

INTERNET OF THINGS

THEME	Software in Internet of Things projects
FORMAT	Group (all students work simultaneously)
PREPARATION TIME	1 hour
ACTIVITY LENGHT	30-45 minutes
DIFFICULTY LEVEL	easy

PEDAGOGICAL GOALS

Understand what software is and the difference between software and hardware.
Learn that software are computer programs developed by people.

Identify software elements in an example of IoT systems.

NECESSARY MATERIAL

This printed lesson plan.

Leading the activity:

This activity consists of two steps. The two stages can be conducted as a collective discussion of the whole class.

Step 1 Software:

Start a collective discussion with the class of students about software, what it is, who develops it, what is the difference between software and hardware. See examples of questions you can ask:

- What is software? What is the difference between software and hardware?
- Does the computer work only with hardware and without software?
- Who develops programs (software)? What programming languages do you know?

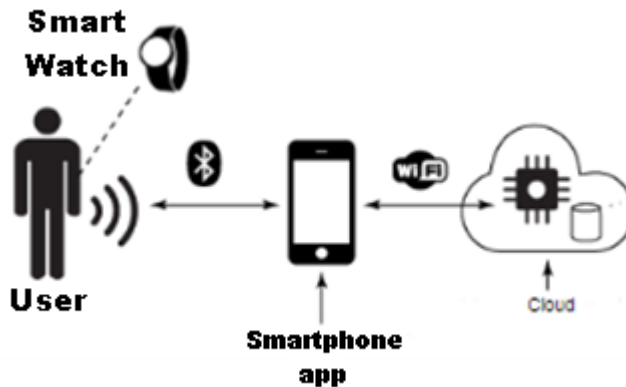
Observe if students realize that software is the set of instructions that a person writes for the computer to execute. Hardware is a piece of equipment that has weight and can be touched. Software are programs and applications that we cannot touch and have no weight.

Try to lead the discussion to the conclusion: “The computer works because it has hardware and software, that is a set of instructions. People develop software using programming languages like Java, HTML, Python, etc.”

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Etapa 2 Software em projetos de Internet das Coisas:

Read the 'Smart Watch' text below aloud or have a student read it.



“Smart watch

This figure illustrates an IoT system for controlling patients remotely. It works as follows: a user uses a smart watch which, in addition to displaying the time, is also capable of detecting the heartbeat. These beats are captured by a sensor positioned on the watch strap, so it is easy to measure. The captured heart rate data is sent to an application that, in turn, sends it to a hospital server where the user is insured, for the doctor's analysis.”

Discuss this example with your students to find out where there is software or programs on this system. See examples of questions you can ask.

- Is the smart watch example a useful example? For whom? (elderly, sick, hospital patient)
- What equipment is used in this system? What are the hardware elements? (clock, smartphone/cell phone, server)
- Which sensor is used in this application? (heart rate sensor)
- Where is the software? Where are there programs? (on watch, smartphone/cell phone, server)
- What does the program on the watch do? (captures the heartbeat with the sensor and sends it to the cell phone application) How? (via bluetooth connection)
- What does the cell phone program do? (sends the person and heart rate data to the hospital server) How? (via Wifi network or 3G/4G connection)
- What does the server program do? (receives patient information, stores and displays it to the responsible physician)

Discussion and reflection:

After completing the activity, discuss other examples of Internet of Things systems with your students. Are there different applications that use a smart watch?

Credits:

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