proactiveparent

Be Involved | Be the Difference

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# Team $P^2$

<table>
<thead>
<tr>
<th>Name</th>
<th>Roles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jean-Paul Togbe</td>
<td>Final Report Editor/Writer, Final Video Participant, Application Developer, Presentation Creator</td>
</tr>
<tr>
<td>Karan “Kay” Singh</td>
<td>Videographer &amp; Video Editor, Final Video Participant, Presentation Creator, Application Developer</td>
</tr>
<tr>
<td>Richard Fricke</td>
<td>Final Report Writer/Editor, Presentation Creator, Application Developer, User Testing Coordinator, Interviewer, User Testing Videographer</td>
</tr>
<tr>
<td>Tejen Shrestha</td>
<td>Final Report Writer/Editor, Assistant Videographer, Presentation Creator, Application Developer, Website Developer</td>
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**Mission Statement:**

We want Proactive Parent to improve parental involvement in their children’s education by providing a very intuitive and user friendly interface; it aims at providing a mobile platform through which teachers and parents can come together and interact.
**Problem & Solution Overview**

Montgomery County Schools (MCPS) exclusively use Edline, a Learning Community Management System (LCMS), and it is the only system available to parents. While county school system administrators like the strong online infrastructure that Edline offers, the same feeling is not shared by parents. Parents often have to endure training seminars so that they can learn how to navigate the Edline portal. Many parents lead busy lives, so attending these time consuming training seminars may not be an option for them, so they may never use the system. Consequently, these parents could be unaware of their children's academic performance and be unable to take the necessary actions on time.

Even though some parents know how to use the system, they are not pleased by the amount of time and effort it takes to do simple tasks like checking grades or contacting a teacher. This is mainly due to the poorly designed user interfaces of the system. Another drawback of the system is the unavailability of the application for a mobile platform, so access to a desktop or laptop computer is required. Through our interviews, we learned that there were some parents who could not afford computers, however they owned smartphones. This information revealed that some parents who want to be more involved in their children's education could be at a disadvantage, therefore it supports the need of a smartphone application such as Proactive Parent (P2).

The P2 solution focuses on providing parents with the convenience, ease of use and satisfaction that Edline fails to provide. Many smartphone owners use social media applications like Facebook and Twitter, even though they are not forced or obligated to do so. They naturally use those applications because it satisfies their need for a specific type of information in a very user friendly way. We want to promote the same motivation when parents use P2 by implementing only the features and functionalities important to parents and students. P2 will provide parents with a user friendly interface that will allow them to check their children's grades, assignments, and find help quickly and effortlessly. More importantly, P2 will be accessible from any smartphone or tablet with internet access, so it will be able to serve more parents than Edline.
**Background & Review of Past Work**

Information systems are not uncommon among schools across the nation. Before P²’s development, we needed to learn more about the current systems that existed, what they did well, and what needed to be improved in order to make our application better. From our research, we learned that different schools use different systems. For example, Montgomery County Public Schools (MCPS) uses Edline, Hyattsville Elementary School in Prince George’s County uses Parent Connect, while other schools use Edvance, and Pinnacle. But, the most popular system is Edline, although it suffered from many flaws just like its counterparts. This motivated us to create an application that was devoid of the flaws present in those systems and purely focus on parents. Therefore, we began implementing our ideas that now makeup P².

One of the major problems with the current systems is that they are outdated, user unfriendly and require training. The interfaces in these systems are very cluttered with a mix of useful and useless information. Although there is a wealth of information being provided by these systems, the the way it is presented overwhelms the user and even confuses them sometimes. It is because of this that we decided it was necessary to limit the amount of information presented on each screen of our application, and make the text and buttons bigger and easier to see. With this adjustment to our design, P² would be user friendly and easy to use, even for first time users.

Simplicity has also been an issue with systems such as Edline. Schools have had to hold training seminars for parents and teachers to teach them how to use these applications. The amount of effort that is needed by parents to check their student’s grades, assignments, or attendance is discouraging and could potentially drive them away. A good system should be intuitive and easy to use. One complaint that we received regarding the Edline system was related to the grades feature. While conducting surveys to gauge the responses towards the current systems, we spoke with a parent who believed that the way the Edline system presents his child’s grades was overwhelming [2]. He then went on to state that it would be much simpler if the system allowed him to view the overall grades for each subject before showing the detailed grade report [2]. In this case, the Edline system confused the user as he felt that he needed to really interpret the information to actually figure out his child’s grade.

Due to the unavailability of a mobile application, some parents who do not have access to a personal computer or laptop are unable to use systems such as Edline. These parents are at a disadvantage because they are unable to access the same wealth of information as other parents. These parents are forced towards calling or visiting the schools in order to attempt to retrieve information on a timely basis and with time constraints, this is not a desirable option.
Our interactive prototype was created using the JQuery Mobile framework, HTML 5, CSS 3 and Javascript. Originally, we wanted to create a native application for Android devices, but all of us were inexperienced with Android development. Also, another problem with a native application is that P² would have been limited to users with an Android smartphone. Therefore, we decided it was best to develop a mobile Web application instead. With this method, there was only a small learning curve and it made developing our interactive prototype more feasible, given our time constraint. More importantly, it makes P² work on any mobile device, including tablets such as the iPad.

The main source code for P², besides style sheets, is contained in a single file. We did this to make the transitions between views much smoother. Originally, we used separate files for different views but we noticed some lag and jittering during page loads and transitions. We assumed this was due the extra time required to fetch the correct file containing the code. Including all the code in one file improved the load time of pages and made the transitions smoother.

We found it helpful to use the buttons and other interactive elements provided by the JQuery framework. Although this made our interactive prototype look slightly different than our lo-mid fidelity prototype, the interactive elements provided by the JQuery framework are the Web standard and users are more familiar with them. So, using the framework helped us provide the correct affordance and improve user interactions.

Although the current version of P² is interactive, it is purely a prototype. This means that many features were only implemented to give users an idea of the way the application would work.
Since we do not have access to MCPS’s student database we had to create fictional students and hardcode their information such as names, subjects they are enrolled in and their current grade in each subject. However, for the “subject help” function, we implemented some Javascript code that determined the subject selected by the user and then performed a Bing search query using the user’s selection. Then, the relevant search results were displayed to the user. The email part of the “get help” feature does not actually email a teacher or anyone. It is there simply to show the way a user would be able to contact a teacher. But, we do provide a fake confirmation page after the fake email is “sent.” The assignments shown for a student are also hard-coded, since we do not have access to that information either. But, this was necessary in order to show our users the examples of P²’s most important features.

Checking grades was one of the three tasks our participants tested. A user would start by entering his/her credentials to login (figure 1, left), then, from the “Child Selection” page (figure 1, right), select one of their children. After this action they would be taken to the “Home” page (figure 2, center) for the selected child. Since checking grades is the task, the user would touch the “Grades” button (figure 3, left). This action would display the page containing the overall grades for all the subjects for the current student (figure 3, right).

Figure 2: login and selecting a child
The last step, viewing a detailed report for a subject, is an optional step for the user. However, this can be done by simply touching the button corresponding to the subject or grade. This would reveal another level of detail showing the scores for each assignment, quiz or test (figure 4).
The next task is checking assignments. A user could simply touch the “Home” button from the current page (figure 4) and they would be returned to the “Home” page for the current student (figure 3, left). From the home screen, the user would select “Assignments” which would display the subject list (figure 5, left).
To view the assignments, the user would touch the corresponding subject and be taken to the “Due Dates” page (figure 5, right). In this example we are assuming that the user chose to view assignments for Algebra. So, the next page displays the assignment names and their due dates.

To start the next task, finding help, the user has two options. If the user wanted to get help with Algebra, he/she can simply select one of the assignments from the current screen (figure 5, right). Let’s assume that the “Worksheet 3” was selected. After this selection, the preview for that assignment is displayed (figure 6, left).
To get help, the user would press the “Get help” button. Then, $P^2$ would search for helpful resources that are relevant to the assignment and display the results to the user (figure 6, right).
Testing Method

Participants
In order to be sure that we had successfully created an effective system, we needed to find the right participants to test it. Specifically, the participants had to be parents of elementary or middle school children that had experience with smartphones. As parents, they know what information they need in order to be fully involved in their children’s education. Our participants consisted of a school teacher and a mechanic, both of them had kids in middle school and owned smartphones, but it was especially important that we received feedback from the teacher. Our system will require that the information is updated regularly in order to remain effective, which introduces issues with a possible increased workload for teachers and school officials. It is our goal to make the system easy to use for both parents and teachers. Parents must be able to easily check their student’s academic information, while the teachers should be able to update it effortlessly.

Figure 7: Test user using application on his Blackberry smartphone
Study environment

One of the most important features of our system is that it is platform independent. This means that it will work on any smartphone or tablet. However, the system will mostly be used in areas where a computer is not easily accessible. Therefore, we tested the application generally in areas where the users were just living their everyday lives. We watched as the mechanic used the application in a garage, and while the teacher was simply sitting on her front porch. The environment in both of these situations would easily be the type of surroundings that these users would normally use our application. There were no desktops or laptops in the immediate area, and therefore both situations warranted the use of a smartphone to access any kind of remotely accessible information.

Tasks

Our solution provides many different tasks that parents can complete in order to obtain information about their children’s education. When conducting our user tests, we needed to be sure that they could easily complete each of these tasks. These tasks included finding their child’s grades, checking assignments, emailing the teacher, and looking for help with a subject. Each of these tasks were provided with fictional information about a fictional student named Andy.

The first task that was tested was the grades feature. The testers needed to figure out how Andy was performing in his studies. As referred to earlier, we received some great feedback in our contextual inquiry phase that helped us build this aspect of our application to be as simple and easy to use as possible. The parent we spoke to in our surveys conveyed the fact that the Edline system was too complicated when it came to checking grades, and that when he checks his children’s grades he would much rather be given the overall grades first, with details as an option [2]. Using this feedback, we created the task to show the overall grades for each subject first. We used a color scheme, with lower grades colored in red and the others in green. The parent can then select a subject to see the detailed grade report for that subject.

The next task that we covered was viewing the student’s assignments. The purpose of this task is to provide parents with insight about what their child has to do in order to keep up with his/her studies. If the student is struggling in a subject, it may be in the parent’s best interest to check up on their child’s assignments to make sure that they are getting done in a timely fashion. After seeing the actual assignments and the dates in which they are due, the parents can then select the assignment and actually see its details.

A third task we included in this system is the subject help feature. During our interview with the principal of Hyattsville Elementary, we were told that many parents call the school each day asking how they can help their children with their studies at home [1]. Most parents are far separated from the subjects that their children are taking in school. When these parents attempt to help their children with their assignments, many of them find that they cannot
remember the material. This feature allows parents to select a subject they would like to help their children with and then have a list of helpful websites and videos provided to them that will allow them to fully understand the material themselves.

**Procedure**
Without the correct procedures for our tests, we would not have been able to receive the best possible feedback for our application. Our group split into a few different roles before completing the tests, allowing us to log the results, record the video for the experiment, and help the users understand what they needed to do. The video recording for the experiments was done by Kay, while Richard served the purpose of facilitator, and Tejen and Jean-Paul logged the critical information of the test.

The first step of the test was to have the user open the application in the browser on their own smartphone. This actually served a purpose for our experiment because we wanted to see how the different pages looked on different smartphones. Because our application did not have their actual children on record, we needed to inform the users that they were going to assume that they were searching for academic information on “Andy.” They were informed that the tasks they needed to complete included finding Andy’s grades, then looking up his assignments, and finally, searching for help with the subject, which in this case was Algebra.

While they interacted with the system, we had the users narrate their feelings towards different aspects and tell us what their next step was at each point in the test. Any important information received from these opinions and logical steps were logged. If the user made an error, such as touching the wrong button or misunderstanding information, we made a log and then guided them towards the next step in the application.

**Test measures**
We want to make the front end of our application as user friendly as possible. Users should be able to navigate through the system in a natural and intuitive way. Based on the feedback we received from the first round of user testing, we went back and reiterated on our design. We took into account many factors upon completing our second round of user testing. These factors would be indicators of how successful we were in making P² a better application. Our first indicator was how intuitive P² is. Some of the questions we asked ourselves included: “Was the user able to easily identify the goal of the application?” “Was the user able to navigate through the application without any directions?” By answering these questions, we wanted to make sure that our primary goal of appealing to our potential users was met. Another aspect we noted was the amount of time each of our participants took to complete their tasks. For testing purposes, we had them complete a set of three different tasks rated low, medium and high difficulty, respectively.

The simplicity of our design approach aims to make every task a user would ever have to complete as easy and fast as possible, no matter what level of difficulty the task is. As a matter of fact, we only recorded how easily they performed each of the tasks regardless of the tasks’ level of difficulty. We also kept track of their level of satisfaction at each level of interaction. If
they performed an action and did not get the result they had expected to get, then this was an indication that our design had failed. We received a wide variety of results, as every participants performed differently from one another. We gathered all of the information above, in addition to any information or suggestion that the participants may have given us to improve the design of our application.

**Testing results**

After completing the user evaluations of our interactive prototype, we were very pleased with the results. The users were able to navigate through the application with ease while also providing us with great feedback about possible additional features, positive aspects, and improvements. We were able to record each of our participant’s feelings towards the system and through their actions while using the system, we were able to pinpoint some possible flaws with the interface.

With the users opening the application on their own smartphones, we were able to see how each specific page looked on different sized screens. As a result, we found that the system reacts somewhat differently depending on the smartphone. The user in figure 7 had the application running on a blackberry smartphone. During his use of P^2, we noticed that the size of the screen had an effect on the look of our interface. The text and buttons provided on each screen looked much smaller, and at times it was hard to read. While there were no visible flaws in the interface with positioning of elements, the readability of text was a concern.

Another situation that presented itself during our tests was that in some areas the wrong affordance was provided. In one case, the user was searching for Andy’s grades and upon reaching the detailed grade report, he wanted to touch the assignment with a zero-grade in order to check the details of the assignment. The problem in this situation was that there is no option to go any further from that point in the application. If the user wants to find information on their child’s assignments, they would need to go to the assignments section of the application. This action leads us to believe that the wrong affordance was provided to the user as to whether or not they could touch the assignments to view them.

There was also a question of overhead brought about by one of our testers. The tester was both a parent and school teacher. She believed that the idea of the system was great and is important in allowing parents to have access to their student’s information, but she also questions the amount of overhead it would create for teacher. The workload would be increased for teachers in attempting to maintain the information provided by P^2. The point of the application is to make academic information easy to access for parents. However, it is important to keep in mind that it also needs to be easy to maintain and update. The system is only as useful as the information that it provides, and if the information is not able to be uploaded quickly and easily, the application most likely will not be updated very often.

Despite the errors, the overall reactions towards our application was positive. The users felt that the application is a necessity, and they even inquired about P^2’s release date. They felt that it was easy to use, smooth, and provided the correct information in a simple and understandable manner. Watching their actions while using the application reiterates this point, as in most
situations, they were able to navigate through the application without trouble and even react to the information that was given to them.
Suggested interface revisions

Figure 2, figure 3 and figure 4 show the evolution of the design of one of the pages of our application during the three phases of the evolution of our prototype.

Figure 2 represents the very first sketch of what we had envisioned our page to look like. Based on this page, we created a mid-fidelity version which we later used in our first round of user testing. The version we created is represented in figure 3. This is the page our users would be presented with if they wanted to check a student's grades. Checking grades was one of the three tasks we asked our participants to perform. What we had originally intended was for the list of subjects shown on the page to be selectable, meaning that the user would be able to select or press one of the subjects and see a detailed report of the grade in the next screen. However, when the users were presented with this page, it was not obvious to them that they could touch a subject and proceed further into the application. The page did not provide the proper affordance to the user, therefore our design for this particular page was a flaw we had to fix.
Figure 4 is the revised interface for the grades page. As it is shown, we took into account the fact that we needed to make the subject buttons look more “clickable” in order to provide the proper affordance. Although the text font is slightly smaller than in the original design, each subject now has an elevated structure that makes it look like a “clickable” button. Again, our new design, just like the old one favors simplicity.

![Revised prototype of grade page](image)

**Figure 4:** Revised prototype of grade page

We noticed that this issue was reported by our testers on other pages as well. For example, figures 5, 6 and 7 also show the evolution of the home screen from a low to high fidelity prototype. When the users were presented with figure 6 they were confused. “Are we supposed to click on the images?”, “Should we click on the links below the images?” were some of the questions they asked us. Figure 7 is the redesigned version of the home page. We put emphasis on the fact that it should be intuitive for our users to select a topic without wondering if they could or could not. We also changed the background color on both designs to make the appearance of a button more noticeable.
Figure 5: Sketch of home page

Figure 6: First prototype of home page

Figure 7: Revised prototype of grade page
It is important to note that these are the major modifications we made to our interactive prototype based on user feedback. We also made some minor modifications to improve readability, clarity and to prevent as much confusion as possible. We changed the “Homework” button to “Assignments”. This was also one of the many language suggestions some of our participants made. We added an “email” and “help” section to the homepage that way a parent can get help or contact the teacher once he/she is on the home screen. Therefore, it reduced the number of steps required to complete a basic task.
Summary Discussion & Lessons Learned

Overall, all of us would agree that this project as a whole was a valuable experience. When we started the project, we had a vague idea of what we wanted to accomplish and how our final product would look like. Most of us had no idea whatsoever about the design, cycle and amount of work that goes into going making an idea a tangible prototype that can be tested on potential users.

As we learned that sketching is very important in the design process, we first sketched out our ideas. It helped us bring the imagery and vision into the real world. It also helped us see some of the limitations of our design and how to overcome them. The next part after sketching was designing our first low fidelity prototype. The mid fidelity prototype followed shortly after. This exercise was very enriching as we reiterated on our design at each step of the process. We would try different layouts, different colors, and different naming conventions all for the sake of making our design as appealing to users as possible.

The next step would be the biggest challenge of this project: user testing. User testing is great. This is where we make our product, at least the mid-fidelity prototype version of it, available to the public. At this point, everything has been designed by the team and we had no idea what the users would think of it. The idea of people seeing our product and critiquing it for the first time created mixed feelings among us. We were excited and nervous at the same time for we had no idea what to expect. We were to interpret every piece of feedback we received from our user test participants as constructive criticism aimed at coming up with a better design; after all, we were making an application for our users, not for ourselves.

Armed with a substantial amount of feedback from our first test, we went back and revised the design from our prototype. All participants had different views and suggestions. The hardest part during this step was to combine all of them together as to accommodate them all. Our high fidelity prototype was finally taking shape and was ready to be implemented into an interactive prototype. At this point we had to choose the programming languages to go with. We decided to go with HTML5/CSS and JQuery mobile. We encountered some problems while implementing the interactive prototype as this was the first time some of us had ever used JQuery mobile. However as any programmer would have, we learned a great deal from our mistakes and our failures and it made us better programmers. The interactive prototype came with a great deal of satisfaction. Finally all of our efforts and all of our work was taking form. All that was left was the second user testing with our interactive prototype. This stage of the project also went well and the users were better able to navigate more intuitively and naturally throughout the application.

The best part of the project for all of us was that we got the chance to do all of this while working with great and amazing team members. We learned new concepts and we had the opportunity to interview and interact with different people with different background. It was challenging sometimes as we got mixed results but we kept pushing on. As a team project, we had to learn to collaborate between each other. We had to learn to respect each and everyone’s opinion and
learn how to depend on others in order to achieve something big, something that we could all be proud of when the journey ends.
**Website report**

Our Web page is very simple and contains only one page. It is also hosted by one of our group members, Tejen Shrestha. We used a sub domain for the P2 website so we did not have to buy a domain name. The Web site is live and publicly accessible.

For simplicity, the website was created using HTML 5, CSS 3 and part of the JQuery UI framework which was used to create the “accordion” styled menu. The main purpose of our Website is to demonstrate P² and its functionalities. In order to fully portray these functionalities we embedded the application into our website, in which it functions exactly the way it would on a smartphone. We achieved this by simply adding the application’s URL inside an iframe tags. Since P² is not distributed to any users, our web page would let potential users test it.

Our Web page also contains links to all of our documents that we created during our design process. These documents include our proposal of P2, “User Research, Task Analysis, and Sketching,” “Task Refinement, Storyboarding, and Video Prototyping,” “Lo-to-Mid Fidelity Prototype Testing and Refinement,” and “Interactive Prototype and User Testing.” Links to our videos are also available on our website. We wanted our website to represent the simplicity and ease of use P2 provides. I think we accomplished this by providing all the information in a single page without having a cluttered look.
### Appendix B: Raw Data

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<tr>
<th>User</th>
<th>Task</th>
<th>Severity Rating</th>
<th>Details</th>
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<td>1</td>
<td>home screen</td>
<td>1</td>
<td>“I would love to have an application like this.”</td>
</tr>
<tr>
<td>1</td>
<td>subject guides</td>
<td>1</td>
<td>“This is a nice page.”</td>
</tr>
<tr>
<td>1</td>
<td>grades</td>
<td>3</td>
<td>user attempted to touch graded assignment</td>
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<tr>
<td>1</td>
<td>home screen</td>
<td>3</td>
<td>elements on blackberry phone seem somewhat small</td>
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<td>2</td>
<td>home screen</td>
<td>1</td>
<td>“This is a great idea. Something all parents should want.”</td>
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<tr>
<td>2</td>
<td>home screen</td>
<td>1</td>
<td>“When you putting this on the market.”</td>
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<td>2</td>
<td>assignments (detailed)</td>
<td>4</td>
<td>“I'm a little worried about the workload this will put on teachers.”</td>
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<tr>
<td>2</td>
<td>subject guides</td>
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<td>“This is good. Now I can get help and help my son.”</td>
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<td>assignments</td>
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<td>2</td>
<td>home screen</td>
<td>2</td>
<td>hit back button to go to homescreen instead of home</td>
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</tbody>
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References

1 - Ms. Washburn. Personal interview. 1 Mar. 2012


