

# Transforming Room Access with SEKEYRITY Solutions!

TÉCNICO LISBOA SEKEYRITY, project nº 15, 2023-2024

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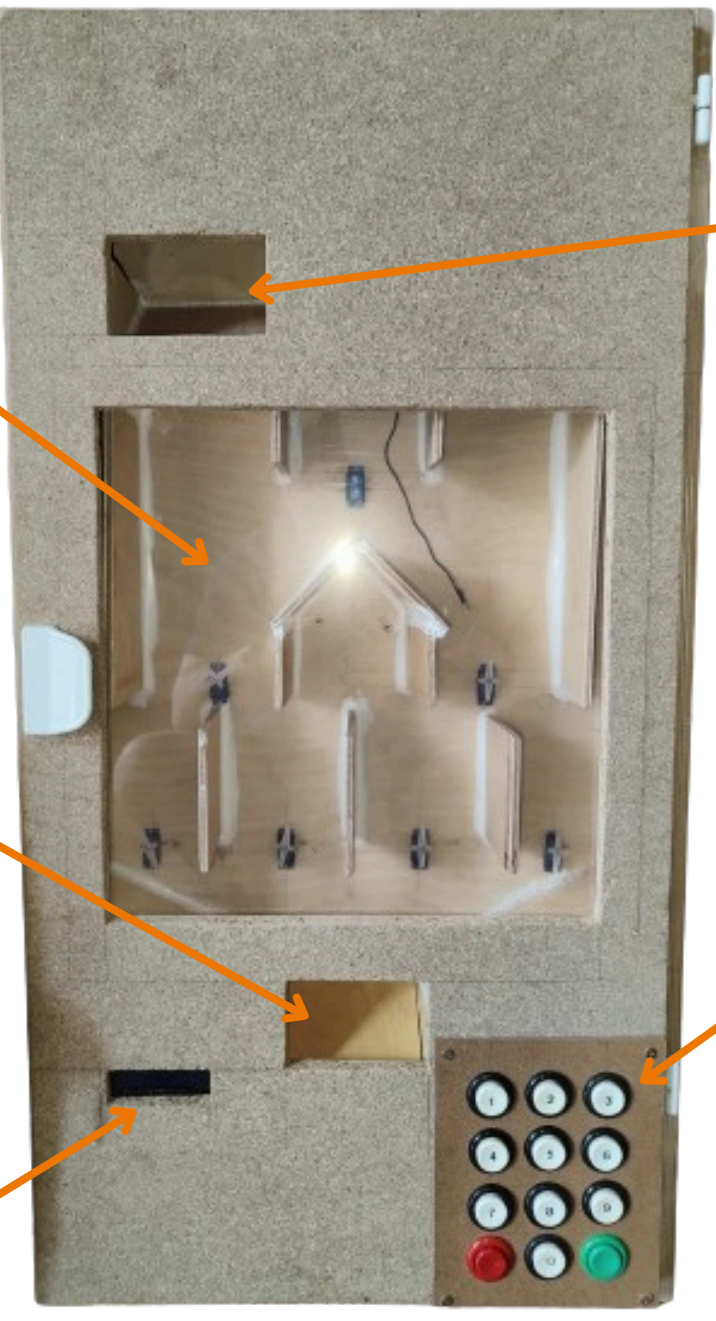
## THE PROBLEM

Efficient access management within the NEEC (Núcleo de Estudantes de Engenharia Eletrotécnica e de Computadores) in the Eletro/North Tower was needed because accessing designated rooms required a manual, paper-based process involving the security guard. This system led to inefficiencies, inconsistencies, and confusion due to varying practices among guards. Additionally, the manual key management often resulted in keys not being returned promptly, causing disruptions for students and security personnel. This issue affected multiple users within the facility

After thorough research, we found that access control at IST mainly relied on two methods: card readers for validated user cards or manual key exchanges with security guards. The manual process was common for less-used, older rooms mainly used by students. This highlighted the need for an automated solution that could simplify access while requiring minimal infrastructure changes.

## OUR SOLUTION

Our prototype maintains the use of keys but in an intelligent way. We built an **automatic key dispenser** that, without getting rid of old, classic keys, improves the way they are acquired. Additionally, it **stores the keys automatically** when they are returned.



**AUTOMATIC STORAGE**  
When a key is retrieved, the reader identifies the key number and moves the platforms so that the key is stored in the correct place.

**NO NEED OF SUPERVISION RETURN**  
Automatically detects if it's the right key. If the user inserts something it gets rejected.

**AUTONOMOUS DISPENSER**  
The selected key will be dispensed automatically.

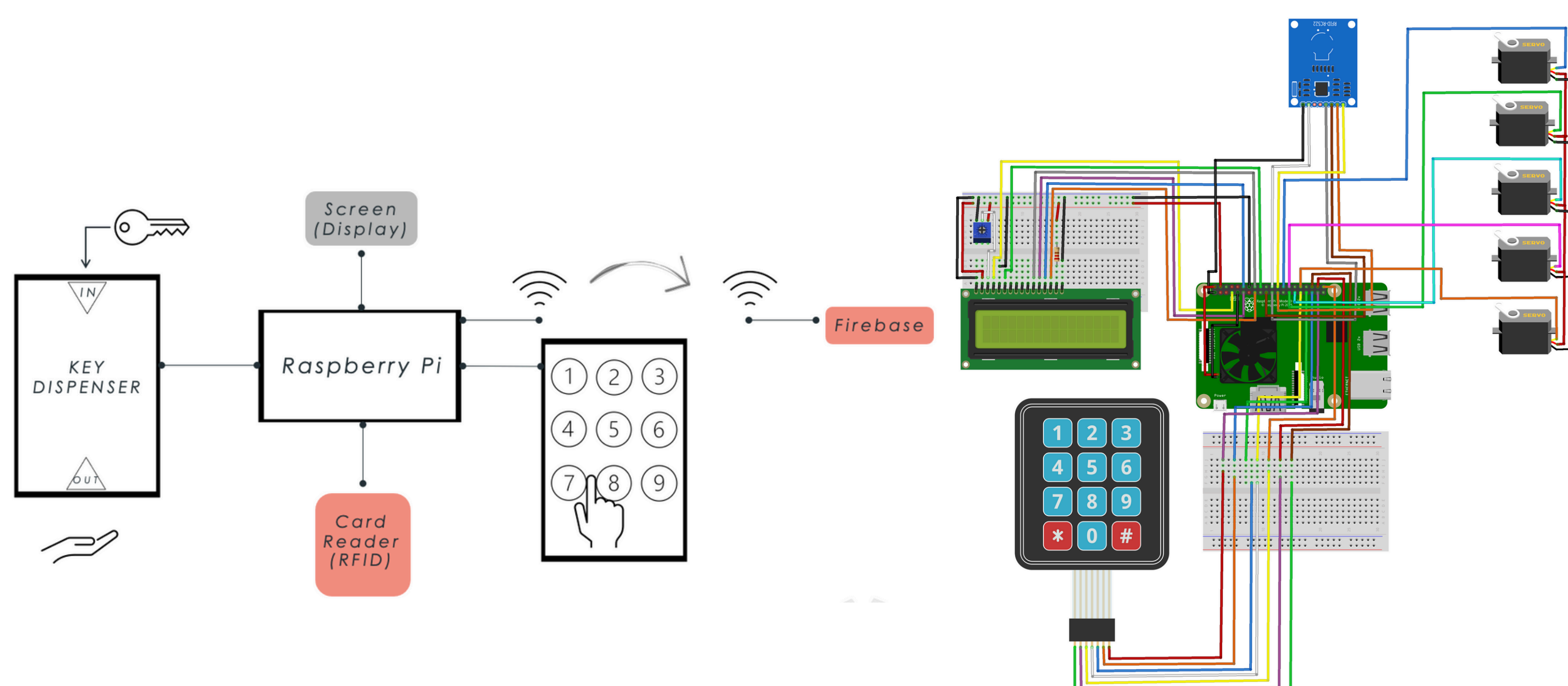
**EASY AND INTUITIVE TO CHOOSE KEYS**  
Homemade keyboard.

**SIMPLE USER INTERFACE**  
The user is given instructions through the LCD screen

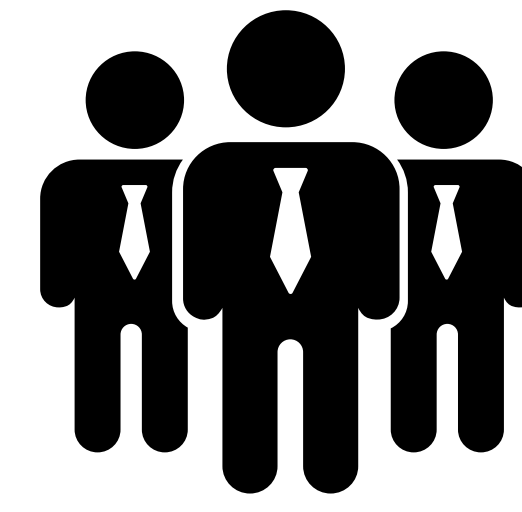
Our prototype can hold up to **4 different keys**, each key has a **RFID tag** to enable the dispenser to automatically detect the key. The keys are stored in compartments controlled by servo motors. Depending on the key returned or requested a sequence of movements of the servo motors are triggered. A user is identified by his card, when swiped the user can request the keys he has access if they are available.

The dispenser is connected to a **realtime database (Firebase)**, where the all privileges and permissions of each user to the available keys are stored. A new user scans his card for the first time, and the dispenser gives the user a code which will be used for the registration in our WebApp. After registration the user can ask for for the permission of the keys available.

The Admins have a dedicated page were they can **manage permissions, consult event logs** and **notify** users to return the keys.



## TARGET AUDIENCE



**Small companies** in need of better access management looking for a technological and low-cost solution, **education infrastructure**, ect.



## COMPETITORS



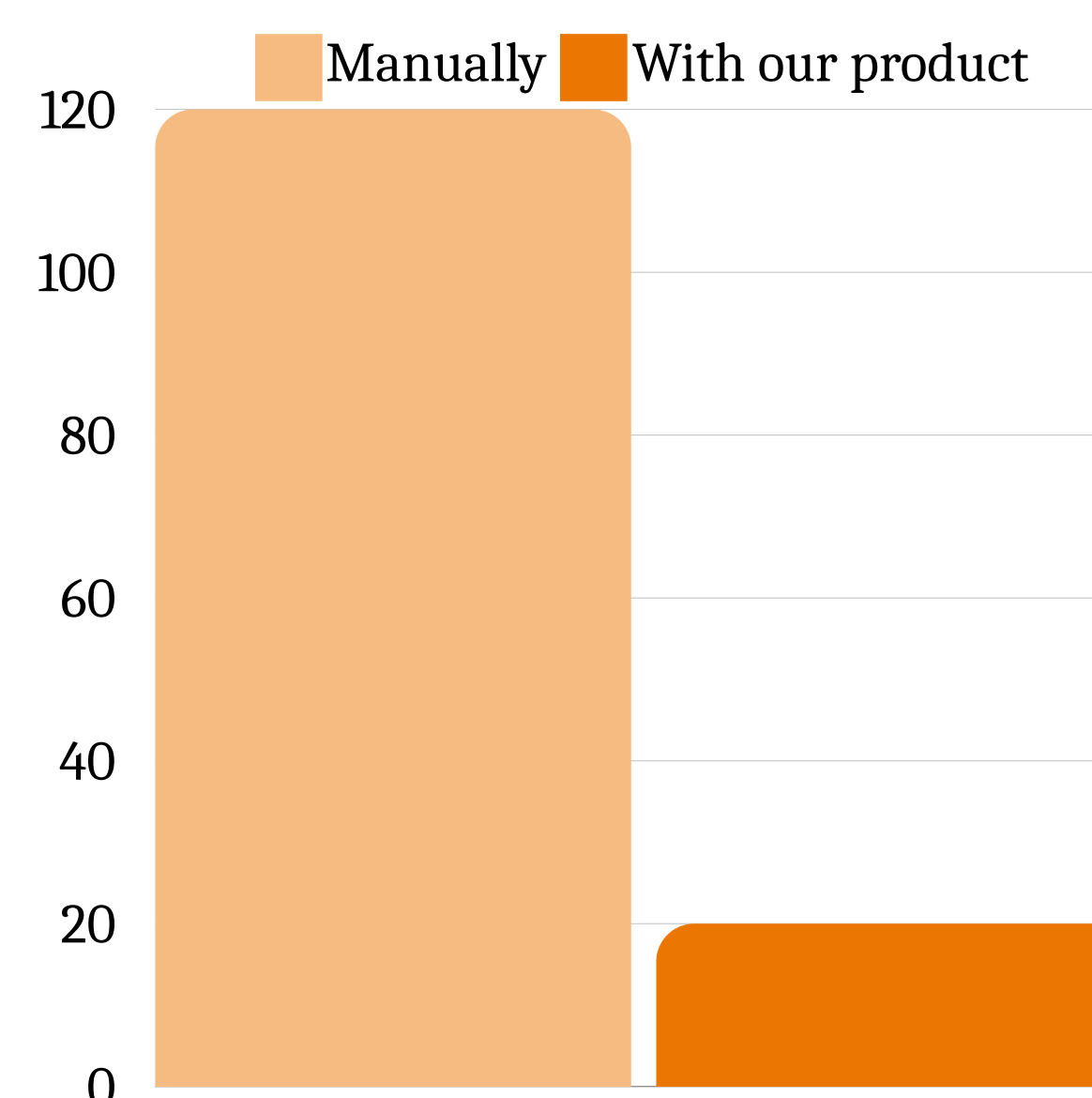
Smart locks in each door, very clever solution and practical, but might be to expensive for some people, they are also hard to install in every door.



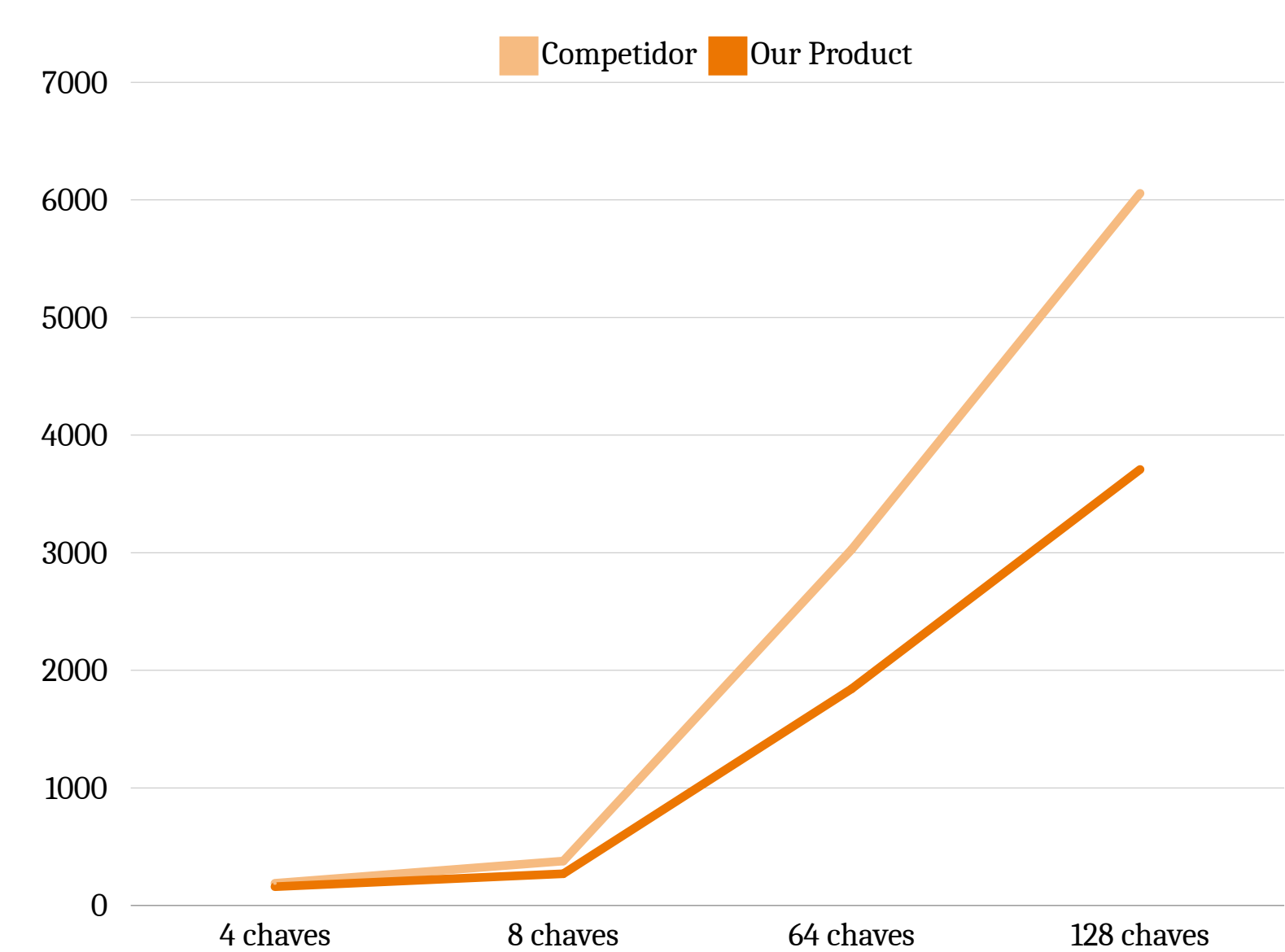
Manual management, someone has is responsible for all the keys and has to manually write down all the movements, its becoming obsolete.

## RESULTS

Average **time** spent, in seconds, requesting a key



**Cost** of installation in by number of keys



Opinion of students who are affected by manual key management:

- It would be nice to not have to wait for the security guard, this prototype delivers fast and efficient key access.

## COSTS AND BENEFITS

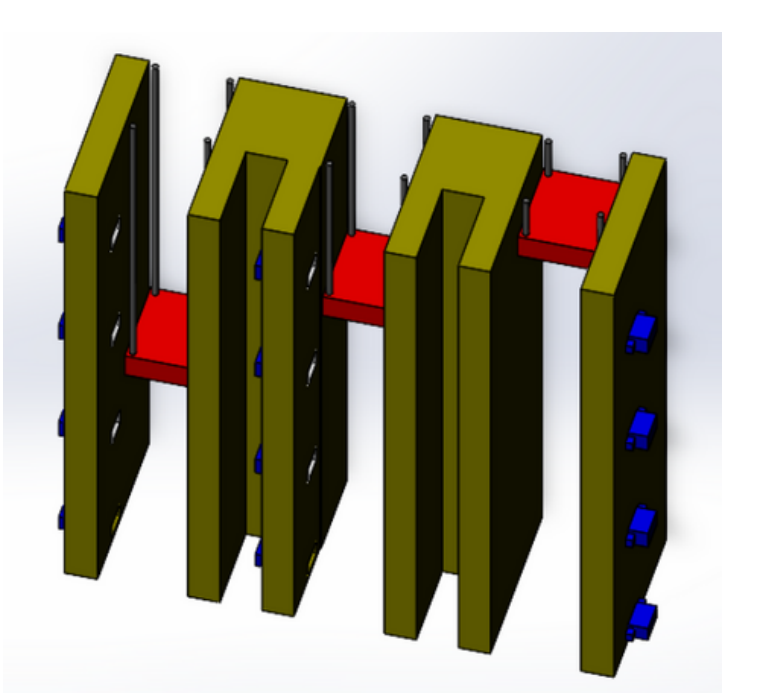
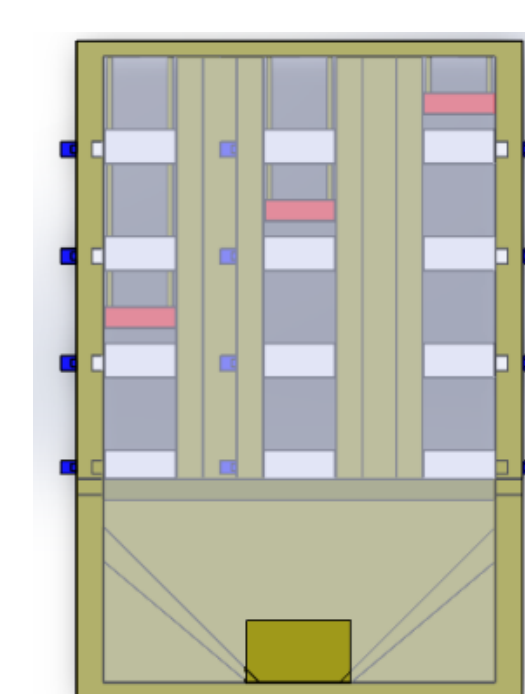
Cost of production of our prototype: 114€

**Why choose SEKEYRITY?**

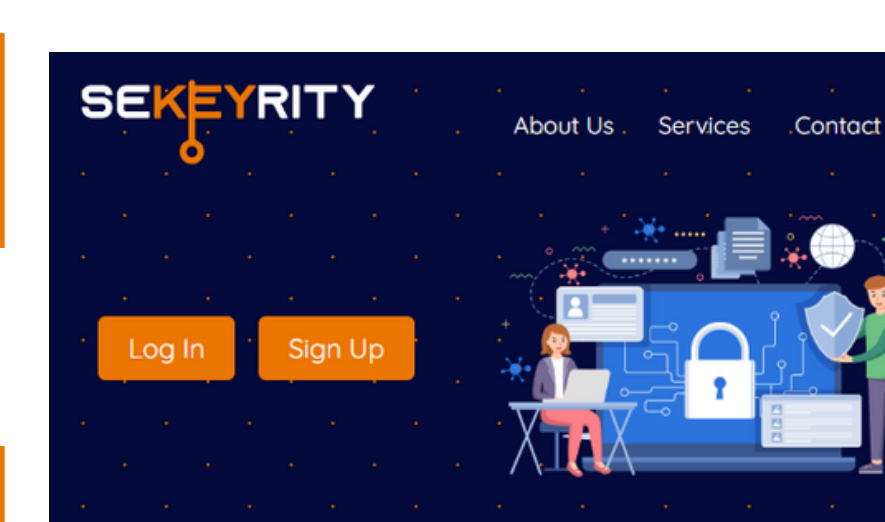
- Most smart locks in the market have a limit of 1000 users, while our protopyte **has no fixed limit of users**.
- Easier to setup** than most smart locks.
- Faster, safer and more efficient** than manual management

## WHAT'S NEXT?

**Redesign** our dispenser to be able to hold more keys. If we use the same method for more keys, the dispenser would be exponentially larger.



## Web APP



## Blog

