Polytechnic University of the Philippines

Paranaque Campus

Bachelor of Science in Computer Engineering

Case Study 2:

Different Arduino Boards

CMPE 30184

Microprocessors

Submitted to:

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Executive Summary

Arduino was established by two innovators, David Cuartielles and Massimo Banzi, who were inspired by Hernando Barragán, the inventor of wire. At the Interaction Design Institute Ivrea in Ivrea, Italy, it is an easy-to-use programmable device for interactive art design projects. They needed a device that was easy to configure and connect to a variety of devices, such as relays, motors, and sensors. Since then, the Arduino has changed in many ways, with some versions getting smaller and others becoming larger. Each one is tailored to a certain market. The on-board bootloader firmware that comes preloaded on the microcontroller of every Arduino board and the Arduino runtime AVR-GCC library that comes with the Arduino development environment are the only things they have in common.

Table 1-1. Timeline of Arduino products

Board name	Year	Microcontroller	Board name	Year	Microcontroller
Diecimila	2007	ATmega168V	Mega 2560	2010	ATmega2560
LilyPad	2007	ATmega168V/ATmega328V	Uno	2010	ATmega328P
Nano	2008	ATmega328/ATmega168	Ethernet	2011	ATmega328
Mini	2008	ATmega168	Mega ADK	2011	ATmega2560
Mini Pro	2008	ATmega328	Leonardo	2012	ATmega32U4
Duemilanove	2008	ATmega168/ATmega328	Esplora	2012	ATmega32U4
Mega	2009	ATmega1280	Micro	2012	ATmega32U4
Fio	2010	ATmega328P	Yún	2013	ATmega32U4 + Linino

Background

The designers at Arduino.cc have created a lot of board designs over the years. The Diecimila, the first widely available Arduino board, was released in 2007. The Due is the first Arduino to use a 32-bit ARM Cortex-M3 CPU, and it stands apart from the rest of the family in terms of processing power and board pinout design. The newest versions include more modern CPUs with more memory and greater input/output (I/O) functions, but they use the same pinout configurations and will work with existing shields and add-on components like sensors, relays, and actuators.

Case Evaluation

While the Arduino's circuit design and software are open source, the Arduino team has reserved the term "Arduino" for its own projects, and the Arduino logo has been trademarked. The AVR microcontroller on which the Arduino is based also has a lot of power and potential. Real-world monitoring, small-scale control, small-scale automation, and performance art are just a few examples of possible Arduino uses. Only your imagination limits the possibilities. You can incorporate an Arduino into a variety of intriguing applications as long as you don't try to make it work as a full-fledged computer system.

Proposed Solution

Many devices are either physically compatible or software compatible with the various board types produced or sanctioned by Arduino.cc. The Arduino bootloader is built into these devices, and they can be programmed using the Arduino IDE by selecting the proper compatible Arduino board type from the IDE's drop-down list. Programming a device is significantly simplified using the Arduino bootloader firmware, and the design options are endless.

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