping and eating in order to cram for a big exam or become overly stressed about performing well on an exam, there is a real risk for the student's health that can often be overlooked by colleges. This application breaks down a student’s assignment and allows them to work on the assignments gradually rather than all at once. This method of approach for completing assignments greatly reduces this risk of any harm coming to the student from over exertion.

**Technical Discussion and R&D Plan**

One key technical challenge that this project faces by being brought into the market is being able to advertise its unique features as a time management application for students. This project could be generalized as a scheduling application and be overlooked for more popular applications or other time management applications created by large brand names like Google. Therefore this project must be able to set itself apart from similar applications and reach the intended audience because this applications services only a specific group of the population. The next technical challenge also comes from this project being solely intended for students. This project will need to prove to the intended consumer that this product is more effective and beneficial than an ordinary scheduling application or even smart calendar. If students find that this application is not having any beneficial results or that it is too complex, they may choose another product or remain with their current method for managing their time. The challenge comes from trying to achieve a simple user interface design that is easy to use as well as display the progress of the user and demonstrate how this application is helping them. Another technical challenge derives from this project's use of Google Calendar API in order to pull information about a user’s current schedule. Google Calendar is necessary because it would be extremely difficult to store a user's entire schedule over long period of time. This creates a small dependency that the user’s Google Calendar is available and is filled with all of their other activities. In the case that the calendar is either not available or is not filled out, this application will be unable to properly schedule assignments optimally.

One of the most difficult challenges this project faces is streamlining the process of getting a user to begin working on an assignment and remain on task for the full duration of the scheduled event. It is assumed that this application will not always be running on the user’s device make it difficult to alert the user on when to begin their assignment. With the application no running on a device, it will also not be able to pull information from the user’s calendar to check when to begin the assignment. These challenges will be the focus of the Phase I project. This application will have regular sync period that pull only the events created by this application. This is much less information to store and allow the application to know when these events should begin. With this that application can send notification to the user’s phone leading up to and when they would need to begin working on the assignment. The user will be able to select the notification from their device and bring up the application’s performance timer. From here the user will have the ability to begin their assignment and track the time it requires to complete it. This will require minimal oversight from the while not sacrificing any functionality.

This innovation, while possibly similar to other applications that help with time management, is unique in that its intention is to solve a key issue that many college level student face. As it was described previously, college student are granted an immense amount of free time in between their classes, yet they are left to their own devices to organize and complete all of their assignments during this free time. Each assignment can be for a hundred different educational departments and require the student to do anything from reading in a textbook, writing and essay, or even completing Calculus problems. Unlike a standard time management application that is designed to schedule meetings or specific events, this application is designed to handle every type of assignment(math problems, history reading, programming, etc.) and schedule each one based on how long it will take the user to complete it. It is also able to be adjusted to better service any user with detailed preferences of the user, the user’s skill and speed with each type of assignment, and established research findings about the improved performance of students at varying times of the day and week. All of this information is used to improve the efficiency of students in their studies and ensure that each user does not plan to little or too much time on each of their assignments.

With college level student being the primary and intended customer, this application is creatively designed to accommodate every type of student. The major feature of this project that supports its innovation is the automatic scheduling process that is unique between all users. Every student is very likely to have varying experience and skills with each type of assignment. The speed of each student in areas such as reading or computing basic math can also differ greatly. The application uses a scheduling algorithm and takes these characteristics of the user into account when scheduling each assignment. With this information the application is able to scan through the user’s calendar and find available times in their schedule that agree with the established parameters and preferences of the user. The user is then prompted to select for the top 3 choices for time that the algorithm returns in case the user has any conflicting information that the application cannot process into its algorithm. This process that the scheduling algorithm uses is also dynamic in its ability to adapt to the user based on the previous performance of the user. As the user completes an assignment, the time remaining or the extra time the student needed for the assignment is tracked and used to adjust the scheduled time for the next assignment. Each type of assignment has its own time modifier that the application tracks and uses when scheduling that particular type of assignment.

One of the major goals of this project during Phase I research is the aggregation and implementation of scientific studies involving the habits and health of students. As this project aims to improve the efficiency of student’s time management skills, a large amount of research will be needed to ensure the methods that this application uses will be beneficial to student. Organizing and scheduling is a vital part to a student's success in their academic lives and improving these skills in students is a primary goal for this application. However, for our application to produce a beneficial solution, it must first be established that students are currently lacking or have underdeveloped time management skills. With the reality of this issue being shown, it must then be proven to be a serious matter for the the prospect of this project to hold merit as a real solution. If these issues are shown to be real as well as the current state of students time management skills be harmful to the students success, the methods used in this project for correcting this issue need to also be proven. Assisting students with time management through an automatic scheduling algorithm will require this scientific backing to also show that it is actually teaching students health study habits and is not just a tool that does all the work for the student. With the addressing of these questions, this project’s proposed concept if given real value as to how it can positively impact the community.

Another key objective for the feasibility of the project in the market is the assurance that the proposed application design is functional and non-complex for any of the intended audience. As a mobile application it will need to operate on all smart phones to ensure any student who wants the application can use it. This project uses Android studio to construct the application and support most all of the major mobile operating systems. The user will also need a google account and be able to fill their google calendar for this application to be most effective. This application is largely based around the automatic scheduling process, but is intended to assist and teach those methods and skills that it utilizes in its algorithm to the user. Ensuring the user does not use the application purely as a scheduling application is an important feature in its success. It will also be important for the application to track and show the users their progress and give feedback as to how they can improve with those statistics. This addresses the question of how will user’s know how this application is able to help them and to continue using it. The last key goal for this project is defining its originality in its design and properly representing this to the intended audience. Having this project standout amongst the many scheduling applications is vital to its commercial success.

In preparation for this application to get to the market, there are several milestones that this project must accomplish. Many of these milestones focus on the developing the software of the application and each milestone marks an important feature.The order of the milestones determines how the features are tested. The first critical milestone is properly establishing the Google API within the application and test generating new event within the application and then transferring them to user’s live google calendar. This application has dependencies on pulling and pushing information from the google calendar is vital to prioritize first. The next milestone for this project is creating an interface to display a user’s live calendar in the application. Also within this interface is the create event function that will prompt the user with text boxes and allow the user to input information and submit the new event. With the view of the live calendar and ability to create new events, the applications ability to push information onto the google calendar. The results of each attempt at creating an event would be visible in the application and make testing very fast. Next comes the implementation of that automatic scheduling algorithm with the event creation method already being complete. This algorithm will need to take the user’s input about a new event, and begin scanning through the information that was pulled from the google calendar. A strong understanding of Google’s calendar API is necessary here as it will ensure the algorithm is efficient in pulling the calendar information and running on that information. Bulky programming will cause major issues with testing if the algorithm is not able to pull the necessary information quickly or if it has to convert the data to a usable format. These milestones mark the current state of the project as all of these features are functional.

The following milestones are still in development and are necessary pieces of the final design. The tracking and adaptive parts of the application are the next milestones. This application notifies the user when the event starts and prompts the user to work on an assignment. The application times the user and records the time remaining after the user completes the assignment. The following milestone will be developing a process for the application to run in the background of a device and regularly sync with the user’s google calendar to pull necessary information and to check if it's time for an assignment. This feature lessens the dependency on Google calendar by holding event information locally as well as alerting the user of an event without the need of a live connection. Next will be a major overhaul of the application’s interface and allow a user to navigate the other features of the application. The settings control and profile preference pages are also important to implement as the information they manage directly affects the algorithm for testing. The user’s calendar can now be viewed fully in the application and display necessary information to help the user organize their day. The implementation of a small database to hold multiple user’s information is important in reducing the dependency on the google calendar. This is one of the last major steps to allow mass testing across several devices and volunteers to receive feedback from these testers about the application.

The research and development of this project will be no simple feat and will take a considerable amount of time spread out over the coming school semester. To ensure that the final protect is completed by the end of the semester, the milestones discussed previously will make up the major sections of a timeline. Establishing this timeline will provide a roadmap for the rest of the project's development and show when the development is falling behind schedule. The start of this timeline will be the current state of the project as of December 18th, 2016. The current state being an android mobile application that can freely create new events on a user’s google calendar through the application. These events are automatically generated and scheduled with a sub-optimal algorithm that only finds the next available time for the user based on the prefered time of day. The application can read when it is time for these events and begins a timer for the duration and record how long the user take to complete the assignment. The development of each remaining section is scheduled between now and the end of the next semester.

The winter break will largely consist of technical research into running android application in the background of the device. The objective will be to implement this ability and have it function on a device without needing the application open. A key feature of this application is time sensitive with scheduled events and the application will need to alert the user when they should begin on an assignment. Another goal of the project's development over the winter break is a syncing feature as well as a local database. The background notification feature will require the application will need access to the start time of an event without having a live connection for testing. Experimenting with the application’s ability to run in the background should provide a way for the application to also sync with the google calendar while not being open on the device. The syncing and storing of information on the application, as well as the background notifications, should all be completed when the break ends.

The remaining time in January after winter break has ended will heavily focus on optimizing the scheduling algorithm within the application. This will require substantial research into discovering and implementing those methods for teaching beneficial study habits. This research will provide necessary direction for the algorithm and reduce the amount of testing required to achieving an efficient algorithm. A possible stretch goal for this period of time is to implement the user preferences, that the algorithm uses to make testing more accurate. Testing of the algorithm will be very expensive due to the application purpose of helping students with time management, if the algorithm is wrong it could backfire and further complicate a user’s schedule. It may also prove helpful to extend this feature by another week if initial tests do not provide any beneficial feedback.

The following 3 weeks in the month of February will mark the time for establishing a login feature that will save a user’s preferences and progress. Along with the ability to login, the project will also experiment with storing more information from the google calendar in the application and saving it along with each unique user. Despite google calendar being a major part of this project, experimenting with methods that would greatly reduce the dependency on the calendar.With locally hosted information, a user can have their own view of their day-to-day schedule and browse this interface if they want to reveal more details about the events. The major objective for the development during this time is preparing the project for mass testing. Before this application can reach that point, it will need to demonstrate that it is stable and that it has some part of every feature designed for the final project. With each feature being present, all test results will give feedback on the major features of the project. This feedback will offer a good idea of what to fix before the final project. This time period in the development process is the last planned milestone at this time. This is not entirely due to lack of planning, but the remaining pieces for the application are only designing the user interface and the theme of the application. Work on the appearance and interface for the application will be ongoing throughout the development process.