

Singapore Polytechnic
School of Digital Media and Infocomm Technology
Diploma in Information Technology
ST0217/ST0257 Web Applications Development
Individual Assignment – CA1
Semester 1 2016/2017


Instructions and Guidelines





1. To be submitted to ESP site by **25th June 2016 (Sat) 11:59PM**.
2. All programs must be coded in C# and JavaScript by using Microsoft Visual Studio.NET.
3. Student is required to submit the *softcopy* of the assignment (ZIP) to ESP Assignment Submission Link. Provide the Class, Admission Numbers and Names.
4. The interview will be conducted during the practical sessions. Your lecturer may also arrange the interview with you beyond the practical sessions if he/she is not able to complete the interview. Students who are absent from the interview will be awarded **zero mark** for the assignment.
6. 50% of the marks will be deducted for assignments that are received within ONE (1) calendar day after the submission deadline. No marks will be given thereafter.
7. Exceptions to this policy will be given to students with valid LOA on medical or compassionate grounds. Students in such cases will need to inform the lecturer as soon as reasonably possible.
8. No marks will be awarded if the work is copied or you have allowed others to copy your work.




Warning: Plagiarism means passing off one's own idea, works, writings, etc., which belong to another person. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turning it in as your own even if you would have permission of that person. Plagiarism is a serious offence and disciplinary action will be taken against you. If you are guilty of plagiarism, you may fail all modules in the semester, or even be liable for expulsion.

Video Resource

Media Resource for you to analyse how your web application should behave.

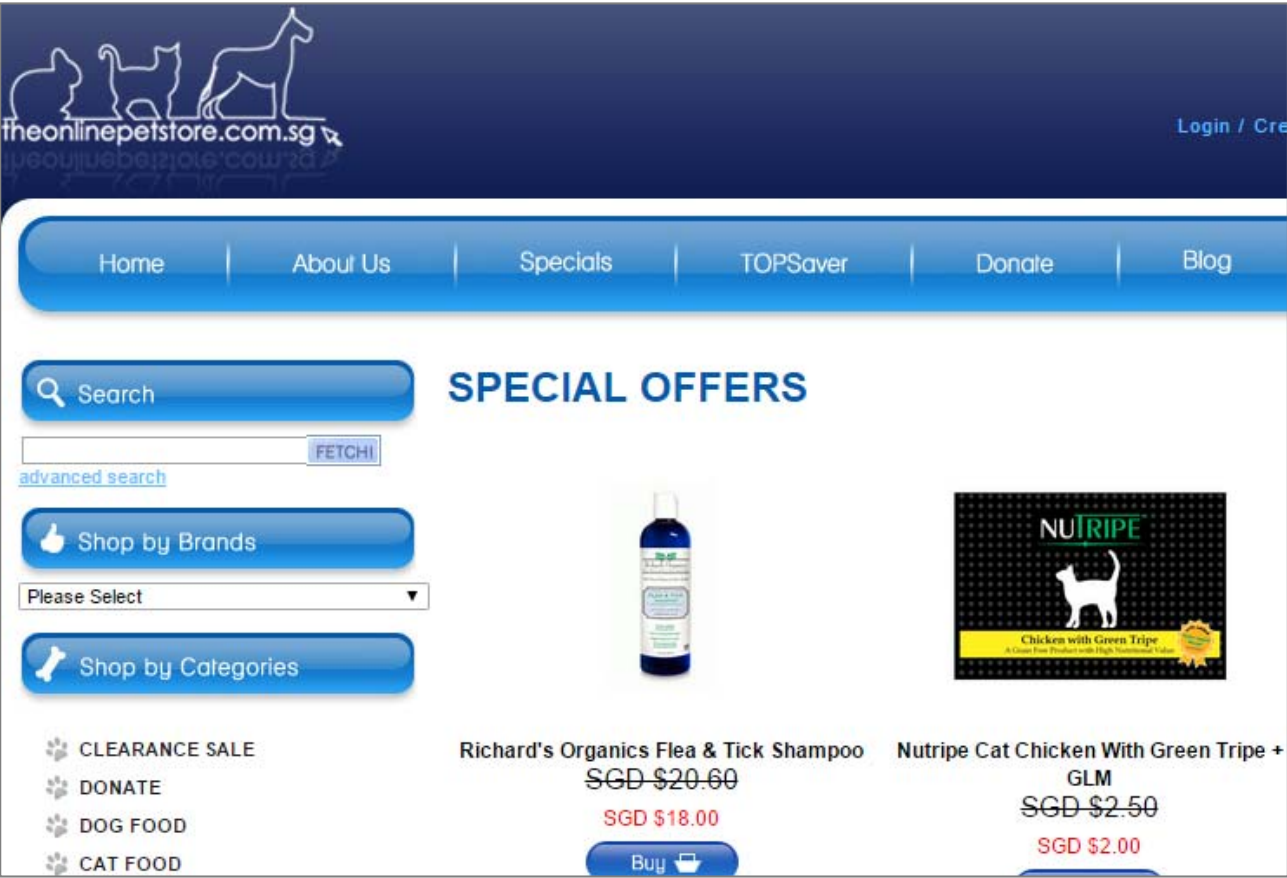
 > Assignment CA1



Name ▲	Modified
 Add Product Quick Demo for CA2.mp4	3/5/2016 6:01 PM
 WEBA_Assignment_CA1_Demo_Part_1.mp4	3/5/2016 10:35 AM
 WEBA_Assignment_CA1_Demo_Part_2.mp4	3/5/2016 4:14 PM

In this assignment, you will observe the website at <http://www.theonlinepetstore.com.sg/> . The website homepage is shown in the following figure.

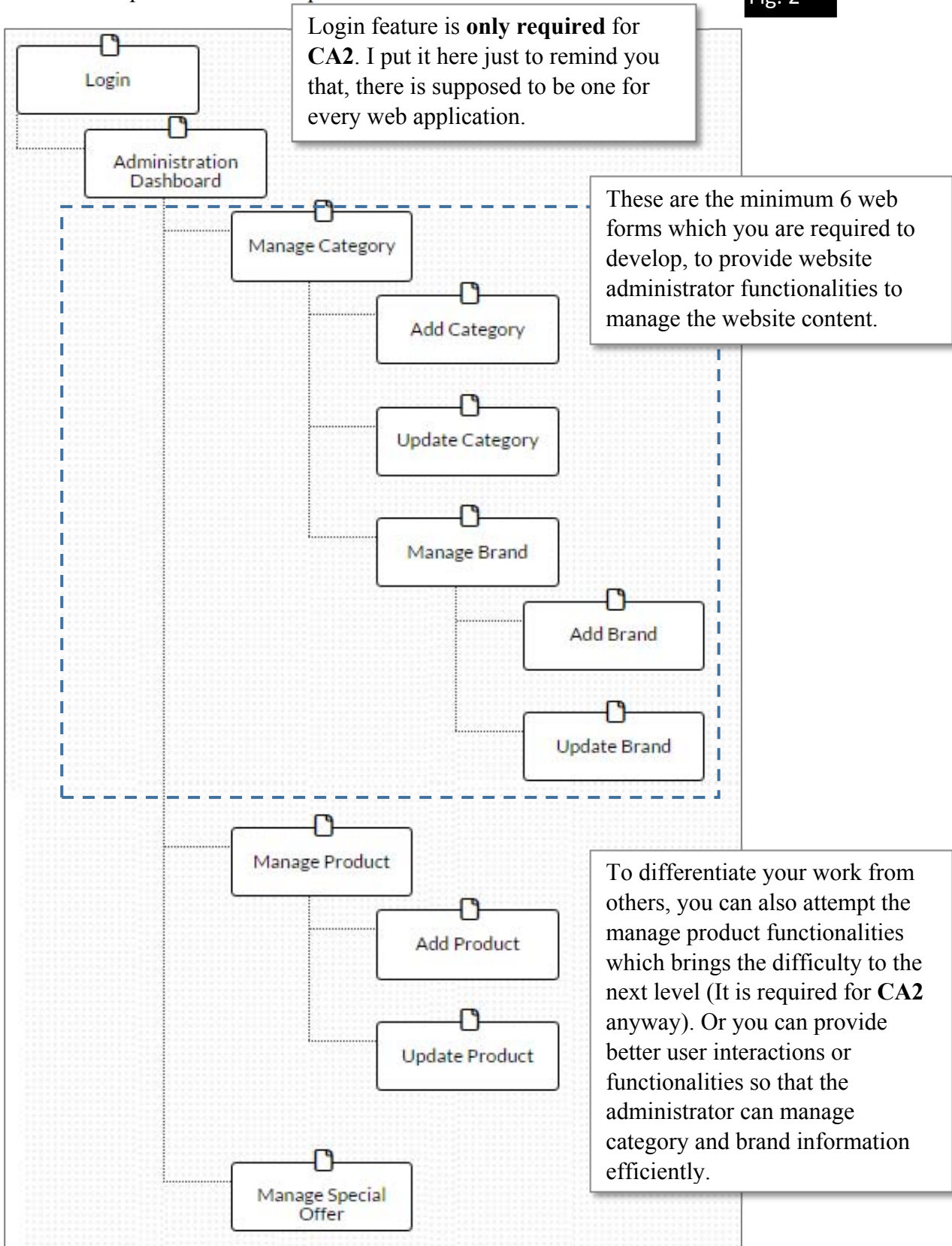
Fig. 1



The CA1 assignment requires you to:

- ① Analyse the website carefully and derive a suitable database design.
- ② Develop 6 database-driven web forms which helps the website administrator manage category and brand content in the website. Note that, in real scenarios, there are more than 50+ web forms needed to help the website administrator in managing the website content.
- ③ Besides the 6 web forms, learners who wish to **differentiate** themselves from others can attempt to do Add New product web form.

Fig. 2



Add Product web form

It is meaningless, if I jump into the category management and brand management feature requirements too soon without describing Add Product web form first (Page 4 to Page 6). Only CA2 assignment requires you to develop the Add Product web form. Appreciating the features of this web form gives you an idea why category management and brand management is important.

The website administrator uses the add product web form to create a new product record. So that the web application can display the product record information to the public (Fig. 3).

[Home](#) » [Dog Food](#) » [Bosch](#)
BOSCH HIGH PREMIUM ADULT FISH & POTATO
[BHP5512]
SAVINGS OVERVIEW

Weight	3kg	15kg
RRP	\$36.00	\$132.00
TOPS Price	\$30.60	\$112.20
SAVINGS	\$5.40	\$19.80

DESCRIPTION

Bosch Adult Fish & Potato is a balanced complete food for all adult dogs with normal activity levels.


SGD \$30.60


Fig. 3

Fig. 4 and Fig. 5, describes **partial information** about the Add Product web form interface for capturing user entries to create a product record in the database.


Fig. 4

Add Product

Product Name

BOSCH HIGH PREMIUM ADULT FISH & POTATO

Select File



bosch_highpremiumadultfis

bosch_highpremiumadultfish_petfood.jpg

Remove

Browse ...

Description

B

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abc

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As a key source of amino acids, Bosch Adult Fish & Potato contains high-quality fish protein. Optimally solubilised and highly digestible potato starch supplies valuable energy as a fully bioavailable source of carbohydrate.

The energy and protein concentration is selected such that, when used in conjunction with mussel extracts, the risk of obesity is prevented to protect the cartilage and joints.

Bosch Adult Fish & Potato is also suited to sensitive dogs.

- protein of the highest quality (including fish)
- gentle on the stomach and easy to digest (potatoes)
- essential fatty acids from fish for skin and coat (omega-3 / omega-6)

Price

36

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Server-side C# functionality (Business Layer Development)

- i) Collect user input and create a new product record in the database. The user entry should at least include product name, description, ingredients, price, unit, guaranteed analysis and brand. **The assignment specification only provides partial information.** Phrasing it in another way, the Fig. 4 and Fig. 5 **did not show all the field input interface**. You need to **observe** how the product information is displayed to find out those missing fields in the Add Product and Update Product web form.
- ii) Perform validation checking on the product name to ensure that it is unique. Disallow the record creation if duplicate product name is detected.
- iii) Able to upload image and store image.

Update Product web form

The Update Product web form should share a similar user interface as the Add Product web form. It is important to note that, the Update Product web form should display the correct product information and the respective product image inside the input controls so that the user can make changes.

Server-side C# functionality

- i) Display the correct product information to the user.
- ii) Collect user input and update the correct product record in the database.
- iii) Validate the product name to ensure that it is unique. Disallow the record update if duplicate product name is detected and display helpful message to the user.
- iv) Able to replace image. If the user did not select any image to upload, the server-side logic should only make changes on other product details.

- v) Able to delete the product if the user clicks a Delete button in the Update Product web form.
- vi) The website administrator cannot delete the product if the system detects that there are already customer orders made on the product. An appropriate message should be displayed to the user to help him decide the next action. For example, display the customer orders related to the product.
- vii) The product record will never be physically deleted from the database table, Product. It is only *marked as deleted*.

The development process of the Update Product web form is *tricky* and requires triple the effort of the Add Product web form development. It is advisable to finish the Add Product web form functionality first, before working on the Update Product web form.

Manage Product web form

Fig. 6

Product Id	Product Name	Brand	Quantity	Threshold Inventory Quantity	Published	Created At	Created By	Updated At	Updated By		
1021	Bosch High Premium Adult Fish & Potato	BOSCH	35	20	YES	12/09/2015 09:10	DANIEL TAN	15/09/2015 10:55	TEO LOKE KWAN	Update	View Customer Orders
1022	Bosch High Premium Adult Lamb & Rice	BOSCH	15	20	YES	20/09/2015 09:15	LEONG HUI LING	20/09/2015 09:15	LEONG HUI LING	Update	View Customer Orders
1023	Bosch High Premium Adult Poultry & Spelt	BOSCH	100	20	YES	20/09/2015 09:30	TEO LOKE KWAN	20/09/2015 11:15	LEONG HUI LING	Update	View Customer Orders
1024	Bosch High Premium Junior Lamb & Rice	BOSCH	100	20	YES	20/09/2015 10:30	TEO LOKE KWAN	20/09/2015 10:50	LEONG HUI LING	Update	View Customer Orders

The above figure describes the **basic interface** of the Manage Product web form. This web form helps the website administrator have an overview of the product records. The user can click the Update link (which looks like a button) at the respective product row to navigate to the Update Product web form. The user can also click Add Product link (not shown in the figure) to navigate to the Add Product web form.

Server-side C# functionality

- i) Display the correct product information based on user search.
- ii) Able to integrate well with the Update Product web form so that the Update Product web form can display the correct product for the user to make changes.
- iii) Able to highlight which product's quantity is below the minimum threshold quantity.
- iv) Able to display the user name who created the product. Also able to display the user name who made changes to the product record. Your database design should contain tables such as User table which stores user test records. So that, the records in the Product table can link to the respective user in the User table.

Category Management

When the website administrator need to manage category records, such as add category, update category or view categories, he can use the Category Management function. There are 3 web forms working together (Fig. 8, Fig.9 and Fig. 10) to provide the Category Management function. The three web forms are, Manage Category web form, Add Category web form and Update Category web form.

By observing the main website at <http://www.theonlinepetstore.com.sg/>, you will notice that the one category such as DOG FOOD (Fig. 7), has relationship with **many brand information** such as Addiction, AvoDerm, Bosch, By Nature etc. From this observation, the Manage Category web form needs a Manage Brand button interface *at each row* of category data, so that the website administrator can click to visit the Manage Brand web form to manage all the brand information *related* to the category.

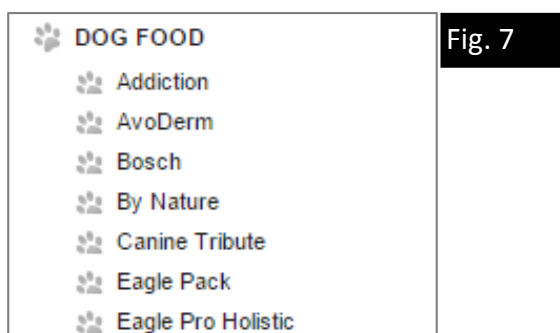


Fig. 8.1

Category Id	Category Name	No. of Sub-Categories	Created At	Created By	Updated At
1021	CLEARANCE SALE	0	20/09/2015 09:10	LEONG HUI LING	20/09/2015 09:10
1022	DONATE	0	20/09/2015 09:15	LEONG HUI LING	20/09/2015 09:15
1023	DOG FOOD	28	20/09/2015 09:30	TEO LOKE KWAN	20/09/2015 11:15
1024	CAT FOOD	18	20/09/2015 10:30	TEO LOKE KWAN	20/09/2015 10:50

Created By	Updated At	Updated By		
LEONG HUI LING	20/09/2015 09:10	LEONG HUI LING	<input type="button" value="Update"/>	<input type="button" value="Manage Brand"/>
LEONG HUI LING	20/09/2015 09:15	LEONG HUI LING	<input type="button" value="Update"/>	<input type="button" value="Manage Brand"/>
TEO LOKE KWAN	20/09/2015 11:15	LEONG HUI LING	<input type="button" value="Update"/>	<input type="button" value="Manage Brand"/>
TEO LOKE KWAN	20/09/2015 10:50	LEONG HUI LING	<input type="button" value="Update"/>	<input type="button" value="Manage Brand"/>

Fig. 8.2

Add Category web form

Fig. 9

Create New Category

Category Name

Category name allows you to group products by similar attributes. All text are converted to uppercase after save.

Visibility ☐ Visible (ignore start date and end date) ☒ Visible (with start date and end date) ☐ Hidden

Display Start Date

Display End Date

Cancel **Save**

The website administrator uses the Add Category web form to create new category record. Besides providing the category name, the administrator can decide when the public can access the category at the public pages and menu.

Refer to Fig. 9, the user is creating a category, DOG FOOD and he only wants this category to be seen by the public (customers) from 20th October 2015 to 25th October 2016.

Server side C# functionality

The server-side C# logic must ensure that the category name is unique. If the server-side logic detects identical "DOG FOOD" in the **Category** database table, the server-side logic must not create the record. Instead, it should display helpful message to the user.

When the user clicks the **Save** button, the server-side C# logic must create a new category record in the **Category** table.

Update Category web form

Fig. 10

Update Category

Category Name

Category name allows you to group products by similar attributes. All text are converted to uppercase after save.

Visibility ☐ Visible (ignore start date and end date) ☐ Visible (with start date and end date) ☒ Hidden

Display Start Date

Display End Date

Delete **Cancel** **Save**

The website administrator uses the Update Category web form to update a category record. The Manage Category web form has one Update button in each row of category information display. If the website administrator clicks the Update button in the row which displays DOG FOOD, the logic in the Manage Category web form should redirect the user to the Update Category web form.

Sever side C# functionality

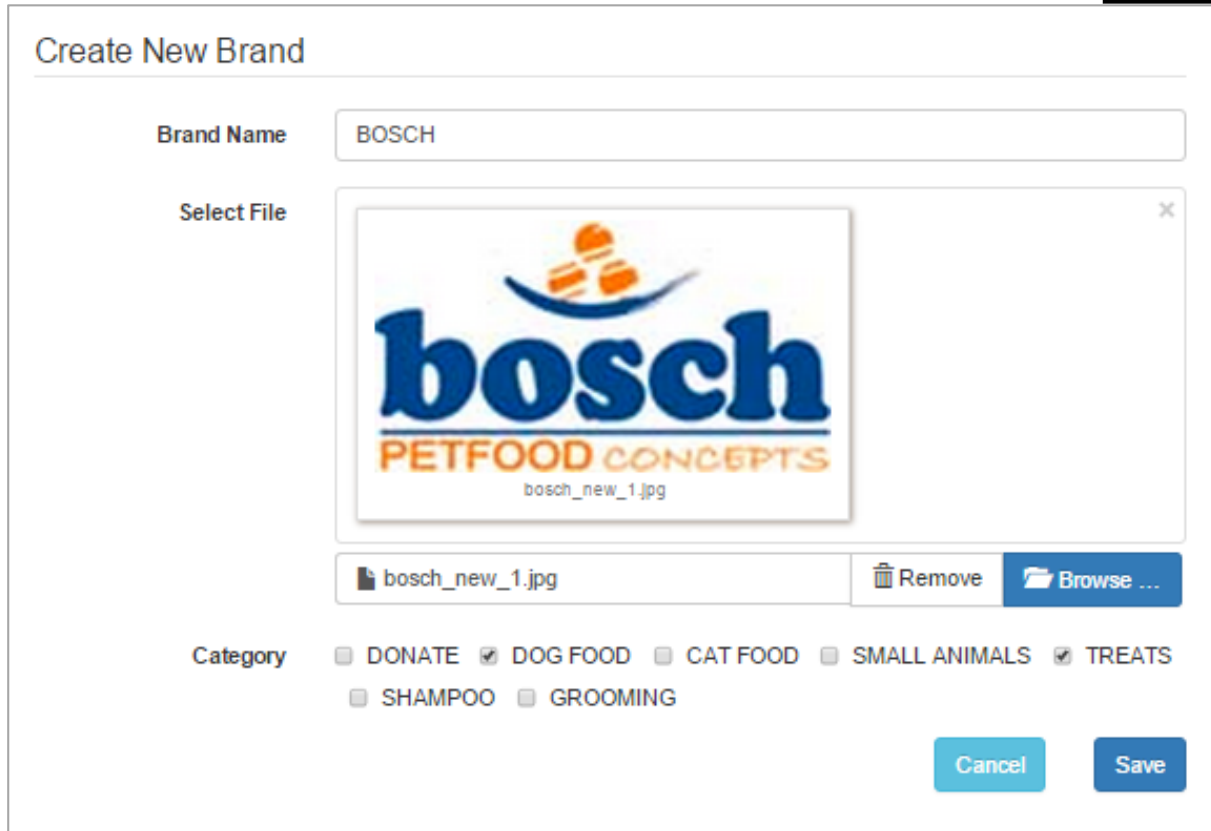
- i) The server-side C# logic must ensure that the category name is unique.
- ii) When the user clicks the Save button, the server-side C# logic must update the correct category record in the Category database table.
- iii) When the user clicks the Delete button, you need to find a way to code the client-side and server-side logic which checks whether this category has any brand records (or product records) tied to it. If there are brands or products tied to the category record, the server-side logic must cancel the delete and display a meaningful message to the user.
- iv) When the user clicks the Delete button, the category record is only marked as deleted. The category record was never physically deleted from the database table.

Brand Management



By checking the website <http://www.theonlinepetstore.com.sg/>, you can pick up some key points:

- i) Each brand information can be represented by using a brand image and a brand title. This affects the database design of the Brand table. The administrator must provide the brand name and a brand image when they add and update brand records.
- ii) The web application can show all the brands that are associated to the DOG FOOD category. When the public user (potential customer) clicks the DOG FOOD, the website displays a page with all the brand names such as Addiction, BOSCH etc. Observe that, some brands can also go under the category TREATS. For example, you can find Addiction brand again sitting under the category TREATS. Therefore, the web form interface will need a checkbox interface which allows him to select **at least one** category when he is either creating a new brand record, or updating an existing brand record.



The screenshot shows a web form titled "Create New Brand". It contains the following elements:

- Brand Name:** A text input field containing the word "BOSCH".
- Select File:** A section for uploading a brand image. It features a large preview area showing the Bosch Petfood Concepts logo. Below the preview is a file name "bosch_new_1.jpg", a "Remove" button with a trash icon, and a "Browse ..." button with a folder icon.
- Category:** A group of radio buttons for selecting one or more categories. The categories are: DONATE, DOG FOOD (checked), CAT FOOD, SMALL ANIMALS, TREATS (checked), SHAMPOO, and GROOMING.
- Buttons:** "Cancel" and "Save" buttons at the bottom right.

Fig. 12 describes the web form interface of the Add Brand web form. Assume that brands can be linked to one or more categories, the web form interfaces should allow the user to specify:

- i) Brand name (required)
- ii) Brand image (required)
- iii) Category information (**optional**). Selecting category is optional because, there are some brands such as Add Mate which does not belong to any category.

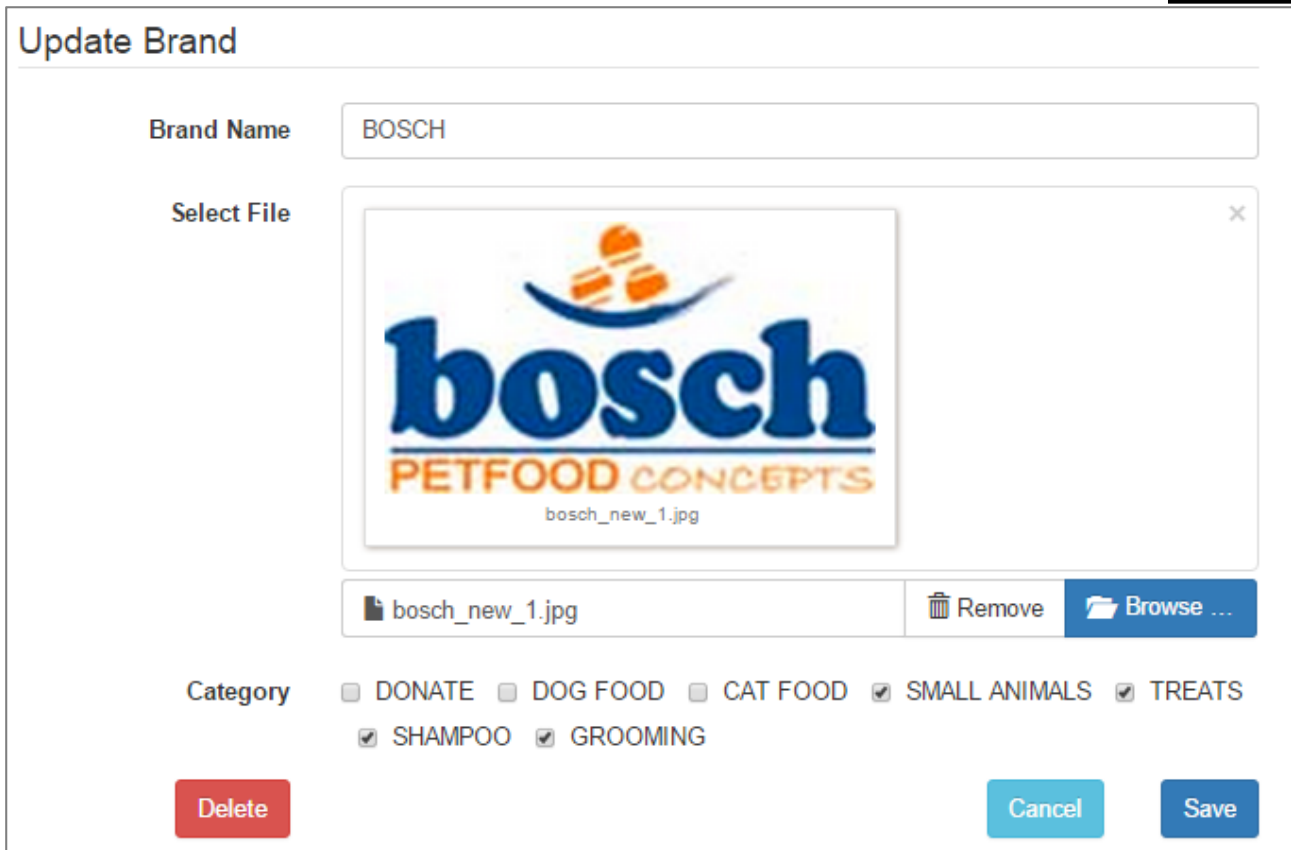
Server-side C# functionality

- i) Collect user input and create a new brand record in the database. The user entry should at least include brand name, brand image and categories.
- ii) Perform validation checking on the brand name to ensure that it is unique. Disallow the record creation if duplicate brand name is detected and then display a meaningful message to the user.
- iii) Able to upload image and store image.

Update Brand web form

The Update Brand web form (Fig. 13) should share similar user interface as the Add Brand web form. It is important to note that, the Update Brand web form should display the *correct* brand information and the respective brand image inside the input controls so that the user can make changes. Also, the Update Brand web form should have a Delete brand button so that the user can delete a brand record.


Fig. 13






Update Brand

Brand Name

Select File

 X

 bosch_new_1.jpg  Remove  Browse ...

Category ☐ DONATE ☐ DOG FOOD ☐ CAT FOOD ☒ SMALL ANIMALS ☒ TREATS
☒ SHAMPOO ☒ GROOMING

Server-side C# functionality

- i) Display the *correct* brand information to the user. In other words, the server-side logic must display the correct brand record details in the web form field inputs.
- ii) Collect user input and update the correct brand record in the database.
- iii) Validate the brand name to ensure that it is unique. Disallow the record update if duplicate brand name is detected and display meaningful message to the user.
- iv) Able to allow the user to delete a brand and at the same time checks whether the brand has any products related to it. If there are products related to the brand, the system will not allow the user to delete the brand record. The system will display a helpful message to the user.

Manage Brand web form

The website administrator can use the Manage Brand web form (Fig. 14) to search and view brand information. The Category Management web form works closely with the Brand Management web form. If the user clicks on the Manage Brand button of the row which displays DOG FOOD (Fig. 14), the Manage Brand web form should display all the brand records that are tied to DOG FOOD category.

The administrator can also use the search features within the Manage Brand web form to search and view brand records that meet the search criteria.

Fig. 14

The screenshot shows the 'Manage Brand' web form. At the top, there is a search bar with the label 'Search by Brand Name' and a text input field 'Enter partial product name'. To the right of the input field is a 'Category' dropdown menu currently set to 'ALL BRANDS'. A green 'Search' button is located to the right of the dropdown. Below the search bar is a table with the following columns: Brand Id, Brand Name, Category, No. of Products, Created At, and a series of columns for user information (Name, Date, Name). The table contains four rows of data. Each row has an 'Update' button to its right. A dropdown menu is open from the 'Category' field, showing a list of categories: ALL BRANDS, BRANDS NOT TIED TO CATEGORY, DOG FOOD, CAT FOOD, TREATS, SMALL ANIMAL, and SHAMPOO.

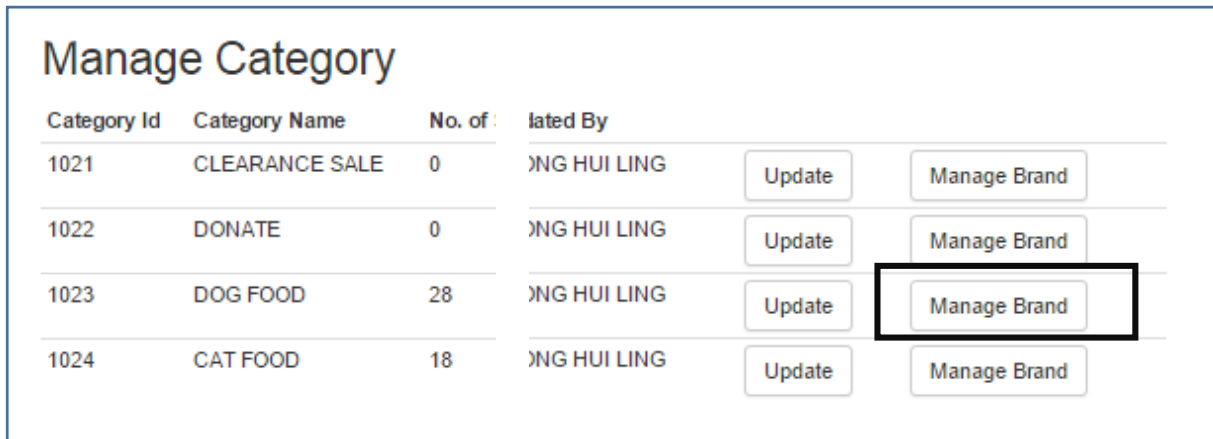
Brand Id	Brand Name	Category	No. of Products	Created At					
55	ADD MATE		9	10/10/2015 09:10					<button>Update</button>
56	ADDICTION	CAT FOOD, DOG FOOD, TREATS	9	25/10/2015 09:15	LEONG HUI LING	25/10/2015 09:15	LEONG HUI LING		<button>Update</button>
57	ADVOCATE (BAYER)	FLEA & TICK CONTROL	9	15/11/2015 11:30	TEO LOKE KWAN	16/11/2015 11:15	LEONG HUI LING		<button>Update</button>
1024	AEOLUS		3	14/10/2015 14:30	TEO LOKE KWAN	14/10/2015 14:55	LEONG HUI LING		<button>Update</button>

Linking Manage Category and Manage Brand web form

The Manage Category web form and Manage Brand web form work closely together too. When the user:

- Use the Category Management web form.
- Clicks the Manage Brand button which is associated to the DOG FOOD category (Fig. 15)

The system will bring the user to the Brand Management web form which can display all the brand records related to DOG FOOD category (Fig. 16).

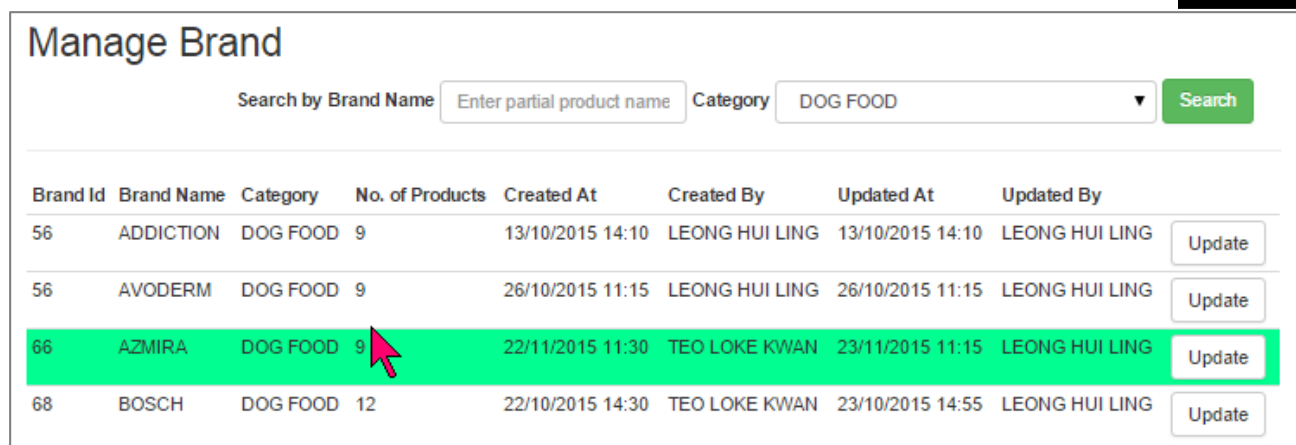


Manage Category

Category Id	Category Name	No. of	lated By		
1021	CLEARANCE SALE	0	YNG HUI LING	<button>Update</button>	<button>Manage Brand</button>
1022	DONATE	0	YNG HUI LING	<button>Update</button>	<button>Manage Brand</button>
1023	DOG FOOD	28	YNG HUI LING	<button>Update</button>	<button>Manage Brand</button>
1024	CAT FOOD	18	YNG HUI LING	<button>Update</button>	<button>Manage Brand</button>

Fig. 15

Fig. 16



Manage Brand

Search by Brand Name Category Search

Brand Id	Brand Name	Category	No. of Products	Created At	Created By	Updated At	Updated By	
56	ADDICTION	DOG FOOD	9	13/10/2015 14:10	LEONG HUI LING	13/10/2015 14:10	LEONG HUI LING	<button>Update</button>
56	AVODERM	DOG FOOD	9	26/10/2015 11:15	LEONG HUI LING	26/10/2015 11:15	LEONG HUI LING	<button>Update</button>
66	AZMIRA	DOG FOOD	9	22/11/2015 11:30	TEO LOKE KWAN	23/11/2015 11:15	LEONG HUI LING	<button>Update</button>
68	BOSCH	DOG FOOD	12	22/10/2015 14:30	TEO LOKE KWAN	23/10/2015 14:55	LEONG HUI LING	<button>Update</button>

Server-side C# functionality

- Display the correct brand information based on user search.
- Able to integrate with the Update Brand web form so that the Update Brand web form can display the correct brand for the user to make changes.
- Able to integrate with the Category Management web form so that the Brand Management web form can display all the brands which are related to the category selected by the user at the Category Management web form.

WHAT IS TO BE SUBMITTED?

Zip the web project folder and submit a single ZIP file to the ESP Assignment Submission link which will be available. The naming convention of the zip file should be **<Your Name>_<AdmissionId>_2A##.ZIP**.

Feature(s)	Marks Allocated
1.1 Model preparation (ApplicationDbContext class, Entity classes, relationships)	10
1.2. Test data preparation. By observing the website, you should create test data inside the Product, Brand, Category and other tables (if deem necessary) by using the app.SeedData() technique. To score full 20 marks in this part, you must use the data you observed in the official online website to seed your tables. The quality of the data will help you self-verify your database model. (Time consuming but is essential in Final Year Project)	10
2. Business Layer Web API development on Brands Web API controller class, Categories Web API controller class. Server-side validation to ensure database integrity. Naming conventions used in server-side variables, methods and files. Effective error handling implemented in Web API controller classes. Image file (binary file) management.	40
3. Presentation Layer Development using JavaScript. Effective use of validation library, moment.js , noty.js , jqWidgets or any client-side	30

libraries etc. to fulfil the user needs. Effective use of Bootstrap framework library (or other library of your choice) to provide consistency in the web solution's interface.	
4. Additional features which helps user achieve their user goals effectively. For example, when the category's publish start date is very close (e.g. 1 day left) and there are still no brand or product information linked to it, you need to think of a way to remind the administrator.	10
Program Score	100

Means of Assessment

This assignment contributes **35%** to the final grade. You will be graded according to your ability to work independently, site design, program design, functionality, and user-friendliness and the ability to be creative in solving problems.

Reference:

Brand Management

Although the Web Application Development focuses in programming, knowledge acquisition in other areas provides purpose. Very often, clients have website business goals. And they often communicate with you how your work can help them one step closer to achieve their website business goals. This article at <http://affiliate-program-management.com/affiliate-text-links-vs-banners-the-great-debate/> is about a person's reflection and studies on whether image size affects sales results. These knowledge helps a professional developer to educate the clients the appropriate image sizes (such as brand image size, product image size) which best suite their business needs.

Bootstrap Checkbox

When I was writing this assignment specification, I had to go through a bunch of resources to study the implementation of checkbox interface which are Bootstrap friendly.

<http://montrezorro.github.io/bootstrap-checkbox/>

Date Picker

I referred to the <http://formvalidation.io/examples/bootstrap-datepicker/> to quickly whip up the date picker interface for the Update Category and Add Category web form. There are more powerful bootstrap friendly datepicker widget which you can apply too.

Bootstrap Library

I strongly suggest you all begin with Bootstrap Library for aligning web forms elements. It is a good library to begin with. It is a good foundation for any learners to pick up other useful libraries such as Kendo UI, Ionic Framework etc.

Product Price

Many learners did not put in enough thoughts on the Product table design. For example, the price field **should not be inside** the Product table design. There should be a separate Price table.

Product, Customer Order and Order Detail Table Design

This database design of these two tables are necessary in the assignment even if you are not required to code the shopping cart functionality. You should provide valid test records inside these tables so that you can test the delete product functionality (CA2).

The Assignment is not perfect – Many Assumptions were made

There are many assumptions made for the Product Management, Category Management and Brand Management functionality. So that the assignment scope is scaled properly while meeting the learning outcome. For example, notice that the Clearance Sale category does not have brand records associated to it. Instead, the product records are associated to the Clearance Sale category. For learners who wish to differentiate themselves from others, **they can put in more thoughts in how to cater what has been observed in the actual website.**

End