Automatic SMS Attendance Program (ASAP)

0. Project Abstract

The project aims to help the government to maintain an accurate database of students attendance dynamics as well as enabling schools manage communications between the school management and parents. Its main purpose is to enable the government to have quality reports on the behavior of school attendance in the country in general, but also in provinces and even specific schools. The government then will be able to use the data to create accurate information mostly needed in creating policies for education in particular, but also for other purposes. We thank IDIN to provide us this opportunity to use our expertise and talents to bring this proposed solution into trial. We also thank all the institutions supported us on the ground, including Boys School of Tajpura, ITU, and last but not least, IDDS Lahore and the organizing team who largely made all this happen. We feel highly honored.

1. Background

With high student-teacher ratios, teachers have limited time and energy to dedicate to personalized teaching and stronger relationships. Instead, tasks like grading homework and marking exams take up too much attention. We worked with teachers, students and staff at the Boys School of Tajpura in Lahore to create an ICT solution to free up time for teachers and to allow them to focus on teaching, while also building better communication linkages between teachers and parents, to get them more involved in their children's education.

2. Information Gathering

We began by spending a day at the school and meeting with teachers, parents and students. During our teacher interviews, what they mentioned was during the December exam results most parents come and after that, not so much. Most parents struggle to engage even if they want to because they are illiterate. Some teachers wanted more support from the government and said that the government did not provide enough attention to schools.

The team visiting Tajpura School for Boys

3. Persona (typical user)

Teacher's name: Sir Rashid (a composite of teachers who we spoke to)

Sir Rashid is a middle aged teacher who teaches maths at the Tajpura School for Boys. He loves his job, but faces many difficulties to exercise it . Every day, Sir Sadhid teaches 6 to 8 classes in the school, then runs to a private academy, where he teaches until 10pm, since his earnings are not enough to sustain his family. He worries that he's not able to provide individual attention ot his students, as there are so many he's responsible for. When his best students have problems, he likes to contact their parents to try and help them, but more often than not, is unable to reach them.

4. Problem Framing Statement

Teachers are teaching 6-8 periods a day in a class of 60-80 students, along with jobs at academies as well as household responsibilities which leave them with minimal time for administrative tasks. One time consuming task is contacting parents individually when a student is absent. We will create a communication platform that will allow teachers to contact parents about attendance issues allowing them to save valuable time

5. Problem Framing Tree

Reduce Time for attendance and increase Individual student attention
1. Use Machine to take attendance
    a. Smartphone readable curecode with database
    b. Entrance biometric reader with database
    c. Entrance RF ID with database
2. Reduce number of students per class
    a. Divide the class in day and night shifts
    b. Reduce the number of kids enrolled
    c. Increase the number of teachers and classes
3. Pass attendance register book to students as the class continue
    a. Pass attendance to students while class continue
    b. Students come to check their names as class continue
    c. Students ware name tags and special attendance taker go around and check their names on the register

5. Value Proposition

We aim to help teachers by making attendance process more efficient and reliable; on top of that, we will address the communication gap between teachers and parents.

6. Summary of Design Process

We met as a team to discuss different possibilities and challenges in the education space, which we can potentially tackle. These discussions started with an aspect of:
- What are the possibilities?
- What are some of the biggest challenges from our own personal experiences?
- Where can we have the most impact?

The above conversations, plus the guidelines and background brief we were given, led us in the development of our hypothesis, on the before site visits and the questions we wanted to ask to test out hypothesis such as:
1. Attendance can take up to 10 min.
2. There are no working computers at school
3. There are no ITs being used
4. Teachers have no time to prepare to every class
5. Teachers forget what they are teaching every class
6. Students are not getting individual attention due to high student to teacher ratio
etc.

Once in the site visits, we interviewed different stakeholders. We conversed with teachers and tried to understand their pain points and prove our hypothesis right or wrong, leading to a better understanding of the scope of issues and areas where we could develop some

ICT solution. These conversations were open ended to allow us to get a free flow of conversation and we used our questions as tools to direct the conversation only.

Teachers mentioned that the biggest challenge they face is over-crowded classes that lead to other issues, such as not having time to address individual students problems or reaching to their parents.

We did a brainstorming session where the ideas were all over the spectrum from extreme to practical. The session initially was just writing down anything we thought can solve the issues we uncovered in site visits from snail mail letters, to drones or apple guns. There were some crazy ideas, as well as some really simple, so we clustered the solutions into buckets, so we could figure out the themes.

The next brainstorming session involved selecting ideas on a scale of practicality and awesomeness, which resulted us in left with around eight ideas and then we discussed what we wanted to move forward with.

A Gantt/rating chart was then created and we rated each solution on different verticals. We shortlisted the solutions based on our interest, feasibility, usability, scalability, cost, and partner interest.

We talked with partners who can potentially help us roll it out. This discussion allowed us to see where there were possible synergies and what is practical as a solution. Initially we had several ideas for the input but after discussion with one of the stakeholders they were looking to roll out student id cards, so we thought if we can combine an input system with the student id cards then we will have an easier possibility to get buy in.

We developed a prototype for the solution that we felt was most feasible. Our system can have any kind of input but we choose QR codes because it could be combined with government's rollout of student ID program. We chose SMS as output to parents as most of the parents have access to feature phones and are already used to SMS technology.

At this stage this system can be deployed in areas beyond education as well and we see partner interest as well.

7. Concept Selection
We compared the different ideas that we came up with against a baseline of an automated email system to see which performed better and worse on different metrics:

Idea	Price	Time to implement	Learning curve	Time savings	Additional capabilities	Technology availability	Team interest
Automatic Email	0	0	0	0	0	0	0
Snail Mail	+	- -	- -	++	- -	- -	++

Web Portal	+	+	+ +	- -	- -	0	- -
RFID	0	+	- -	- -	+ +	+ +	- -
Fingerprint Tracking	0	+	- -	- -	+ +	+	- -
SMS	-	0	- -	0	-	-	- -

8. Design Requirements

| User Need	What are you going to measure	How are you going to measure it? (units)	Good Value	Better Value
Efficiency	How long it takes to take attendance	Minutes	<5	<3
Intuitiveness	Time to train a teacher to use the system	Minutes	<60	<30
Affordability	Upfront cost	USD per school	<$1000	<$500
	Running costs	USD per school per year	<$1	Free
Usability	Number of new processes and technologies		3	1
	Setup time	minutes	<1	0
Reliability	Breakdowns	Breakdowns/year	<4	0
	Bugs	Bugs/year	<5	0

9. How it works
1. The teacher has a smartphone with the ASAP app loaded on it

2. The student has a badge with a QR code inside that s/he presents to the teacher on arriving in the classroom

3. If a child's badge is not scanned, an SMS will automatically be sent to the parent
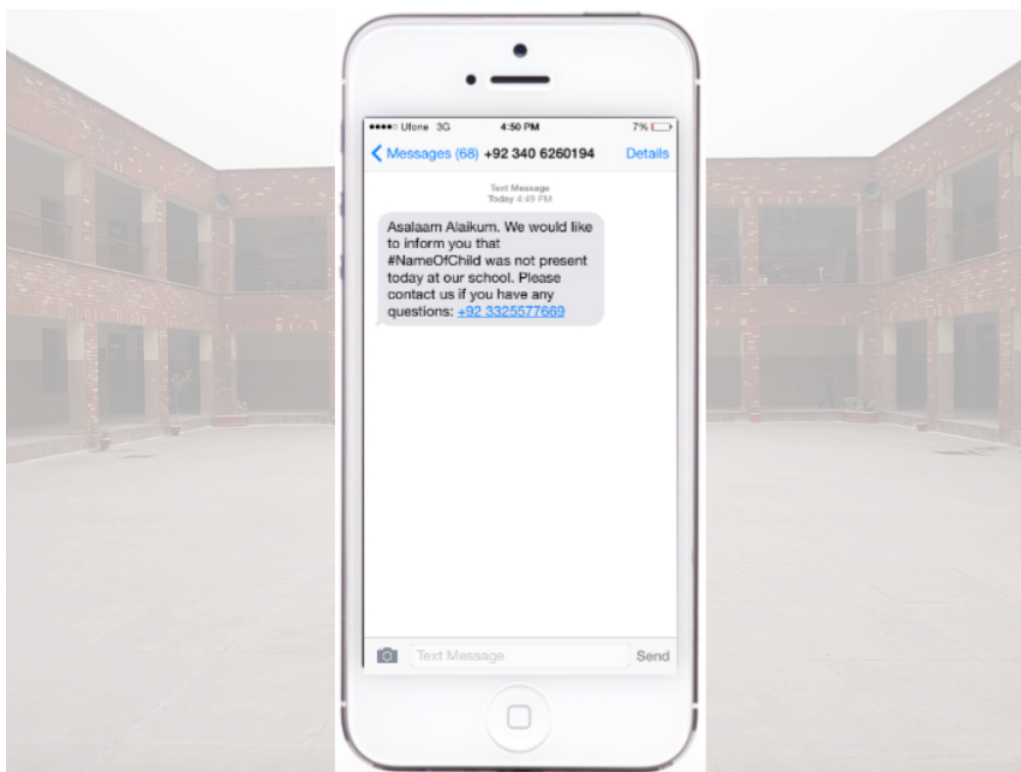
10.   User Feedback

Parent engagement and attendance data credibility is a big challenge and stakeholders want a solution. There have been several instances where parents were not aware that their children had skipped school. The government is planning to roll out a student ID program and pilot tablets. A system that can engage parents on attendance issues will be very helpful.

11.   Project Continuity

The team decided not to continue working on this project. Although the technology received positive feedback, the team members were not able to continue development.

12.   Stakeholders

Our point of contact at Boys School of Tajpura was Aizaz Anwar, a teacher and alumnus of ITU.

13.   Team Members

Aneeqa Ishaq
Nara Schenkel
Hassan Bhatti
Victor Nyang'a
Redon Skikuli
Krista Nordin (Design Facilitator)