Sachons Sourions
Team Aether

Group 4

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Stillwell Pan
Power Programming
Our Objective

Overview

- Create a safe, self contained mobile computer lab
- Increase literacy rates in Mali
- Provide students with a quality education
Our Challenge
Problem Statement

Classroom
Our challenge is to create a sustainable, self-contained, and maintenance-free electronic ecosystem while optimizing space usage.

Power
The ultimate test for such an ecosystem is the duration of efficient operation pertained by the rate of battery degredation.

Learning
The team will have to decide what the best teaching solution using computers will be based off what resources we can provide.
Project Outline

Let us Learn, Let us Smile

START
RESEARCH
DESIGN
DEVELOP
TEAM
TIME
END
Brainstorming
Design Phase

- Project build must not go over allotted time
- Will be able to be transported to desired location without issues
- Able to withstand years of weather abuse
- Cost effective and self sufficient

Children can adapt to the classroom easily
We have decided to design the lab with a conference style setup, which would allow an instructor to easily maneuver through the classroom and assist students without the hassle of squeezing through tight spaces.
Solar Power
Typical Off Grid Setup

Solar Panels -> Panel DC Disconnect -> Charge Controller

System DC Disconnect <-> Meters / BHPCU <-> AC Breaker Panel

Inverter

Battery Bank

Computers/Lights/Fans
Performance Measures

We will be implementing a Battery-Health Preservation Control Unit (BHPCU). This unit will collect and use the following data:

- rate of energy collection
- rate of energy usage
- battery charge level
- battery temperature level

From the collected information the BHPCU will first decide if energy being collected is more or less than the energy being used.
Gigabyte GB Mini Case
- Abundant peripherals
- WiFi and Lab built in

Intel Atom N3510
- Quad Core
- Intel HD graphics equivalent to an AMD Radeon HD 6310
- 7.5 Watts Max Power Consumption

64 GB EVO SSD
- Lower power consumption than a standard HDD
- Higher tolerance to heat and vibration

Total power consumption: ~520W
Total cost: ~ $8000
EdUbuntu

Pre loaded with applications ranging from graphic design to simple addition games.

Built in intelligent power management

Low system requirements and optimization ensure a smooth experience even on low power hardware.
openthinclient
Hardware

ThinkServer TS140
- Running Ubuntu 14.04 LTS
- Core i3-4150
- 180 watt max

Thinclients Thinkpad x61s
- Core 2 duo max TDP of 17 watts
- Gigabit PXE support LAN

Total power consumption: ~510W
Total cost: ~ $2500
Cornell Cup
First Round Entry
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Instructional Assistant

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References


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Questions?