***CSE FINAL REPORTS***

*Andino Rochon -- Karan Shah -- Rishi Patel*

***ROLE REPORTS***

***Andino Rochon Role Report***

In engineering, it is extremely important while working on a team to assign roles so you each have some responsibility to work on to get to a finished goal altogether. For this project, the role that I worked with was a software specialist. When we were brainstorming what all would come from this project, we wanted to build a prototype software that pharmacist or doctors could use to set dosage and time for a patients medicine. This was one of the most important parts. Showing that we could make it easy, organized, and secure for this concept to work. So I worked a lot on this software made in Java to make a prototype program with an authenticated login, interface to simply set the dosage and time for the medicine, and a finishing page where the doctor can close the application or set another patient. A big problem we ran into making this application was the learning curve of making a user interface. Java is the only language I have worked in before so learning some JavaFX wasn't too bad but definitely had many problems come with it along the way.

Another part of my role as a software specialist was working with the others with Arduino components to write code to make them work in a union the way we wanted them too. This is where we ran into most of our problems with some components not being wired correctly and thinking the code was messed up or had it wired correctly and making sure the code works properly. When working on the product we had to communicate with each other while working on our individual pieces to them come together and make it a whole. When working with the group on getting the product working we had a few issues right off the bat with figuring out how exactly to use Arduino and what we were going to need to get this product to have all the features and functionality it needed.

I really realized this semester that software is something I am very interested in and writing code can be a lot more interesting than I thought. I think in the future this is what I want to go into more. Working with the hardware and software sometimes would get irritating not knowing where the issues stemmed from. A big part of working on coding on this project was debugging. There were many problems that we would run into, like the servo not functioning properly that we would have to go thru the code tracking variables to make sure that the right information was first being passed to the motor and making sure it was giving us the output we intended.

Having these roles we split into was important but it was also important we did not leave each other out or behind from parts of the project. Even though I worked on more software components, the others in the group would still be involved in helping to make the need software so we could have it functioning with the other parts of the project. When we would meet together to get parts of the product done we would break into our “stations” almost where the others might be dealing with wiring and making the Arduino parts be in the right place, while I would be working on code functionality. Once we were ready to test things we would have to look into each other's parts and make sure everything would work together with the way we wanted it to and that the code was doing what we needed to the hardware.

Throughout working on this project in the semester I have really started to realize how much I enjoy software over hardware. I still do not have a great understanding of how hardware components work together but have enough knowledge to know how to write some code to make it function the way we would like it too. I think each role in our group came together well to produce our product, and I for sure enjoyed working more on my coding skills this semester and learning how to apply it to given hardware.

***Karan Shah Role Report***

My role in our team’s project was concentrated around the electrical components of our final design and deliberation. Being assigned to this role was a monumental task as I had to come up with ideas on how to successfully operate and build our team’s final project design. Our team wanted to help people who were having a hard time accessing or taking their medication. This led us to brainstorm a couple ideas that might be beneficial to that niche. We thought we could maybe create smart pill dispensers, smart medication vials, or even smart capsules. However, we decided to go with the creation of smart pill dispensers as this seemed like a more plausible approach to our problem at hand.

We decided to go with the pill dispenser because it would be more plausible and we also thought we could impact more people with the creation of this project. This is because we felt like we could add more components to our pill dispensing system so that it also helps people who are facing problems with drug abuse. These components could include timers that would only dispense pills at certain times. Something that we hope would prevent drug abuse for individuals who had a hard time constraining themselves.

In order to build this project, we assigned ourselves to different roles that we thought would serve important to the final build of this project. Thus we created the roles of Hardware specialist, electrical specialist, and software specialist. We felt as though this roles were essential for bringing our final project to life. I was assigned with the vital role of being the electrical specialist.

Being the electrical specialist, I had to use outside knowledge for this project. In order to create a pill dispenser, I had to know which components would be necessary in order to create a opening and closing mechanism that would allow for a single pill to slip through. This was difficult as I had to make sure the proper wirings and electrical components were small enough to fit in a dispenser system and also inexpensive enough that we could actually build a working model of it. In order to do this, we decided that going with the route of using an Arduino would be the most efficient and effective method of building our pill dispenser.

Using the Arduino, I learned a lot about what goes in electrical components in order to make working machines. I had to make sure that we were using the right type of wires when setting the system up. The placement of the wires also had to be very precise otherwise the component would not fit inside of our pill dispensing unit. This means that I had to study all the safe ways in which a wire could be bent and cut in order for it to become essentially “smaller” in length. I was also tasked with the job of piecing the components together so that the electrical components would actually produce movement from the opening and closing system of the mechanism. This was done by having a small battery attached to the components so that they would have the voltage required to open and close.

For our second component of the project, the timer, this took a bit more work. We had to apply a locking system to the final design. This locking system would allow the pills to be released only when the timer runs out. This would hopefully provide a lesser chance to abuse the pills that were located in the dispenser. In electrical terms, our opening and closing mechanism was controlled by a locking mechanism that would only open when a pulse was sent through it. This pulse was sent by the timer installed in the mechanism.

***Rishi Patel Role Report***

Being an engineer is not only about how well you work, it is how well you are able to collaborate with your teammates. It takes many minds to engineer a product or even an idea. Even with this in mind, it can still be challenging working with others since every team member has their own special talents to contribute. During this project, I took on the role as hardware engineer. In general, I was in charge of the hardware aspect of the product, design wise and building it from the ground up. All three of us has specialized roles which made the engineering process flow smoothly. Like any project, we ran into many problems throughout the way but each of our specializations contributed to solve it in a timely manner.

We initially were going to 3d print the parts required for our pill dispenser. I however had no idea how to design 3d models to print so I looked around on the internet and found some easy applications that simplified the creation of a 3d model. I played though the program and created some 3d models that were very early in our engineering process. Since I designed these so early it did now account for what we could actually produce with the time and the budget we had. These prototypes still helped us design out final product. Even though we did not 3D print the parts we found parts that were similar to what I initially designed and that assisted us in how we could actually visualize what we could produce.

One of the biggest problems from my end was designing the entire system that will function as our dispenser. I did not know the dimensions of the motor and the board since I was designing it before we received physical components. Once we got our hands on the motor, board, led lights, etc. I realized that my design did not compensate for how big these components actually are. The smaller the component the more expensive it was so it was not financially smart to get the smallest ones we could fine so we decided to make it work with these components. I had to redesign the entire project from the ground up, This time however I received the help of my teammates to design it. After I consulted with them and redrawing everything we came up with a concept that was able to use the motors we had. With all this in mind, the way our product functioned was different than we intended but it still outputted the result we wanted. We initially designed the product to grab one pill at a time by one motor and it was fall through the system and give the user one pill. We ran into many problems while creating the product that utilizes this idea. We then decided that putting two motors in the product will simplify the mechanical part of things.

The way we split up these roles really helped us efficiently complete this project. As the hardware specialist I learned a lot of things about the mechanical side of things that I did not know about. For one I learned that it takes many iterations of one initial design to actually create something that is feasible. Now that I have learned a lot about the hardware side of things I am eager to learn about the software and electrical side of things since talking to my group members who were specialized in this area widened my interests.

***TEAM ASSESSMENT REPORTS***

* ***Karan- Electrical specialist***
* ***Andino- Software design specialist***
* ***Rishi- Hardware design specialist***

***Andino Rochon Team Assessment Report***

I believe that our team did a great job coming together to get a finished product completed on time and efficiently. In the beginning, it was important to talk about our roles in the project but it was also important to keep our end goal in mind. When we decided what our roles would be, it wasn't so much that we would all disperse and not focus on the aspects that had to deal with another member role, but instead, we focused on our areas while working together to combine all of our skills to finish the product most efficiently.

For example, while we would work on the pill bottle prototype with Arduino, having to write code and wiring and understanding components were all important parts. Having our separate roles did make this easier to manage. Rishi and Karan would be working with hardware components and discuss with me how we would need to use them in the project. At these parts, we would all brainstorm together about how we would manage certain parts. Rishi as hardware specialist would look at the component we were needing to use and thought how we would fit it in our product and how it would function to correctly work with the other parts. While in the meantime Karan and I would discuss how we were going to wire this component up correctly and discuss the needed code to get it to function the way we intended.

After brainstorming separately and together how things would function, we would dive into implementing it. While Karan and Rishi worked on wiring different parts of the Arduino components together, they would communicate to me what pins were being used and what needed to be set as inputs or outputs. We would run into some problems along the way with miscommunication with either a component not being wired correctly or code being written incorrectly, but our group did a fantastic job at problem-solving. When a problem was thrown our way and something was not working the way we were intending it would get a little frustrating at first. After just a few mistakes coming up, we got in some kind of system that seemed to work very well. After we would get all of our parts done, we would look through each other's parts to make sure they functioned with ours before moving forward. For example, if I was to write code to something Karan, as our electrical specialist, was wiring we would then after look at each other's parts to make sure it is consistent with what we just did. This became very helpful in minimizing the errors we ran into in the future.

I think our group did a great job of managing our time well throughout the semester. We always made sure to be up to date with where we needed to be and set goals for ourselves to be at certain places along the way. One of our big setbacks was our components taking a long time to ship in. So when we were waiting to get building for a little, we made a plan of where we needed to be the next couple of weeks if we wanted to be able to complete it on time. We did very well sticking with this plan although it was hard to meet some weeks when we had conflicting schedules and not having a true class meeting time made it difficult sometimes to stick together and plan.

One big part of our project was the software we made for doctors offices and pharmacies to use to make our product most easily usable. This really just involved a lot of coding in JavaFX which was my role, but since it was such a big part of the project we all sat down together to plan the functionality and design of this software. My team did a great job with not putting too much on anyone's shoulders and all working together to get our finished product the best it could be.

***Karan Shah Team Assessment Report***

Our team consisted of three members who had their own vital responsibilities to the success of our group. Our team built a pill-dispensing system that allows one pill to be dispensed once the time is right. The time is based on the specific prescription that a user might have, such as one pill every four hours. In order to successfully build our team’s planned project. We were each assigned roles that we felt were vital to the creation of the project. I Karan, was the electrical specialist in the group. While Andino was the software specialist and Rishi was the hardware specialist.

Andino, being the software specialist, had to make sure that the arduino was behaving properly as it should. This means that he had to code the software that actually provided the mechanisms with instructions on how to run. He coded the software using the programming language java through emacs. Andino had the most tedious job as programming the mechanisms took a lot of effort and patience.

There were multiple parts that had to be coded for our project. For instance, the arduino came in multiple pieces and each piece had to be coded individually unless they worked as one unit together. The moving parts that we had in this project were the opening and closing mechanisms. However, we had to code more than these pieces in order to fully program the pill dispenser. Andino had to program the timer as well which allowed the opening and closing mechanisms to fully operate. This was completely done through java. Andino also coded the Application which would run the pill-dispenser. This was done using GUI software in Java. This application allows for doctor login to make sure that the medication process is authenticated.

Rishi was the hardware specialist of the group. This gave him the responsibilities of making sure that all the pieces came together and were working properly. He was tasked with assembling the pieces that came with the arduino. We had to create parts that would allow us to create an opening and closing big enough for only one pill to escape through. This was difficult as size was a constraint from the beginning. We were constrained to the size of our pill dispenser which made it harder to model the pieces that operate our final design. Rishi had to find new ways to fit the machinery inside our system.

One of the things that we had to do was shorten the lengths of any bread boards that were provided in the arduino. This is because the given lengths were to long to fit in our pill dispenser. The shortening process was completed by soldering the boards until they were at a sufficient length. After we had shortened the bread boards, we had to make sure we were correctly connecting the necessary wires that were needed in order to open and close the mechanism. If the wires weren’t set up properly the mechanism would not operate at the level that we needed it. We also needed to position the wires in such a way that there would be enough room for the pills to fall through the opening. This was a very tedious process that Rishi was able to do by making sure everything was in its proper position and length. After building the final project, Rishi made sure that everything was working correctly as it should be. This was done through numerous trial and errors tests that allowed us to see the pill dropping from the dispenser. If the pill did not drop from the dispenser as we would have wanted it to, we would have had to look at all the parts that we built and see what was wrong with the process of the pill dropping. Then we would start the trial and error all over again until we perfected the process of the pill dropping. Once we perfected the process, we made sure the pill dispenser worked continuously.

***Rishi Patel Team Assessment Report***

Our team had and immense amount of synergy. Our group has three members and each of our roles were important for the delivery of our product. Karan focused on the electrical side of things which included the Arduino board and wiring everything together and also creating a wiring diagram that the rest of the group could use. Andino was responsible for the coding of our product which included creating a GUI that will make it easy for the user to set parameters for the product. I was the hardware specialist and my main role was to design and put together what everyone made into one cohesive product. Each of our efforts was necessary since it made the work seem not as daunting as we all three initially thought it was going to be.

One of our strong points is the communication skills we all possessed. Whether it be a simple question or a suggestion for the final product we all would tell each other and respond in a timely manner. One example of this was while I was designing the product and Andino received the parts for us to build. He immediately showed the group what the products looked like and gave me dimensions so that I could continue my designing with these factors in mind. Whenever I was stuck I would ask Karan and Andino to help me and they would assist me the best they could and the little things like that is what not only make it enjoyable to work with them but helped us advance this product further. Since Karan was the electrical specialist, I had to ask him for his assistance while destining the product. I asked to see what he had planned out for the wiring aspect of things so I could seamlessly incorporate that in my final design. He showed me what he has and continued to work together so that the electrical parts of the product would complement the hardware I designed for it.

Not only did I individually work with Karan, I also needed Andino’s software skills to complete design and build the product. I had to show Andino what I had planned for the product so he could code in how the motors were going to move and where the pill would end up in the end. We ran though many ideas on how this would work together but we finally decided on using two motors and have them work together to get the pill to the user. While building the product we had to test the software every time I added a component or we decided to change something. This was the most frustrating part since the hardware and the software have to work together and one change to either can compromise everything. We did some rigorous testing together so that we can ensure that the motors will move the pill to the right place. This took a lot of time because we had to tweak something small, test it, and if it didn’t work tweak it again, and this loop went on until we got a result that we all were pleased with the results. Trial and error is one thing each of us encountered and none of us liked that we had to do the same thing over and over again but in the end, this trial and error period we all did ended up making our product seamless and produce consistent results that we could rely on.

Sometimes working with a group can be frustrating and it can seem like all the work is put on to one person. In our group we were able to not follow that path and each of us has a vital role in the delivery of the end product. Working with Karan and Andino has make my views on engineering in total a lot better and it really makes me eager to do more projects especially with people that are knowledgeable and diligent in what they do.

***WHAT'S NEXT REPORTS***

***Andino Rochon What's Next Report***

Working on this project has really inspired me to want to do more with it. I know it is in the very early stages of the prototype, but I believe this product has a lot of potentials. I am very happy I took the role of software specialist, working on more of the coding components of the product. I see a large area where this software program can be improved in the future and extend its functionality to many more uses. Since this is the biggest part of my interest and the part I worked on the most, I would like to dive into my future plans with the software and then later dive into how to can improve the hardware prototype and what can be updated to make it better.

With the software that we made with JavaFX, I would really like to dive further into software development and make an application that looks more professional and follows more conventions used that I need to learn about. I would really like to dive further into programming and make the application be able to be presented in a way that makes the product seem easy to use and a better alternative to how doctors offices and pharmacies function today. Having a secure and easy to use software for our product is extremely important and without it, the vision for the product just cannot be seen. One thing I want to dive into first with the application is design. I would like to learn more about CSS and styling in JavaFX so I can make the application look the way it should.

The next part of the software that is extremely important that it does not have right now is a better-authenticated login and password encryption to make it a very secure application for doctors to use and make it unhackable. This is one of the most important things to present about the software because of how important it is for an application like this to be secure. If people could just hack into the system and rig it to give them all the medicine it would completely defeat the purpose.

The largest part I would like to add to our application and for the product as a whole, is a medicine database in the application where the doctor can set a wide range of medications in the application so if the patient needs a place to go to see side effects, related medications, or instructions they can go to their page to see all of this info. This will start to stem into how we need to change the hardware product to work better for all people. Right now it does really work will all sizes of pills, but in the future, we would like this product to be able to work with any size pill. Something we wanted to have in this prototype but did not really have the resources to make possible is the pill sorting. Right now the pill bottle is not a secure as we would like it to be. We need to have smaller components that will work to sort pills by numbers on the inside to output the correct dosage to a patient. 3D printing components this small is very difficult and we need to still stay price efficient when adding these features.

Another part of the product I would like to work on a lot is making it look more like a pill bottle so it is more advertisable. For the hardware, we need to work on having a balance between 3 major things. The first is having the functionality all stay the same and adding the pill sorting. We also need to make it look like a more official project that people would use. The last is keeping our price low because of how cheap a normal pill bottle is. Doctors offices and pharmacies are never going to make the change to this is the product is too expensive or insurance won't cover the changes.

I believe that if we really want this product to be successful we need to have the hardware and software work in better harmony. Some ideas I have thought of is when the patient takes the pills home and the doctor has set the dosage there could be a time where the patient may need some for an emergency if they start feeling worse. I would like to add a feature where they can call into the doctor and have them override if it is necessary dispensing the pills at that time. Another interesting thought is to add smartphone functionality. Maybe making an app for users so they can read about the medicine they are taking or communicate with the doctors if they need to.

There is a lot of directions I have thought about where I can take this project and I hope in the future my teammates will work with me on taking it to new heights. I see a lot of potential for this and a lot of applications where it can really help a lot of groups of people. We want our product to be used by anyone that is why it is very important it keeps the functionality it has now and even add to it to specialize for any disabilities. I really think this product would help so much with addiction as well as it keeps people taking their pill in time and not over the limit. This is a big issue in the world right now and I hope one day I can take this product to help more and more people. Making the new way to get your medicine the best way.

***Karan Shah Whats Next Report***

As electrical specialist, I feel like I can make further tremendous impact with this project. This project is so versatile that in the future we can make so many improvements to it that can help more people than we initially thought. At first, when we thought of this project, we thought that we were only going to impact people that either A) had a hard time remembering to take their medicine B) could not take their medicine because of some sort of disease or C) have a hard time with abusing medicine such as when they take medicine when they were not supposed to. However we soon learned that with the proper equipment and technical upgrades to our final design, we could make an even better product that would help more types of people than we initially intended to.

In my role as electrical specialist, I became very accustomed to working with tasks that I had no prior experience working as. Some of these tasks included wiring the arduino so that it would work specifically with our needs such as opening and closing the “door” that would release the pill. Another task that included the electrical component of this project was to make sure that the battery was providing enough power to the components in order for dispenser to open and close its hinges. If the battery did not provide enough power to the mechanisms, we would have to switch out the battery and make sure that the 2nd battery was a viable option to use. The limits to the second battery can include looking at its price and size. If it was too expensive, we could not use it in mass production. If it was too big or too small, the battery would not fit properly in our device. I was very determined to do the best in my role. Thus, I only want to get better in the future as well. I believe that I would have to keep learning about electronics in order for me to get better in my role. This can include learning about how a battery operates and how to maximize the longevity of a battery. This can increase the efficiency and effectivity of our product which would thus make more more customers want to buy it. I can also learn how to reduce the wear and tear of a wire when it is in action. This would allow our product to last a lot longer and make it more consumer friendly. By becoming more informed in the electronics industry, I feel like I would be able to make a better product. This is only logical as I would posses more knowledge on how to make a better electrically equipped product for consumers to purchase.

By learning more about electronics, I feel as though I can make a much more improved product than what we initially built. For instance, I believe that one upgrade we could have is using a smaller battery but one that also provides more power as well. This would provide the final product with a lot of pros. The consumer would be able to store more pills inside the dispenser with a smaller battery. This is because there would be less room taken by the battery thus adding more room to put pills in. Another benefit of using a better equipped battery is that the final product would last much longer than the original prototype. By lasting longer, our consumers would be allowed to use their machine for a longer amount of time. This would also allow our machine to be more environmentally friendly as there would be less batteries thrown out because of the fact they were not usable. As our environment is becoming more and more vulnerable to damage, anything that we can do to even be slightly environmental friendly can go a long way. To be even more environmentally conscious, we can make our product out of environmentally friendly materials. We can research materials that are recyclable and durable at the same time. This would have a lasting impact on the earth as it would reduce harmful materials getting tossed out on earth.

Another upgrade that we can make to our product that would make it better is to allow multiple brands of pills in the dispenser. This means our dispenser would be okay with handling different sizes of pills. This would give our product unprecedented versatility as many more consumers would find our product a lot more helpful. Instead of being constricted to one size pill, our consumers could put multiple pills and add more times for the opening and closing mechanism to work. This would give consumers one central station to put all their medication, making their lives much more easier. This would give consumers an even greater reason to buy our products.

Another improvement that could be made with our final product is making it more advertisable to future consumers. This way, we could bring in more business which would mean more revenue. By gaining more revenue, we would be able to further our research into making our product a lot more better for our buyers. To make our product more advirtisible, we could show the many benefits that our products provides for an individual. We can showcase how our product is fine-tuned for the average individual. This means our product helps solve a wide-range of problems. This means our product appeals to a bigger niche of customers than previously thought. We can show how this product reminds the average person to take a certain pill on time. It can also help the individual that takes many types of pills because of our product’s versatility of being able to dispense different shaped pills. Our product also appeals to hospitals and clinics that are trying to help individuals that might be addicted to drugs because of the locking mechanism. Our product is the future of medication.

***Rishi Patel Whats Next Report***

For the future of this project we have many plans we thought of, from an hardware points of things the mains things we want to improve on is, quality of the product, size, cost, and simplicity. The first thing is quality. Right now we don’t have the resources available to create a product that is up to standards like other products. For this product we improvised and repurposed some things we had laying around in order to get the right components for the product.

The biggest thing from a mechanical side of this is looks and size. Right now our product is pretty small but it still doesn’t look like it can replace a pill bottle. The current design we have cannot hold as many pills as a real container so it will have to be refilled quick. A real pill bottle can sometimes hold hundreds of pills so we need to make our pill storage part of the product bigger but discrete. Out product looks short and stubby which is great on its own but as a bedside or portable product we need to find ways to make this look like any other pill bottle. The main reason we want to make it look like a real pill bottle is so that the user does not feel like they are limited and that they have to use different things than the majority of people. Making it look like just another pill bottle adds to the discreteness of the product. The Size of the product is general needs to be worked on.

As mentioned above we need to increase the container size but we also need to make the other components smaller. Since the logic is pretty simple we could scale down and use a basic custom board built for this product. This would not only reduce it in size but also cost as producing your own things is cheaper for a large scale application. Systems like the wiring, lights and vibrating motor can also be made into cheaper alternatives. Right now our product requires it to be plugged in to work, this is good for a bedside application but for the on the go user it severely limits them. This is a simple fix since all we need to do is add a battery for it to run on. Adding a batter will take more space however and it will complicate the circuity only a little bit so we have to look into more ways on how to incorporate it without sacrificing much

The cost of the product is something we need fix, with all the individual components the product is well over 70 dollars. Not many people are going to buy something that replaces something you get for free. Our product has to be cost effective since actual pill bottles take pennies to make and ours right now takes tens of dollars. Most people who are in need of this product don’t have the spending money to just buy a 70 dollar pill bottle. Some ways we thought of that tackle this problem relate to the simplicity of the product. The simpler the product is the less labor and materials are needed in order to create the product. In order to make the product simpler we have to tweak on our original design by removing unnecessary items and using more cost effective materials.

In order for any product to succeed it has to be consumer friendly. Right now our product works perfectly fine but it very rudimentary. It doesn't look the part nor does it function in a way that makes it smoothly run for the user. There are two type of people that will use this product. The first one being the person that sets the times the dispenser opens. This could either be the doctor or the pharmacist that fills the prescription. The software and the method used to fill the drugs need to be easy so that there is not a big learning curve when using this product. With this in mind we have look at the software we have and what we want to do with it. The software has to be user friendly and easy for the doctor or pharmacist to use. Right now it does that but more improvements to make it easier to run and have it upload the data to the product seamlessly is something we need to work.

One things we need to do more of as a group is research the topic more in depth and add minor things to our product that will better assist the people the using it. Things we can look into is people who have a history of drug abuse. This will help us decide the lock situation on the pill dispenser and make the product overall more secure. We should also look at other products already available on the market and improve off of those. Current products that try to solve this problem only tackle one aspect and we want to try to encompass all of those idea into one product. Seeing what other product have and don’t have can assist us on future development and allow us to think outside the box with more creative ideas.

Overall, we have a solid product that is very useful for the people who need it. For the future I hope we can develop on this product and make it almost market ready because I think this is product that many people need but isn’t available at an affordable option. At the begging while we were first developing the promeb we just thought of people who could not physically take the pills out of the people or if it is very difficult for them to take the pills out of the bottle. While researching we found out that this can not only help them but having an automatic dispenser can help people with amnesia and even limit the amount of pills people are taking. From reducing OD and drug abuse to simplify helping out the people take their medications, this product can do it all and with that the potential market for this product is huge. With further development and refinement on this product we will have a product that fits almost all the needs of a disabled person trying to take their medications.