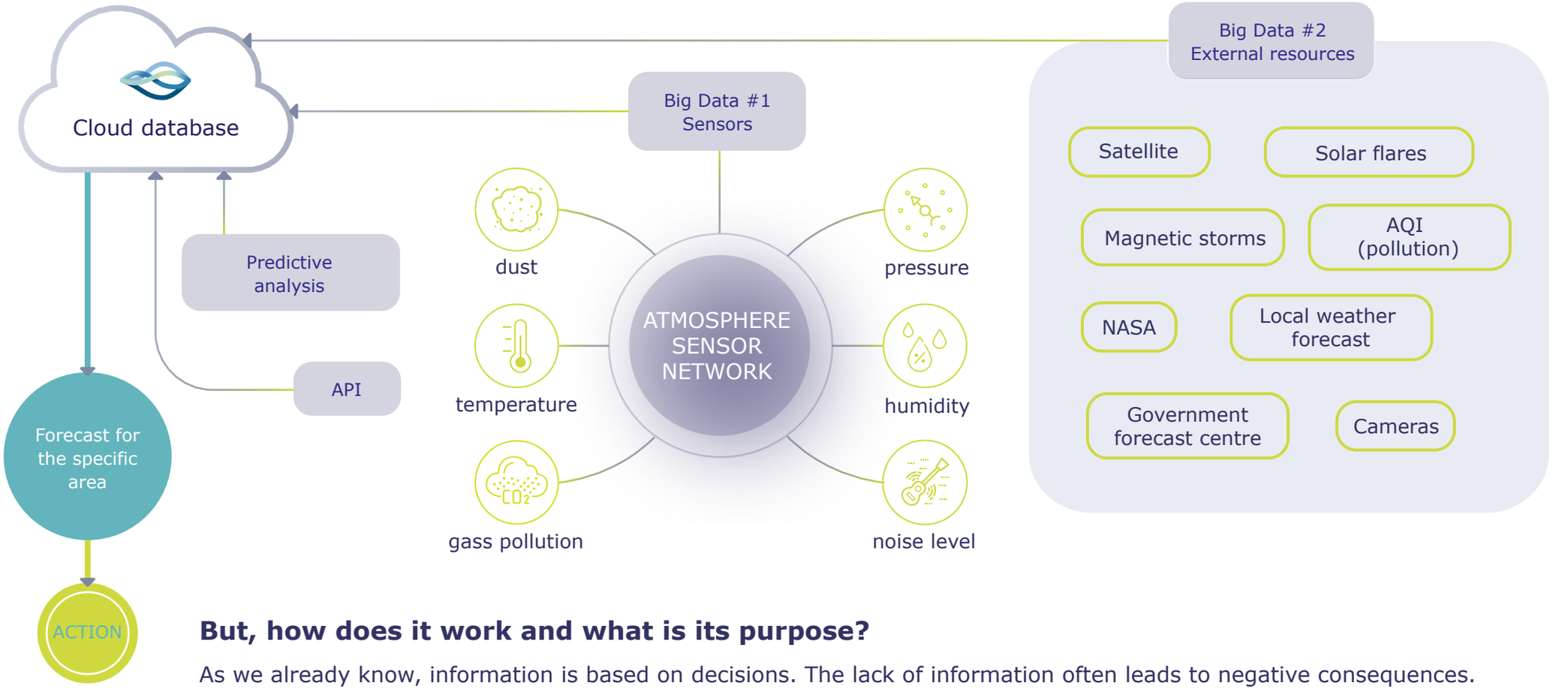
Atmosphere

The world of the future - everyone dreams about it, but not everyone dares to define it in practical terms and walk towards it. The trouble is to comprehend that the future means a different way of life, not just more of what we've had before. And now we are but in a short pass from new technological era, where everything is ruled by intellectual systems, which collect so-called Big Data and create new aware approach to the surrounding world - rapidly changing world. Especially, in the Environmental research, where humanity is falling behind in awareness. Of course, in the end of XX - beginning of the XXI century we do have automation, we do have various sensors, we do have ways to estimate events based on collected data. However, these only provide a response to a situation and a rough warning, which can lead to significant errors due to the so-called "human factor" that we are trying to avoid

Or, even if it does work automatically, how early would the reaction be?

We proudly present you Project "Atmosphere", an intellectual system, aimed for aware approach to environment. **It races the Time, allowing you to track changes in air and water and create a very accurate forecast for 8 hours ahead.** This is the only system that maximizes the localization of the problem to the scale of a town quarter. "Atmosphere" is capable of integration in a wide spectrum of industries (weather forecasts, industrial health protection, ecology, sports). The core is the information hub (Big Data Cloud) and its physical manifestation - a modern complex of sensors in various modifications. "Atmosphere" is an effective tool for combating **insufficient awareness about** climate change.

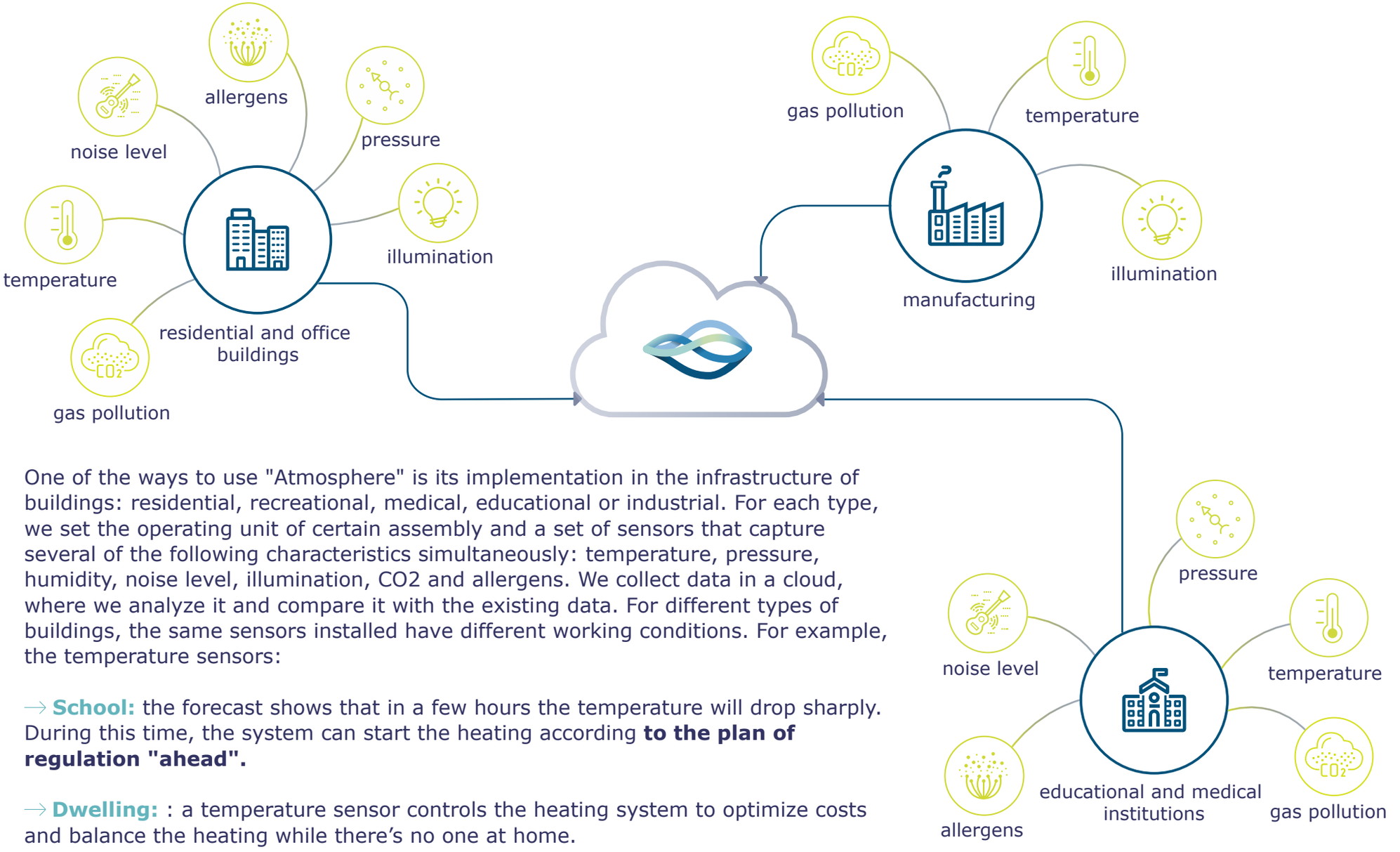


But, how does it work and what is its purpose?

As we already know, information is based on decisions. The lack of information often leads to negative consequences. Avoiding this - filling the emptiness in the array of indicators needed to clarify the consequences of the solution. Thus, the most important function of "Atmosphere" is to collect the data.

The core of the system consists of a data bank, software capable of processing it dynamically, and a computing power (server). On the premises, there are sources of information and devices that provide a control signal. Depending on what the device is, the system can be customized for both individual users (Eg: a smartphone application) and for educational institutions or industrial companies (Ex: a network of lighting, ventilation).

Weather forecasting, which is the first stage of implementation, can become as precise as predicting how long it will rain, for what duration and the exact location - with sufficient preliminary data to build a matrix. Integration with maps on a smartphone will allow you to link geocaching predictions. Just like you've seen it in Sci-Fi!

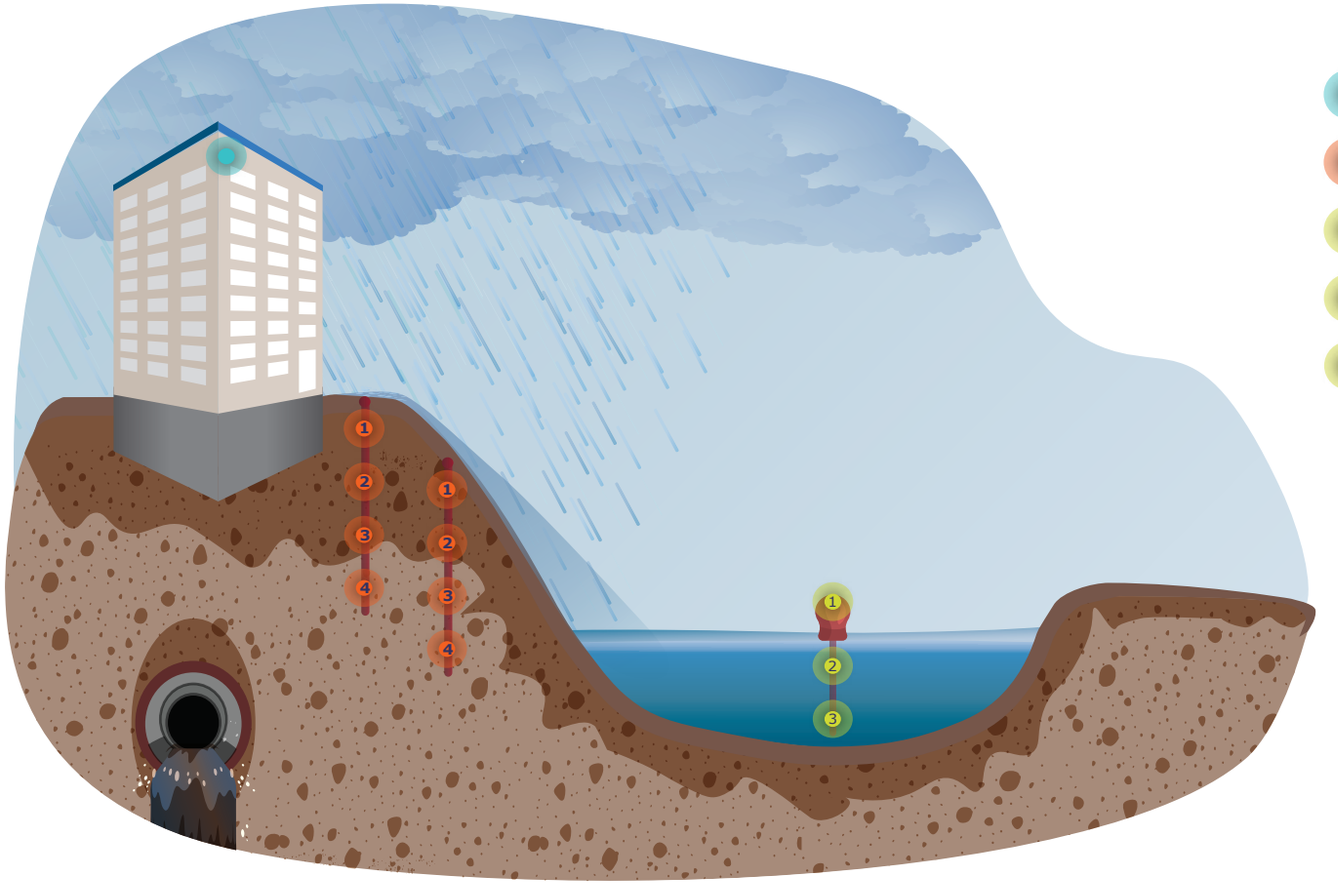


One of the ways to use "Atmosphere" is its implementation in the infrastructure of buildings: residential, recreational, medical, educational or industrial. For each type, we set the operating unit of certain assembly and a set of sensors that capture several of the following characteristics simultaneously: temperature, pressure, humidity, noise level, illumination, CO2 and allergens. We collect data in a cloud, where we analyze it and compare it with the existing data. For different types of buildings, the same sensors installed have different working conditions. For example, the temperature sensors:

→ **School:** the forecast shows that in a few hours the temperature will drop sharply. During this time, the system can start the heating according **to the plan of regulation "ahead".**

→ **Dwelling:** : a temperature sensor controls the heating system to optimize costs and balance the heating while there's no one at home.

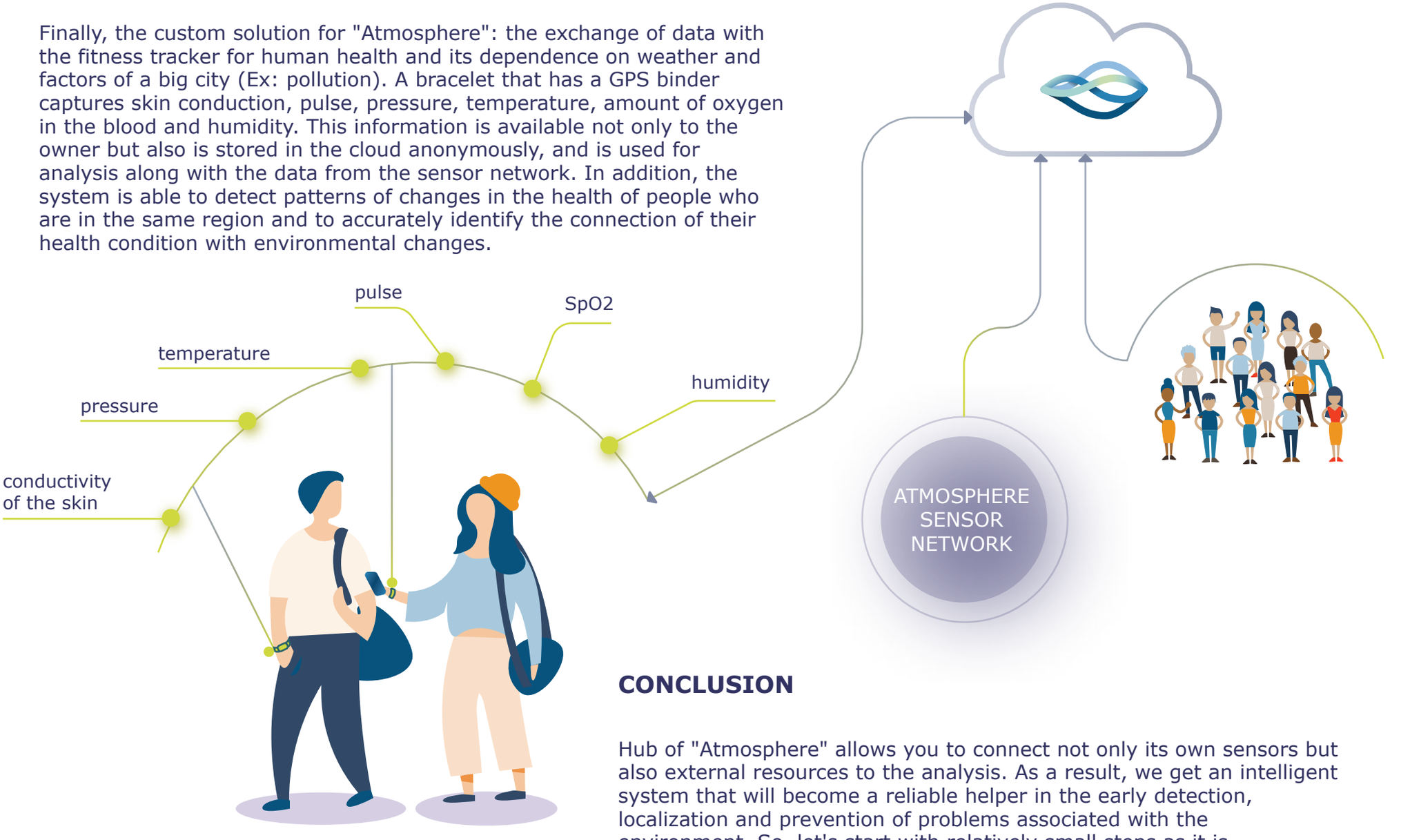
→ **Plant:** thhe study of heat flux in the air affects the efficiency and safety of the process, as well as the costs of the plant for utilities.



Another aspect of Project “Atmosphere” is connected to hydrological measuring devices in order to monitor the water cycle in nature and to study its purity. Consider a building built on a slope. Under the building are installed drains and in the soil are humidity sensors. These sensors are required to record the stability and density of land that is washed away by groundwater and rainwater. If the soil is "soft" - the risk of collapse, landslide or destruction of buildings increases.

In addition, rainwater from the entire city flows into bodies of water, bringing with it particles of soil at the very least, which **affects the silt of the water body, the profile of its bed**. It can also change due to fast or slow currents. This data is collected by an echo sounder, located on the buoy, where the temperature sensors are also installed. **They "check out" the temperature of the air and water temperature at different depths**. Relevant sensors track changes in the transparency and conductivity of water, which determine the level of its contamination. This way we learn about the factors that shape the ecosystem of the water body and among them - the "contribution" of the rains.

Finally, the custom solution for "Atmosphere": the exchange of data with the fitness tracker for human health and its dependence on weather and factors of a big city (Ex: pollution). A bracelet that has a GPS binder captures skin conduction, pulse, pressure, temperature, amount of oxygen in the blood and humidity. This information is available not only to the owner but also is stored in the cloud anonymously, and is used for analysis along with the data from the sensor network. In addition, the system is able to detect patterns of changes in the health of people who are in the same region and to accurately identify the connection of their health condition with environmental changes.



CONCLUSION

Hub of "Atmosphere" allows you to connect not only its own sensors but also external resources to the analysis. As a result, we get an intelligent system that will become a reliable helper in the early detection, localization and prevention of problems associated with the environment. So, let's start with relatively small steps as it is impossible to solve the problem of climate change globally if you cannot overcome its manifestations in the neighbouring streets of your own city.