**School: Peicai Secondary School**

**Team Members:**

Jeremy Miracle William (1IN)

Jervin Yeo Kai Jie (1IN)

Nathan Boh (1IN)

Elden Zeng Zeng (1EE)

Lim Ziliang Jasper (1EE)

Team Name: Future Forgers

Teacher in charge: Mr Tong Yechuan ( Tong_Yechuan@Schools.gov.sg ) H/P: 92368840

**Theme: Workplace wellness**

**Research:**

Through our research approach comprising both a Google survey and stakeholder interviews(with students and teachers), it has become evident that the prevailing challenges surrounding the school restroom facilities have notable implications for student well-being and resource management. The data collected from the survey and interviews revealed a recurring issue wherein students tend to overestimate their toilet paper requirements due to the paper's location being outside the restroom area. This discrepancy in estimation leads to a significant surplus of toilet paper consumption, with students taking up to four times more paper than necessary. This behaviour stems from a fear of potential inconvenience, compelling students to preemptively stockpile toilet paper. Consequently, this surplus consumption not only generates wastage but also strains the availability of this essential resource. Additionally, this excess toilet paper has been exploited for vandalism within the restroom premises, a concern voiced notably by the teaching staff. Addressing these concerns is pivotal not only for curbing paper waste but also for ensuring a conducive and hygienic restroom environment that supports student well-being and minimises unnecessary stressors.

**Link to Student Survey:**

https://docs.google.com/forms/d/e/1FAIpQLSeKtuGAveiLubh1SR_zjTP9UgKku5uU2Ckz32dYl CKWgiitXw/viewform?usp=sf_link

**Link to Teachers Survey:**

https://docs.google.com/forms/d/e/1FAIpQLSdBIHgI9Noj9FGbk-SscyJEhcu92U4_Wagv6h82f C34gDVTEw/viewform?usp=sf_link

**Problem:**

Within our school, the current state of the Toilets poses a significant challenge to the well-being of students, as the availability of toilet paper is inconsistent and often inadequate. This issue has led to heightened stress levels among students who are unable to access basic restroom amenities when needed. Moreover, the problem escalates due to instances of excessive toilet paper usage and vandalism, which not only deplete the resources but also create unhygienic and unpleasant restroom environments. Addressing these challenges is crucial for fostering a supportive and healthy school environment where students can focus on their studies without unnecessary distress

As a group we have come up with the how might we statement for the aforementioned problem.
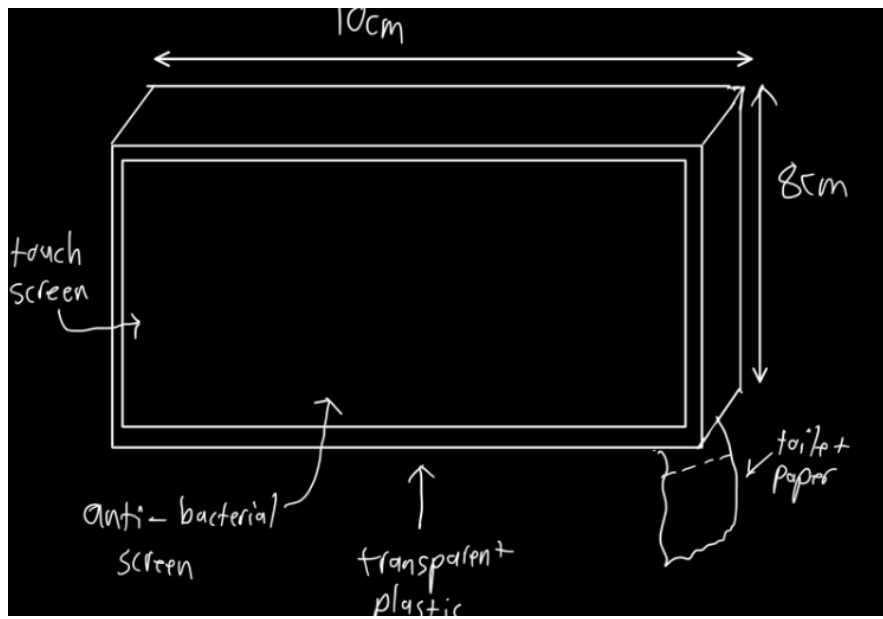
**HMW:**

"How might we ensure a stress-free and hygienic restroom experience for students by addressing the issues of toilet paper availability, overuse, and vandalism in a way that promotes workplace wellness?"

**Solution:**

A proposed resolution involves the implementation of an automated toilet paper dispensing system, designed to alleviate the issues identified in our research. According to the survey findings, the most frequent toilet paper requirement falls within the range of 5 to 10 squares. To cater to this, the system will dispense an average of 7 squares per use, striking a balance between adequacy and waste reduction. The innovation entails user identification, achieved through either the scanning of an Ez link card or manual login in of their unique student issued MIMS account. This step serves a dual purpose: firstly, it facilitates efficient tracking of individual paper consumption, enabling early detection of potential excesses. This data-driven approach aims to empower teachers with the ability to monitor and intervene, should patterns of overuse emerge, thereby enhancing resource management. Secondly, this identification mechanism bolsters accountability, as user information will be logged in a database accessible to teachers. In cases of vandalism or misuse of resources, this stored data can provide valuable insights into potential culprits. By intertwining technological advancement with data analysis, this proposed system seeks to not only curb wastage but also foster a sense of responsibility among students and maintain a conducive restroom environment. Students will be able to make timely reports on the condition of the toilet ; if anything has been damaged or if vandalism has occurred. When students press the report button on the panel, it will alert the school's OM to investigate. A time log will be logged into the database to facilitate any investigations.
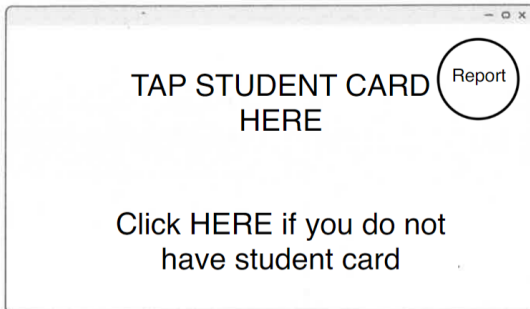
**Planned Design of auto dispensing machine**



10cm

8cm

touch screen

anti-bacterial screen

transparent plastic

toilet paper

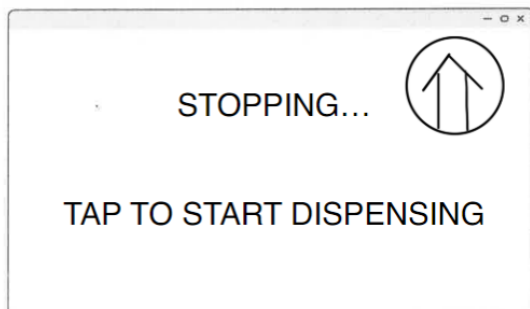**Wireframing of the interface**

TAP STUDENT CARD HERE
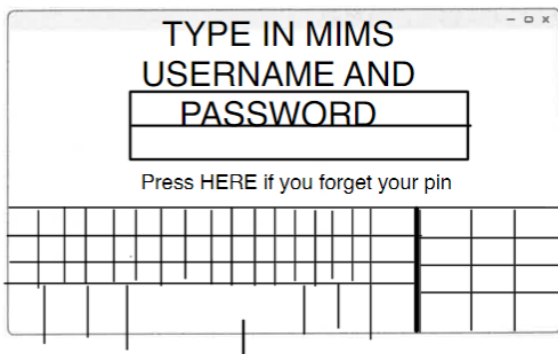
Report

Click HERE if you do not have student card

This is the first page where students are prompted to identify themselves. Students can press the report button if something is faulty or vandalism has occurred

DISPENSING

Tap to stop

Students can press dispensing if they want toilet paper

STOPPING...

TAP TO START DISPENSING

If you press stop on the second page it will stop and you can tap it again to start dispensing

TYPE IN MIMS USERNAME AND PASSWORD

Press HERE if you forget your pin

If you press forgot password on the first screen you will need to Type in mims the students username and password on the screen

**Conclusion**

In conclusion, addressing the issue of workplace wellness within the school environment, especially in the area of restroom facilities, is important for fostering a supportive and stress-free atmosphere for students. Through surveys, interviews, and data analysis, the team identified challenges of toilet paper availability, overuse, and vandalism. The proposed solution, an automated toilet paper dispensing system, stands as a promising remedy to these issues. By aligning paper dispensation with actual usage patterns, this innovation not only ensures a more efficient allocation of resources but also minimises wastage, contributing to a sustainable school ecosystem.

The integration of user identification mechanisms introduces a layer of accountability that empowers both students and teachers. This data-driven approach not only assists in proactive resource management but also provides a deterrent against misuse. Moreover, the ability to track patterns of excessive paper consumption allows for timely intervention and guidance, promoting responsible usage among students.

Finally, the correlation between restroom wellness and overall student well-being cannot be overstated. The proposed solution is a step toward cultivating an environment where students can focus on their studies without unnecessary stressors. The reduction in vandalism incidents resulting from the accountability mechanism can contribute to a more hygienic and pleasant restroom experience for all.

**Prototype:**
Accompanying Video with different scenarios.

**Disclaimer:**
Ideas, surveys and proposed solutions are of our own. However we acknowledge the use of ChatGPT to paraphrase and to check for grammatical mistakes.