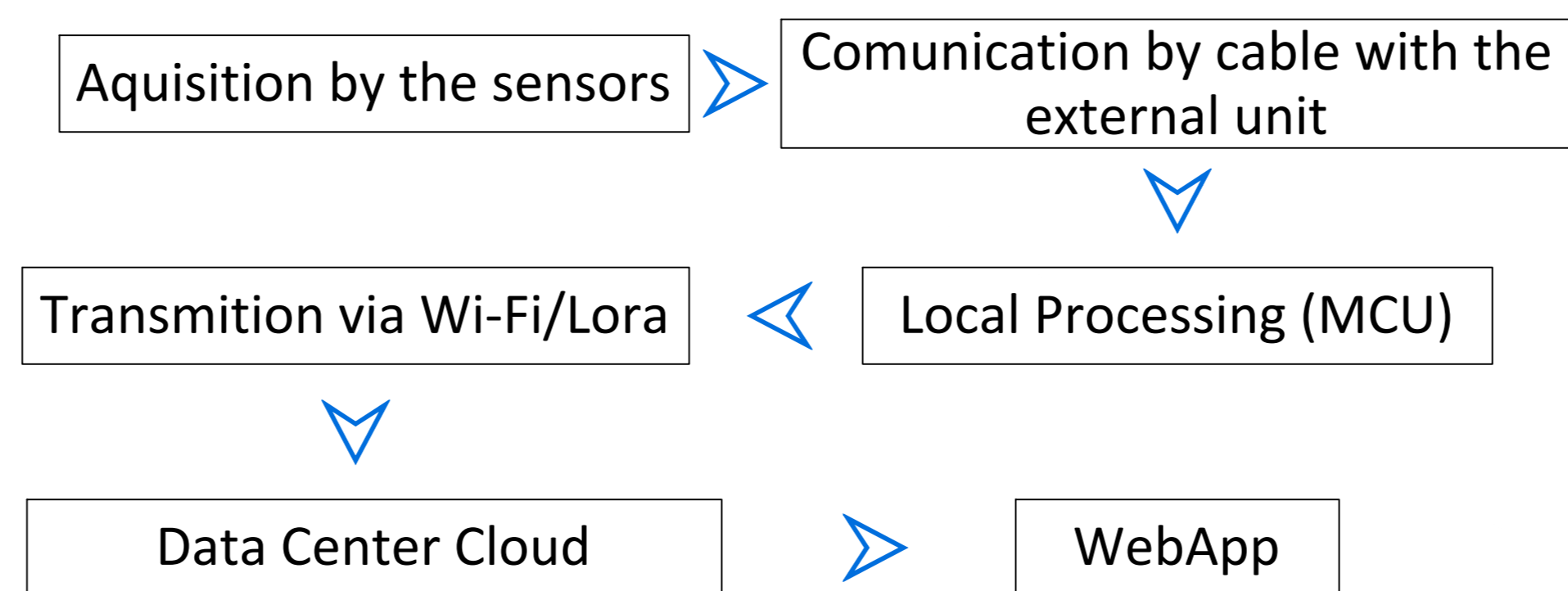


PROBLEM

Concrete is one of the main elements in today's civil engineering. Yet, concrete curing is still done in a very manual and imprecise way. The process still depends on the evaluation of the concrete relative humidity over time, without really being based on accurate information and relying on a subjective perspective. Mistakes during the curing and vibration often lead to cracks, bubbles in the concrete, that compromise the structural integrity of the work.

DATA FLOW



SOLUTION

The creation of a system that monitors determining conditions in the concrete would enable a much more informed action during the curing. The system would be able to measure the relative humidity and temperature inside and outside the concrete, display the data gained in a WebApp to be consulted in the work site and in the laboratory, and notify erratic values for those conditions.

BENEFICIARIES

The whole civil engineering industry would benefit with the implementation of this system, once it gives more credibility to the construction process. Also, the labs used to assist the concrete curing would be able to implement this system and make use of the data it gives.

TESTING

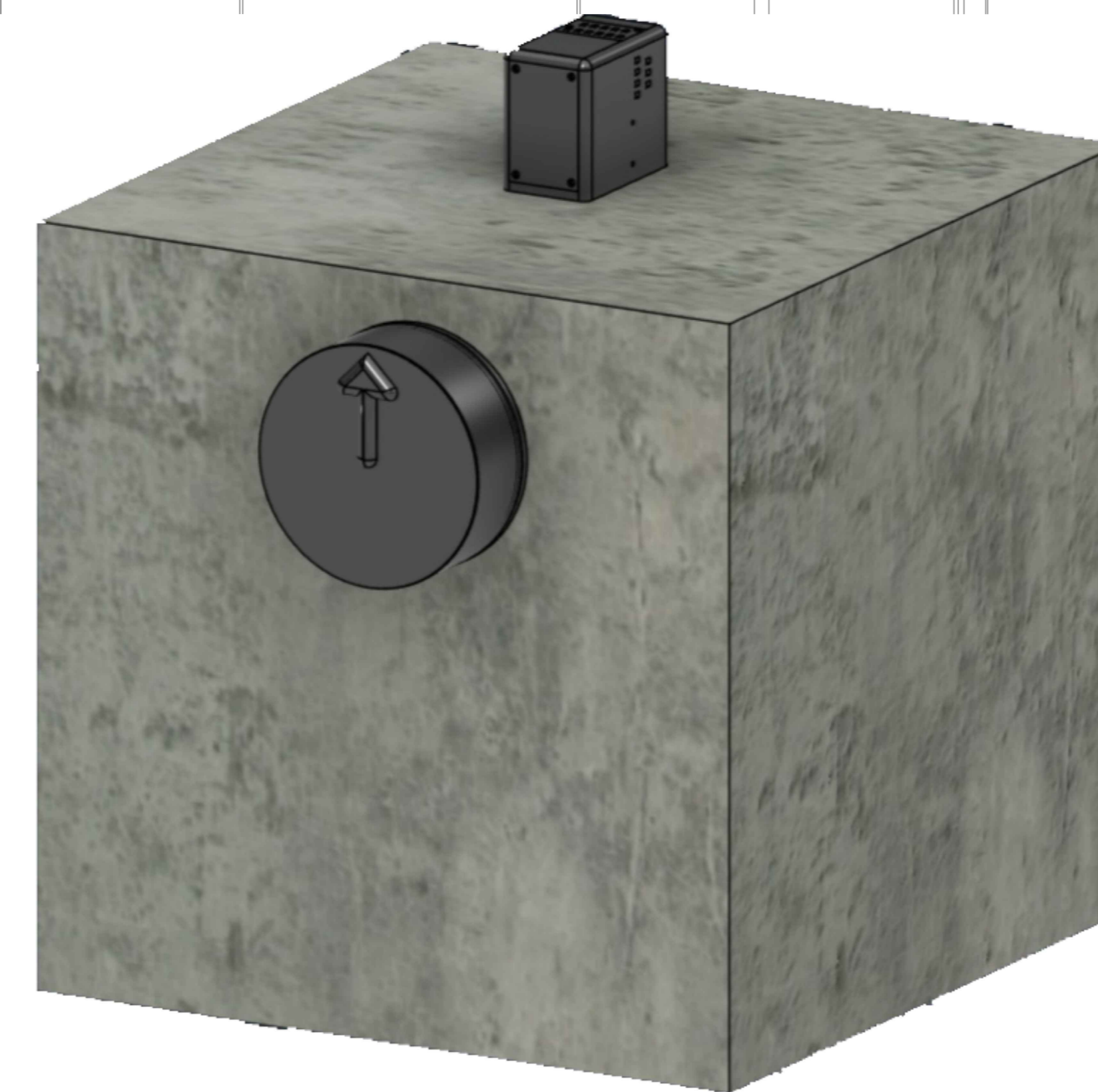
The group runned diverse tests on the prototype and concluded that the system was sucessfully measuring all the data required. From the tests, we were able to conclude some critical conditions for the cure, proving the theoretical research we've made previously.

CONDITIONS FOR SUCCESSFUL CURE	
VARIABLE	CONDITION
temperature	under 70 °C
relative humidity	over 65% %
evaporation rate	under 0,996 kg/m ² /h

VALIDATION

"The use of temperature and humidity sensors, with aquisition system and transmission in real time, its a powerful tool to have in quality concrete structures."

Manuel Vieira
Investigador Principal do Laboratório Nacional de Engenharia Civil



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Gonçalo Gonçalves



José Batalha

CMS

CONCRETE MONITORING SYSTEM

PROJECT

PROJETO INTEGRADOR DE 1º CICLO

AREA

CONCRETE CURING

DESIGNATION

POSTER

DATE

JUNE 2026

SCALE

S/E

DESENHO N.º

01