Electronic price tag

Countries:	Slovenia 🇸🇮	Slovakia 🇸🇰
Suitable for grade:		3 – 4
Specialization:		Technical lyceum Electrotechnics
Responsible teacher:		Michal Copko

Project description:
Goal is to build electronic price tag that will display name and price of goods in the shop. Price tag should be energy efficient, small and updatable by NFC, Bluetooth or WiFi. One part of project is to build display controlled by microcontroller with LCD, OLED or eInk display that have NFC, Bluetooth or WiFi module to update information displayed on tag. Second part is system for preparation of information that will be displayed on tag (name, price, tax, …) and upload of these information to tag.

Project tasks:
Student #1 (SK):
- Design circuit for display part of tag controlled by microcontroller with NFC, Bluetooth or WiFi module
- Design PCB for microcontroller with connected display and communication module
- Prepare microcontroller program for reading data from application through NFC, Bluetooth or WiFi and showing them on display
- Test the functionality of system

Student #2 (SI):
- Design communication protocol and data format for sending into price tag
- Prepare application for sending data to price tag through NFC, Bluetooth or send it to server, from which can price tag download information through WiFi
- Application can be programmed for smartphone or webserver
- Test the functionality of system

Success criteria:
Project will be successful after construction of working electronic price tag that will display price and name of article in shop with possibility to display other information (category, expiration …) in which information will be provided wirelessly. Project should also follow safety rules according to possibility of placement in moist area (near vegetables or fridges). All project parts should be cost efficient and software code should be well designed (time and memory efficient, without bugs). Project documentation has to be prepared based on given template in the range of 15-25 in English and native language.

Developed hard skills:
Programming, debugging, working with wireless technology, electronic measurement, working with optoelectronic parts, working with datasheets, programming, working with network protocols, computer graphics, computer networks, CAD systems, design of PCB, soldering

Developed soft skills:
Cooperation, working with computer, planning, teamwork, tracking progress, communication in foreign language, responsibility, compliance with agreements, respect deadlines, problem solving, finding and processing information, design thinking, following safety and ergonomic rules