ElectroCap SmartRack

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SMART RACK

TÉCNICO LISBOA

Advisors and Mentors

- Scientific Advisor: Prof. Teresa Vazão
- Scientific Co-advisor: David Martins – Civil Constructor
- Mentor: T.A. Gerson Ferreira

Problem definition

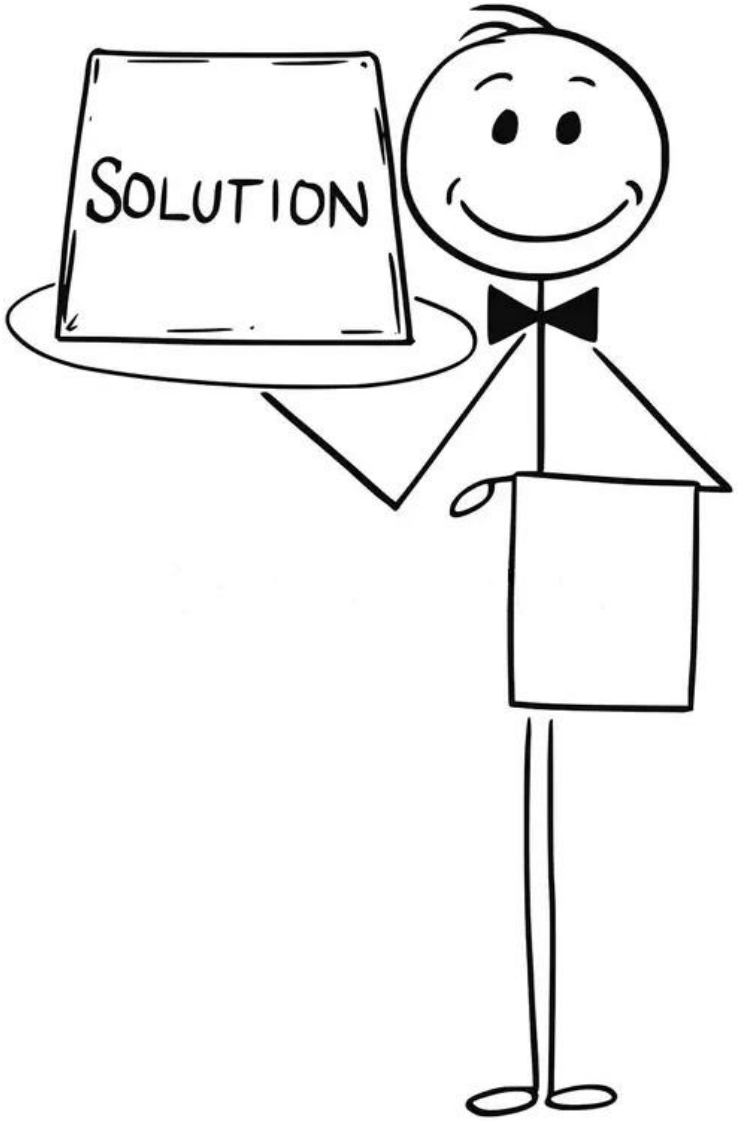
Rain can soak freshly washed clothes when left unattended, forcing people to dry them indoors or rewash them.

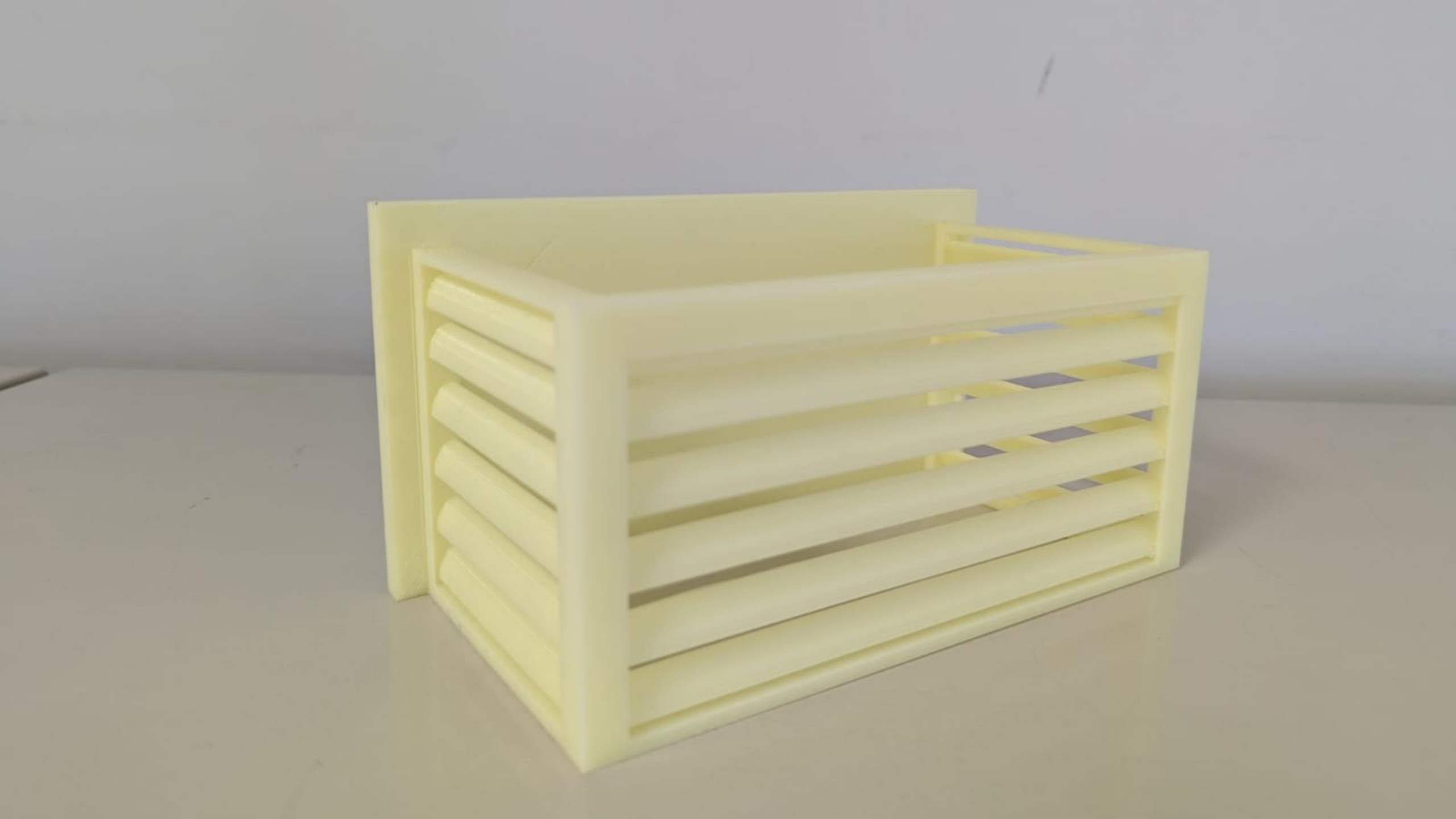
Solution beneficiaries

- Building contractors;
- Residents.

Technological solution

- Folding system activated by rain levels;
- Adjust angle of lateral plates to protect from rain;
- System only activated over certain threshold;
- Cheaper and more eco-friendly solution.





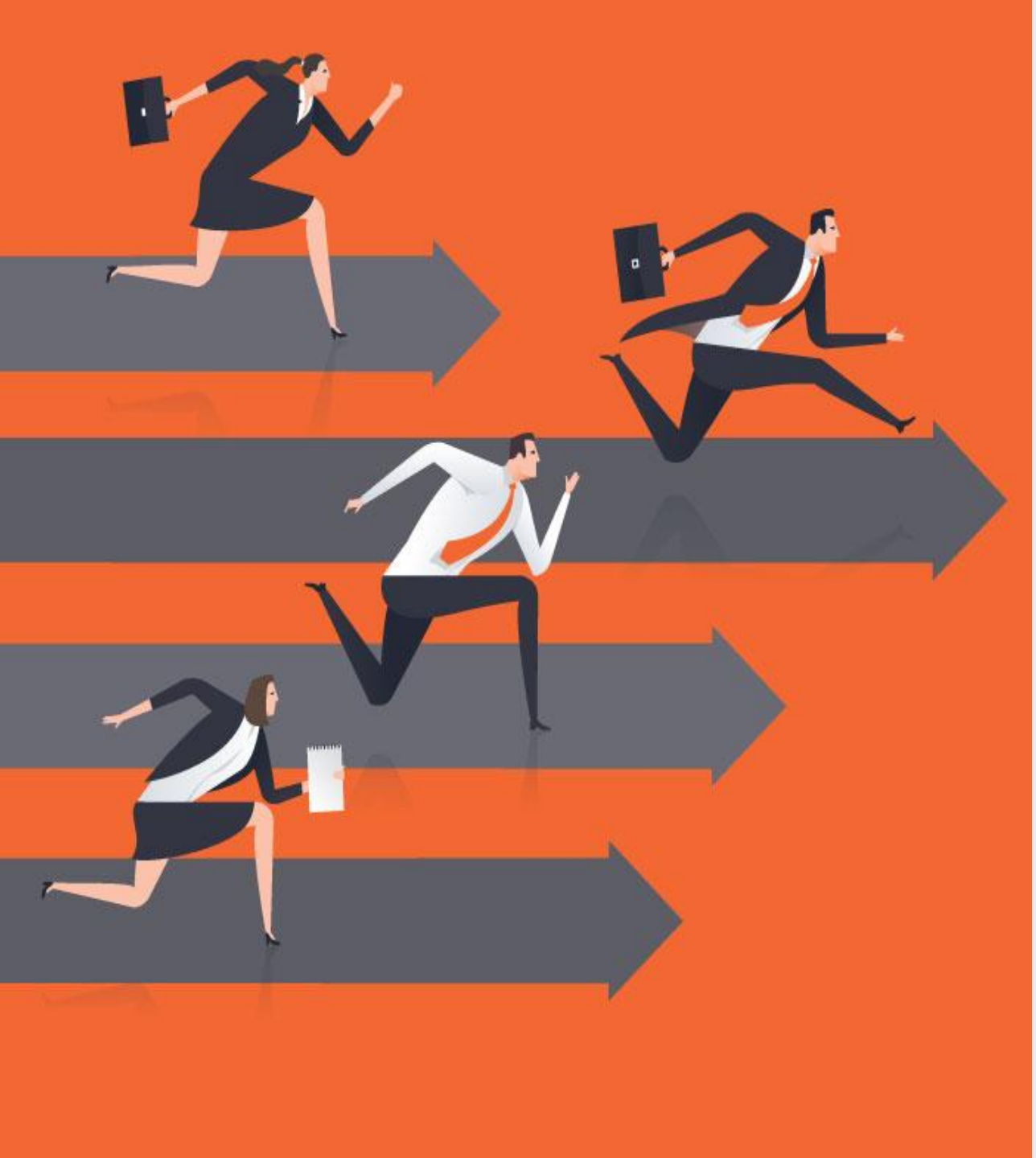
Competitors and previous work

Competitors

There are some competitors in this field, the most relevant being: drying machines and typical drying racks. Furthermore, there are some other competitors that tried to implement some automation in this process (Peggyrain and CleverCloseLine).

Previous work

There is some previous work in this topic, but, despite that, none of them offered an efficient solution.



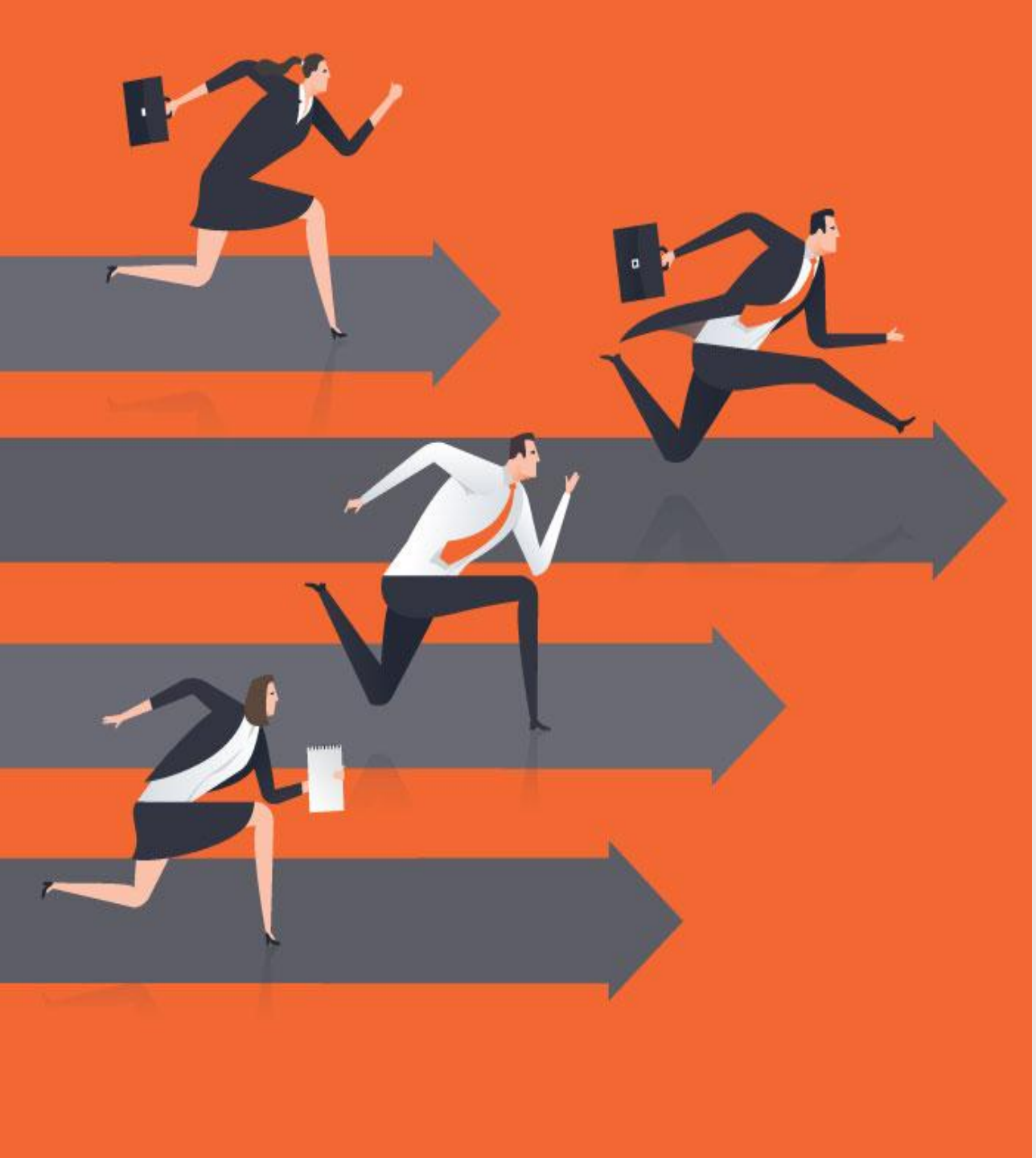
SmartRack

Pros

- Lower energy consumption;
- Can withstand adverse weather conditions;
- User friendly;
- High Value for Money (VFM);

Cons

- Limited to new apartments blocks;
- Could have relatively high maintenance;
- Functionality conditioned by extreme weather;



Competitors

Pros

- Cheaper (Peggyrain);
- Faster to use (drying machine);
- Better for the environment (Peggyrain);
- Suitable for unpredictable climate (CleverCloseLine);

Cons

- Weaker structure (Peggyrain);
- Higher energy consumption (drying machine);
- Lacks adaptability (CleverCloseLine)

Energy consumption

SmartRack

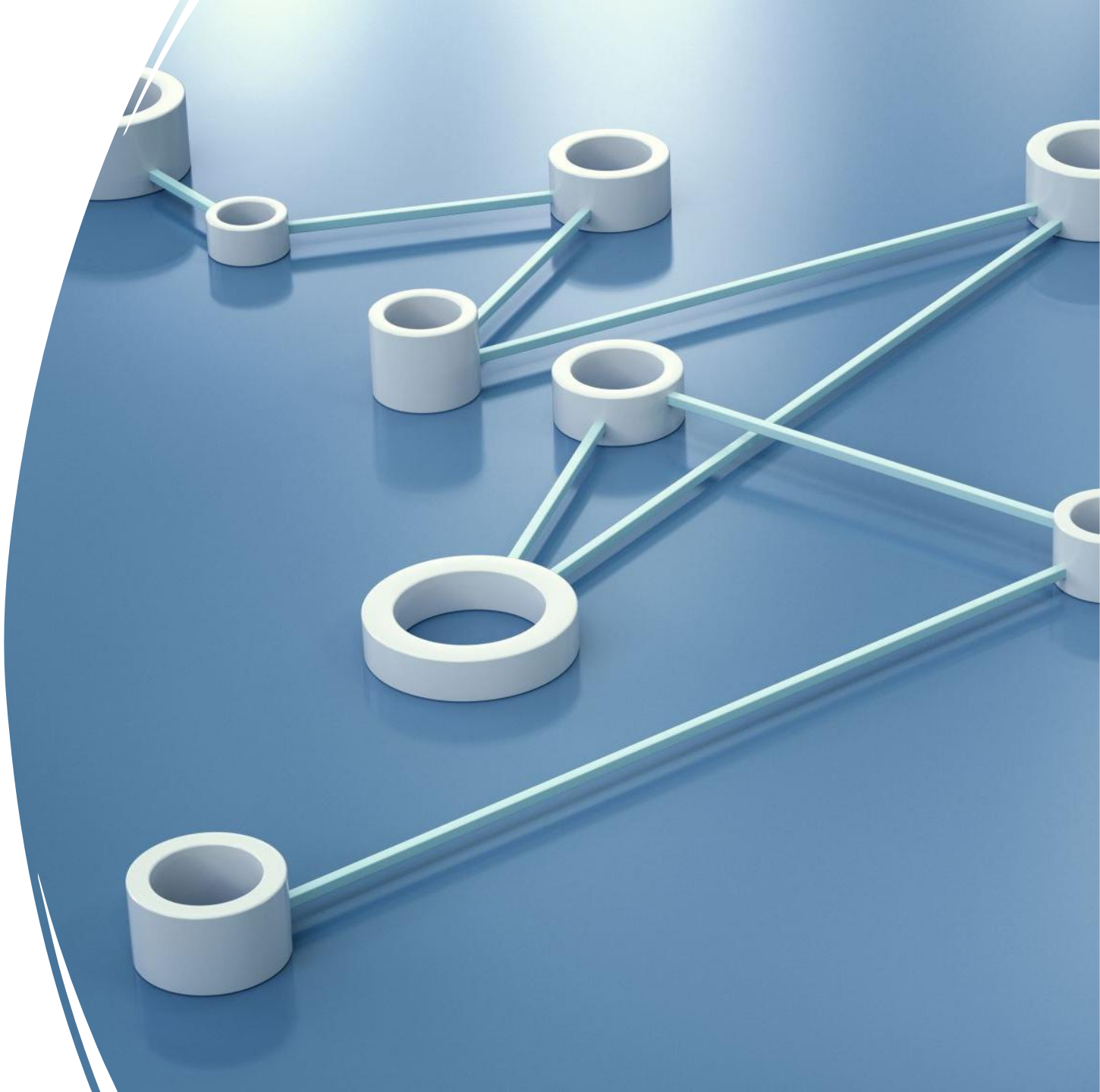
clevercloseline

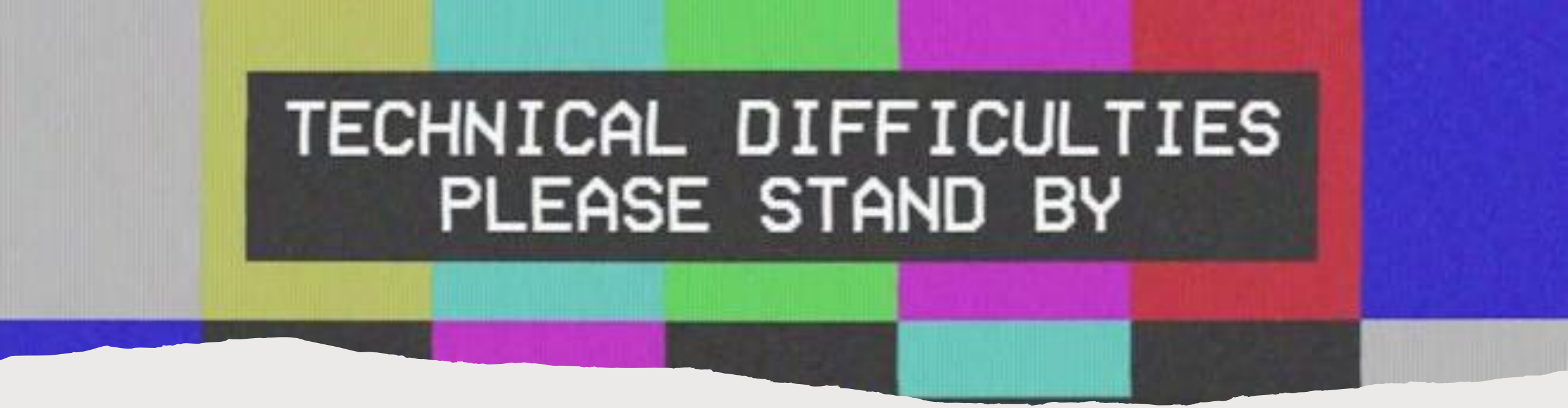
PEGGYRAIN
HAS YOU COVERED

Time spent

Solution requirements

- Newly built appartement blocks;
- Electricity;
- Motor/engines;
- Sensors;
- Protective top part;
- Clothes;
- Adverse weather conditions.





Technical challenges

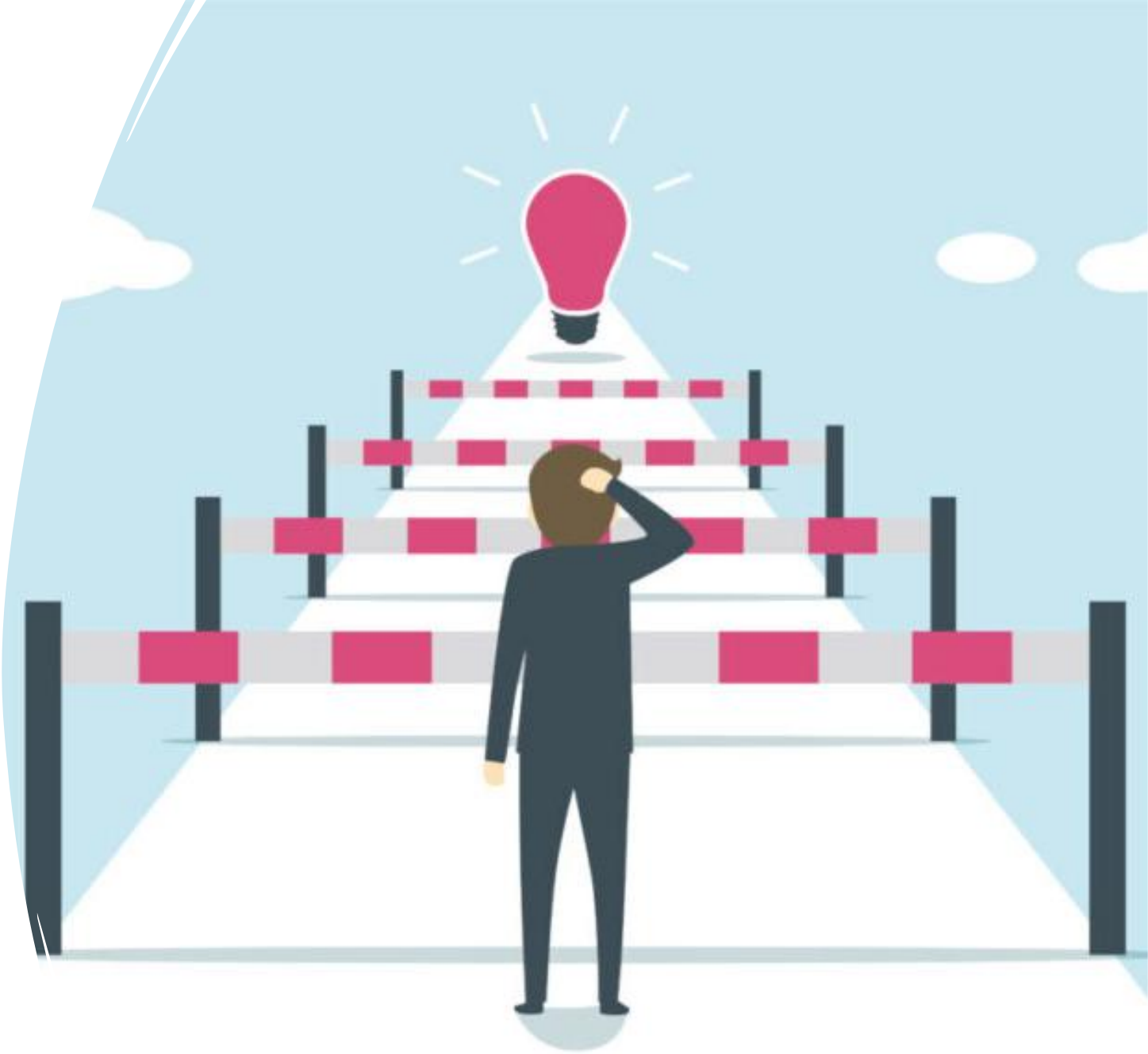
- Aim to only have the drying rack working with continuous rain and not random droplets of water (only activated over a certain threshold);
- Have a sturdy structure;
- Choose a material capable of withstanding all weather conditions;
- Setting the position of the blades as needed;
- How to properly install the product;
- Acquiring all the necessary skills/knowledge.

Testing and validation metrics

- Beneficiaries' satisfaction;
- Energy comparison: $\frac{Energy\ ESP32}{Energy\ DryingMachine}$;
- Time comparison: $\frac{Dry\ Time\ SmartRack}{Dry\ Time\ Drying\ Rack}$;
- Time efficiency: $\frac{Dry\ Time\ SmartRack}{Energy\ SmartRack}$.

Challenges faced by the team

- Incompatible schedules among team members;
- Balancing coursework with other commitments;
- Defining exact validation metrics to measure the product's success;
- Large learning curve when it comes to implementation (materials/components/architecture).



Deviations from original schedule

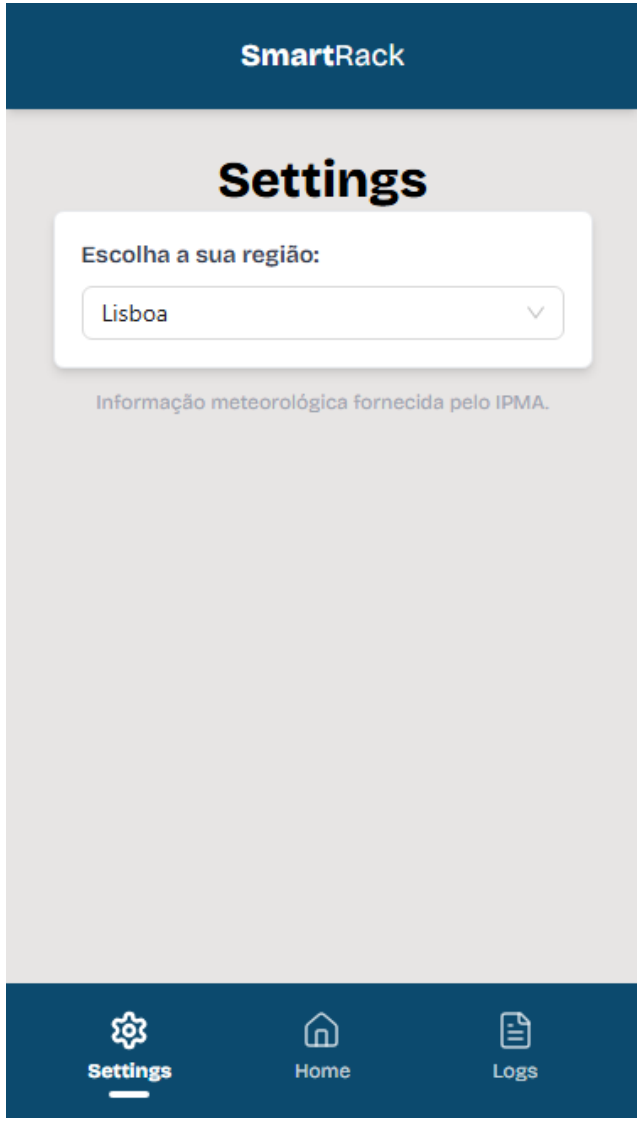
- Difficulty in deciding, unanimously, a solution design and implementation;
- Interviews conducted a week later than intended;
- Market evaluation took longer than expected;
- Delay in deciding components.

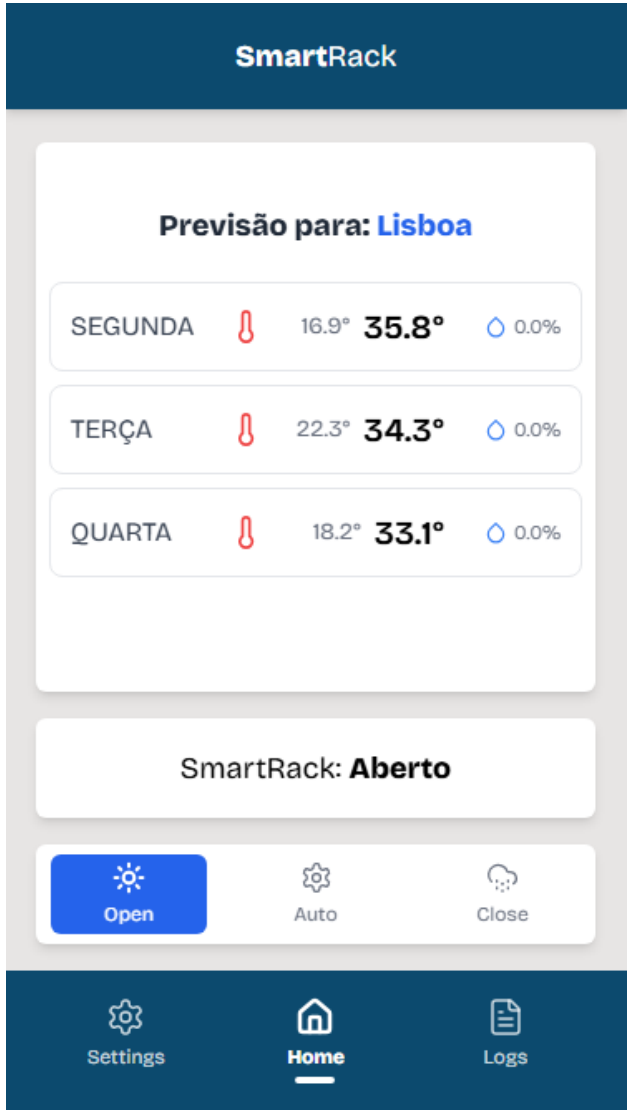
Team 1 Schedule

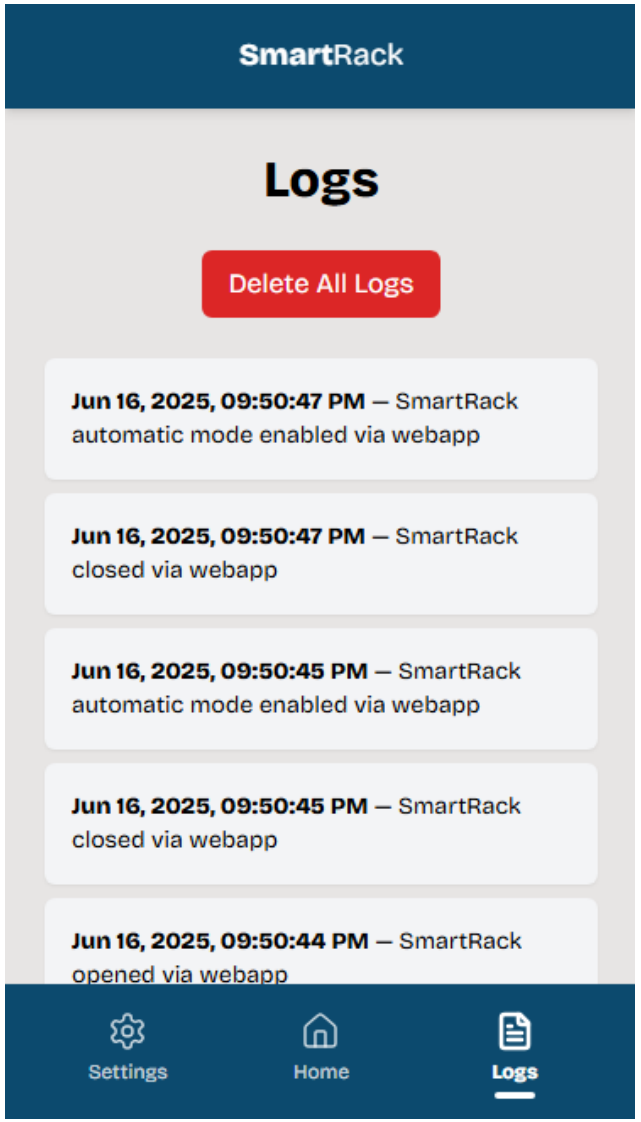
Stage	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17
Website Development and Blog Updates														
Market Evaluation														
3D modelation and first printed model														
Interviews														
Material Selection														
Mid-term presentation														
Physical structure development														
Hardware development														
Software development														
WebApp development														
Prototype testing														
Video and Poster														
Final presentation & Electrocap														

Achieved results (1)

Achieved results (2)







Contribution of each team member (1)

Diogo Palma	Miguel Martins	José Fonseca
WebApp	**ESP32**	**Site**
Blog	Interviews	WebApp
Pitch Decks	Research components	Blog
Research components		Physical Structure

Contribution of each team member (2)

Leonardo Laia	Rodrigo Moura	Diogo Monge
3D Modelling	**Physical Structure**	**Poster & Video**
Video	Research components	Physical Structure
Blog	Blog	Research components
Pitch Decks	Pitch Decks	3D Modelling

Where to find us!

SmartRack

WebApp

Website