

Development Project: Online Business During/Post COVID

SciEngr Electronics

Team Members

Min Khant Soe	122277
Pyae Sone	122645
Xavier Blake	122080

E-commerce store name: SciEngr Electronics

Background

In Myanmar, electronic components are not easy to buy and there are not many shops selling them. Thus, people in Myanmar, especially engineering students have to spend longer time and more money than in Thailand. Thus, we plan to create an online shop where Myanmar people can conveniently buy our products from home with the affordable delivery service fee. Our shop is partnered with the companies such as “**Dielectric**” which produces micro-controllers and sensors and “**Kiddeelab**” which is a training school which provides training courses and sells training sets.

Purpose

Our purpose is to help the electronic training schools and engineering students (Electrical, Electronics and Mechatronics) get the electronic components for their projects. We also intend to provide the high quality 3D prints and PCB design according to the customer’s project. Another goal is to provide the efficient and effective training courses for those who want to learn about microcontrollers and electronics.

Description

In this project, we will create an ecommerce store which will be built as both a website and a mobile application. On our online store, each of the products and services are grouped by categories and are described in detail in order to avoid misunderstandings by our customers. Our website contains basic features such as customers creating accounts, choosing and adding products and services to cart, and purchasing them. We also allow customers to choose different payment options and to write reviews for the products and services; they can also read the reviews that other customers have written. For businesses, they can sell their products and services on our website and we will help them find and contact other businesses to work.

Target Customers

Our target customers are electronics training schools and engineering students (Electrical, Electronics and Mechatronics) in Myanmar.

E-Commerce Type

Since we are targeting engineering students and electronics training schools in Myanmar, our e-commerce type falls under the B2B and B2C model. Seeing that we are creating a digital market where people can transact for goods, our B2B model represents the E-procurement B2B model. In addition our store is an online version of a traditional retailer and also we are creating a digital environment where buyers and sellers can meet and transact so it falls under E-tailer and market creator, respectively, for B2C models.

Revenue Model

Since we have 3 business models, we also have 3 different revenue models such as service fees from E-procurement (B2B) model, sales of the products from E-tailer (B2C) model, and fees from merchants for access to our store from Market Creator (B2C) model.

Value proposition

Our value proposition contains ease of searching for products, reasonable prices, and different payment options.

Market Strategy

Goals

Our goals are to reach more customers and increase the market and to increase gross revenue by 30 percent within 24 months.

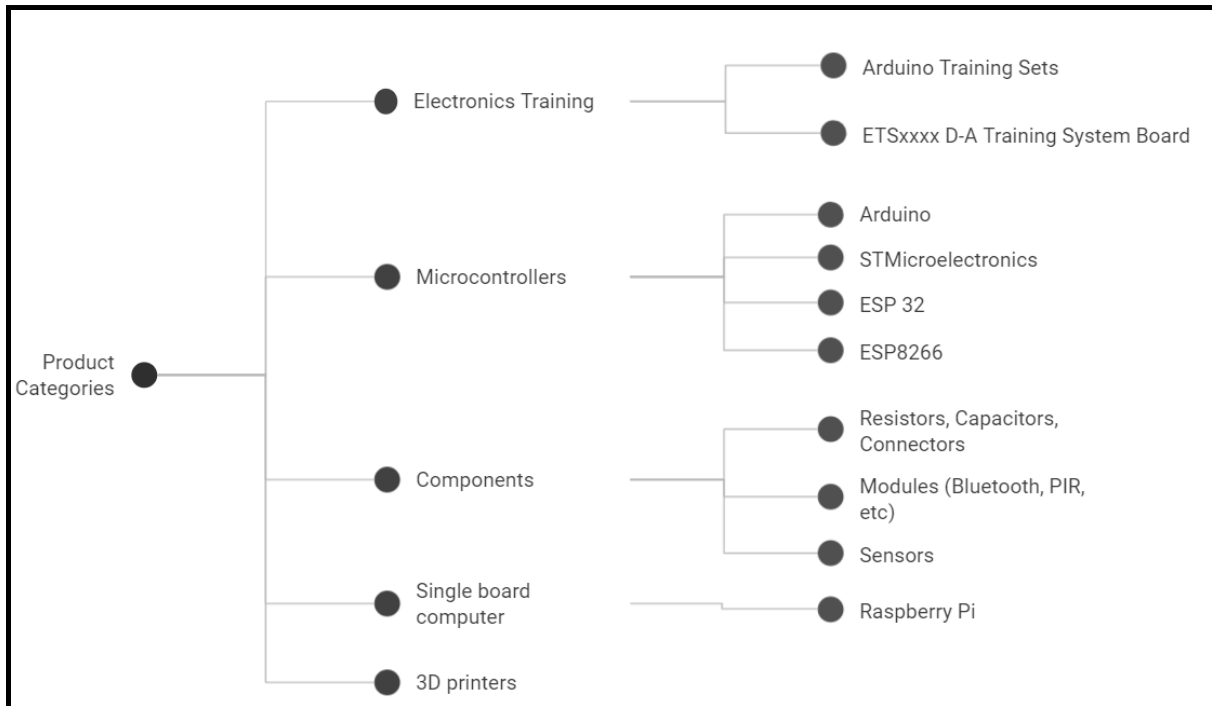
Plan

In order to achieve our goals, we set the plans. First, we will use social media advertising; for example, advertising on Facebook with lucky draw promotions. Next, we will contact private and public universities in Myanmar, and try to make business agreements and contracts to collaborate with us; we will offer them some benefits such as special discounts for training sets and long term contracts to work with KiddeeLab company. Lastly, we will create sales events such as 12.12, Christmas, New Year sales; we will offer special discounts for products and delivery fees.

Products and services

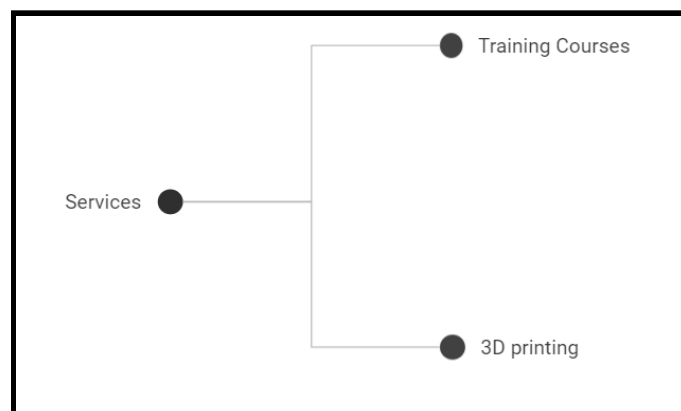
Our products and services by categories are shown below with tree diagrams.

Products



We have products with five different categories: Electronics training, Microcontrollers, Electrical components, Single board computers, and 3D printers. We help other businesses to sell Arduino training sets and ETS7000 D-A training systems on our store website for the electronics training category. For the microcontrollers category, we sell essential microcontrollers such as Arduino, STMicroelectronics and ESP 32 and 8266. Below the components category, we have resistors, capacitors, connectors as well as modules such as bluetooth, PIR and sensors. We have raspberry pi for the single board computers category. For 3D printers, we have Ender and Anet brands.

Services



Our store also provides services that may be divided into two main categories: training courses and 3D printing. For training courses, individual customers can choose the class schedule according to their time availability. Businesses such as universities can contact us to have business agreements and collaborate with us on training programs. For 3D printing, customers have to upload the design that they want to print so that we can use 3D printing software to slice the design and let the customers know how much their 3D printed design will cost.

SWOT Analysis

Strengths <ul style="list-style-type: none"> • Lower Prices • Ease of searching/purchasing products/services • Variety of products 	Weaknesses <ul style="list-style-type: none"> • Costs of maintaining the equipment • Inventory cost
Opportunities <ul style="list-style-type: none"> • Growth of online shoppers in Myanmar • Expansion of Internet Access to rural areas in Myanmar 	Threats <ul style="list-style-type: none"> • Many competitors for e-tailing and 3D printing service • Low customer's trust and preference on using the service online • Fraud • Data Concerns • Myanmar Military Junta

Existing and Potential Competitors

Since Myanmar is also a developing country, it already has some online and offline electronics and educational training centers which are our existing and potential competitors. In order to know our competitors, we did research and found the following competitors: Cherry plaza, DCX store, MicroWorld, GreenElectronics Store, Lat Twae Education, PN Electronic Lab, BeSimple Electronics and Crenonative.

Information of some of our competitors for both electronics & teaching and 3D printing services are shown in the table below.

Name of Companies	Products and Services
Cherry Plaza	Electronic - Retail microelectronics & kits - Emulators

DCX Store	Electronic - Microelectronics kits - Retail second hand laptops
Lat Twae Education	Education Service - Basic Web Technology - HTML, CSS - Python - Basic Robotics
I am MAKER	Thailand-based 3D Printing services
Proto Factory	Thailand-based 3D Printing services
THE FAST 3D PRINT	Thailand-based 3D Printing services

Competitive Advantages

As for competitive advantages over our competitors, we provide not only products but also services. Next, our products are cheaper and better quality than that of other competitors since we buy them from different suppliers. And we buy and store most of our products in the warehouse based in Myanmar, thus we can also deliver them to our customers in a shorter period of time. In addition, the courses that are available on our website are effective and offered by the company which has professional teachers..

Moreover, we also provide higher quality 3D printing services than most of the competitors in Myanmar. Besides, our customers do not need to come to our store to give us detailed information; they can upload it on our store website. They can also check the status of their order on the store website and interact with us through the email. Compared to the 3D printing services based in Thailand who accept work from Myanmar, we have advantages on price. Since our 3D printing shop will be based in Myanmar, we can offer our customers cheaper prices and faster delivery time than the 3D printing shops in Thailand.

Investment Requirement

Initial Investment

Items	Cost (฿)
Custom language extension for OpenCart website	1,200
Devices for Services (3D printer, etc)	100,000
Website Building and Hosting	60,000
Total	161,2000

Recurring Investment and Expenses per year

Items	Cost (฿) / year
Product Stock	100,000
Warehouse for Storage	48,000
Delivery Fee	24,000
Electricity and Water	15,000
Website Maintenance	10,000
Staff (Web Developer)	192,000
Total	389,000

Projected Revenue

Revenue Model	Cost (B) / year
Service Fees from E-Procurement (B2B) Model	350,000
Sales of Products from E-tailer (B2C) Model	250,000
Fees from Merchant for access to store from Market Creator (B2C) Model	132,000
Total	732,000

Technical Infrastructure

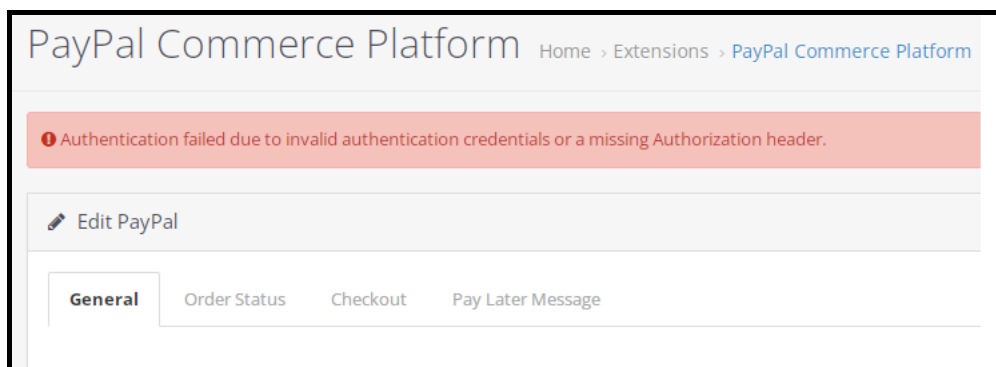
The main technical infrastructure of our business is the internet and E-commerce environment. We have cart capabilities in our website so that customers can add any products and services they want. We also have our inventory where we store and manage our goods. After purchasing, customers will get an email regarding their personal purchases. We also have a newsletter system, so that customers will be up to date with our business news and events.

Human Resources Requirements

As for the human resources requirements, we will hire a web developer to maintain the website since the three of us can manage 3D printing, PCB design, inventory management, acting as a representative as well as admin to manage other things.

Payment Methods

We plan to set 3 payment methods such as direct bank transfer, cash on delivery and paypal on our e-commerce store. Although the Paypal extension for OpenCart comes pre-installed, we did not finalize it's setup in our project website: we must link a genuine PayPal business account to our OpenCart shop in order to enable the extension. This requirement is demonstrated below.



Delivery Agents

For delivery, we use Thai post and Aung Thai-Myanmar cargo for cross border delivery.

E-Commerce Platform

We use OpenCart (OpenCart, 2021) to implement our store as it is a good open-source platform for self-hosted E-commerce websites. It is easier than the other platforms for non-technical users. It offers us many extensions such as payment gateways, shipping and pricing, sales records, etc. By default, websites created with OpenCart are responsive, allowing mobile phones to easily browse without the need of horizontal scrolling. Search engine optimization tools are also available in OpenCart. It has a relatively high amount of low level control compared to some cloud-based E-commerce platforms, since we have full access to the website source code. We can also manage marketing campaigns from the Administrator dashboard. Since it provides us many features and functions that are enough for our store, we chose it to implement our store.

Our OpenCart website implementation was done without paying any fees for the extensions employed. We need a web host to make our store online. For testing, we can use the local network as a host and can test the store from different devices. On our store website, we allow customers to browse, add to cart and buy our products as either registered members or guests. We set the email service, so the store will send email to customers after they registered their account, purchased the products and services, or their orders are updated. We also set up SEO settings, shipping pricing and payment options for our store. We use Google Analytics to analyze the performance of our store.

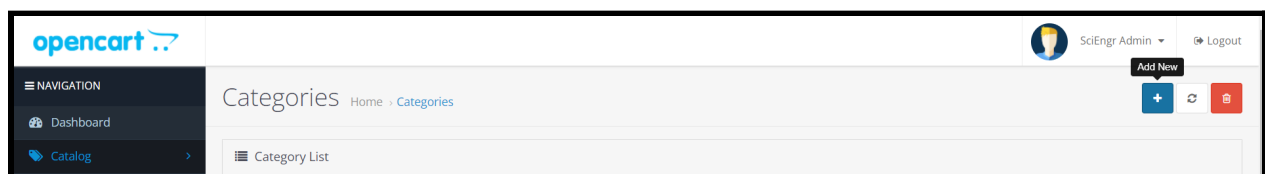
OpenCart Website Implementation

Initial Setup

We used the current version of OpenCart, version 3.0.3.8 (OpenCart, 2021). By following the setup guidelines from (Chakraborty, 2017) and editing the Apache server httpd.conf file, our website was set up to work for our local network.

Creating Category for Products or Services


1. As an admin, click **Categories** under the **Catalog** tab which is on the left side of the page. Then click the “**Add new**” button as shown in figure below.




2. In the General tab, create the **Category Name**. **Description** of this category can be written to tell the customer what this category is about. **Meta Tag Title** is to tell the search engine what the title of this category is.

Categories

[Home](#) > [Categories](#)




 Add Category

General

Data

SEO













Design

 English

* Category Name

Raspberry Pi

Description

 **B** U  Open Sans ▾ 13 ▾ **A** ▾          

* Meta Tag Title

Raspberry Pi

3. In the **Data** tab, if the category is the sub category of a category, name the **parent** category (which must already be created) and the **image** for the current category can be added to visually describe.

General **Data** SEO Design

Parent: Single Board Computers

Filters: Filters

Stores: ☒ Default

Image:

- Under the lower part of the **Data** tab, we can set the **status** of this category as either Enable or Disabled to show on the store page or not. Sort Order can be set to display which category shows on the left (for parent category) and on the top (for child category). If we set default 0, the categories will be solved by alphabetical order. **Top** and **Columns** are to display the parent category in the Menu Bar and to display the child category of a parent category in specific numbers of columns.

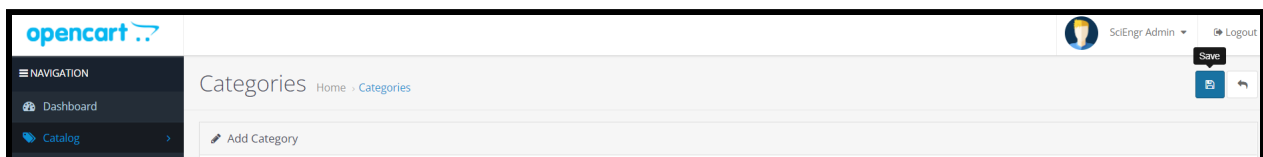
Top ☐

Columns: 1

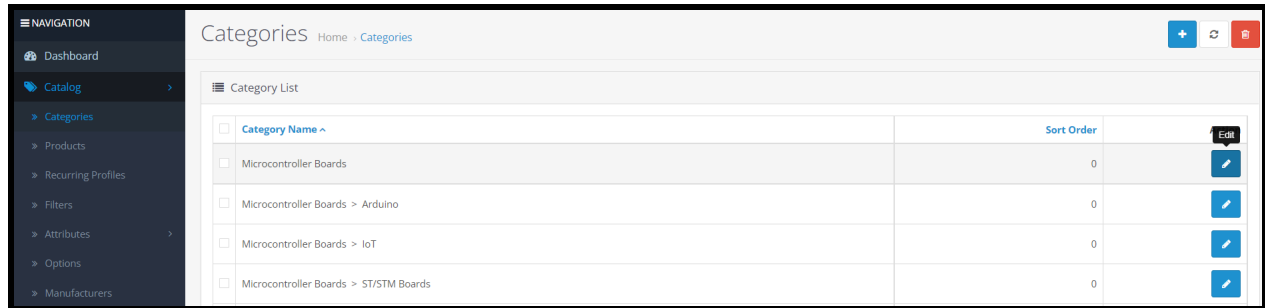
Sort Order: 0

Status: Enabled

- After that, click **save** to create the category.

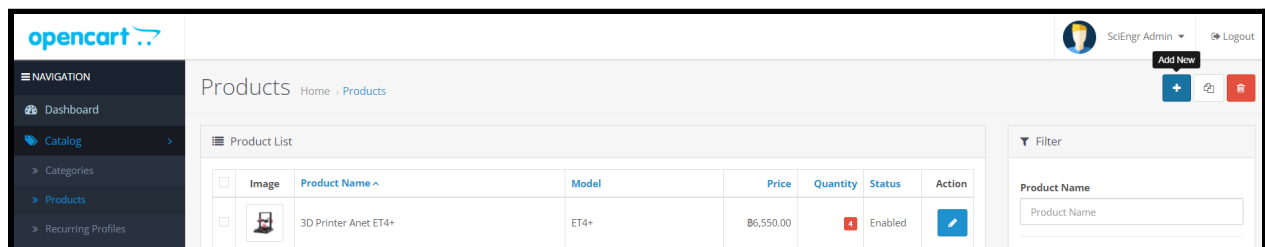


- To edit the information of a category, we can click **edit**.



Adding Products or Services

1. As an admin, click **Products** under the **Catalog** tab which is on the left side of the page. Then click the “**Add new**” button as shown in figure below.



2. In the General tab, create the **Product Name**. **Description** of this product can be written to tell the customer what this product is. **Meta Tag Title** is to tell the search engine what the title of this product is.

Price	<input type="text" value="250.0000"/>		
Tax Class	--- None ---		
Quantity	<input type="text" value="20"/>		
Minimum Quantity ?	<input type="text" value="1"/>		
Subtract Stock	Yes		
Out Of Stock Status ?	In Stock		
Requires Shipping	<input checked="" type="radio"/> Yes <input type="radio"/> No		
Date Available	<input type="text" value="2021-10-22"/>		
Dimensions (L x W x H)	<input type="text" value="55.00000000"/>	<input type="text" value="26.00000000"/>	<input type="text" value="13.00000000"/>
Length Class	Millimeter		

4. In the **Links** tab, we can **categorize** our product and describe the name of the **manufacturer**. If it is a service, we can describe the name of the service provider.

General	Data	Links	Attribute	Option	Recurring	Discount	Special	Image	Reward Points	SEO	Design
Manufacturer ?		<input type="text" value="Espressif Systems"/>									
Categories ?		<input type="text" value="Categories"/> <ul style="list-style-type: none"> Microcontroller Boards Microcontroller Boards > IoT 									

5. This step is required only if we have different versions of the same product. In the **Option** tab, we can add the **different versions** of the same product with **different prices and available quantities**. By selecting **Yes** for **Subtract Stock**, everytime the product is bought, the quantity of that product will be deducted by the number of that product bought.

General Data Links Attribute **Option** Recurring Discount Special Image Reward Points SEO Design

ESP32 Version

Option


Required Yes

Option Value	Quantity	Subtract Stock	Price	Points	Weight	
ESP32 DEVKIT DOIT (30 Pi)	7	Yes	50.0000	0	0.00000000	+
ESP32S WROOM 32 (38 pi)	6	Yes	0.0000	0	0.00000000	+
						+


6. If we add different versions of the same product, we can also add the **images** for each version.

General Data Links Attribute Option Recurring Discount Special **Image** Reward Points SEO Design

Image



Additional Images

	Sort Order	
	0	+
		+

7. After that, click **save** to create the product.

opencart

SciEngn Admin Logout

NAVIGATION

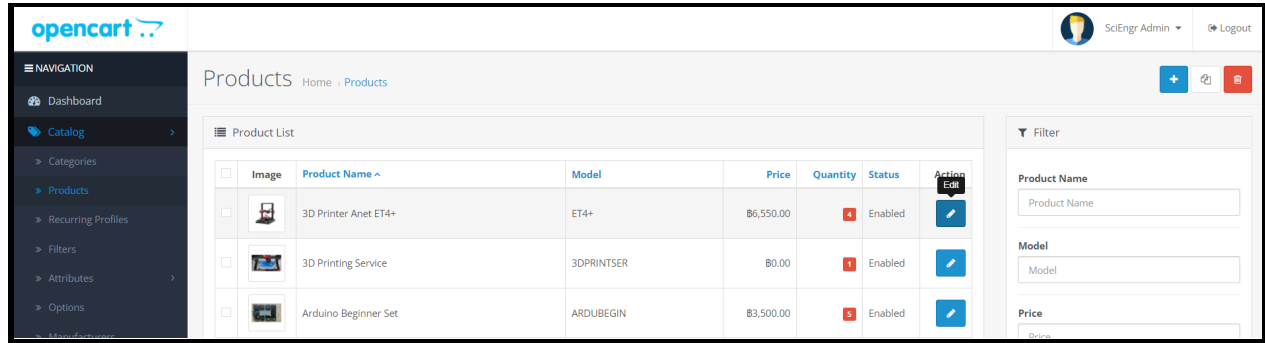
- Dashboard
- Catalog

Products Home > Products

Add Product

Save

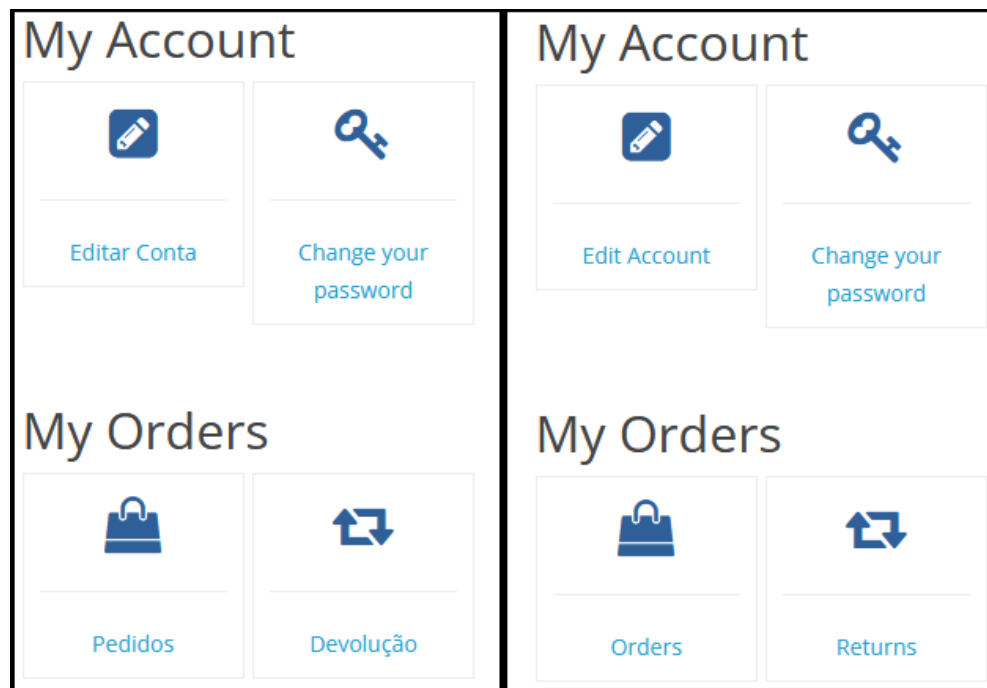
8. To edit the information of a product, we can click **edit**.



Implementing the OpenCart built-in functions

After populating the categories and products, we set the theme to (OpenCart, 2018), which is not fully compatible with our version of OpenCart but is available for free. One of the issues caused the “Edit Account”, “My Orders”, and “Returns” buttons to use the wrong language, as shown below. Another issue caused the radio buttons to not be aligned with the text and each button would be partially off the screen when viewed in the app. These issues were resolved by editing the source files for the theme.

Shown below are the before and after of the wrong language fix.



Below shows the before and after for the website and app for the radio buttons fix.

Before

Available Options

* Capacitance

☐ 1nF (278 available)

☐ 2.2nF (234 available)

☐ 10nF (199 available)

After

Available Options

* Capacitance

☐ 1nF (278 available)

☐ 2.2nF (234 available)

☐ 10nF (199 available)

Before

07:04

Ceramic Capacitor

Product Code: CCAP
Availability: Check Options Below

฿5.00

Available Options

* Capacitance

☐ 1nF (278 available)

☐ 2.2nF (234 available)

☐ 10nF (199 available)

☐ 0.1µF (229 available)

☐ 0.22µF (623 available)

☐ 0.47µF (111 available)

☐ 1µF (293 available)

☐ 10µF (+฿2.00) (232 available)

☐ 47µF (+฿2.00) (90 available)

☐ 100µF (+฿2.00) (55 available)

Qty

1

Add to Cart

After

07:06

Ceramic Capacitor

Product Code: CCAP
Availability: Check Options Below

฿5.00

Available Options

* Capacitance

☐ 1nF (278 available)

☐ 2.2nF (234 available)

☐ 10nF (199 available)

☐ 0.1µF (229 available)

☐ 0.22µF (623 available)

☐ 0.47µF (111 available)

☐ 1µF (293 available)

☐ 10µF (+฿2.00) (232 available)

☐ 47µF (+฿2.00) (90 available)

☐ 100µF (+฿2.00) (55 available)

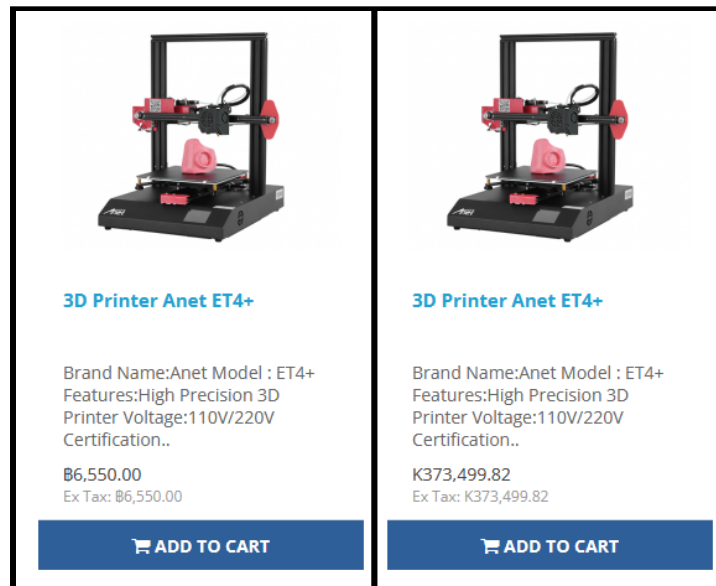
Qty

1

Add to Cart

Currency Exchange Feature

We set the website currency to switch between Thai Baht and Burmese Kyat, as shown in the image below.



Implementation of correct stock amount visibility

In order to allow the customer to view the current amount of stock available for each product, we installed the extension, (OpenCart, 2020), which is meant to display the quantity of product options. Since this extension was likely meant to be used for products with options that are add-ons to a the product rather than selecting variations of a specific product, it was not able to display the current stock when the options of a product did not alter the original price. It is also not designed for our version of OpenCart. As we are using the product options to allow a customer to select variations of a product and we do not sell any products that have optional add-ons, our modifications will not cause any issues for us.

The steps to resolve the unseen option stock amounts are shown below.

1. Edit the index.xml file from the extension folder. This file contains the changes to be made to the OpenCart code when the extension is enabled.

Before

```
15 <file_path="catalog/view/theme/default/template/product/product.twig">
16 <operation>
17 <search><![CDATA[({{ option_value.price_prefix }}{{ option_value.price }})]></search>
18 <add_position="after"><![CDATA[ ({{ if option_value.quantity <= '5' %}}<span style="color: #ff0000;">{{
option_value.quantity }}</span> {{ text_qty_option_pp }}{% else %}}{ option_value.quantity }} {{
text_qty_option_pp }}{% endif %}]]></add>
19 </operation>
20 </file>
21 <file_path="catalog/language/en-gb/product/product.php">
22 <operation>
23 <search><![CDATA[<?php]]></search>
24 <add_position="after"><![CDATA[
25 $_[ 'text_qty_option_pp' ] = 'pcs.';]]></add>
26 </operation>
27 </file>
```

After

```
15 <file_path="catalog/view/theme/default/template/product/product.twig">
16 <operation>
17 <search><![CDATA[({{ option_value.price_prefix }}{{ option_value.price }})]></search>
18 <add_position="after"><![CDATA[ {% endif %}}({% if option_value.quantity <= '5' %}}<span style="color: #ff0000;">{{
option_value.quantity }}</span> {{ text_qty_option_pp }}{% else %}}{ option_value.quantity }} {{
text_qty_option_pp }}{% endif %}}{% if 0 %}]]></add>
19 </operation>
20 </file>
21 <file_path="catalog/language/en-gb/product/product.php">
22 <operation>
23 <search><![CDATA[<?php]]></search>
24 <add_position="after"><![CDATA[
25 $_[ 'text_qty_option_pp' ] = 'available');]]></add>
26 </operation>
27 </file>
```

2. Since OpenCart's built-in stock display only shows a stock quantity that is unrelated to the options the OpenCart source code file, product.php, was edited.

Before

```
261 if ($product_info['quantity'] <= 0) {
262     $data['stock'] = $product_info['stock_status'];
263 } elseif ($this->config->get('config_stock_display')) {
264     $data['stock'] = $product_info['quantity'];
265 } else {
266     $data['stock'] = $this->language->get('text_instock');
267 }
268
```

After

```
261 if ($product_info['quantity'] <= 0) {
262     $data['stock'] = $product_info['stock_status'];
263 } elseif ($this->config->get('config_stock_display')) {
264     if(empty($this->model_catalog_product->getProductOptions($this->request->get['product_id']))) {
265         $data['stock'] = $product_info['quantity'];
266     } else {
267         $data['stock'] = 'Check Options Below';
268     }
269 } else {
270     $data['stock'] = $this->language->get('text_instock');
271 }
272
```

The before and after of step 1 are shown below.

Available Options	Available Options
<p>* Capacitance</p> <p><input type="radio"/> 1nF</p> <p><input type="radio"/> 2.2nF</p> <p><input type="radio"/> 10nF</p> <p><input type="radio"/> 0.1μF</p> <p><input type="radio"/> 0.22μF</p> <p><input type="radio"/> 0.47μF</p> <p><input type="radio"/> 1μF</p> <p><input type="radio"/> 10μF (+฿2.00) (232 pcs.)</p> <p><input type="radio"/> 47μF (+฿2.00) (90 pcs.)</p> <p><input type="radio"/> 100μF (+฿2.00) (55 pcs.)</p> <p>Qty</p> <div><input type="text" value="1"/></div> <p>Add to Cart</p>	<p>* Capacitance</p> <p><input type="radio"/> 1nF (278 available)</p> <p><input type="radio"/> 2.2nF (234 available)</p> <p><input type="radio"/> 10nF (199 available)</p> <p><input type="radio"/> 0.1μF (229 available)</p> <p><input type="radio"/> 0.22μF (623 available)</p> <p><input type="radio"/> 0.47μF (111 available)</p> <p><input type="radio"/> 1μF (293 available)</p> <p><input type="radio"/> 10μF (+฿2.00) (232 available)</p> <p><input type="radio"/> 47μF (+฿2.00) (90 available)</p> <p><input type="radio"/> 100μF (+฿2.00) (55 available)</p> <p>Qty</p> <div><input type="text" value="1"/></div> <p>Add to Cart</p>

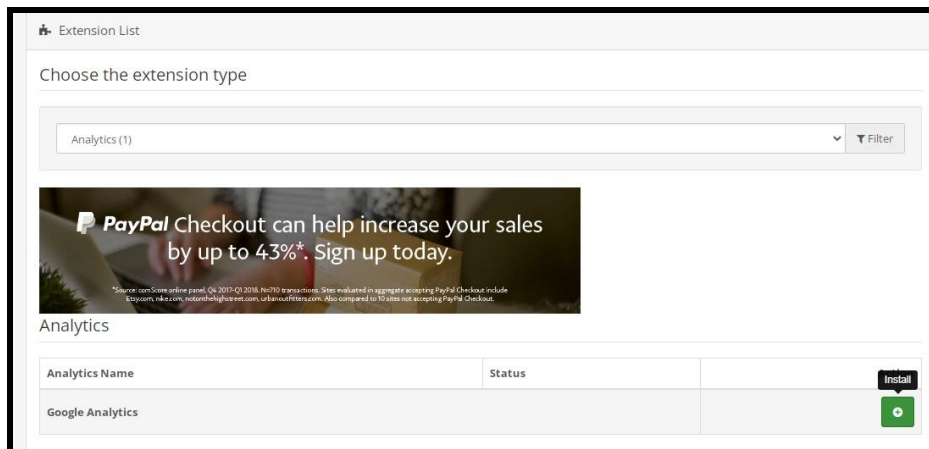
The before and after of step 2 are shown below.

Ceramic Capacitor	Ceramic Capacitor
<p>Product Code: CCAP</p> <p>Availability: 145</p> <p>฿5.00</p> <hr/> <p>Available Options</p> <p>* Capacitance</p> <p><input type="radio"/> 1nF (278 available)</p> <p><input type="radio"/> 2.2nF (234 available)</p>	<p>Product Code: CCAP</p> <p>Availability: Check Options Below</p> <p>฿5.00</p> <hr/> <p>Available Options</p> <p>* Capacitance</p> <p><input type="radio"/> 1nF (278 available)</p> <p><input type="radio"/> 2.2nF (234 available)</p>

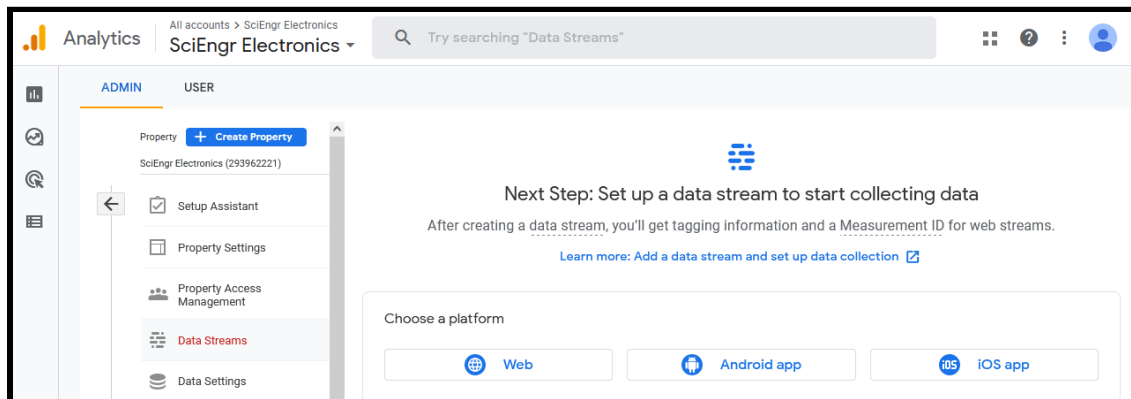
Setting Up Google Analytics

We decided to use Google Analytics as our analytics platform, as it is free, cloud-hosted, and easy to set up (Rohloff et al., 2019). The setup steps for using Google Analytics in OpenCart are shown below.

1. Install the Google Analytics extension that comes with OpenCart by default.



2. Create a Google Analytics account.



3. Setup the Google Analytics data stream.

Set up data stream


Set up your web stream

Website URL

http:// 10.90.20.166/shop


Stream name


SciEngr Electronics


 **Enhanced measurement**


Automatically measure interactions and content on your sites in addition to standard page view measurement. Data from on-page elements such as links and embedded videos may be collected with relevant events. You must ensure that no personally identifiable information will be sent to Google. [Learn more](#)


Measuring:


 Page views

 Scrolls


 Outbound clicks

 Site search

 Video engagement

 File downloads

[Show less](#)



Create stream


4. Copy the global site tag and paste it into the setting for the extension.

Tagging Instructions

Use one of the following to start collecting data.

Add new on-page tag

Use existing on-page tag

 **Global site tag (gtag.js)** Use this if you're using a website builder or CMS-hosted site

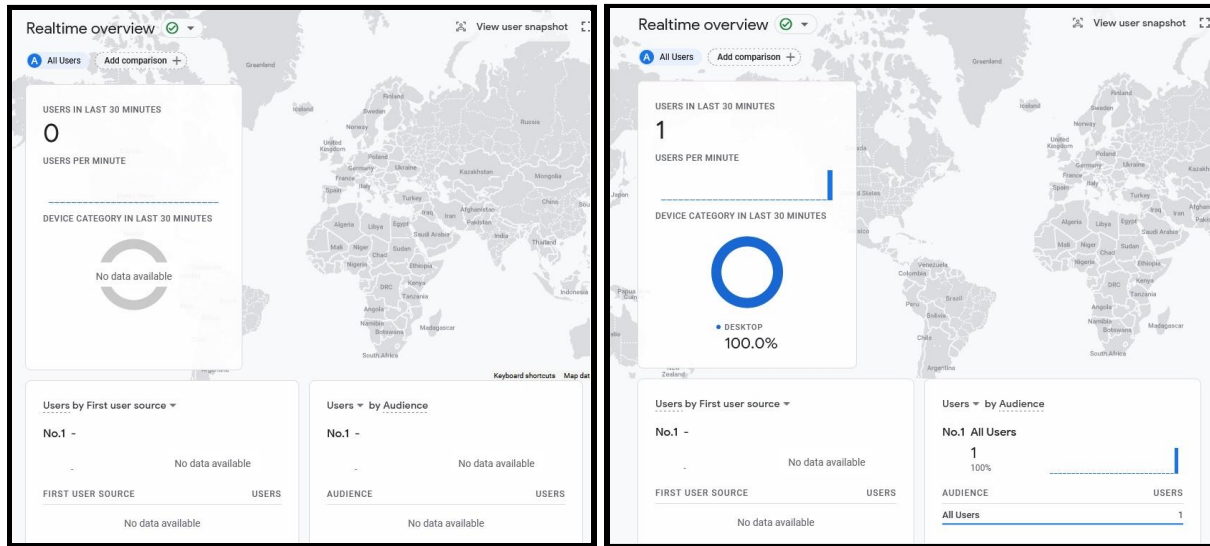
Add the Analytics tag to your website to begin seeing data in your property.

Copy the global site tag into the **<head>** section of your HTML. Or, if you use a website builder (e.g. GoDaddy, Shopify, etc), [copy the global site tag into your website builder's custom HTML field.](#)

```
<!-- Global site tag (gtag.js) - Google Analytics -->
<script async src="https://www.googletagmanager.com/gtag/js?id=G-X3GB23DLMX"></script>
<script>
  window.dataLayer = window.dataLayer || [];
  function gtag(){dataLayer.push(arguments);}
  gtag('js', new Date());

  gtag('config', 'G-X3GB23DLMX');
</script>
```

Below is the output of the real-time display from Google Analytics before and after a user visits the site.



Setting Up Store's Email

We set up OpenCart to use Gmail via the Simple Mail Transfer Protocol. The setup steps are shown below.

1. Create a Gmail account.
2. Input Gmail account information into OpenCart.

The screenshot shows the 'Mail Engine' configuration page. The 'Mail Engine' dropdown is set to 'SMTP'. Below it, the 'Mail Parameters' field is empty. The 'SMTP Hostname' is 'ssl://smtp.gmail.com', 'SMTP Username' is 'sciengrelectronics@gmail.com', 'SMTP Password' is masked with black dots, 'SMTP Port' is '465', and 'SMTP Timeout' is '5'. Under the 'Mail Alerts' section, the 'Alert Mail' checkboxes show 'Register' and 'Affiliate' are unchecked, 'Orders' is checked, and 'Reviews' is unchecked.

3. Allow less secure apps access the Gmail Google account.

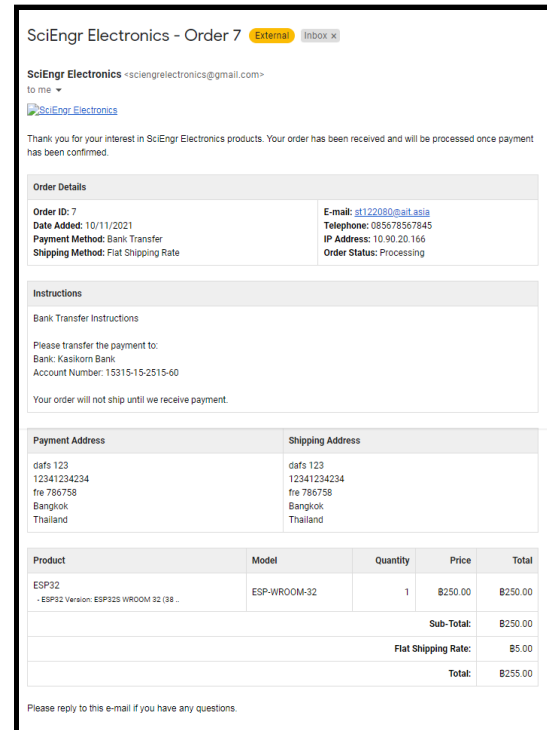
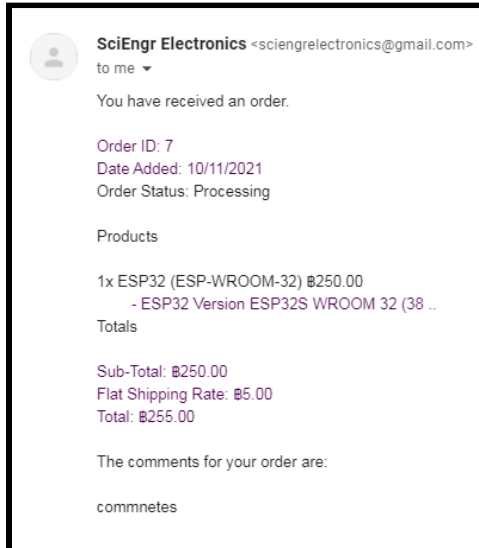
The screenshot shows the 'Google Account' settings page for 'Less secure app access'. It explains that some apps use less secure sign-in technology, making the account vulnerable. At the bottom, the toggle switch for 'Allow less secure apps: ON' is turned on, indicated by a blue checkmark.

4. Trigger OpenCart to try to send an email by ordering a product.

The screenshot shows an email confirmation message with the heading 'Your order has been placed!'. The body text states: 'Your order has been successfully processed!', 'Please direct any questions you have to the [store owner](#).', and 'Thanks for shopping with us online!'.

5. Gmail will have stored the information for OpenCart and will allow it to send emails when the less secure app access is automatically turned off.

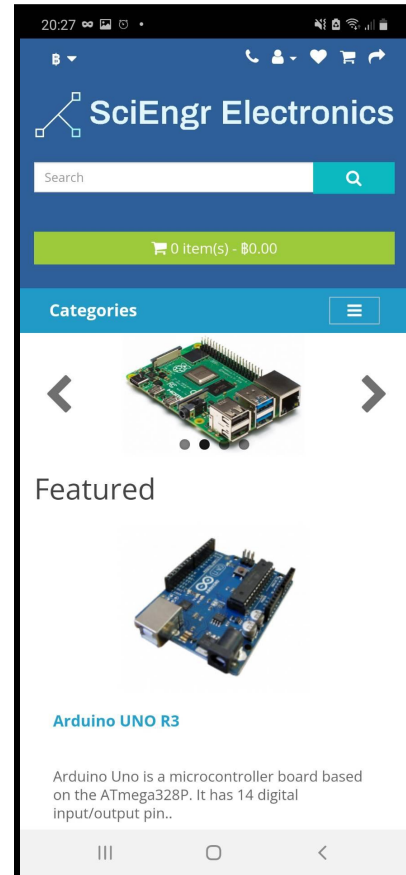
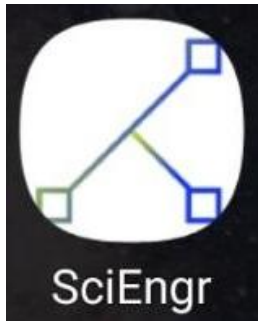
The emails sent to the store owner and the customer from OpenCart are shown below.



Mobile App Implementation

We implemented the app using MIT App Inventor (MIT, 2012). The app utilizes a webviewer to access our responsive website. For a better user experience, we set up a splash page to appear when the app starts while it is loading the website. The app also has full use of a smartphone's back button and does not require the user to log in each time the app is started.

The app icon, splash screen, and the website homepage as viewed from the app are shown below.



Website Usage

Our website homepage is shown below.

Currency ▼


123456789


My Account ▼


Wish List (0)

Shopping Cart

Checkout

 **SciEngr Electronics**



 0 Item(s) - B0.00

3D Printers

Electronic Components

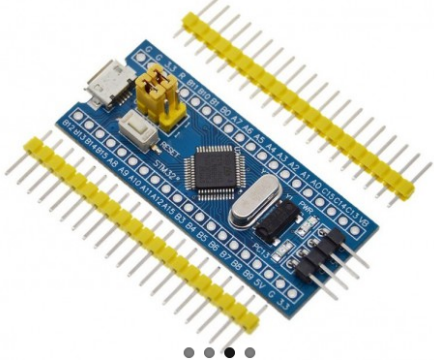
Electronics Training

IoT


Microcontroller Boards

Single Board Computers

Our Services



Featured




Arduino UNO R3

Arduino Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pin..

B280.00

ADD TO CART




Raspberry Pi 4 Model B

The Raspberry Pi 4 Model B is the best performing single-board computer to date from the Raspberry..

B1,900.00

ADD TO CART




ESP32

The ESP32 is a development board that is built around the powerful ESP32 system on a chip microc..

B250.00

ADD TO CART



Bluetooth Serial Module HC-05

The HC-05 is a popular bluetooth module which can add two-way (full-duplex) wireless functionality t..

B180.00

ADD TO CART

Information

- About Us
- Delivery Information
- Privacy Policy
- Terms & Conditions

Customer Service

- Contact Us
- Returns
- Site Map

Extras

- Brands
- Gift Certificates
- Affiliate
- Specials

My Account

- My Account
- Order History
- Wish List
- Newsletter

Powered By OpenCart

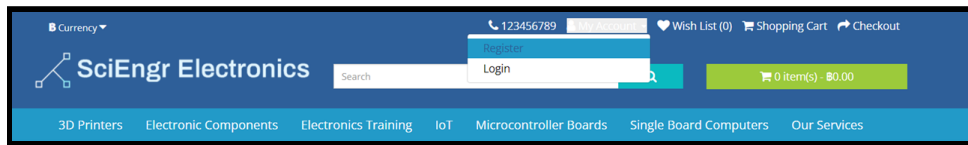
SciEngr Electronics © 2021

Tema Gratuito desenvolvido por WNWEB na Plataforma de E-commerce Opencart

Customer registers an account

The steps for a customer to register are shown below.

1. Customer clicks on “Register”.



2. Customer fills in registration information.

Register Account

If you already have an account with us, please login at the [login page](#).

Your Personal Details

* First Name

* Last Name

* E-Mail

* Telephone

Your Password

* Password

* Password Confirm

Newsletter

Subscribe ☐ Yes ☒ No

I have read and agree to the [Privacy Policy](#) ☒

3. Customer is now registered.

Your Account Has Been Created!

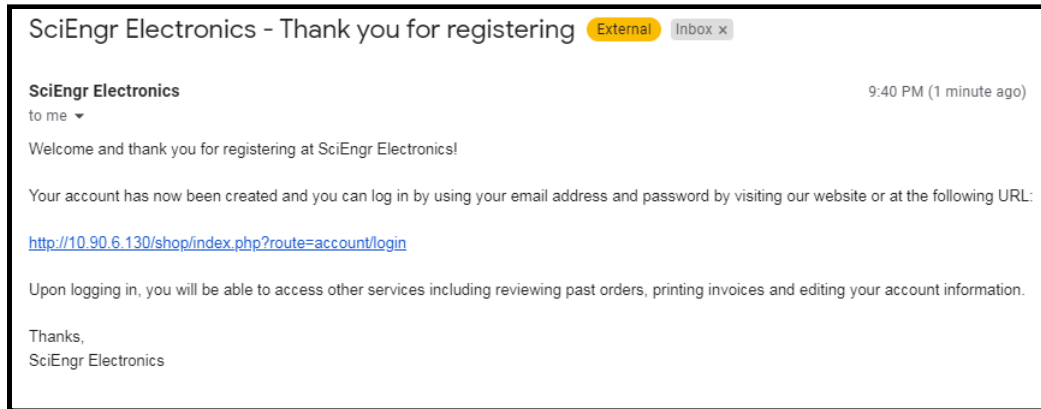
Congratulations! Your new account has been successfully created!

You can now take advantage of member privileges to enhance your online shopping experience with us.

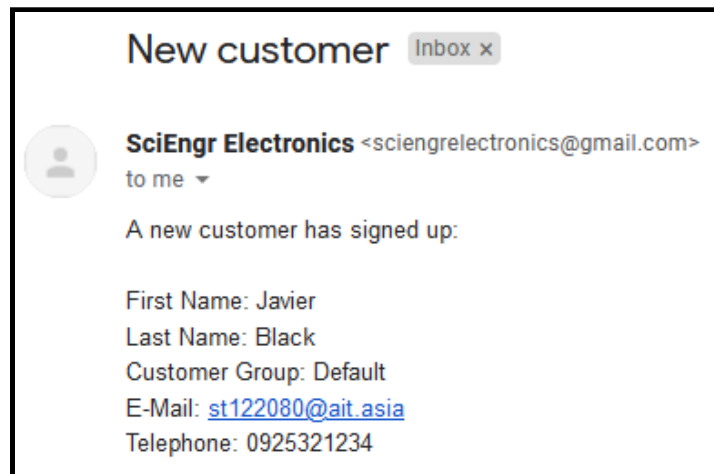
If you have ANY questions about the operation of this online shop, please e-mail the store owner.



A confirmation has been sent to the provided e-mail address. If you have not received it within the hour, please [contact us](#).

4. Customer receives a confirmation email.



When a customer creates their account, the store admin also receives an email alert and can use OpenCart to see that a new user has registered, as shown below.

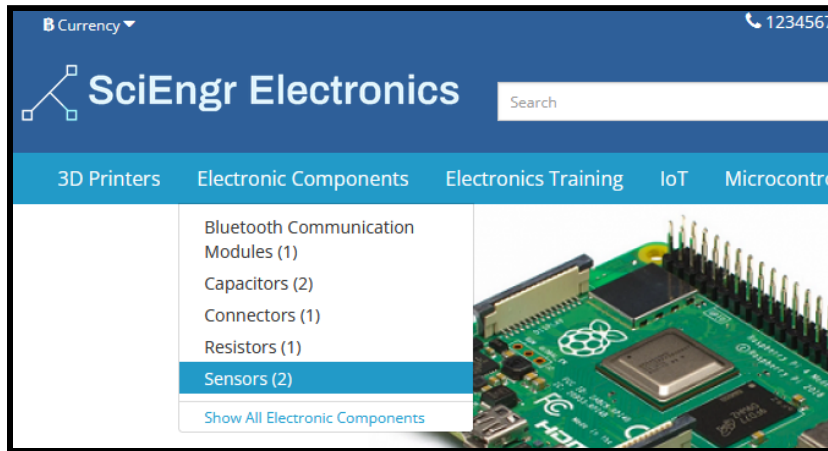


Customer List							
<input type="checkbox"/>	Customer Name ^	E-Mail	Customer Group	Status	IP	Date Added	Action
<input type="checkbox"/>	Javier Black	st122080@ait.asia	Default	Enabled	10.90.6.130	22/11/2021	 

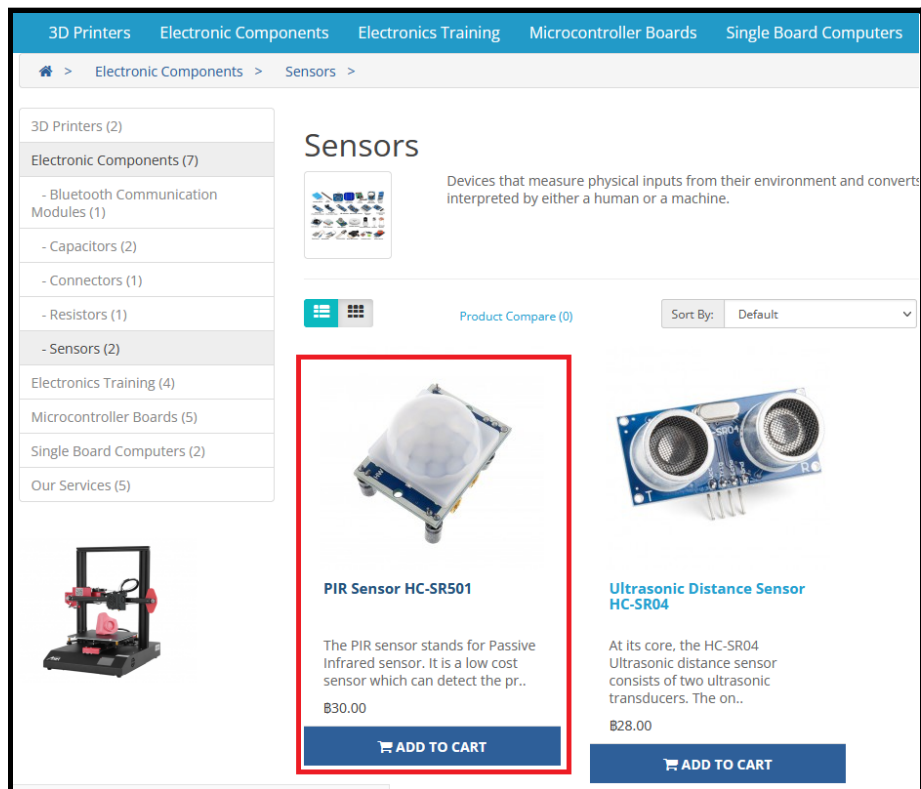
Customer orders a product

The steps below are an example of the steps performed by a customer with a store account in order to purchase 15 PIR sensors.

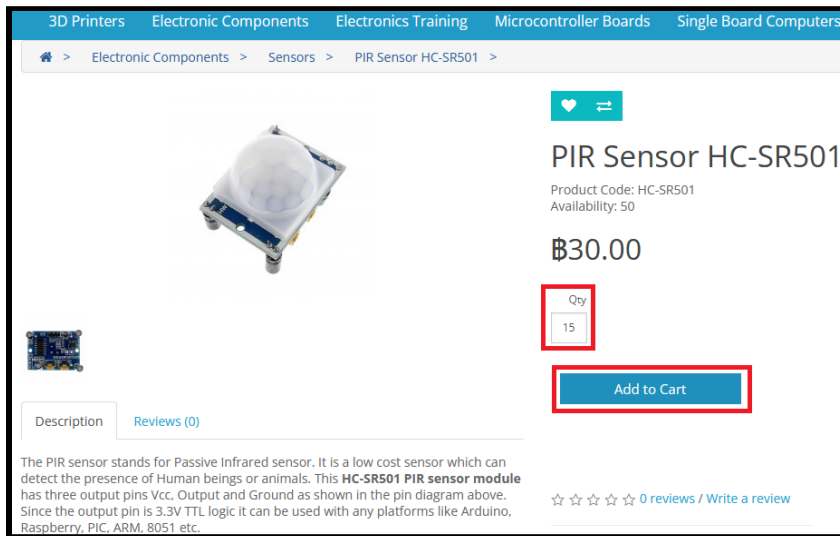
1. From the home page, go to the sensors catalog.



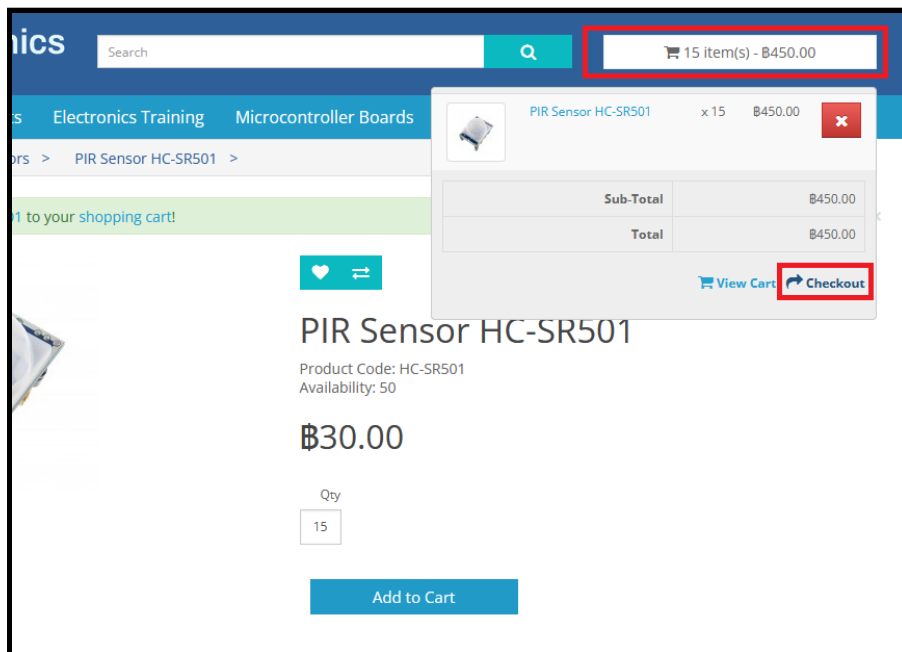
2. From the sensors catalog, go to the PIR sensor product page.



3. Set the qty option to 15 and click Add to Cart.



4. Go to the checkout page.



5. Set the billing address.

Checkout

Step 1: Checkout Options

Step 2: Billing Details ▾

* First Name

Javier

* Last Name

Black

Company

Company

* Address 1

AIT

Address 2

Address 2

* City

AIT City

Post Code

Post Code

* Country

Thailand

* Region / State

Nakhon Phanom

Continue

6. Set the delivery address.

Checkout

Step 1: Checkout Options

Step 2: Billing Details ▾

Step 3: Delivery Details ▾

☒ I want to use an existing address

Javier Black, AIT, AIT City, Nakhon Phanom, Thailand

☐ I want to use a new address

Continue

Step 4: Delivery Method

7. Set the shipping method.

Checkout

Step 1: Checkout Options

Step 2: Billing Details ▾

Step 3: Delivery Details ▾

Step 4: Delivery Method ▾

Please select the preferred shipping method to use on this order.

Flat Rate

☒ Flat Shipping Rate - ฿5.00

Add Comments About Your Order

Continue

Step 5: Payment Method

8. Set the payment method.

Step 4: Delivery Method ▾

Step 5: Payment Method ▾

Please select the preferred payment method to use on this order.

☒ Bank Transfer

☐ Cash On Delivery

Add Comments About Your Order

I have read and agree to the [Terms & Conditions](#) ☒ [Continue](#)

9. Confirm the order.

Step 6: Confirm Order ▾

Product Name	Model	Quantity	Unit Price	Total
PIR Sensor HC-SR501	HC-SR501	15	฿30.00	฿450.00
Sub-Total:				฿450.00
Flat Shipping Rate:				฿5.00
Total:				฿455.00

Bank Transfer Instructions

Please transfer the total amount to the following bank account.

Please transfer the payment to:
Bank: Kasikorn Bank
Account Number: 15315-15-2515-60
Your order will not ship until we receive payment.

[Confirm Order](#)

10. See the confirmation message.

Your order has been placed!

Your order has been successfully processed!

You can view your order history by going to the [my account](#) page and by clicking on [history](#).


If your purchase has an associated download, you can go to the account [downloads](#) page to view them.

Please direct any questions you have to the [store owner](#).

Thanks for shopping with us online!

11. See the confirmation email.

SciEngr Electronics - Order 15 External Inbox x

SciEngr Electronics
to me ▾


Thank you for your interest in SciEngr Electronics products. Your order has been received and will be processed once payment has been confirmed.

To view your order click on the link below:
http://10.90.6.130/shop/index.php?route=account/order/info&order_id=15

Order Details	
Order ID: 15	E-mail: st122080@ait.asia
Date Added: 22/11/2021	Telephone: 0925321234
Payment Method: Bank Transfer	IP Address: 10.90.6.130
Shipping Method: Flat Shipping Rate	Order Status: Processing

Instructions

Bank Transfer Instructions

Please transfer the payment to:
Bank: Kasikorn Bank
Account Number: 15315-15-2515-60

Your order will not ship until we receive payment.

Payment Address	Shipping Address
Javier Black AIT AIT City Nakhon Phanom Thailand	Javier Black AIT AIT City Nakhon Phanom Thailand

Product	Model	Quantity	Price	Total
PIR Sensor HC-SR501	HC-SR501	15	฿30.00	฿450.00
Sub-Total:				฿450.00
Flat Shipping Rate:				฿5.00
Total:				฿455.00

Please reply to this e-mail if you have any questions.

12. Go to the order history.

B Currency ▾ 123456789 My Account Wish

SciEngr Electronics


3D Printers Electronic Components Microcontroller Boards ...

[Home](#) > [Shopping Cart](#) > [Checkout](#) > [Success](#) >

Your order has been placed!

My Account
Order History
Transactions
Downloads
Logout


13. See that the new order has been added to the order history


Order History						
Order ID	Customer	No. of Products	Status	Total	Date Added	
#15	Javier Black	1	Processing	B455.00	22/11/2021	

Showing 1 to 1 of 1 (1 Pages)

[Continue](#)

14. Return to the PIR sensor product page and notice that the available stock has been reduced by 15.




PIR Sensor HC-SR501

Product Code: HC-SR501
Availability: 35

B30.00

Qty

[Add to Cart](#)

When a customer makes an order, the store admin also receives an email alert and can use OpenCart to see the information for the new order, as shown below.

SciEngr Electronics - Order 15 Inbox x

SciEngr Electronics <sciengrelectronics@gmail.com>
to me ▾

You have received an order.

Order ID: 15
Date Added: 22/11/2021
Order Status: Processing

Products

15x PIR Sensor HC-SR501 (HC-SR501) B450.00



Totals

Sub-Total: B450.00
Flat Shipping Rate: B5.00
Total: B455.00

Orders

[Home](#) > [Orders](#)

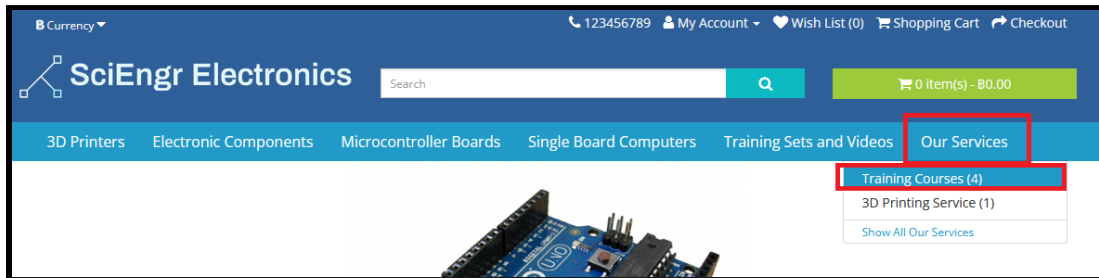
Order List

	Order ID	Customer	Status	Total	Date Added	Date Modified	Action
<input type="checkbox"/>	15	Javier Black	Processing	B455.00	22/11/2021	22/11/2021	 

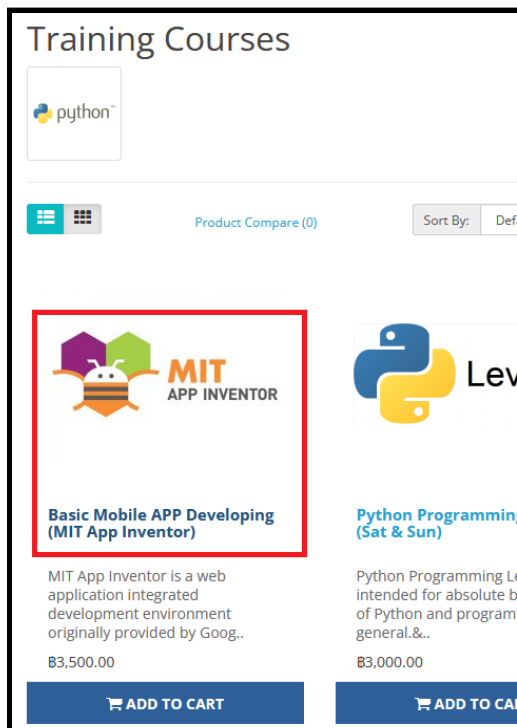
Customer reserves a seat in a course

The steps below are an example of the steps performed by a customer order to one seat in the MIT App inventor course.


1. Going to the training courses catalog



2. Going to the MIT App inventor course page



3. Adding the course to the cart, reserving 1 seat on



Basic Mobile APP Developing (MIT App Inventor)

Product Code: MIT_Lvl1
Availability: Check Options Below

฿3,500.00

Description

Reviews (0)

MIT App Inventor is a web application integrated development environment originally provided by Google, and now maintained by the Massachusetts Institute of Technology (MIT). It allows newcomers to computer programming to create application software(apps) for two operating systems (OS): Android, and iOS, which, as of 8 July 2019, is in final beta testing.

Class Description

This course is intended for beginners who are interested in mobile application development. Block based programming will be taught in the course. This course will take 1 month. Professional and friendly teachers who have at least a bachelor's degree in computer programming. The class is also fun and

Available Options

★ Course State Date and Time Slot

01/12/2021 Morning Slot (9am - 11am) (5 available)

Qty

1

Add to Cart

4. Checkout the order. Since there is no physical product, the shop does not request any address information.

Checkout

Step 1: Checkout Options

Step 2: Billing Details ▾

Step 3: Payment Method ▾

Step 4: Confirm Order ▾

Product Name	Model	Quantity	Unit Price	Total
Basic Mobile APP Developing (MIT App Inventor) - Course State Date and Time Slot: 01/12/2021 Morning S...	MIT_Lvl1	1	฿3,500.00	฿3,500.00
Sub-Total:				฿3,500.00
Total:				฿3,500.00

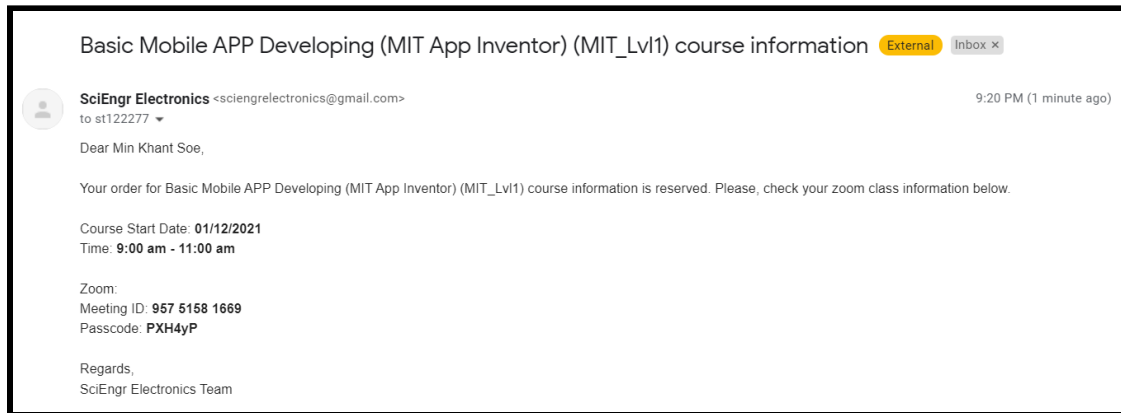
Bank Transfer Instructions

Please transfer the total amount to the following bank account.

Please transfer the payment to:
Bank: Kasikorn Bank
Account Number: 15315-15-2515-60
Your order will not ship until we receive payment.

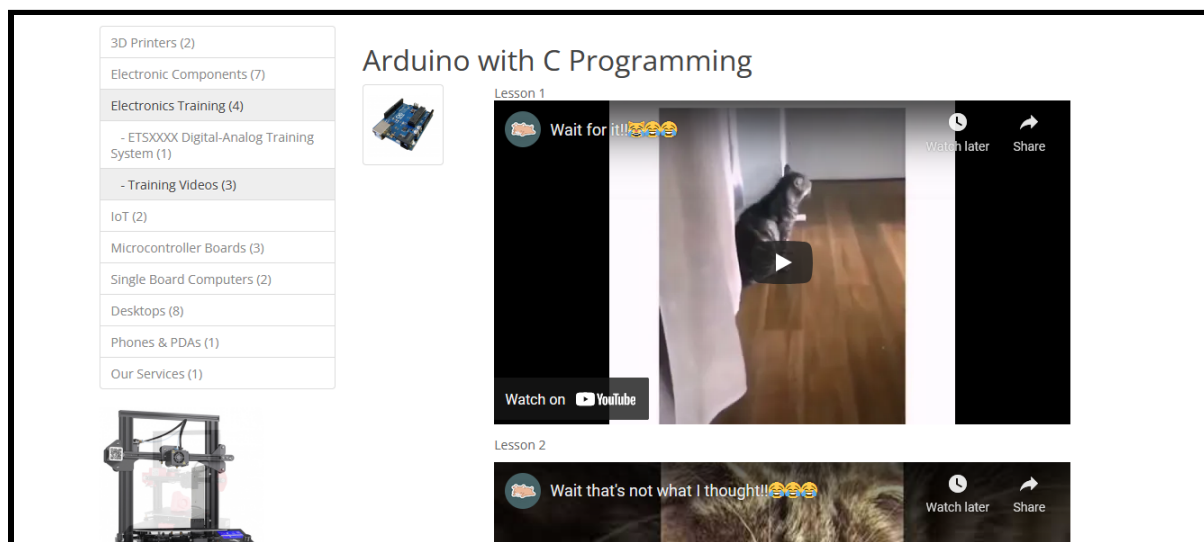
Confirm Order

- Once the payment is received, the shop sends a confirmation email to the customer with the details of the course.



Website user views the free tutorials

Along with the paid courses, we also provide free programming tutorials for using Arduino with C Programming, represented below using cat videos.



Conclusion

In this project we have created a store called “SciEngr Electronics”. Our business model is both B2B and B2C, since our target customers are electronics training schools and engineering students. We implemented our store’s website on a local server using the OpenCart e-commerce platform. Finally, we used our technical skills to customize free OpenCart extensions for our purposes, rather than paying for specific premium extensions that meet our desired capabilities.

References

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<https://www.opencart.com/index.php?route=cms/download/history>
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https://s3.xopic.de/openhpi-public/pages/research/14iHw24js38nRb7ODYrmZG/2019_Utilizing_Web_Analytics_in_the_Context_of_Learning_Analytics_for_Large-Scale_Online_Learning.pdf