



User Created Map Content

Final Report - Spring 2011

I PRO 305



Sponsored by NAVTEQ and IIT

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Executive Summary

This semester IPRO 305's primary focus was to aid NAVTEQ in developing a procedure to produce accurate user-generated map content. User-generated map content is a type of data that is in depth in detail and in nature and which is obtained by a user reporting on features of their community. To improve on the framework of last semester's work, the IPRO 305 team and NAVTEQ decided to target middle school students as their subjects in creating quality data. After recruiting schools to participate in the project, the next and most critical objective was to create a competition that would keep students engaged in generating map content for NAVTEQ.

After meeting with NAVTEQ in early January, IPRO 305's initial task was to find schools that would be interested in the idea of producing user-generated map content. This required the team to initiate conversations with all local middle schools in the Chicago area, attend various meetings with principals and district leaders, and ultimately sell the idea of the project to the middle schools. After the recruiting process, the team had to create internal sub-teams to coordinate their respective activities throughout the semester. The training team had to develop a user-friendly data entry system for the students to submit map content. NAVTEQ provided a web-based user-entry system called Ushahidi. The training team worked on improving the tools, ease of access, and ease of use of this platform throughout the semester. The deliverables team was in charge of producing all content given to the schools and the students as well as the deliverables required by the IPRO office. Finally, the competition team was given the task of structuring a competition that would be fun and exciting for the schools and also beneficial to NAVTEQ in generating quality in-depth map content.

As soon as the IPRO 305 team determined the goals and objectives for the semester, the team knew that recruiting schools to participate was going to be a difficult task. The team and NAVTEQ collectively decided that the best-selling points included exploring one's community, working with a

corporate sponsor and college students, participating in intra- and inter-school competitions, and lastly having an awards ceremony with prizes at NAVTEQ's downtown headquarters. One potential question still lingered, and that was, 'How can we put this project into our curriculum?' The I PRO 305 team had to analyze many potential questions, covering all possible angles, before making their final sales pitch to the interested schools, ultimately deciding that the competition would be an after-school activity. After acquiring schools, the team's next challenge centered around the schools' schedules. Each school had public standardized testing that ran from February through mid-March, and the I PRO team had to structure a competition around those dates. Another issue arose when the I PRO team had to deliver the detailed student packets to the schools and could not print them due to the I PRO office's closure during Spring Break. Due to great leadership and individual sacrifices made by the team, each challenge was met with due diligence and eventually conquered.

The I PRO 305 team found success in every phase of the project from the outset of the semester. Using all of its possible resources, the team attracted three middle schools, comprised of twenty students each, in the Rogers Park community that wanted to be a part of the project. Working with the principals, Otis Dunson of George Armstrong, Antigoni Lambrinides of West Ridge, and Christine Jabbari of Philip Rogers, the I PRO team devised an after school program in which each school would participate. After school, students along with two faculty members would survey Rogers Park and collect as much information as they could on parks, restaurants, buildings, stores, etc. Using the outline created by the competition team, the I PRO 305 team and NAVTEQ founded the Ultimate Map Challenge (U.M.C; ultimatemapchallenge.com). The U.M.C utilizes a point-based scoring system, with bonus points awarded for additional information and pictures. To ensure the accuracy of each data entry, students were required to submit at least one picture, with an address and GPS coordinates attached, in order to be validated. The inaugural U.M.C has already provided NAVTEQ with over 500 data entries in four weeks of time. At the conclusion of the competition, NAVTEQ hosted all the students, teachers, and

parents from the three schools for an awards ceremony where the inaugural winner would be announced. Moving forward, the I PRO 305 team feels that they have successfully laid out a strong foundation for the U.M.C in future semesters.

The I PRO 305 team feels that with some minor changes, the U.M.C can expand to other areas in the region and attract more schools to participate in the U.M.C. Ushahidi proved to be a great tool that was easy to monitor and use this semester, but it may be insufficient in handling an expanded U.M.C next semester. Development of a similar website with more capabilities could prove to be very beneficial in the future. The team also believes that expanding the IPro team itself to more team members would be necessary when working with more schools and students. Overall, the team learned that the idea of user-generated map content can work and that the U.M.C has great potential to become a national competition that would aid NAVTEQ in improving their map content.

Purpose

Navteq considers the accuracy and detail in their maps to be their top priority, but traditional methods of gathering map data, such as the use of survey teams, can be quite time consuming and expensive. Worse yet, often by the time a survey team has finished canvassing an area and processing the data, a substantial percentage of the newly gathered information has been made obsolete due to changes within the region.

One of the most promising ways to mitigate these problems is by gathering additional information for the Navteq database via the use of crowdsourcing. Crowdsourcing for map data is essentially the deputization of local community groups to gather regional data on behalf of Navteq.

It is the long-term goal of IPRO 305 to research and develop new and innovative methods of crowdsourcing this data for Navteq, as well as to research cost-effective incentives for participating in the crowdsourcing process.

This semester, Navteq has tasked IPRO305 with creating and launching the inaugural Ultimate Map Challenge, an inter-school competition between middle schools wherein the winner will be the school that crowdsources the greatest amount of data by the end of an allotted period.

This first pilot program will serve as a testing phase, enabling IPRO 305 to see what worked and what can be improved upon for future semesters. The hope is that this first iteration of the Ultimate Map Challenge will provide a wealth of information allowing both IPRO305 and our partners at Navteq to analyze the relationships between the detail, relevance, and quantity of the gathered data with the competition participants, rules, and incentives.

Objectives

This semester IPRO 305 had many objectives to accomplish in order for it to be a successful IPRO. The main objectives for the semester were to recruit several schools to participate in the competition, devise a competition structure, maintain a data entry system, oversee the competition, and analyze competition results.

Recruit Schools

The first objective of recruiting several schools to participate in the competition was also the most important because without the schools' participation the competition would not have been possible. In order to accomplish this objective IPRO 305 first needed the approval of each school's principal or other administrator. Then, we had to find teachers that would lead the competition at each school and would keep the students engaged in the competition. The school administrators then found students that would want to participate in the competition. Throughout the semester, IPRO 305 also continued to investigate other possible schools to compete in the competition in future semesters.

Devise a Competition Structure

The second main objective was to devise a competition structure that the schools could follow. The competition rules were first decided upon, as these decisions would affect how the competition would be run. Next, the competition scoring system was decided based on the previously determined competition rules. IPRO305 also needed to determine competition

prizes that could be used as incentives for the students. Depending on these incentives, the students may or may not have been more involved in the competition.

Maintain a Data Entry System

Another main objective of the project was to maintain the data entry system. This task included configuring the Ushahidi website so that it could be used for the competition, finding any bugs in the system and reporting them to proper personnel so that they could be fixed, and preparing a user's guide. The students were trained on how to enter data onto the competition website and were given copies of the Ushahidi user's guide to use as a reference.

Oversee Competition

The fourth main objective was to oversee the competition in its entirety. This included validating the entered data and updating the scores for each school. This also included periodically meeting with the schools to check on their progress throughout the competition. IPRO 305 was also responsible for addressing competition questions or concerns that came up during the competition.

Analyze Competition Results

The last main objective was to analyze the competition results. This included gathering all the collected data points and determining the winner of the competition. IPRO 305 would also identify what appeared to work during the competition and what issues came up throughout. IPRO 305 would then provide recommendations for future semesters based on this analysis.

Team Organization

The IPRO 305 group was broken down into three subgroups that dealt with a vital part of the overall group project. Each subgroup was coordinated by our team leaders and faculty advisors, as well as receiving direction and guidance from our NAVTEQ liaison.

The three groups were as follows: Training, competition, and deliverables. The training team dealt with the Ushahidi program, handling the interface development as well as working with the back-end of the program. The training team also supplied a step-by-step guide for proper use of the Ushahidi site to the participants.

The competition team handled the inner workings of the UMC, creating and fine tuning the contest. In addition, they (along with members of the training team) dealt with the upkeep of the contest as well as recording and updating the scores daily.

The deliverables team was in charge of the output of any materials required by IPRO 305. Taking the input provided by the other various teams, the deliverables team crafted and refined it into a professional and pleasing format for publication to the participants and NAVTEQ.

In addition to the above groups, there were also three very important roles on the team, the team leader, the schools sub-teams coordinator, and the minute taker. The team leader was responsible for creating meeting agendas, conducting meetings, interacting with the NAVTEQ liaison, keeping track of deadlines, and any other small tasks that weren't assigned to a specific group.

The schools sub-teams coordinator was responsible for interacting with the schools for the competition as well as keeping track of team members responsible for specific schools and scheduling visits. Various members from the three main groups also participated in a specific school team, being the liaison between that school and IPRO 305, handling contact and fielding any problems or issues that arose.

Lastly, the minute taker was responsible for recording all notes and relevant discussions during every meeting, taking attendance, and keeping track of the budget.

Project Monitoring

IPRO 305 coordinated the project under the watchful eyes of our team and faculty leaders. Through bi-weekly meetings, all members of the team gathered together to discuss the current tasks of the project, as well as future events. Tasks were created and doled out, dividing the work evenly and fairly between each team member.

Our team and faculty leaders remained in constant communication with our sponsor, offering weekly updates as to our progress. Any relevant feedback was immediately put into use by the team.

During the actual implementation of the competition, weekly status reports were sent out to the participants, informing them of their standings in the competition. In addition, the IPRO team promptly handled any issues that occurred, relating the outcome in a timely manner.

Approach

In order to carry out the project, our IPRO team contacted three schools to participate in the Ultimate Map Challenge (UMC). Here, points would be awarded to the school based on the quality of data submitted. The point system itself will be explained in greater detail later.

To entice the students to submit data, we held four weekly competitions as well as an overall competition. Each week would have a bonus category, where POIs submitted would be worth additional points. At the end of that week, the school with the highest amount of points gathered for that week would receive a prize. The weekly prize that was decided upon was a \$15 Best Buy gift card for each student that was a part of the winning team.

The overall winner would be calculated by taking the sum of all points gathered during the four weeks. This winner would be recognized at the NAVTEQ awards ceremony at the end of the competition, they would also receive a trophy in honor of their efforts.

To gather data, the IPRO 305 team used a modified Ushahidi server to store our data. Here, the participants could submit data and our team could verify and accept the data. Because the competition was a week long event, we divided up the work between our team, having one person verify and score data for their assigned day. In order for a POI to be scored and verified, a set of criteria needed to be met. Failure to meet the criteria resulted in a deletion of the POI.

When creating the competition, the I PRO team provided our rules and regulations to the schools, but ultimately left it up to them on how they would structure their data collection methods.

The long term goal for I PRO 305 is to expand the data collection process on a larger scale, providing NAVTEQ with not only marketing and publicity materials, but also data input. In order to do this, refinement will be needed on the competition model, as well as the method of gathering and storing data. While the Ushahidi interface was acceptable for a small-scale project, a different program will be needed for a larger scope project.

Analysis and Findings

This IPRO semester's goals included designing an experiment, conducting a trial run of that experiment, analyzing the experiment's results, and providing guidance for future semesters to continue to improve the experimental design and the experiment schedule itself in the hopes of expanding the experiment in the future. This section describes the results of our attempts to complete each goal.

Experiment Design

The primary goal of this experiment is to determine what incentives work best for young students (middle school level) to contribute map data to NAVTEQ, along with what data types they are most likely to find. In this experiment, three schools will be recruited to collect data. Each school will have one group consisting of about 20 students.

During the course of this experiment, the students will be offered incentives intended to motivate data collection. Data contributed by the students will be recorded for the purposes of data analysis.

The incentives for this experiment are based on a point system which awards a specific amount of points based on the data type along with how in-depth and unique the POI (point of interest) is. The point system is as follows:

- 5 points are awarded for a POI with at least one picture, an address or location, business name, and name of the student submitting the data, if the POI fails to meet this criteria,

it is considered invalid and deleted

- 3 additional points are awarded for a POI that falls into the bonus data type category for the week that it was submitted
- 1 additional point is awarded for a POI that includes additional (and unique) pictures
- 1 additional point is awarded for a POI that includes a detailed description of the POI
- Duplicate POIs are not scored, unless they expand upon a previous POI
- A maximum of 10 points can be achieved for a non-duplicate POI
- A minimum of 5 points can be achieved for a non-duplicate POI
- If a duplicate POI is submitted and it contains additional information, points are awarded based on the additional information (1 point for unique extra pictures and 1 point for a description or improved description)

Data types for this experiment can be defined as a group of similar POIs, there are five data types for this experiment. Specific data types are implemented in this experiment to aid in analysis as well as to add a strategy for the competitors. The data types that will be the focus of this experiment are,

- Arts, History, and Culture – any point that carries historical or cultural significance (ex. Statues, religious buildings, ethnic restaurants, museums, etc.)
- Entertainment and Shopping – any point where one can exchange money for goods or pay for entertainment (ex. Movie theaters, restaurants, clothing stores, electronic stores, etc.)
- Services and Public Points – these points include places that provide public services as well as private services (ex. Doctor's offices, bus stops, post offices, auto repair, etc.)
- Parks and Recreation – places where individuals can play, exercise, or relax (ex. Baseball fields, bike trails, basketball facilities, parks, etc.)
- Other – any other place that may not fall into one of the above categories

The incentives portion of the experiment was divided into two categories, weekly incentives and an overall incentive.

1. Weekly Incentive: Equal incentives given to each student of the school that accumulates the most points week-to-week
2. Overall Incentive: An incentive awarded to the school that accumulates the most points over the life of the competition

To determine which data types are most prevalent or which type students will find the most, the competition will be broken up into four weeks, each week offering bonus points for a different data type. All three schools will receive bonus points for the same data type each week. The weekly incentive remains the same each week. The four week experiment details are listed below:

Week	Bonus Data Type
1	Entertainment and Shopping
2	Arts, History, and Culture
3	Parks and Recreation
4	Services and Public Points

The results analyzed in this experiment will be the point totals for individuals and schools, the amount of each data type collected from every school, both broken up into weekly and overall totals. The results will be compared to see if any trends occurred in data collection.

Trial Experiment

One of this semester's goals, for IPRO 305, is to conduct a trial run of the data collection experiment, and identify potential difficulties. The experiment was implemented based on the experimental design presented above.

Some difficulties were encountered during the experiment. The data collection method desired by NAVTEQ was a web-based application called “Ushahidi”. NAVTEQ supplied 25 Nokia N97 phones available to students that did not have a phone (in order to take a picture to submit with their POI data). However, for students with newer phones, some of the pictures they took were too high of a resolution than the website would accept, causing the POIs to not count (since no picture appeared on the POI submission). To solve this problem, we instructed the students to reduce the size of the photos so that they could be accepted along with the POI data. Any other issues students had were resolved through an email account setup by the IPRO team allowing team members to answer any questions students or teachers had as quickly as possible.

Another difficulty included team member duties in verifying submitted POI data from the students to Ushahidi. Checking for duplicates was time-consuming and we also had to be aware of potential dishonest POIs that involved pictures taken from the Internet being used for a location that a student did not visit in person.

As mentioned earlier, three schools participated in this experiment. For this experiment, the following incentives were offered:

1. Weekly Incentive: Schools were informed at the start of the new week as to which school won the previous week. Each student of the school that won the weekly competition received a \$15 Best Buy gift card.
2. Overall Incentive: A trophy was awarded to the school that accumulated the most points at the end of the competition for all four weeks combined. The intent for this was to have a trophy reward that would be passed around between schools in future semester-long competitions.

The weekly bonus data types went according to planned as outlined in the Experiment Design section, the dates are listed below along with the winner for each week:

Week	Dates	Bonus Data Type	Winner
1	3/21/11 - 3/27/11	Entertainment and Shopping	Philip Rogers Elementary
2	3/28/11 - 4/3/11	Arts, History, and Culture	Philip Rogers Elementary
3	4/4/11 - 4/10/11	Parks and Recreation	Philip Rogers Elementary
4	4/11/11 - 4/17/11	Services and Public Points	Philip Rogers Elementary

Data Analysis for Trial Experiment

There were about 20 students per school for the experiment, the three schools involved were Philip Rogers Elementary School, George Armstrong International Studies Elementary School, and Westridge Elementary School. All students submitted their data through Ushahidi and all data was inspected and either accepted and verified or rejected by team members of IPRO 305.

The school that accumulated the most points over the four-week period was Philip Rogers school with 2257. George Armstrong finished in 2nd with 1035, and Westridge finished 3rd with 783 points. Three students (all from Philip Rogers) achieved at least 350 points during the entire competition, with the highest point total being 579 points by one student.

There appeared to be a dip in the overall point totals from all three schools combined as the competition moved along. The week one combined point total (for all three schools) was 1935 points, week two was 719, week three was 613, and in the final week all three schools combined for 808. However, Philip Rogers remained steady in their number of weekly points (detailed point totals for this are shown in Appendix 1). Further details of the results of this experiment can be found in Appendix 1.

Conclusion

I PRO 305 ran a successful competition between three middle schools in the Rogers Park area called the Ultimate Mapping Challenge. Philip Rogers Elementary was the ultimate winner of this competition with 2257 points. The school in second place was George Armstrong Elementary with 1035 points, followed by West Ridge Elementary in third place with 783 points. The competition was very successful in gathering many points of interests in the Rogers Park area, and the students had a fun time exploring their community and learning things about it that they never knew.

However, several key issues surfaced during the competition. One of these issues was that the students were a little confused about the competition rules and did not initially understand what a valid point of interest consisted of. Some students would submit pictures for the POI from the Internet instead of taking their own picture which was a requirement for the competition. Also some students would misidentify the category of their POI in order to get the bonus points.

There were also issues with the physical boundaries set for the competition. West Ridge Elementary was located near the lower boundaries of the Rogers Park area so it was hard for those students to submit points of interests within the specified boundaries, especially near the southern boundary of Devon Avenue. Several points were submitted that were located below this demarcation and one of the teachers complained.

The most significant issue encountered was declining student engagement throughout the competition. As the weeks went on, fewer and fewer students participated in the competition.

We believe this decline may have been a result of the way students were gathering the points of interests. Some students went out and walked around Rogers Park as a group to collect data while other students were simply left to do this on their own time, often resulting in points of interest whose information came from the Internet.

The scoring system was also an issue during the competition. We discovered that the base point level for a valid POI was too close to the point levels being given for POIs with much more detail. Because of this, the scoring system was not adequately rewarding those students who had entered the kind of data that Navteq is interested in. There were also fairness issues when verifying and scoring data points. There were many different scorers each having different understandings of the competition scoring system. Because of this, the scoring process was not uniform.

There were also several issues with the Ushahidi site during the competition. The site had a photo size limit which we determined to be about 5 MB. The site would not upload the report correctly when a photo a student took exceeded the size limit. When this happened, the report would be submitted without the photo at all, and many of these reports were deleted as invalid entries. Students were then frustrated by needing to submit their report again. Ushahidi also presented issues validating the data the student entered. There was no easy way to check to see if the point of interest was already entered by a different student, there was no way to search the POIs, and pressing the “back” button occasionally un-approved and un-verified the most recently approved and verified reports. But, even with these issues the inaugural Ultimate Mapping Challenge was a success.

Recommendations for Future Semesters

Below are steps that IPRO 305 feels are necessary to improve and expand upon this semester's competition. As we see it, improvements for the next iteration of the Ultimate Map Challenge can be summarized into three general categories: competition improvements, new software features for data entry, and improving overall teacher and student involvement.

Competition Improvements:

The UMC was successful as a first run pilot program, but it became apparent early on in the process of scoring that improvements could be made to the rules in order to reward entries that were unique and detailed beyond what was already available from other sources.

One major issue was that the scoring system used this semester was weighted far too heavily in favor of quantity over quality. A basic, bare-bones POI entered by a student awarded them five points, while an exceptional POI with a large amount of firsthand data was awarded seven points. A student could take a scattershot approach to data entry, simply entering in the minimum information for a large number of locations, and outscore another student who was taking the time to enter in a smaller number of high detail POIs. Since these high detail POIs are much more valuable to Navteq, the scoring system should reflect this in the future.

Another issue with this semester's UMC was a lack of focus regarding the POIs themselves. Our categories were quite broad, and as a result, students tended to enter in data that was easy to acquire, often canvassing high-traffic areas with large concentrations of businesses. While this

in and of itself is not a bad thing, perhaps having the students focus on certain aspects of their neighborhood would be a more constructive approach to achieving Navteq's long-term goals. Examples of possible changes include: limiting storefront POIs to local and small businesses, awarding higher points for POIs not located on a main road, and emphasizing time-sensitive information.

To combat the boundary issues experienced during the competition, we recommend that in future semesters of the competition extra precautions to make sure that the boundary lines are either evenly distributed between the schools or nonexistent. If boundary lines are to be used, each school should have an equal distance from them to prevent the problems we experienced this semester. Or, ideally, the students would not be restricted to finding points of interest within specified boundaries at all.

Finally, as a consequence of having multiple judges scoring POIs at different times, there were inconsistencies in the allocation of points. We propose a scoring rubric to ensure less ambiguity in the point value of individual POI data points and features. Not only will a rubric will make the scoring process easier for the judges, it will ensure that the scores themselves are fair across the board.

Data Entry Software Wish List

Ideally, each participant would have a smart phone with them that was capable of making UMC entries as soon as the student has collected the data. Since this will probably not be feasible in

the near future, the following recommendations will be made under the assumption that students will gather data and then enter it via a PC or laptop.

Over the course of the competition, the team could see that while Ushahidi was usable, it was clearly not designed with the Ultimate Map Challenge in mind. New, proprietary software specifically written as an interface for crowdsourcing participants would be useful beyond the scope of this project and it is our hope that Navteq will develop this new technology. For the UMC, here are the features that the students, teachers, and IPRO team members would like to see:

User Interface

- **User Account** : Each student would log in to their individual account to enter data.
 - Students would be able to check on their new entries and see them on the map before they were approved. This would help them check for errors.
 - The students would be able to keep track of their own points throughout the UMC.
 - The students would have a greater sense of ownership of their part in the competition.
- **POI Entry Form**: The data entry page would be customized by category with specific entry fields.
 - Helps students remember to gather the type of data that Navteq is looking for.
 - Ensures a higher level of detail in each POI.
- **Duplicate POI detection/Alert**: Let a student know when the POI they've entered is already in the UMC database.
 - Would allow a student the option of improving upon the existing POI.
 - Would save time for the IPRO team in checking for duplicates.
 - Would require identity stamping when adding on data to an existing POI for scoring purposes.
 - Would help prevent students from becoming discouraged or feeling like they've wasted their time by entering in a duplicate POI.

Administration Functions

- **Streamlined Approval Method:** Approval and scoring would be built into the system.
 - Eliminates the need for spreadsheets.
 - Points would go directly to student's account.
 - Barring a totally automated approval/scoring system, this will be the only way to expand the competition to 6+ schools without overwhelming the judges.
- **Direct POI Feedback:** Communicate to a student the reasons why a POI was deleted or scored a certain way.
 - Helps students understand the process of grading POIs so they can improve in the future.
 - Fosters a positive relationship between the students and the IPRO team

Other potential features of a new data entry interface include: School specific home pages, a larger home page map, competition wide messaging, and a "tips and pointers" page to help students improve their data entry skills.

Increasing Teacher and Student Engagement

As this semester's Ultimate Map Challenge played out, we noticed that some schools were more active than others. We feel it is of utmost importance to have a high level of participation from each and every school that has entered into the Ultimate Map Challenge.

One way to encourage this high level of involvement is to incentivize school performance at the teacher level. This can be accomplished by something as direct as having a higher stipend for the winning teacher, or something as simple as doing a better job explaining what the UMC is all about. Ideally the teachers would view winning as the ultimate incentive. In addition, the IPRO team needs to ensure that students will be going on field trips on a regular basis, as some

schools had weeks where they did not collect data as a group. This lack of time in the field was noticeable in the final results.

It is interesting to note that nearly all of the negative feedback we received from our students was in expressing frustration with the Ushahidi system (especially picture uploading) and not knowing what was going on behind the scenes. We believe that raising the overall level of student and teacher involvement starts with implementing the improvements in the competition rules and data entry interface outlined earlier. In addition, we can also conclude that a high degree of communication and feedback between the I PRO team and the UMC participants will play a large part in keeping everyone motivated and interested over the course of the next competition.

Appendix

Contact List

I PRO 305 Contact List	
Alison G. Mays	<i>Teacher</i> George Armstrong International Studies
Anna Vlahandreas	<i>Teacher</i> George Armstrong International Studies
Antigoni X Lambrinides	<i>Principal</i> West Ridge Elementary School
Christine Jabbari	<i>Principal</i> Philip Rogers Elementary School
David Ko	<i>NAVTEQ University Program</i> Navteq North America LLC
Leslie Combs	<i>District Director</i> Jan Schakowsky 9 th District of Illinois
Matthew Gullo	<i>Teacher</i> Philip Rogers Elementary School
Otis L. Dunson	<i>Principal</i> George Armstrong International Studies
Samina Andani	<i>Teacher</i> West Ridge Elementary School
Sharokina Awanes	<i>Teacher</i> West Ridge Elementary School
Wei-Yeh Lee	<i>VP, Chief Architect at Navteq</i> Navteq North America LLC
Whitney Orlow	<i>Teacher</i> Philip Rogers Elementary School
Not listed above, are 60 students in total from the three schools whom were the backbone for this semester. We would like to thank all of the names listed above and those 60 students for making the UMC possible this semester.	

Final Results

Philip Rogers	Week 1	Week 2	Week 3	Week 4	Total Score
Student 1	179	150	62	102	493
Student 2	2	122	200	255	579
Student 3	167	52	49	86	354
Student 4	31	18	49	89	187
Student 5	89	0	34	12	135
Student 6	0	6	23	94	123
Student 7	104	0	0	16	120
Student 8	0	0	0	122	122
Student 9	66	0	0	6	72
Student 10	32	0	0	0	32
Student 11	0	28	0	0	28
Student 12	6	0	0	0	6
Student 13	0	6	0	0	6

Week 1	Week 2	Week 3	Week 4
676	382	417	782
Overall:	2257		

Westridge	Week 1	Week 2	Week 3	Week 4	Total Score
Student 14	193	8	0	0	201
Student 15	95	61	20	0	176
Student 16	106	52	0	0	158
Student 17	104	0	0	0	104
Student 18	99	0	0	0	99
Student 19	7	6	0	0	13
Student 20	10	0	0	0	10
Student 21	9	0	0	0	9
Student 22	7	0	0	0	7
Student 23	6	0	0	0	6

Week 1	Week 2	Week 3	Week 4
636	127	20	0
Overall:	783		

George Armstrong	Week 1	Week 2	Week 3	Week 4	Total Score
Student 24	176	67	122	19	384
Student 25	87	22	7	7	123
Student 26	0	58	27	0	85
Student 27	77	0	0	0	77
Student 28	21	35	0	0	56
Student 29	39	16	0	0	55
Student 30	20	0	20	0	40

Student 31	32	0	0	0	32
Student 32	29	0	0	0	29
Student 33	22	0	0	0	22
Student 34	19	0	0	0	19
Student 35	16	0	0	0	16
Student 36	16	0	0	0	16
Student 37	9	0	0	0	9
Student 38	6	0	0	0	6
Student 39	5	0	0	0	5
Student 40	0	12	0	0	

Week 1	Week 2	Week 3	Week 4
623	210	176	26
Overall:	1035		

Results by category

Reports:	Ent./Shop.	s	Recreation	Arts	Other
Philip Rogers	155	126	27	41	15
Westridge	73	24	4	16	0
GA	72	72	22	26	3

Total number of reports:

543