



INTERNET PROGRAMMING AND E-COMMERCE

PROJECT DELIVERABLE 2

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DESIGNING

VISUAL DESIGN

CLASS DIAGRAM

A class diagram is an object-oriented analysis and design tool, that allows a programmer to visually represent the classes of a system, their relationships, their operations and attributes (Ambler, 2009). Class diagrams are used to conceptually model a system as part of the planning process in systems development (Ambler, 2009) (Sparks, 2018).

The following diagram shows the class diagram for the e-commerce website to be made for Jenni Twigg Designs, illustrating the classes, their attributes, relationships and functions (Sawant, 2006):

Class Diagram for Jenni Twigg Designs E-Commerce Website

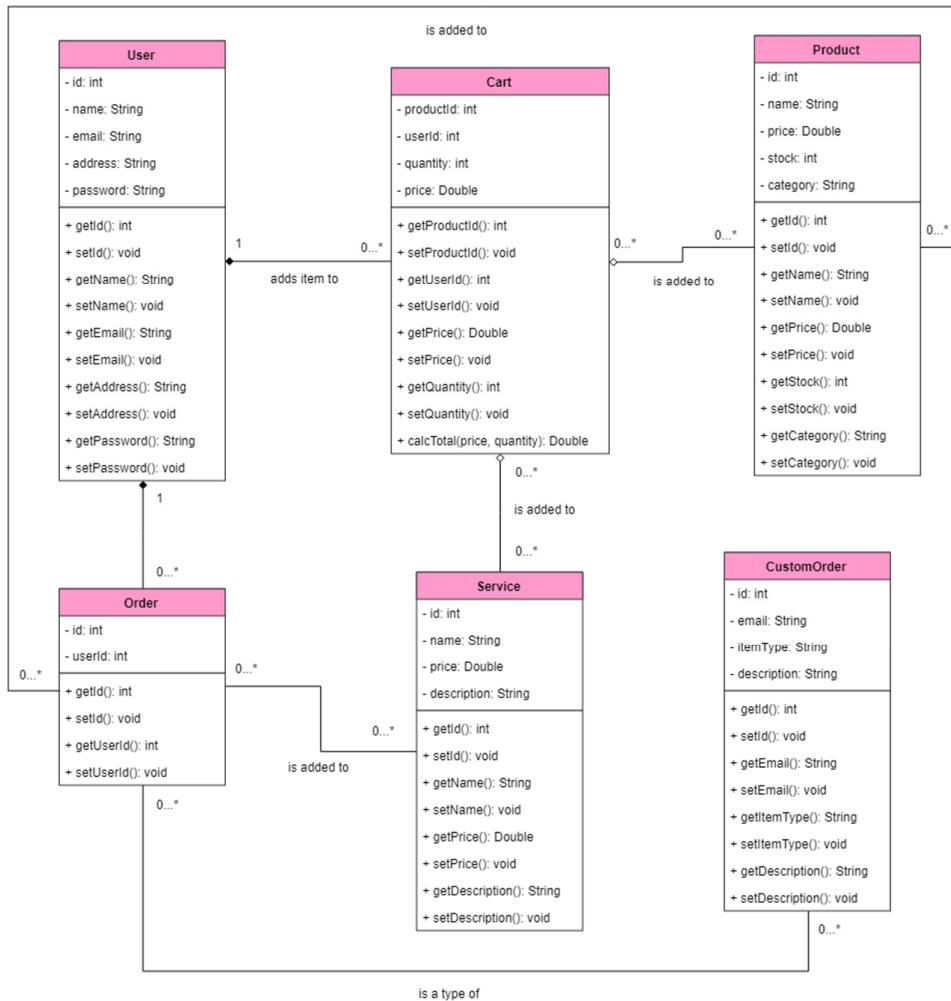


Figure 1 - Class Diagram for Jenni Twigg Designs E-Commerce Website.

CLASS RESPONSIBILITY COLLABORATION DIAGRAMS

A class responsibility collaboration (CRC) diagram is a model that outlines what each class knows or what action they perform, and which classes it interacts with to fulfil these responsibilities (Ambler, 2018).

Table 1 - CRC Diagram for User Class.

User	
Responsibilities	Collaborators
Places orders	Cart
Places items in cart	Order
Name	
Email	
Address	
Password	
Log in to system	
Views orders	

Table 2 - CRC Diagram for Order Class.

Order	
Responsibilities	Collaborators
User ID	User
Product ID	Product
Provides user with list of details	Service
	Custom Order

Table 3 - CRC Diagram for Cart Class.

Cart	
Responsibilities	Collaborators
Product ID	User
User ID	Service
Quantity	Product
Price	
Determine total price	
Store items to be purchased	
Be viewed by user	

Table 4 - CRC Diagram for Product Class.

Product	
Responsibilities	Collaborators
Product ID	Order
Product name	Cart
Product price	
Product stock	
Product category	
Added to cart	

Table 5 - CRC Diagram for Service Class.

Service	
Responsibilities	Collaborators
Package name	Order
Description	Cart
Price	
Added to cart	

Table 6 - CRC Diagram for CustomOrder Class.

CustomOrder	
Responsibilities	Collaborators
Order ID	Order
Email	
Product type	
Description	
Email admin the inputted data	
Add to order	

ENTITY RELATIONSHIP DIAGRAM

An entity relationship diagram (ERD) is a detailed, logical visual representation of entities, attributes, and relationships within the system (Connolly & Begg, 2004). This allows the developer to provide a graphic representation of a complex system and see how entities are related to one another (Connolly & Begg, 2004).

The following diagram is the initial ERD used for planning purposes:

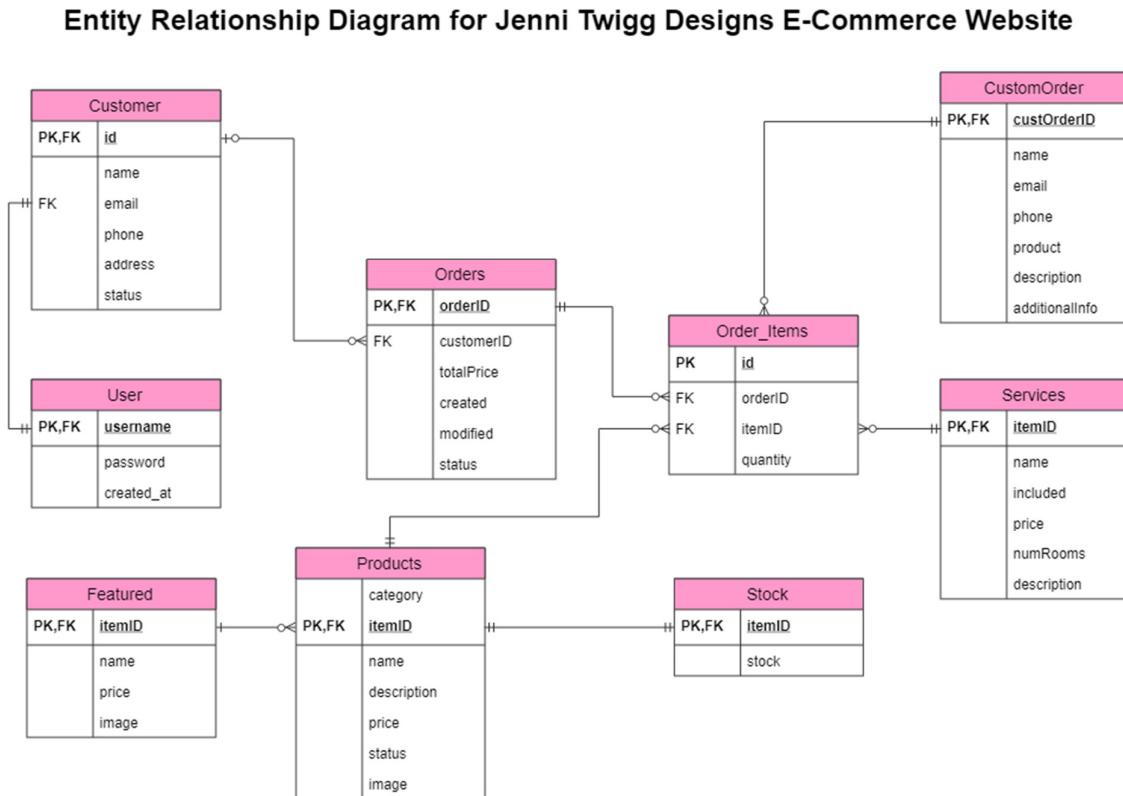


Figure 2 - Entity Relationship Diagram for Jenni Twigg Designs E-Commerce Website.

The following diagram is the generated ERD after creation of the database for the Jenni Twigg Designs Website:

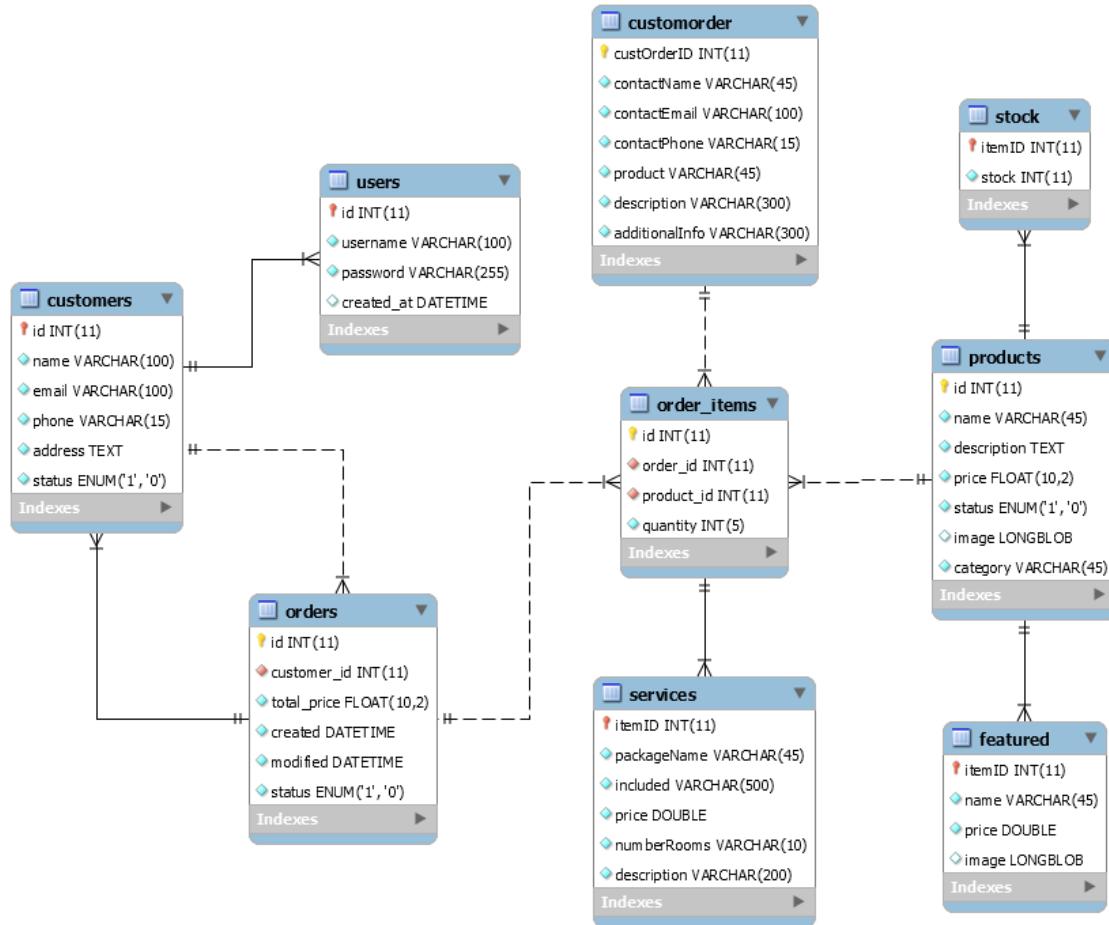


Figure 3 - Generated ERD for Jenni Twigg Designs E-Commerce Website.

CONTEXT DIAGRAM

A context diagram is a high-level data flow diagram (DFD) that shows the system boundaries and the external entities that interact with the system, with the main flows of information between the entities and the system (Valacich, et al., 2015).

The following diagram shows the context diagram for the e-commerce website to be created for Jenni Twigg Designs:

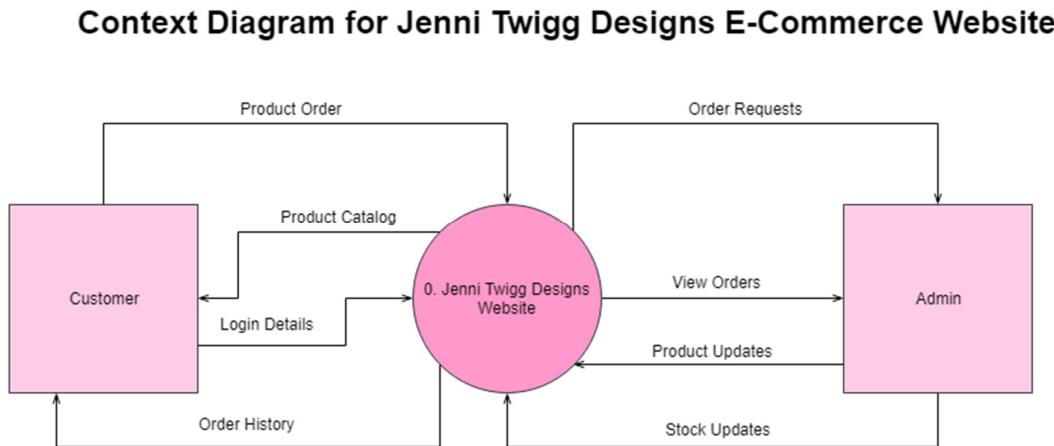


Figure 4 - Context Diagram for Jenni Twigg Designs E-Commerce Website

DATA FLOW DIAGRAM

A data flow diagram (DFD) is a diagramming tool that allows developers to illustrate the movement of data between external entities, processes and the data stores within a system (Valacich, et al., 2015).

The following Level 1 DFD shows the entities, processes, data stores and data flows between them (Kurrey, 2013):

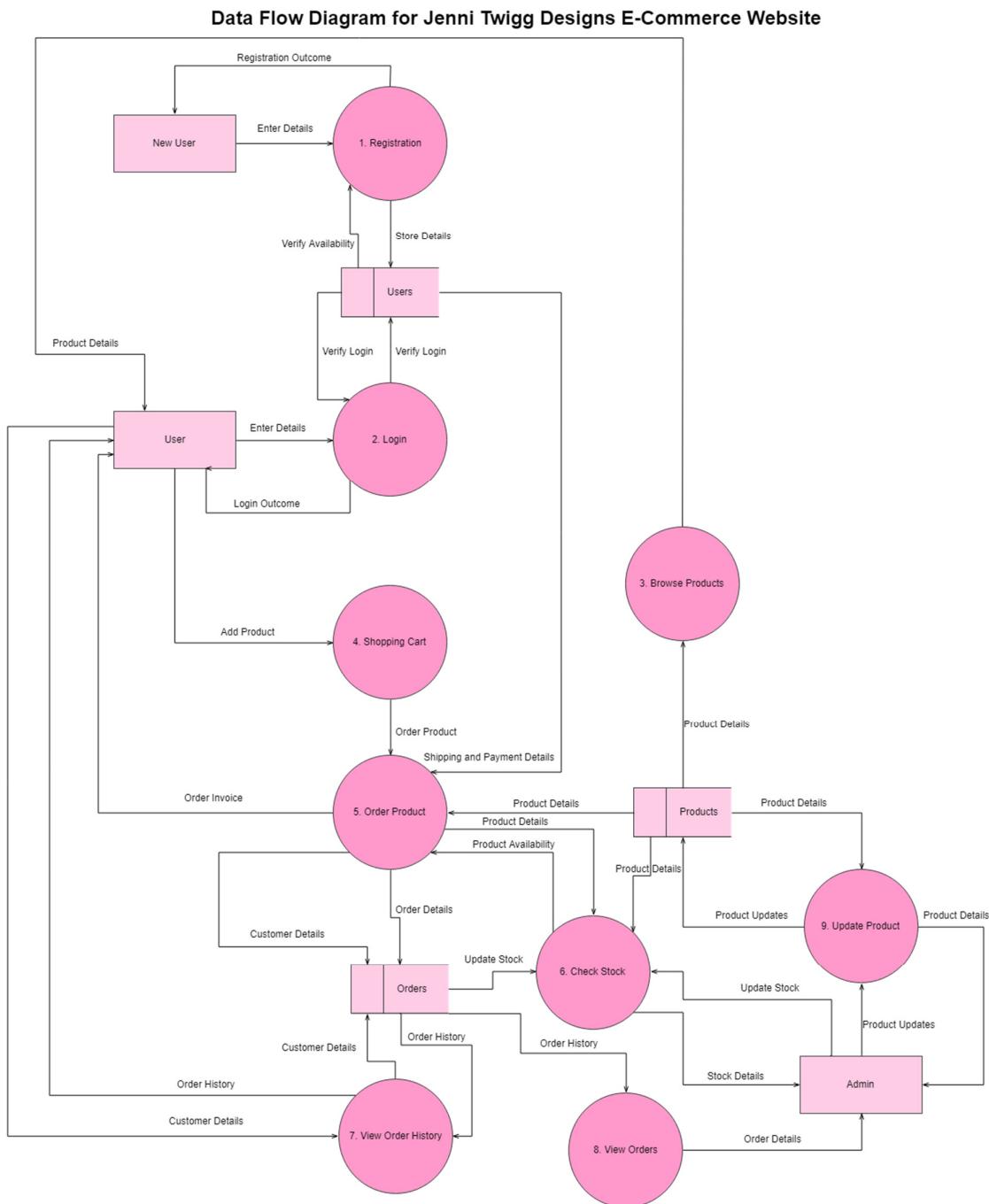


Figure 5 - Level 1 Data Flow Diagram for Jenni Twigg Designs Website.

USE CASE DIAGRAM

A use case diagram is a graphic representation of interaction between users and the system with which they are interacting (Gibilisco, 2014). Use case diagrams are used in systems analysis and design in order to identify, define, and organise system requirements (Gibilisco, 2014).

The following diagram shows the use case for the e-commerce website to be created for Jenni Twigg Designs (Sawant, 2006):

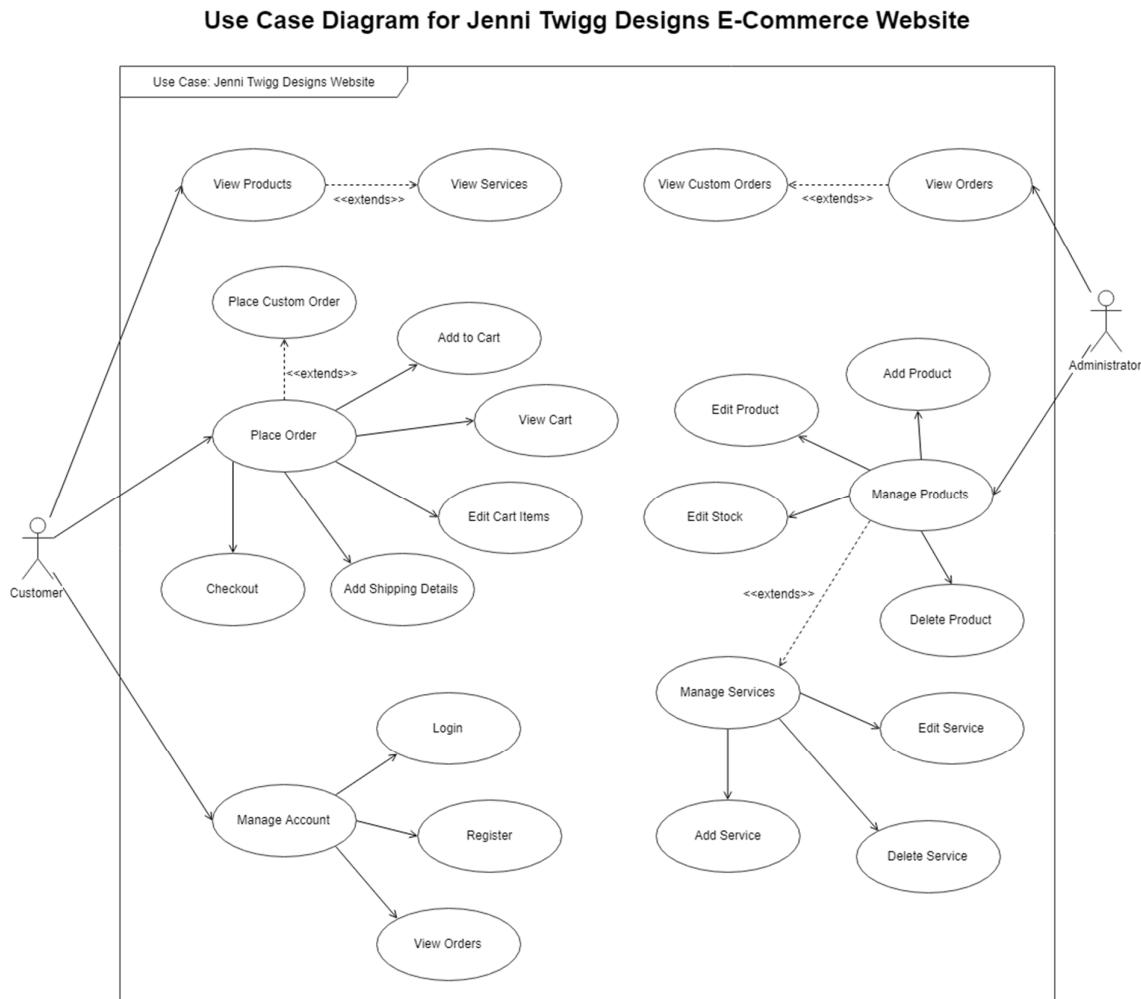


Figure 6 - Use Case Diagram for Jenni Twigg Designs E-Commerce Website.

MOCKUP DESIGN

The following screenshots show the initial prototype design of the user interface, created using a prototyping tool - MockingBot.

HOME PAGE

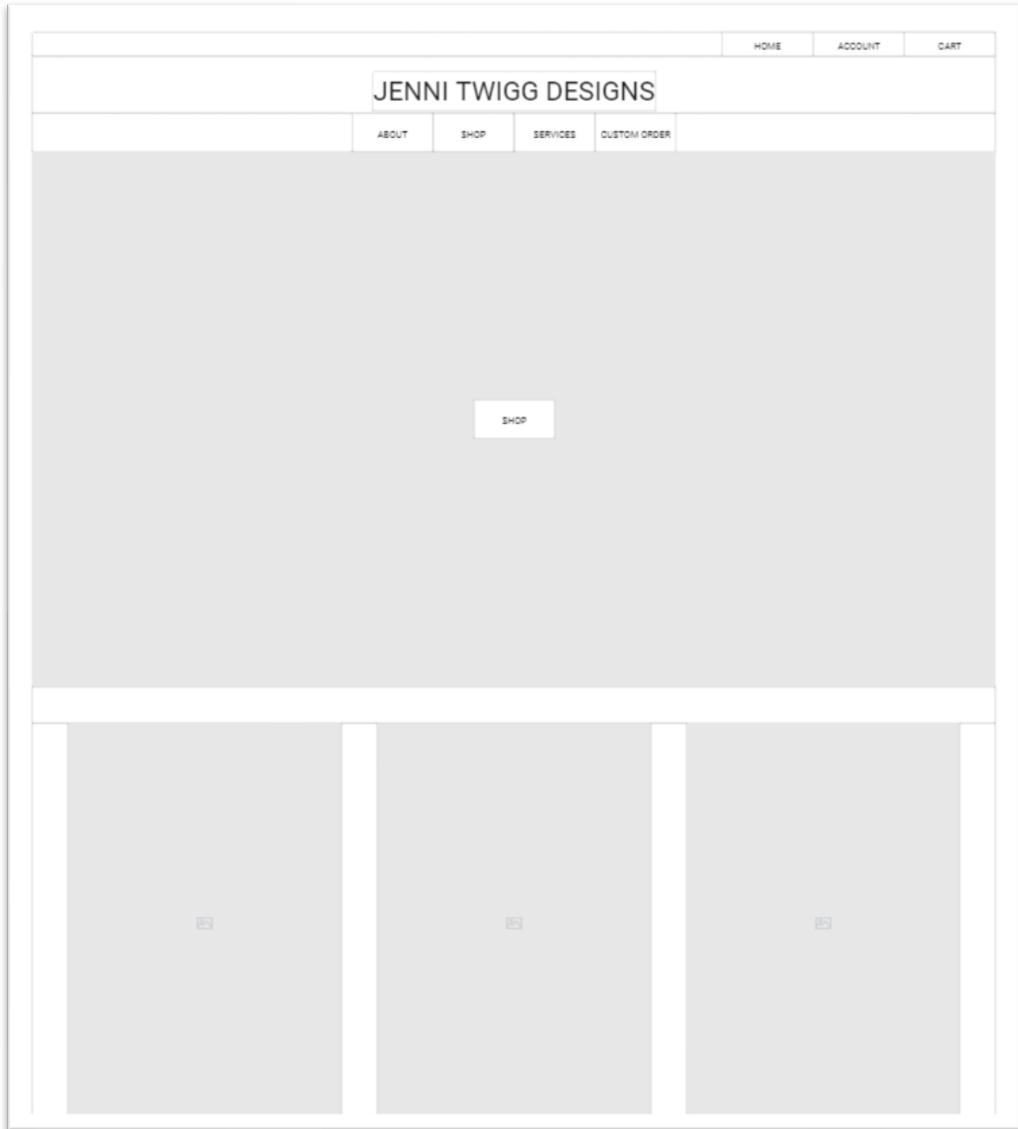


Figure 7 - Home Page Mockup Design.

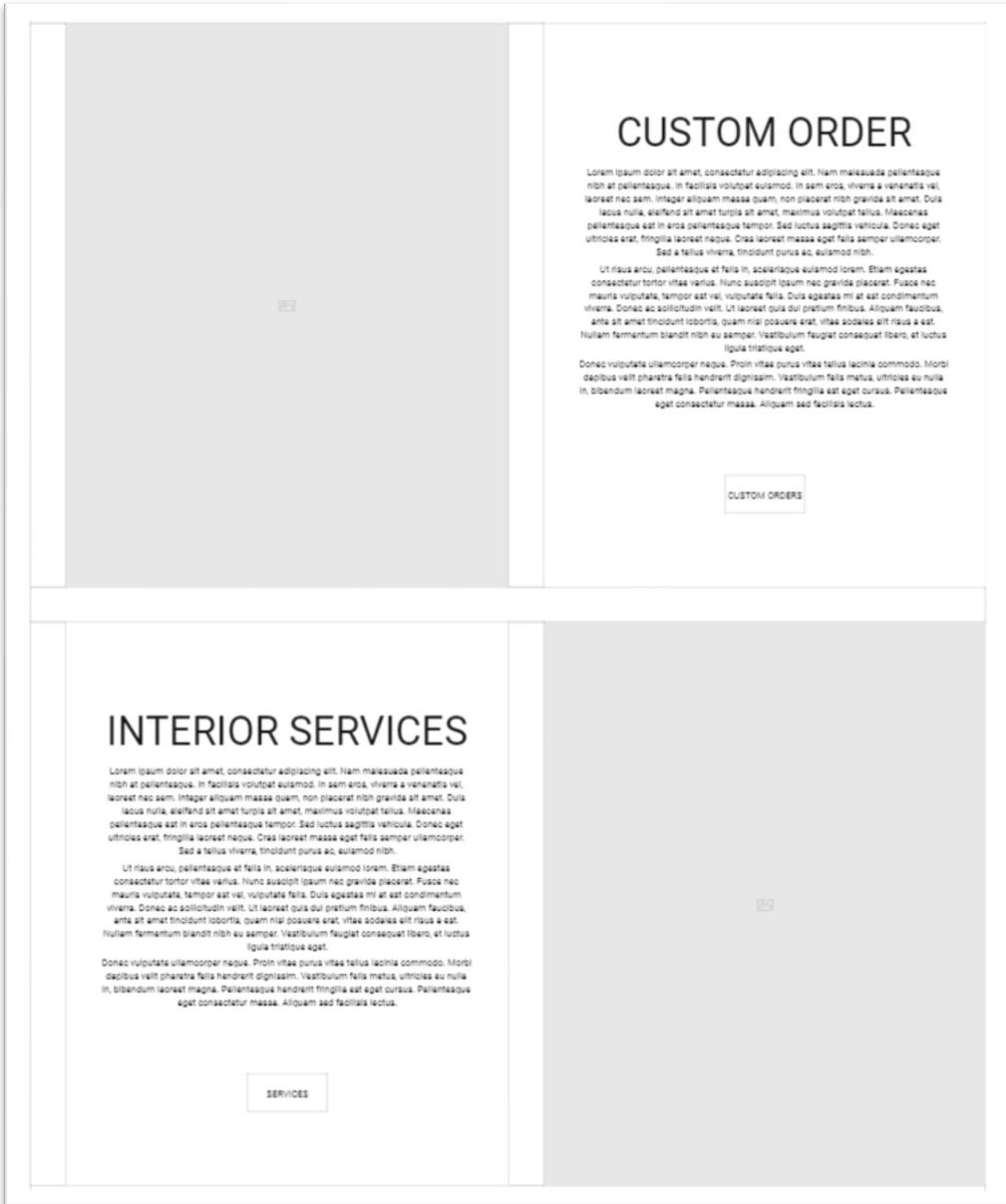


Figure 8 - Home Page Mockup Design.



Figure 9 - Home Page Mockup Design.

ABOUT PAGE

The mockup shows a website layout for 'JENNI TWIGG DESIGNS'. At the top, there's a navigation bar with links for HOME, ACCOUNT, and CART. Below the navigation is a header section with the company name 'JENNI TWIGG DESIGNS' and a menu with links for ABOUT, SHOP, SERVICES, and CUSTOM ORDER. A large, semi-transparent gray overlay covers the main content area. In the center of this overlay, the word 'ABOUT' is written in a large, bold, white font. Below this, the heading 'Our Story' is displayed in a large, bold, black font. To the left of the 'Our Story' heading is a small, dark gray rectangular image placeholder. To the right of the heading is a block of text in a standard black font. Below the 'Our Story' heading, the word 'FAQ' is centered in a large, bold, black font. Underneath 'FAQ' is another block of text in a standard black font. At the bottom of the page, the heading 'RETURNS' is centered in a large, bold, black font. Below it is a final block of text in a standard black font.

ABOUT

JENNI TWIGG DESIGNS

ABOUT SHOP SERVICES CUSTOM ORDER

Our Story

Ut risus arcu, pellentesque et felis in, scelerisque eumod lorem. Etiam egestas
consectetur tortor vitae varius. Nunc suscipit ipsum nec gravida placerat. Fusos
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FAQ

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RETURNS

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egestas consectetur massa. Aliquam sed facilisis lectus.

Figure 10 - About Us Page Mockup Design.

RETURNS

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Donec vulputate ullamcorper neque. Proin vitae purus vitae felis taciti commodo. Morbi dapibus velit pharetra felis hendrerit dignissim. Vestibulum felis metus, ultricies eu nulla in, bibendum laoreet magna. Pellentesque hendrerit fringilla est eget cursus. Pellentesque eget consecetur massa. Aliquam sed facilisis lectus.

SHIPPING

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Donec vulputate ullamcorper neque. Proin vitae purus vitae felis taciti commodo. Morbi dapibus velit pharetra felis hendrerit dignissim. Vestibulum felis metus, ultricies eu nulla in, bibendum laoreet magna. Pellentesque hendrerit fringilla est eget cursus. Pellentesque eget consecetur massa. Aliquam sed facilisis lectus.

VISIT US	SOCIAL	ABOUT
ADDRESS	INSTAGRAM	FAQs
ADDRESS	FACEBOOK	SHIPPING & RETURNS
ADDRESS	TWITTER	CONTACT US
ADDRESS	PINTEREST	TERMS OF USE

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Figure 11 - About Us Page Mockup Design.

SHOP PAGE

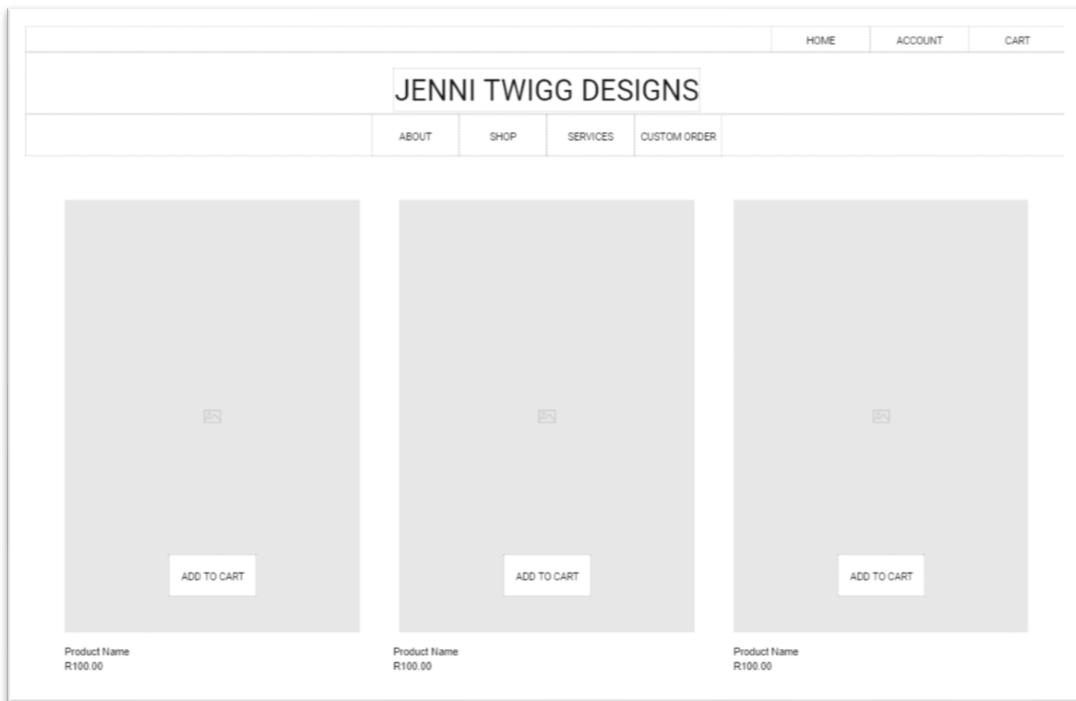


Figure 12 - Shop Page Mockup Design.

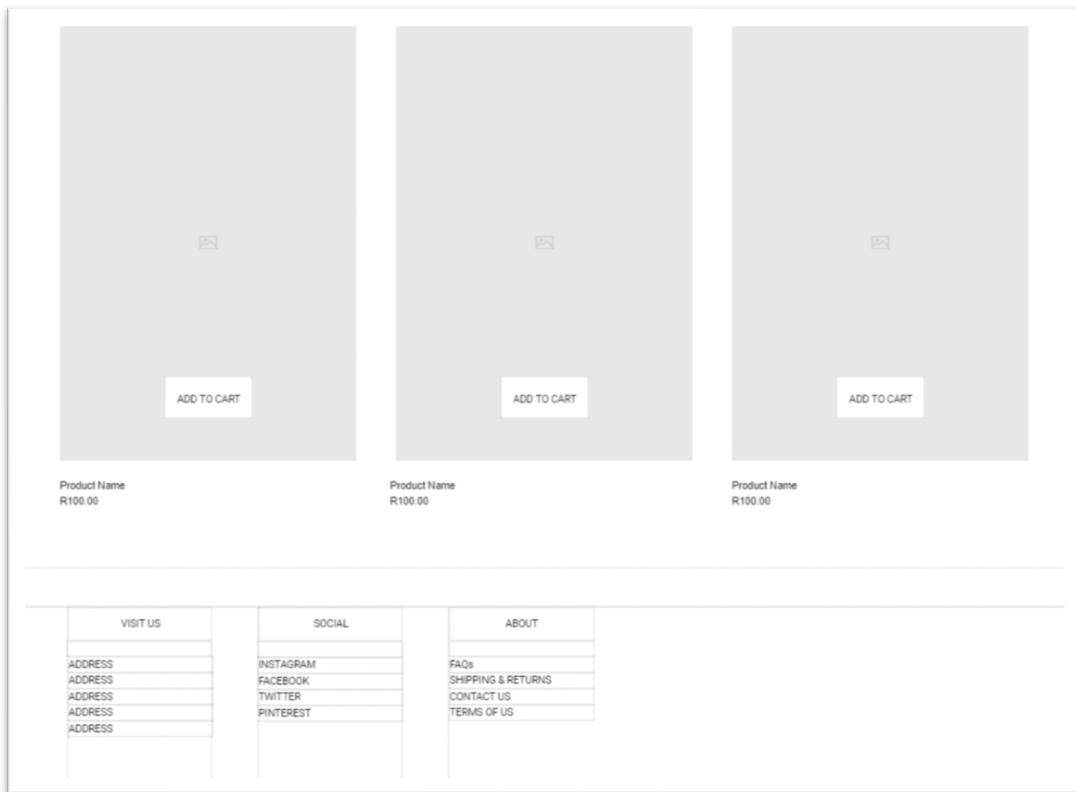


Figure 13 - Shop Page Mockup Design.

SERVICES PAGE

JENNI TWIGG DESIGNS

ABOUT SHOP SERVICES CUSTOM ORDER

SERVICES

Service 1:
 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nam malesuada pellentesque nibh at pellentesque. In facilisis volutpat euismod. In sem eros, viverra a venenatis non, lobortis non, ultricies non, massa euismod non, placerat non gravida sit amet. Duis laoreet nulla, eleifend sit amet turpis sit amet, maximus volutpat tellus. Maecenas pellentesque est in eros pellentesque tempor. Sed luctus sagittis vehicula. Donec eget ultrices erat, fringilla laoreet neque. Cras laoreet massa eget felis semper ullamcorper. Sed a telus viverra, tincidunt purus ac, euismod nibh.
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ADD TO CART

Service 2:
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 Ut risus arcu, pellentesque et felis in, scelerisque euismod lorem. Etiam egestas consectetur tortor vitae varius. Nunc suscipit ipsum nec gravida placerat. Fusce nec mauris vulputate, tempor est vel, vulputate felis. Duis egestas mi at est condimentum viverra. Donec ac

ADD TO CART

Service 3:
 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nam malesuada pellentesque nibh at pellentesque. In facilisis volutpat euismod. In sem eros, viverra a venenatis non, lobortis non, ultricies non, massa euismod non, placerat non gravida sit amet. Duis laoreet nulla, eleifend sit amet turpis sit amet, maximus volutpat tellus. Maecenas pellentesque est in eros pellentesque tempor. Sed luctus sagittis vehicula. Donec eget ultrices erat, fringilla laoreet neque. Cras laoreet massa eget felis semper ullamcorper. Sed a telus viverra, tincidunt purus ac, euismod nibh.
 Ut risus arcu, pellentesque et felis in, scelerisque euismod lorem. Etiam egestas consectetur tortor vitae varius. Nunc suscipit ipsum nec gravida placerat. Fusce nec mauris vulputate, tempor est vel, vulputate felis. Duis egestas mi at est condimentum viverra. Donec ac

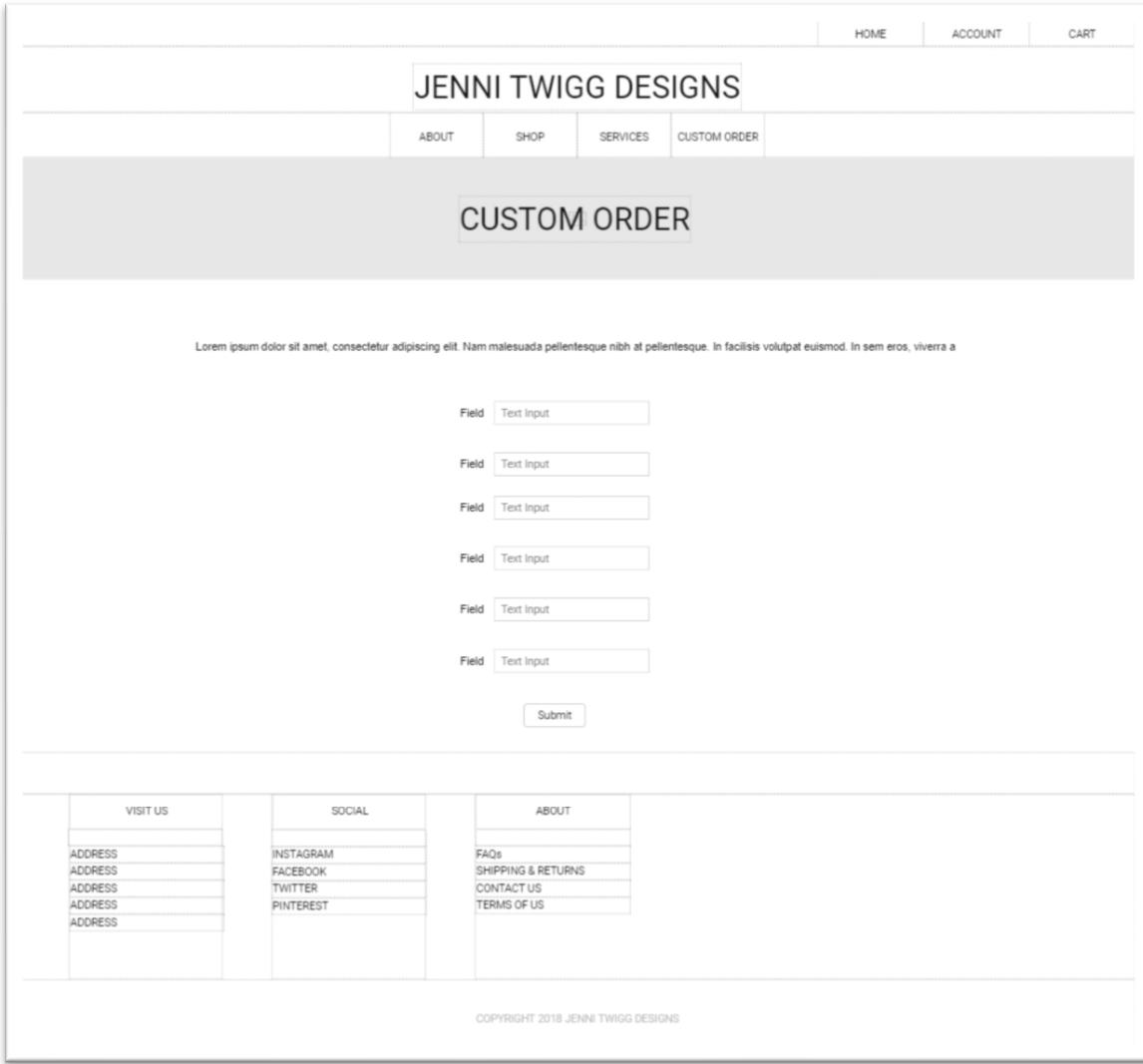
ADD TO CART

VISIT US	SOCIAL	ABOUT
ADDRESS	INSTAGRAM	FAQs
ADDRESS	FACEBOOK	SHIPPING & RETURNS
ADDRESS	TWITTER	CONTACT US
ADDRESS	PINTEREST	TERMS OF US

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Figure 14 - Services Page Mockup Design.

CUSTOM ORDER PAGE



The image shows a mockup of a custom order page for 'JENNI TWIGG DESIGNS'. The header features the brand name 'JENNI TWIGG DESIGNS' and a navigation bar with links for HOME, ACCOUNT, and CART. Below the header is a large, light gray section containing the text 'CUSTOM ORDER'. A placeholder text 'Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nam malesuada pellentesque nibh at pellentesque. In facilisis volutpat euismod. In sem eros, viverra a' is present. The main form area contains six text input fields labeled 'Field' followed by 'Text Input'. Below the inputs is a 'Submit' button. At the bottom of the page, there is a footer section divided into three columns: 'VISIT US', 'SOCIAL', and 'ABOUT'. The 'VISIT US' column lists five address entries. The 'SOCIAL' column links to INSTAGRAM, FACEBOOK, TWITTER, and PINTEREST. The 'ABOUT' column links to FAQS, SHIPPING & RETURNS, CONTACT US, and TERMS OF US. The footer also includes a copyright notice: 'COPYRIGHT 2018 JENNI TWIGG DESIGNS'.

Figure 15 - Custom Order Page Mockup Design.

CONTACT US PAGE

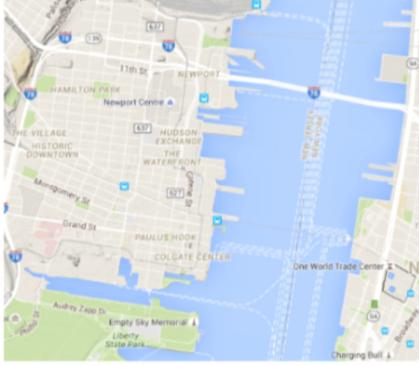
HOME ACCOUNT CART

JENNI TWIGG DESIGNS

ABOUT SHOP SERVICES CUSTOM ORDER

CONTACT US

Lorum ipsum dolor sit amet, consectetur adipiscing elit. Nam malesuada pellentesque nibh at pellentesque. In facilisis volutpat euismod. In sem eros, viverra a



Field

Field

Field

Field

Field

Field

Submit

VISIT US	SOCIAL	ABOUT
ADDRESS	INSTAGRAM	FAQs
ADDRESS	FACEBOOK	SHIPPING & RETURNS
ADDRESS	TWITTER	CONTACT US
ADDRESS	PINTEREST	TERMS OF US
ADDRESS		

COPYRIGHT 2018 JENNI TWIGG DESIGNS

Figure 16 - Contact Us Page Mockup Design.

CART PAGE

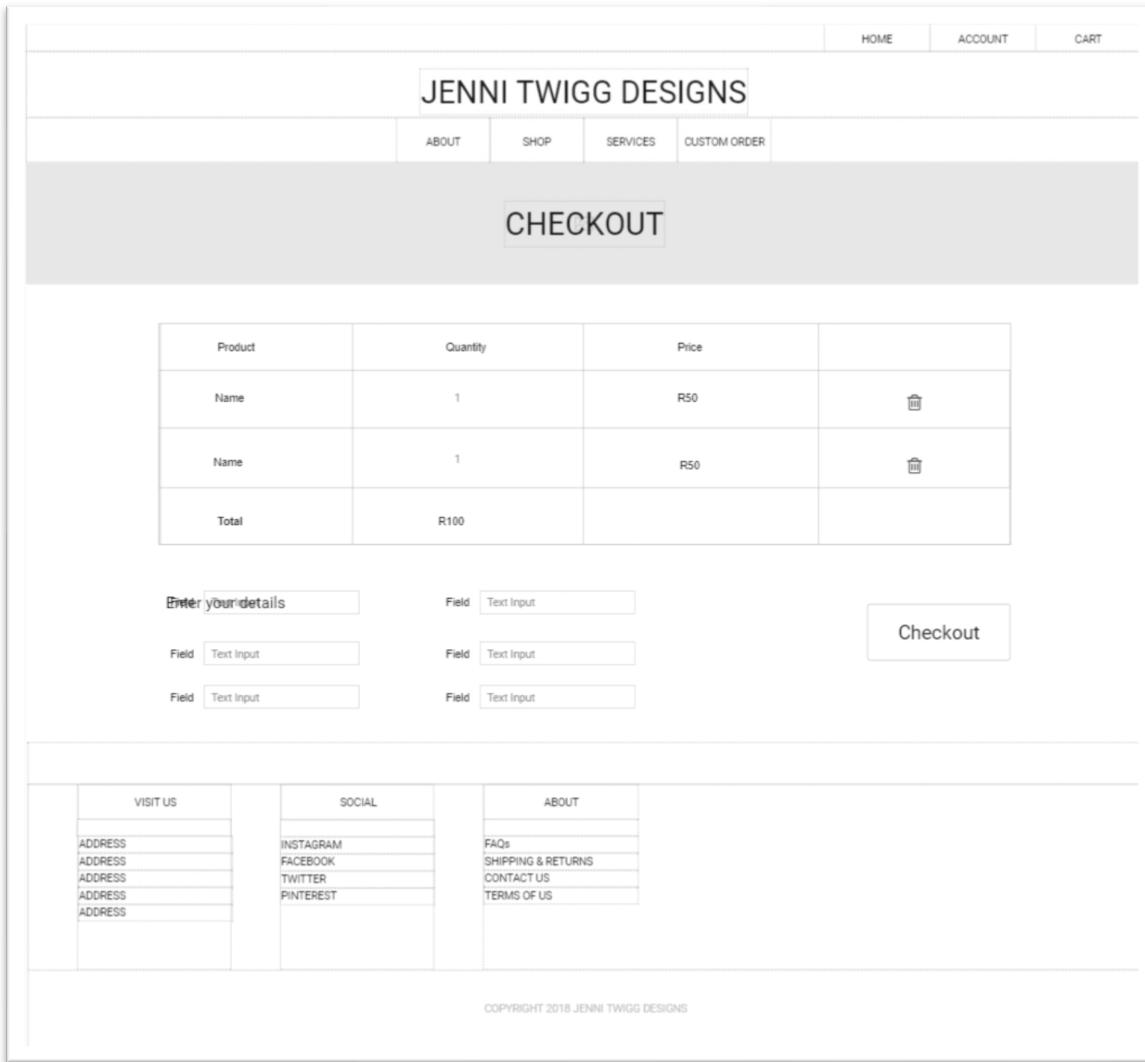
The image shows a wireframe mockup of a website's cart page. At the top, there is a header with navigation links: HOME, ACCOUNT, and CART. Below the header is a logo for "JENNI TWIGG DESIGNS". Underneath the logo is a horizontal menu bar with links: ABOUT, SHOP, SERVICES, and CUSTOM ORDER. A large, light gray rectangular area contains the word "CART" in bold capital letters. Below this area is a table for managing items in the cart:

Product	Quantity	Price	
Name	<input type="text" value="1"/>	R50	
Name	<input type="text" value="1"/>	R50	
Total	R100		<input type="button" value="Checkout"/>

At the bottom of the page, there is a footer section with three columns: "VISIT US", "SOCIAL", and "ABOUT". The "VISIT US" column lists six address entries. The "SOCIAL" column lists five social media platforms: INSTAGRAM, FACEBOOK, TWITTER, and PINTEREST. The "ABOUT" column lists five links: FAQS, SHIPPING & RETURNS, CONTACT US, and TERMS OF US. A small copyright notice at the very bottom reads "COPYRIGHT 2018 JENNI TWIGG DESIGNS".

Figure 17 - Cart Page Mockup Design.

CHECKOUT PAGE



The image shows a wireframe mockup of a checkout page for "JENNI TWIGG DESIGNS". The top navigation bar includes links for HOME, ACCOUNT, and CART. Below the header, a large "CHECKOUT" button is centered. The main content area features a table for product details:

Product	Quantity	Price	
Name	1	R50	
Name	1	R50	
Total	R100		

Below the table, there are two rows of input fields labeled "Enter your details" and "Field". A "Checkout" button is positioned to the right of these fields. At the bottom, there is a footer section with links for VISIT US, SOCIAL, and ABOUT, along with copyright information.

VISIT US

SOCIAL

ABOUT

FAQs

SHIPPING & RETURNS

CONTACT US

TERMS OF US

COPYRIGHT 2018 JENNI TWIGG DESIGNS

Figure 18 - Checkout Page Mockup Design.

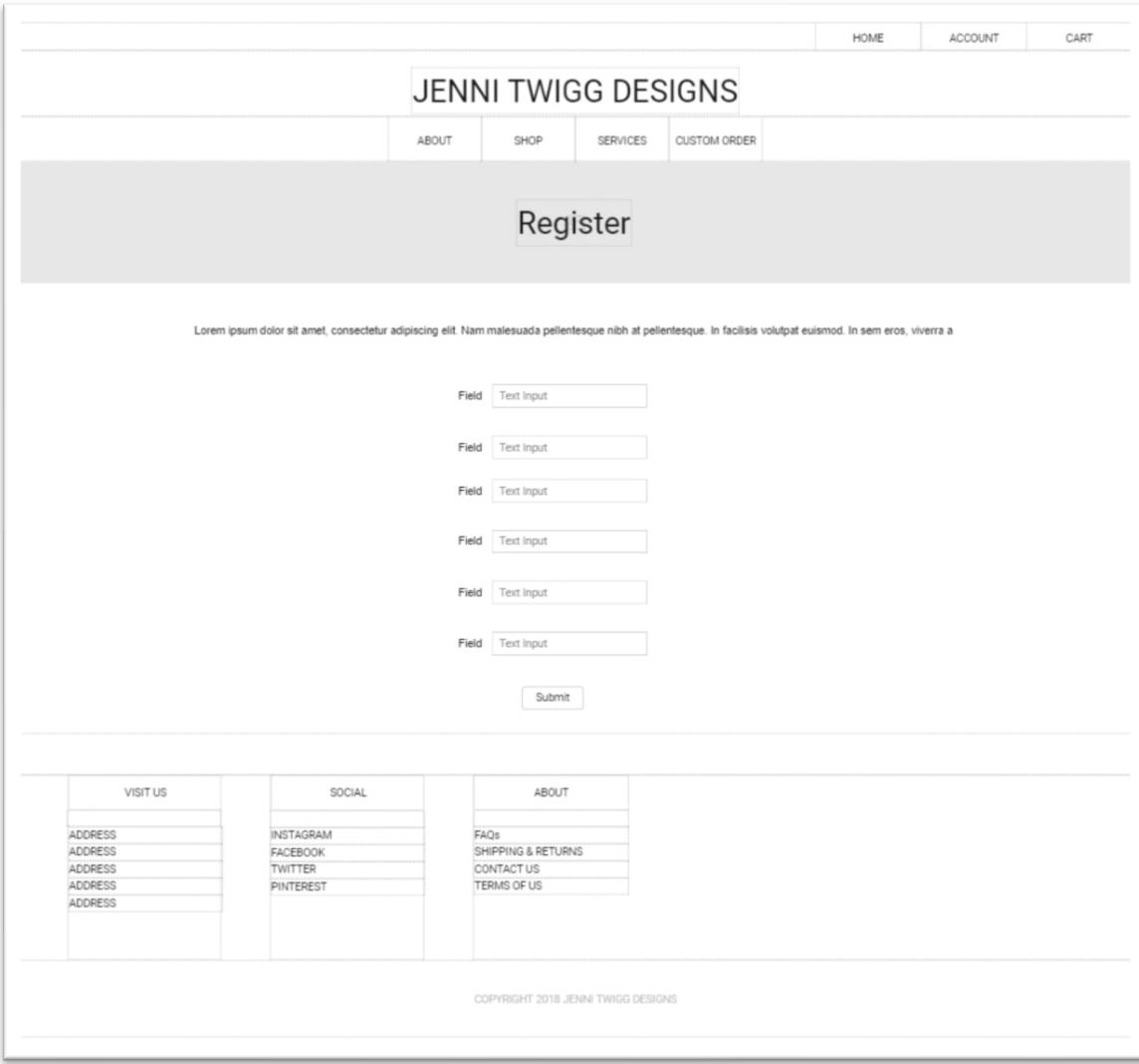
LOGIN PAGE

The image shows a login page mockup for 'JENNI TWIGG DESIGNS'. At the top right, there are links for 'HOME', 'ACCOUNT', and 'CART'. Below the header, the company name 'JENNI TWIGG DESIGNS' is displayed. A navigation bar includes links for 'ABOUT', 'SHOP', 'SERVICES', and 'CUSTOM ORDER'. The main content area features a large button labeled 'Login'. Below this, there is placeholder text: 'Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nam malesuada pellentesque nibh at pellentesque. In facilisis volutpat euismod. In sem eros, viverra a'. The form itself consists of two text input fields labeled 'Field' and a 'Submit' button. At the bottom, there is a footer section with three columns: 'VISIT US', 'SOCIAL', and 'ABOUT'. The 'VISIT US' column lists five address entries. The 'SOCIAL' column lists four social media links: 'INSTAGRAM', 'FACEBOOK', 'TWITTER', and 'PINTEREST'. The 'ABOUT' column lists four links: 'FAQs', 'SHIPPING & RETURNS', 'CONTACT US', and 'TERMS OF US'. Copyright information 'COPYRIGHT 2018 JENNI TWIGG DESIGNS' is located at the very bottom.

VISIT US	SOCIAL	ABOUT
ADDRESS	INSTAGRAM	FAQs
ADDRESS	FACEBOOK	SHIPPING & RETURNS
ADDRESS	TWITTER	CONTACT US
ADDRESS	PINTEREST	TERMS OF US

Figure 19 - Login Page Mockup Design.

REGISTER PAGE



The image shows a wireframe mockup of a register page for a website named "JENNI TWIGG DESIGNS". The header includes a navigation bar with links for HOME, ACCOUNT, and CART. Below the header is a main title "JENNI TWIGG DESIGNS" and a sub-navigation menu with links for ABOUT, SHOP, SERVICES, and CUSTOM ORDER. A large central button labeled "Register" is prominently displayed. Below the button, there is placeholder text: "Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nam malesuada pellentesque nibh at pellentesque. In facilisis volutpat euismod. In sem eros, viverra a". The form area contains six text input fields, each labeled "Field" and "Text Input". Below the inputs is a "Submit" button. At the bottom of the page, there is a footer section divided into three columns: "VISIT US", "SOCIAL", and "ABOUT". The "VISIT US" column lists five address entries. The "SOCIAL" column lists five social media links: INSTAGRAM, FACEBOOK, TWITTER, and PINTEREST. The "ABOUT" column lists four links: FAQs, SHIPPING & RETURNS, CONTACT US, and TERMS OF US. Copyright information "COPYRIGHT 2018 JENNI TWIGG DESIGNS" is located at the very bottom.

Figure 20 - Register Page Mockup Design.

PROTOTYPE DESIGN

The following screenshots show the initial front-end design created using HTML, CSS, JavaScript and Bootstrap. The design was based off a modified Bootstrap WordPress E-Commerce template, Fashe (Aigars & Colorlib, 2017).

HOME PAGE

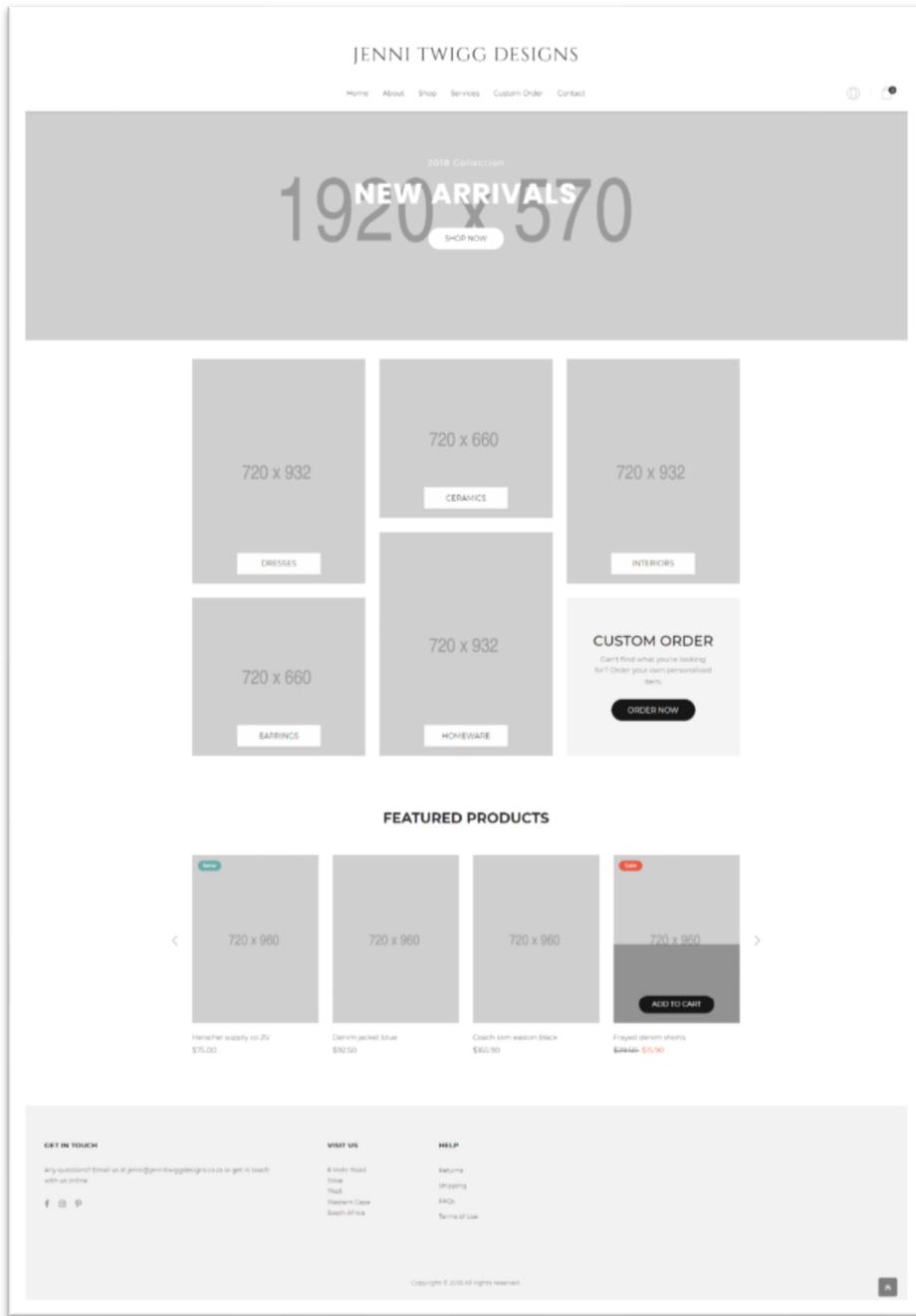


Figure 21 - Home Page Prototype Design.

ABOUT PAGE

JENNI TWIGG DESIGNS

Home About Shop Services Custom Order Contact

1920 x 239
ABOUT

Our Story

Jenni Twigg is the founder of Jenni Twigg Designs. Jenni has a diploma in dress design from the Natal Technical and has worked as a fashion buyer for Greenaces, Game, and Edgars for 12 years. During this period, she focused on women's and children's clothing, and she spent many years travelling to numerous markets to bring back fashion ideas for the South African market. She has travelled to all the fashion capitals of Europe and the US and has also acted as a clothing agent for Nissen & Lester.

While her children were in high school and her husband was travelling for work, Jenni was left with much time on her hands, and she discovered a gap in the interior and home designs market. Having always had a passion for creative projects, she founded Jenni Twigg Designs in 2003.

Jenni Twigg Designs specialises in interior decorating, ceramics and pottery, dress making, cushioning, and costume jewellery. A native of Durban, Jenni has done work in interior decorating for property developers as well as private home owners, and she has sold her self-designed and made items at various markets in and around Durban (such as the I Heart Market, Wonder Market, and the Esmewood Market). In addition, she has run a successful pottery school from her home in Durban North, from which she ran classes for up to 8 people per session.

After relocating to Cape Town in 2015, Jenni has continued with her interior, pottery, clothing and jewellery designs mainly selling through Facebook and word of mouth. She is well known for assisting family and friends, particularly on ideas for both primary and holiday homes.

Frequently Asked Questions

[Question]
[Answer]

[Question]
[Answer]

[Question]
[Answer]

Returns

Aliquam sit amet, consectetur adipiscing elit. Vivamus a mattis nisl, vel rhoncus magna. Curabitur in efficitur lacus, vitae pulvinar justo. Cras eleifend condimentum sem in malesuada. Aenean vel pulsat est enim quam nec gravida. Fusce eget tellus feugiat, ultricies orci et vel, vestibulum velit. Duis egentes efficitur pulvis id mattis. Etiam bilineatum appetet monitus. Nam augue nunc, placat at commodo non, fringilla et turpis. Phasellus dapibus dignissim sapiens, in ornare lacus exelementum et. Quisque mollitie iulius utra uter kantus. Phasellus ut iulius matus. Morbi iulius turpis velit, eu placerat ligula pulvinar eget. Prosequit laoreet odio lauret dignissim ornare. Vestibulum sagittis iulii ou lacus varus curas. Vestibulum et pharetra iulius. Cras tempor, erat nec tristique blanditi, nisi mattis pretium lacus, sit amet mattis nisi lectus vitat magna. Quisque maximus lorem eget eros consecetur portitor. Sed ac augue nunc. Aliquam consector tortor purus. Nullam aliquam massa nunc, eget convallis purus vehicula in. Quisque feugiat nisi eget tellus euismod volutpat. Pharetraque feugiat ligula eris, nec elementum turpis tristique a. Aliquam iunius, erit id placet varus, justo neque malesuada lorem, sed vulputate nibh iulus erit mi. Aliquam elementum tempus quam vitae utrines. Aliquam id sapien oculi, vestibulum lectus sed, venenatis magna. Donec consequat libero feli, ac haudibus iulius volutpat sed. Fusce et odio tempor, sodales du congue, porta matus. Nam eleifend magna est, non tristique orio pulvinar et. Vivamus ac sem faecibus, finibus erat quis, tincidunt ligula. Donec suscipit vestibulum leo eget venenatis. Maecenas vitae venenatis augue, id iulius mi. Etiam et ornare est. Morbi commodo porta matus, vel dignissim ligula ultramcorper vitas.

Shipping

Aliquam ipsum dolor sit amet, consectetur adipiscing elit. Vivamus a mattis nisl, vel rhoncus magna. Curabitur in efficitur lacus, vitae pulvinar justo. Cras eleifend condimentum sem in malesuada. Aenean vel pulsat est enim quam nec gravida. Fusce eget tellus feugiat, ultricies orci et vel, vestibulum velit. Duis egentes efficitur pulvis id mattis. Etiam bilineatum appetet monitus. Nam augue nunc, placat at commodo non, fringilla et turpis. Phasellus dapibus dignissim sapiens, in ornare lacus exelementum et. Quisque mollitie iulius utra uter kantus. Phasellus ut iulius matus. Morbi iulius turpis velit, eu placerat ligula pulvinar eget. Prosequit laoreet odio lauret dignissim ornare. Vestibulum sagittis iulii ou lacus varus curas. Vestibulum et pharetra iulius. Cras tempor, erat nec tristique blanditi, nisi mattis pretium lacus, sit amet mattis nisi lectus vitat magna. Quisque maximus lorem eget eros consecetur portitor. Sed ac augue nunc. Aliquam consector tortor purus. Nullam aliquam massa nunc, eget convallis purus vehicula in. Quisque feugiat nisi eget tellus euismod volutpat. Pharetraque feugiat ligula eris, nec elementum turpis tristique a. Aliquam iunius, erit id placet varus, justo neque malesuada lorem, sed vulputate nibh iulus erit mi. Aliquam elementum tempus quam vitae utrines. Aliquam id sapien oculi, vestibulum lectus sed, venenatis magna. Donec consequat libero feli, ac feacibus iulius volutpat sed. Fusce et odio tempor, sodales du congue, porta matus. Nam eleifend magna est, non tristique orio pulvinar et. Vivamus ac sem faecibus, finibus erat quis, tincidunt ligula. Donec suscipit vestibulum leo eget venenatis. Maecenas vitae venenatis augue, id iulius mi. Etiam et ornare est. Morbi commodo porta matus, vel dignissim ligula ultramcorper vitas.

GET IN TOUCH

Any questions? Email us at jenni@jennitwiggdesigns.co.za or get in touch with us online.

[f](#) [m](#) [p](#)

VISIT US

6 Hinch Road
Trotter
PMSL
Western Cape
South Africa

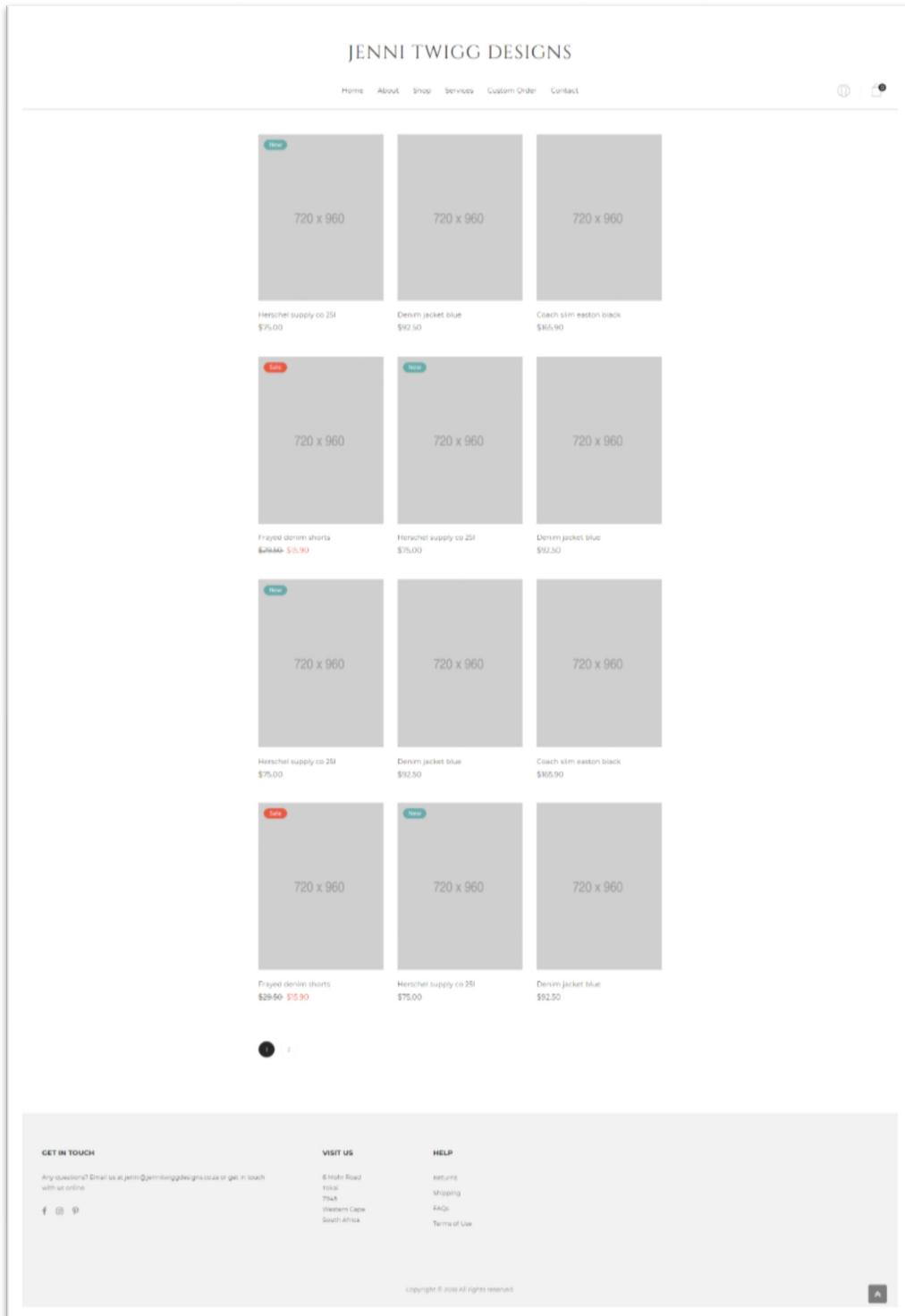
HELP

Returns
Shipping
FAQs
Terms of Use

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Figure 22 - About Page Prototype Design.

SHOP PAGE



The image shows a prototype design for a shop page. At the top center, the brand name "JENNI TWIGG DESIGNS" is displayed in a bold, black, sans-serif font. Below the header, a horizontal navigation bar contains links for "Home", "About", "Shop", "Services", "Custom Order", and "Contact". To the right of the navigation bar are two small icons: a magnifying glass and a shopping cart.

The main content area features a grid of product cards. Each card is a light gray rectangle with a "720 x 960" placeholder image. The first row contains three cards:

- Herschel supply co 25L \$75.00
- Denim jacket blue \$92.50
- Coach slim easton black \$105.90

The second row contains three cards:

- Frayed denim shorts \$29.90 - \$15.90
- Herschel supply co 25L \$75.00
- Denim jacket blue \$92.50

The third row contains three cards:

- Herschel supply co 25L \$75.00
- Denim jacket blue \$92.50
- Coach slim easton black \$105.90

The fourth row contains three cards:

- Frayed denim shorts \$29.90 - \$15.90
- Herschel supply co 25L \$75.00
- Denim jacket blue \$92.50

At the bottom of the page, there is a footer section with three columns:

- GET IN TOUCH**
Any questions? Email us at jenni@jennitwiggdesigns.co.za or get in touch with us online.
[Facebook](#) [Twitter](#) [Pinterest](#)
- VISIT US**
6 Muir Road
Trotter
Western Cape
South Africa
- HELP**
[Returns](#)
[Shipping](#)
[FAQs](#)
[Terms of Use](#)

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Figure 23 - Shop Page Prototype Design.

SERVICES PAGE

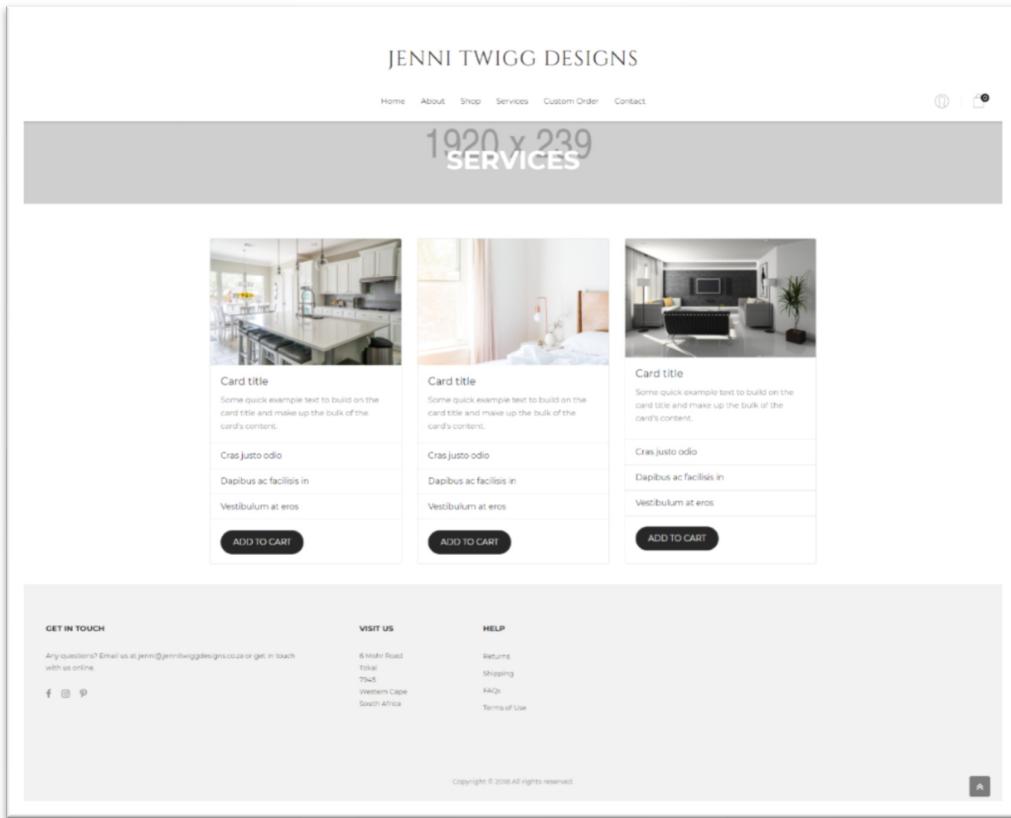
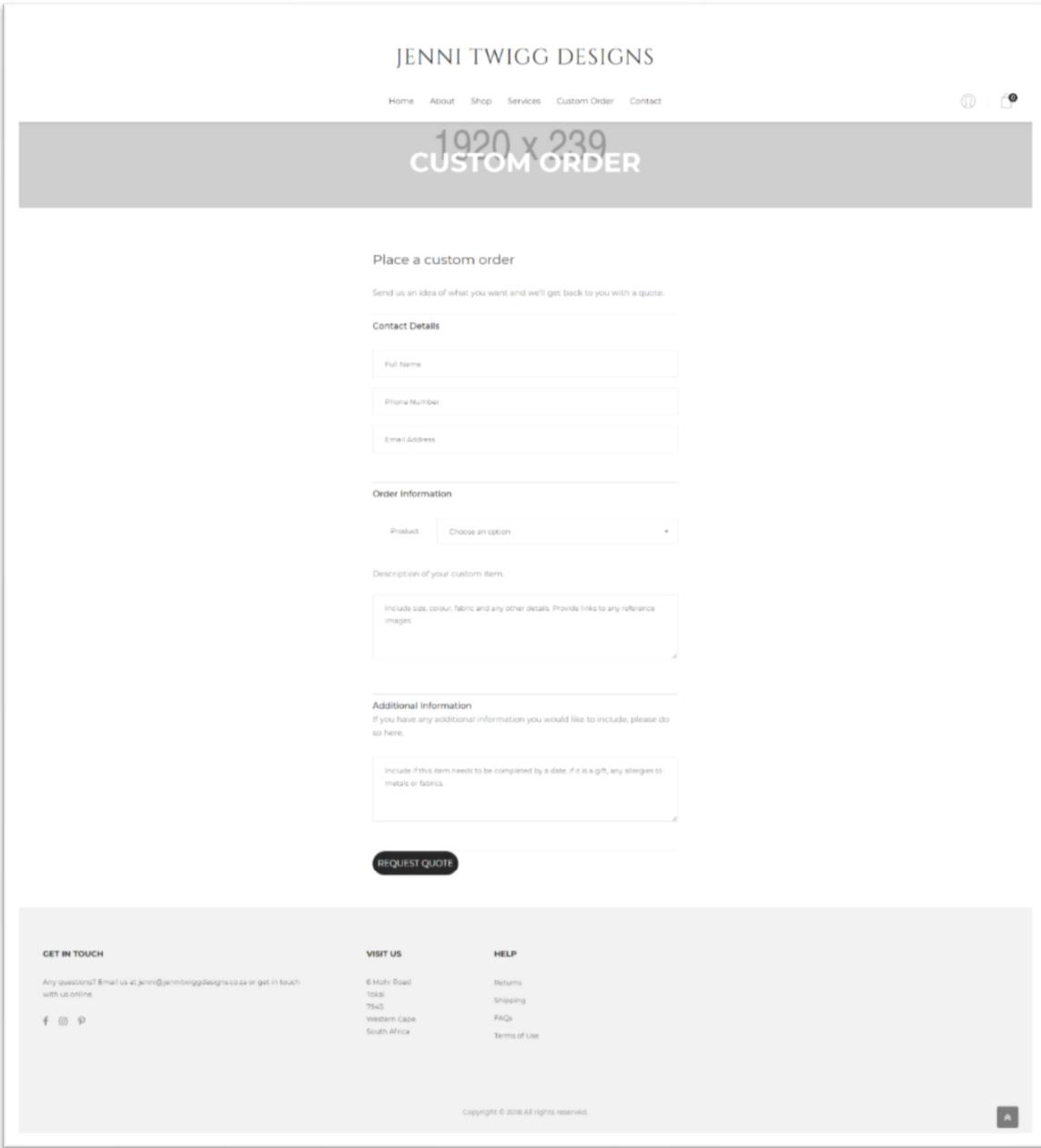


Figure 24 - Services Page Prototype Design.

CUSTOM ORDER PAGE



The image shows a prototype design for a custom order page. At the top, the brand name "JENNI TWIGG DESIGNS" is displayed above a navigation bar with links to Home, About, Shop, Services, Custom Order, and Contact. A search icon and a user profile icon are also present. Below the navigation is a large, light-gray header section with the text "1020 x 230" and "CUSTOM ORDER". The main content area begins with a heading "Place a custom order" followed by a sub-instruction: "Send us an idea of what you want and we'll get back to you with a quote." A "Contact Details" section contains three input fields for "Full Name", "Phone Number", and "Email Address". An "Order Information" section includes a dropdown menu for "Product" (with an option to "Choose an option") and a text area for "Description of your custom item" with a placeholder: "Include size, colour, fabric and any other details. Provide links to any reference images." An "Additional Information" section contains a text area for "If you have any additional information you would like to include, please do so here." Another text area for "Include if this item needs to be completed by a date, if it is a gift, any allergies, status or faconia." At the bottom of the form is a prominent "REQUEST QUOTE" button. The footer of the page includes sections for "GET IN TOUCH" (with social media links for Facebook, Instagram, and Pinterest), "VISIT US" (with address: 6 Mohr Road, Tokai, 7945, Western Cape, South Africa), and "HELP" (with links to Returns, Shipping, FAQs, and Terms of Use). The footer also contains a copyright notice: "Copyright © 2018 All rights reserved."

Figure 25 - Custom Order Page Prototype Design.

CONTACT US PAGE

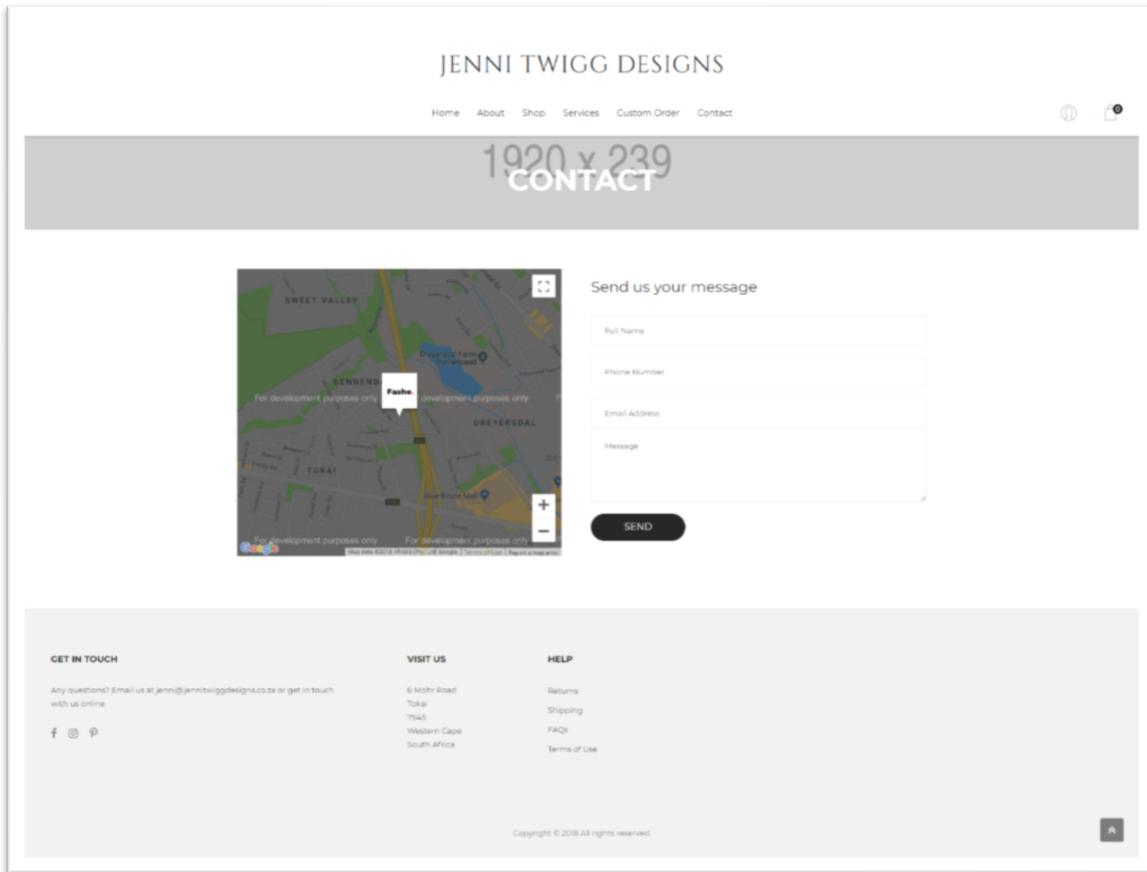
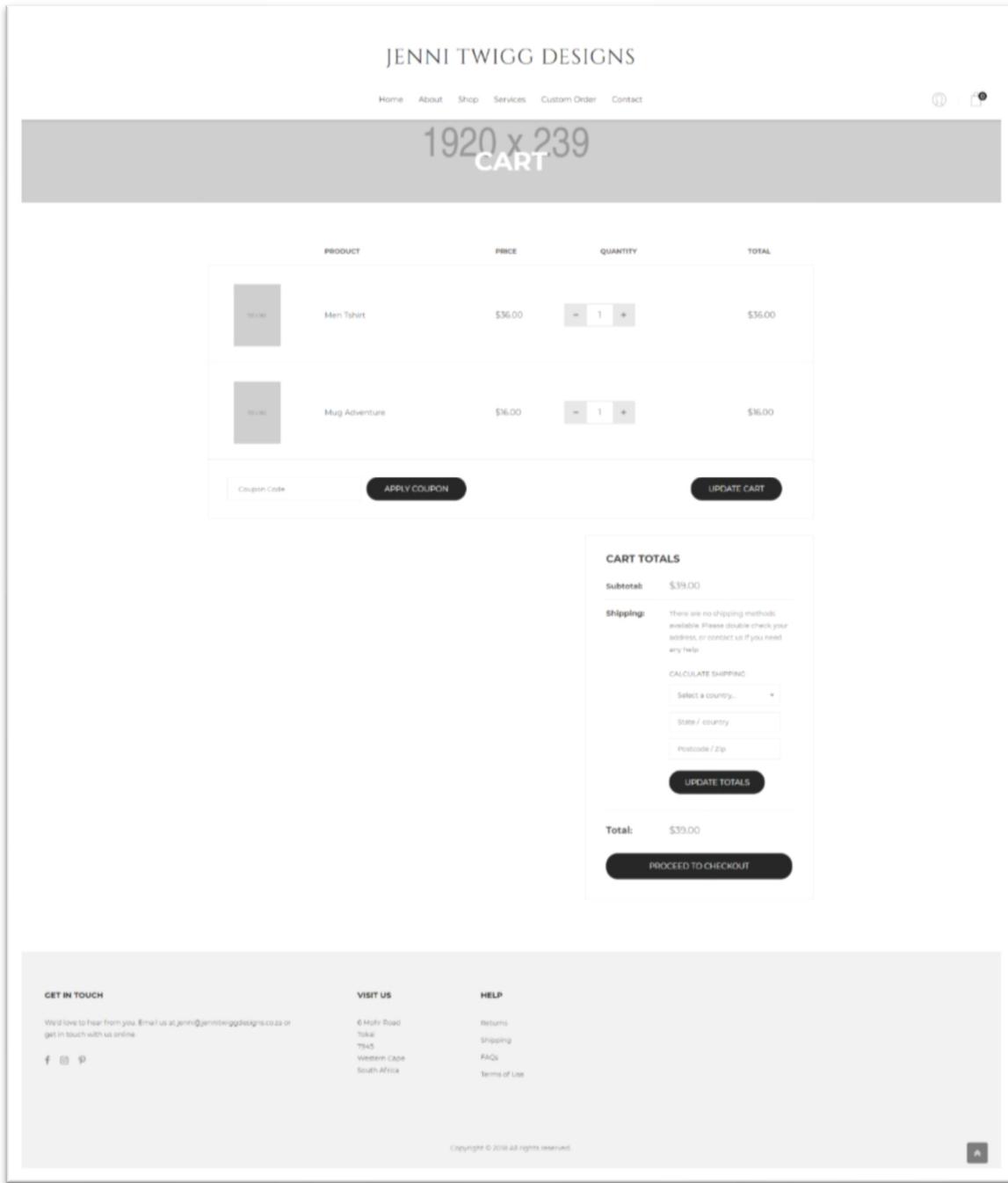


Figure 26 - Contact Us Page Prototype Design.

CART PAGE



The image shows a prototype design for a 'CART' page. At the top, the website header 'JENNI TWIGG DESIGNS' is displayed, along with navigation links for Home, About, Shop, Services, Custom Order, and Contact. A search icon and a user profile icon are also present.

The main area features a large banner with the text '1920 x 239' and 'CART'. Below this, the shopping cart table lists two items:

PRODUCT	PRICE	QUANTITY	TOTAL
Men Tshirt	\$36.00	1	\$36.00
Mug Adventure	\$16.00	1	\$16.00

Below the table are buttons for 'Coupon Code', 'APPLY COUPON', and 'UPDATE CART'.

The right side of the page displays 'CART TOTALS' with a subtotal of \$39.00. It includes a note about shipping: 'There are no shipping methods available. Please double check your address, or contact us if you need any help.' A 'CALCULATE SHIPPING' section allows users to enter their country, state/country, and postcode/zip, with an 'UPDATE TOTALS' button.

The total amount is listed as \$39.00, and a 'PROCEED TO CHECKOUT' button is provided.

At the bottom, there's a footer section titled 'GET IN TOUCH' with social media links for Facebook, Instagram, and Pinterest. The 'VISIT US' section provides the address: '6 Mohr Road, Tokai, 7815, Western Cape, South Africa'. The 'HELP' section links to Returns, Shipping, FAQs, and Terms of Use. A copyright notice 'Copyright © 2018 All rights reserved.' is also present.

Figure 27 - Cart Page Prototype Design.

LOGIN PAGE

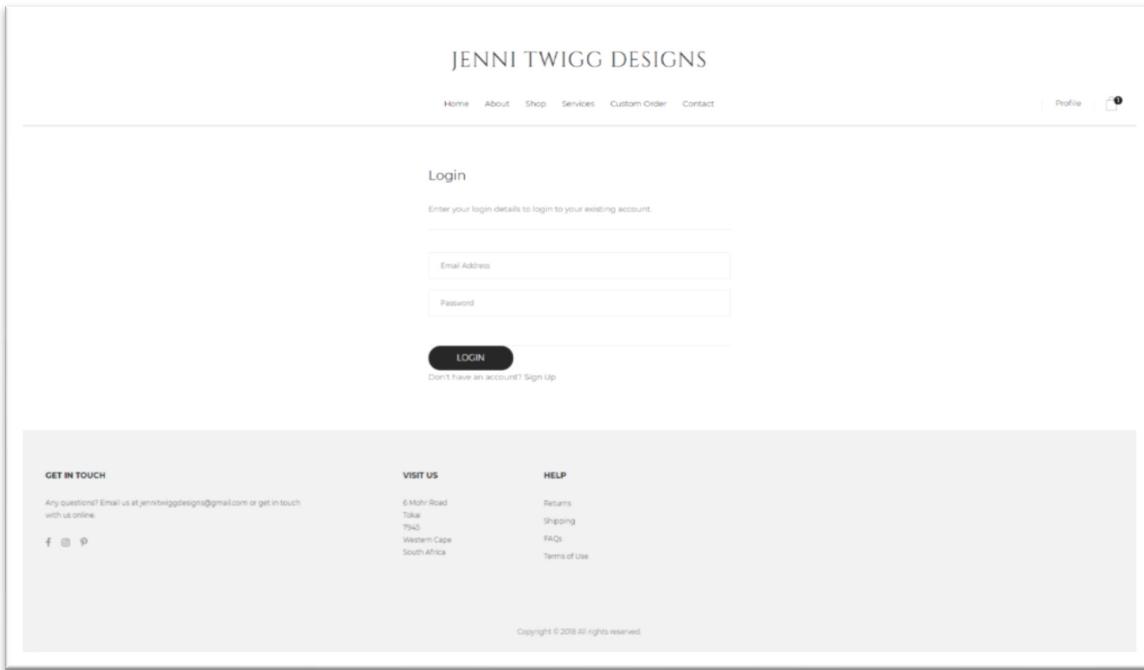


Figure 28 - Login Page Prototype Design.

REGISTER PAGE

The prototype design for the Jenni Twigg Designs Register Page is a wireframe representation of the user interface. At the top, the brand name "JENNI TWIGG DESIGNS" is centered above a navigation bar with links for Home, About, Shop, Services, Custom Order, Contact, Profile, and a search icon. Below the navigation is a main content area titled "Register" with a sub-instruction "Sign up for a new account." It features three input fields: "Email Address", "Password", and "Confirm Password", each with a placeholder text inside. A "SIGN UP" button is positioned below the fields. At the bottom of the page, there are three columns: "GET IN TOUCH" with social media links for Facebook, Twitter, and Pinterest; "VISIT US" with the address "6 Muhr Road Tokai 7942 Western Cape South Africa"; and "HELP" with links for Returns, Shipping, FAQs, and Terms of Use. A copyright notice "Copyright © 2018 All rights reserved." is at the very bottom.

Figure 29 - Register Page Prototype Design.

FINAL DESIGN

The following screenshots show the final interface design for the system, with products loaded from the database, as well as the cart and ordering functionality.

HOME PAGE

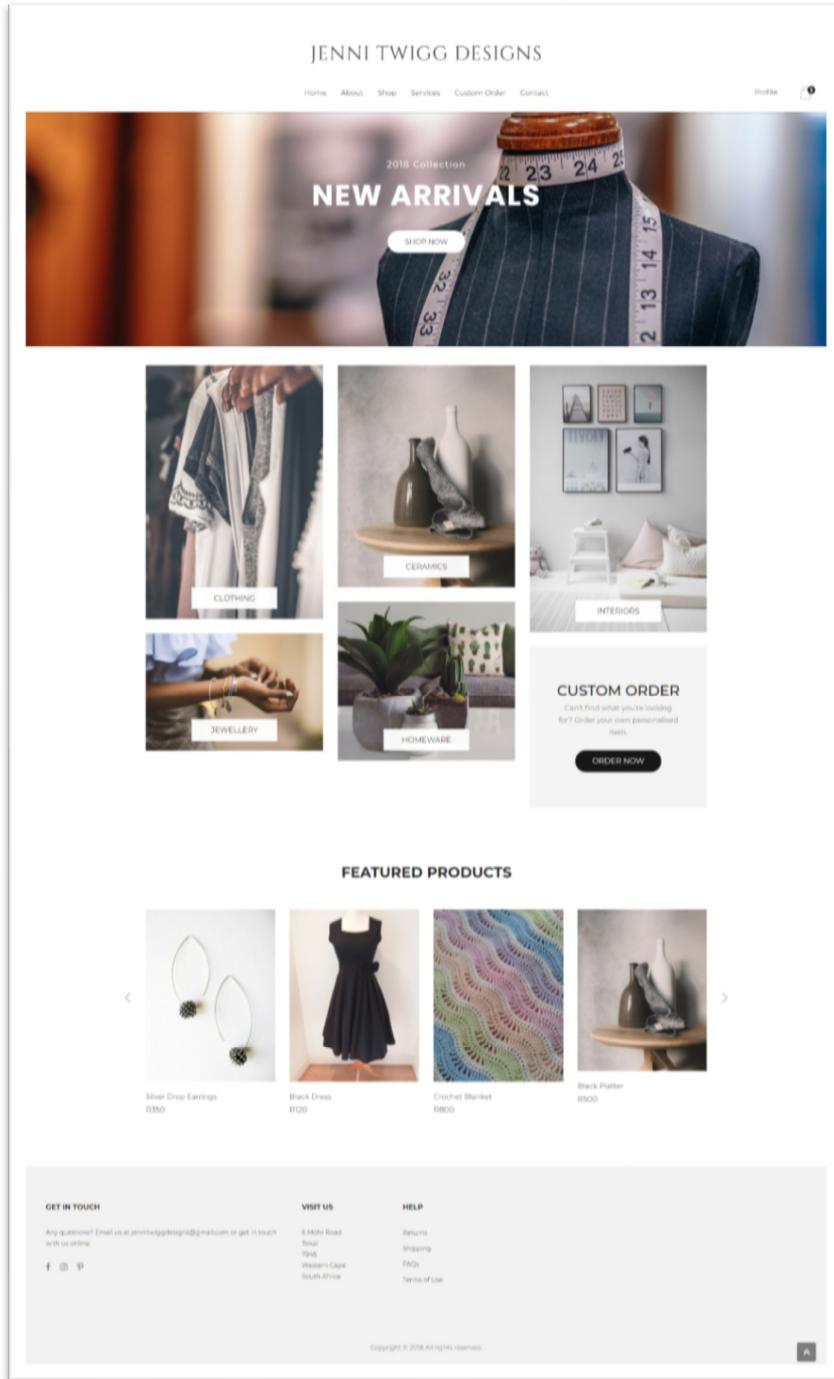


Figure 30 - Screenshot of Final Home Page Design.

DROP DOWN SHOPPING CART OPEN ON PAGE



Figure 31 - Screenshot Showing the Drop-Down Shopping Cart Menu.

DROP DOWN PRODUCT MENU

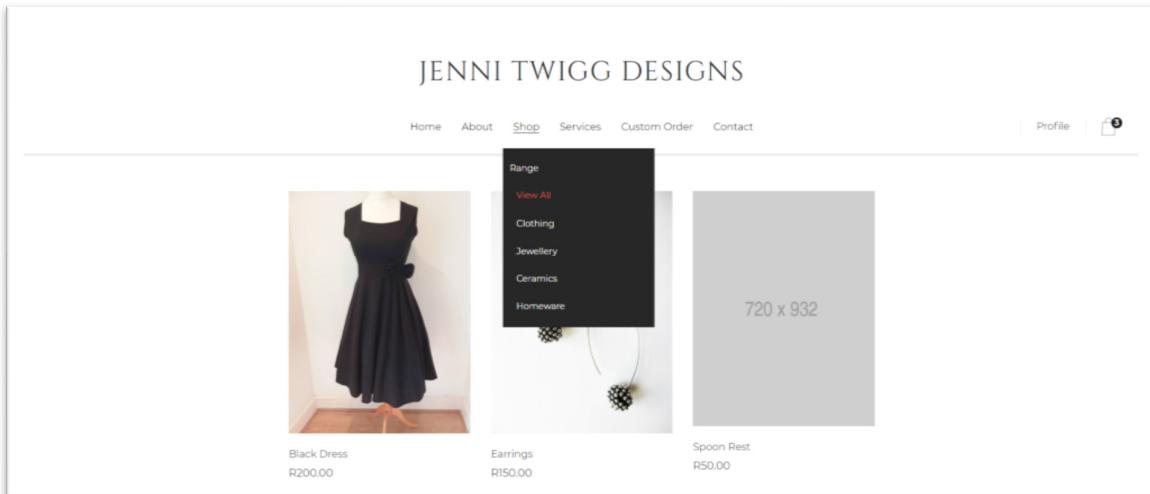


Figure 32 - Screenshot Showing the Drop-Down Product Category Menu.

LOGIN PAGE

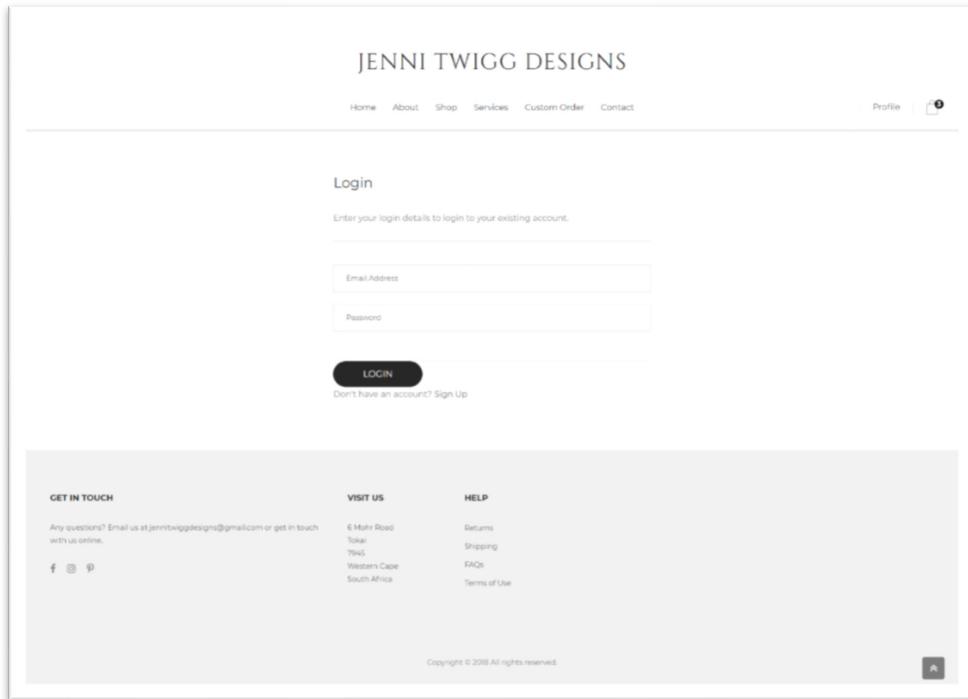


Figure 33 - Screenshot of Login Page Final Design.

REGISTRATION PAGE

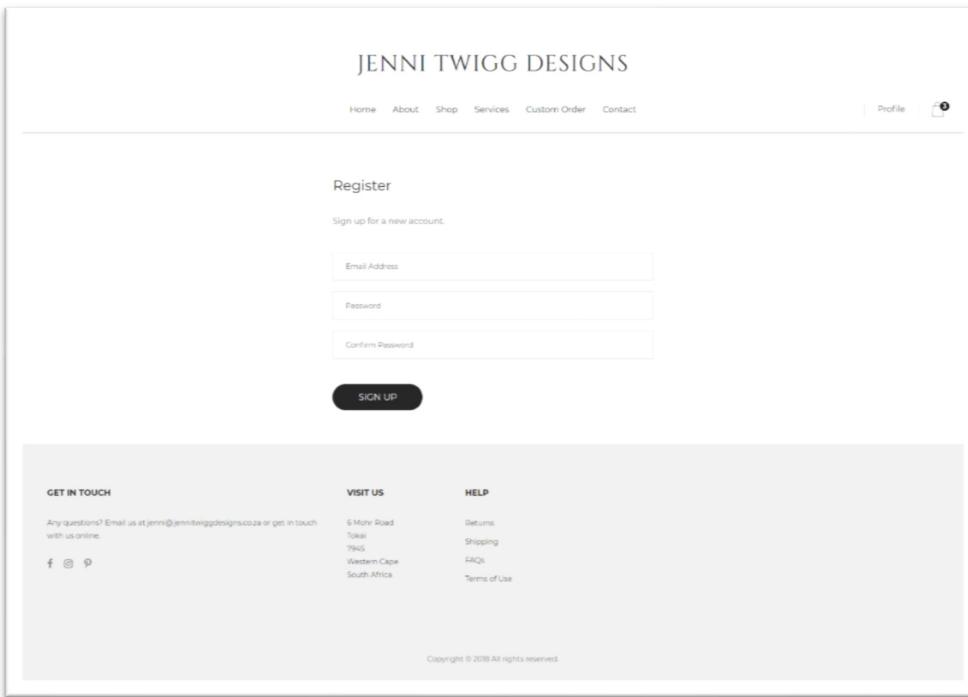


Figure 34 - Screenshot of Registration Page Final Design.

ABOUT US PAGE

JENNI TWIGG DESIGNS

Home About Shop Services Custom Order Contact

Profile

About

Our Story

Jenni Twigg is the founder of Jenni Twigg Designs. Jenni has a diploma in dress design from the Natal Technikon and has worked as a fashion buyer for Greenacres, Game, and Edgars for 12 years. During this period, she focused on women's and children's clothing, and she spent many years travelling to overseas markets to bring back fashion ideas for the South African market. She has travelled to all the fashion capitals of Europe and the US and has also acted as a clothing agent for Nissen & Lester.

While her child was in high school and her husband was travelling for work, Jenni was left with much time on her hands, and she discovered a gap in the interior and home design markets. Having always had a passion for creative projects, she founded Jenni Twigg Designs in 2013.

Jenni Twigg Designs specialises in interior decorating, ceramics and pottery, dress making, cushions, developments as well as private home owners, and she has sold her self-designed and made wares at various markets in and around Durban (such as the I Heart Market, Wonder Market, and the I Swearnever Market). In addition, she has run a successful pottery school from her home in Durban North, from which she ran classes for up to 6 people per session.

After relocating to Cape Town in 2015, Jenni has continued with her interior, pottery, clothing and jewellery design mainly selling through Facebook and word of mouth. She is well known for assisting family and friends, particularly on ideas for both primary and holiday homes.

Frequently Asked Questions

[Question]

[Answer]

[Question]

[Answer]

[Question]

[Answer]

Returns

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Vivamus a mattis nisl, vel rhoncus magna. Curabitur in efficitur lacus, vitae pulvinar justo. Cras eleifend condimentum sem in malesuada. Aenean volutpat eleifend quam nec gravida. Fusce eget tellus faucibus, ullamcorper ex vel, vestibulum velit. Duis egestas efficitur purus id mattis. Etiam bibendum egestas rhoncus. Nullam augue nunc, placerat et commodo non, fringilla et turpis. Phasellus dapibus dignissim sapien, in ornare lacus elementum et. Quisque molliebat laculis urna vitae luctus. Phasellus ut accumsan metus. Morbi luctus turpis velit, eu placidat, ligula pulvinar eget. Praesent lecetur odio lecetur dignissim ornare. Vestibulum sagittis orci, et luctus versus cursus. Vestibulum et pharetra felis. Cras tempus, erat nec tristique blandi, nisi metus pretium luctus, et amet mettis nisi lectus vitae magna. Quisque maximus lorem, erat eros, consectetur porttitor porttitor. Sed at augue nunc. Aliquam consectetur tortor purus. Nullam aliquam massa nunc, eget convallis purus vehicula. Quisque feugiat nisi eget tellus euismod volutpat. Pellentesque feugiat ligula arcu, nec elementum turpis tristique a. Aliquam cursus, erat id placardus varius, justo neque malesuada lacinia, sed vulputate nibh lectus eget mi. Aliquam elementum tempus quam vitae ultrices. Aliquam id sapien laculis, vestibulum lectus sed, venenatis magna. Donec consequat libero felis, ac faucibus. Phasellus volutpat sed Fusco et odio tempor, sodales duis congue, porta metus. Nam eleifend magna est, non tristique orci pulvinar at. Vivamus ac sem faucibus, Phasellus erat quis, tincidunt ligula. Donec iusquae id vestibulum leo eget venenatis. Maecenas vitae venenatis augue, id luctus mi. Etiam et ornare elit. Morbi commodo porta mauris, vel dignissim ligula ullamcorper vitae.

Shipping

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Vivamus a mattis nisl, vel rhoncus magna. Curabitur in efficitur lacus, vitae pulvinar justo. Cras eleifend condimentum sem in malesuada. Aenean volutpat eleifend quam nec gravida. Fusce eget tellus faucibus, ullamcorper ex vel, vestibulum velit. Duis egestas efficitur purus id mattis. Etiam bibendum egestas rhoncus. Nullam augue nunc, placerat et commodo non, fringilla et turpis. Phasellus dapibus dignissim sapien, in ornare lacus elementum et. Quisque molliebat laculis urna vitae luctus. Phasellus ut accumsan metus. Morbi luctus turpis velit, eu placidat, ligula pulvinar eget. Praesent lecetur odio lecetur dignissim ornare. Vestibulum sagittis orci, et luctus versus cursus. Vestibulum et pharetra felis. Cras tempus, erat nec tristique blandi, nisi metus pretium luctus, et amet mettis nisi lectus vitae magna. Quisque maximus lorem, erat eros, consectetur porttitor porttitor. Sed at augue nunc. Aliquam consectetur tortor purus. Nullam aliquam massa nunc, eget convallis purus vehicula. Quisque feugiat nisi eget tellus euismod volutpat. Pellentesque feugiat ligula arcu, nec elementum turpis tristique a. Aliquam cursus, erat id placardus varius, justo neque malesuada lacinia, sed vulputate nibh lectus eget mi. Aliquam elementum tempus quam vitae ultrices. Aliquam id sapien laculis, vestibulum lectus sed, venenatis magna. Donec consequat libero felis, ac faucibus. Phasellus erat quis, tincidunt ligula. Donec iusquae id vestibulum leo eget venenatis. Maecenas vitae venenatis augue, id luctus mi. Etiam et ornare elit. Morbi commodo porta mauris, vel dignissim ligula ullamcorper vitae.

GET IN TOUCH

Any questions? Email us at jennitwiggdesigns@gmail.com or get in touch with us online.

VISIT US

6 Mohr Road
Tokai
7945
Western Cape
South Africa

HELP

Returns
Shipping
FAQs
Terms of Use

Copyright. © 2018 All rights reserved.

Figure 35 - Screenshot of About Us Page Final Design.

[VIEW ALL PRODUCTS PAGE](#)

JENNI TWIGG DESIGNS

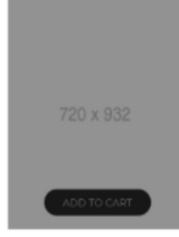
Home About Shop Services Custom Order Contact Profile



Black Dress
R200.00



Earrings
R150.00



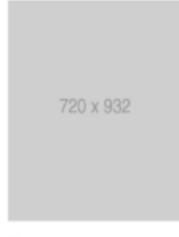
Spoon Rest
R50.00



Crochet Blanket
R600.00



Knitted Blanket
R800.00



Platter
R500.00



Poncho
R250.00



Knitted Shawl
R600.00

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Figure 36 - Screenshot of View All Products Page Final Design.

VIEW SPECIFIC CATEGORY OF PRODUCTS PAGE

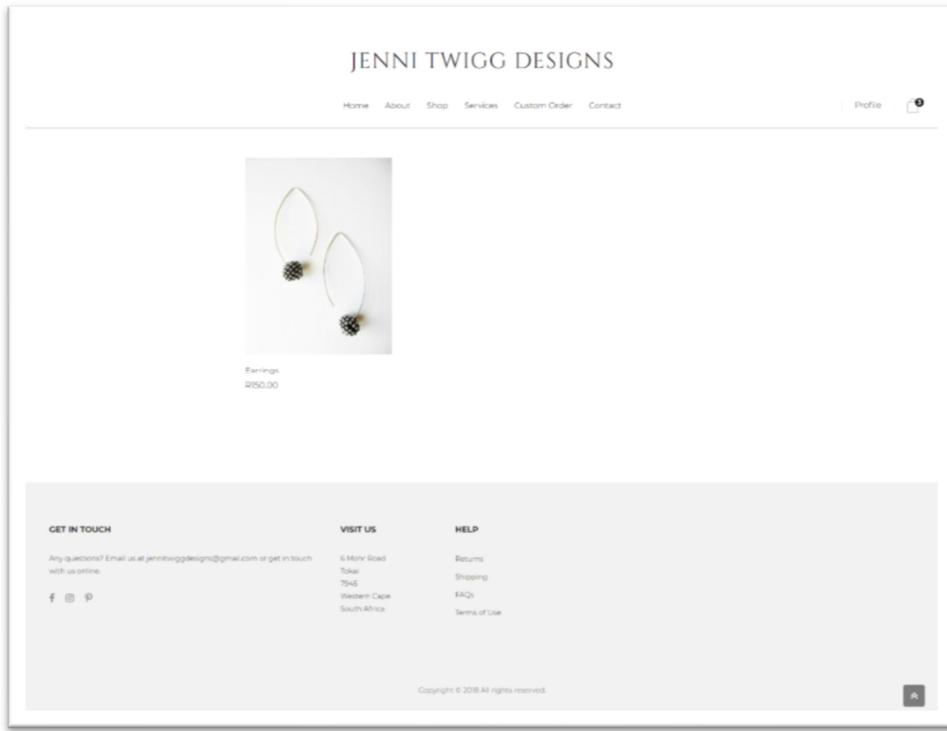


Figure 37 - Screenshot of Jewellery Products Page Final Design.

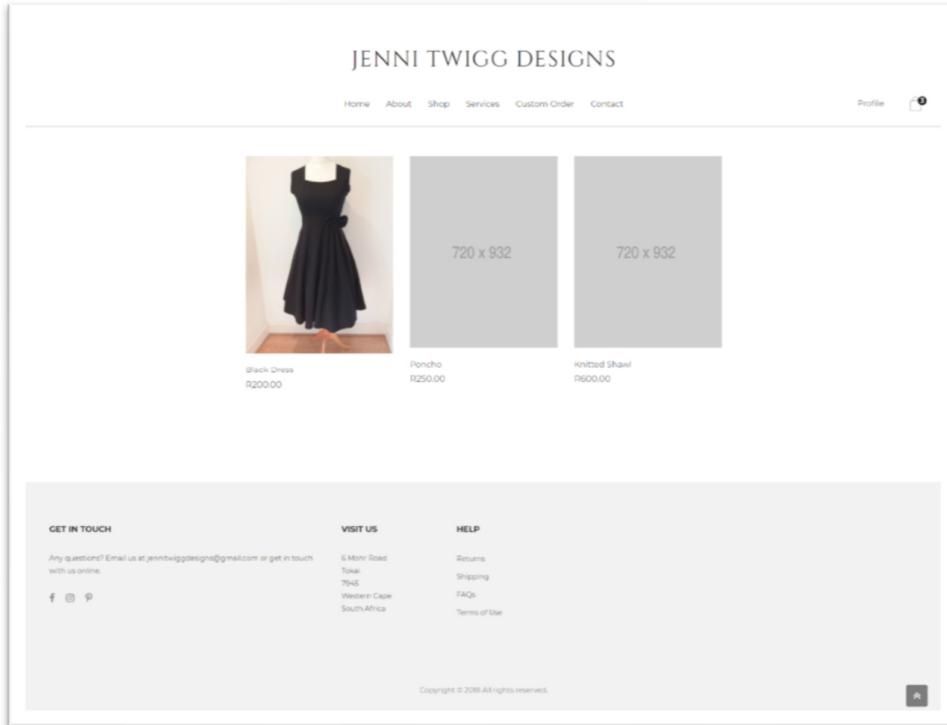


Figure 38 - Screenshot of Clothing Products Page Final Design.

SERVICES PAGE

The screenshot shows the final design of the Services page for Jenni Twigg Designs. At the top, the website's header includes the logo 'JENNI TWIGG DESIGNS' and a navigation menu with links to Home, About, Shop, Services, Custom Order, Contact, Profile, and a search icon.

Services

Interior Decorating Packages

Jenni Twigg Designs offers high quality affordable interior decorating services. We cover the whole of the Cape Town Area.
Please note the pricing does not include furnishings.

Basic Package	Premium Package	Luxury Package
This package is a great option if you are wanting to save costs and do some of the work yourself.	This package is a great option if you're looking to have a small flat or house redecorated for you, with all inclusive deals.	This package is idea for a large house where you would like to have everything done for you.
Package Features: <ul style="list-style-type: none">- On site consultation- Floor plan- Concept mood board- Lighting recommendations- Colour scheme design- Furniture suggestion with full estimate of furniture costs- On site design presentation and recommendations	Package Features: <ul style="list-style-type: none">- On site consultation- Floor plan- Concept mood board- Lighting recommendations- Colour scheme design- Furniture suggestion with full estimate of furniture costs- On site design presentation and recommendations	Package Features: <ul style="list-style-type: none">- On site consultation- Floor plan- Concept mood board- Lighting recommendations- Colour scheme design- Furniture suggestion with full estimate of furniture costs- On site design presentation and recommendations
Number of Rooms: 2	Number of Rooms: 4	Number of Rooms: 5
Price: R2500	Price: R4000	Price: R10000
ADD TO CART	ADD TO CART	ADD TO CART

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Figure 39 - Screenshot of Services Page Final Design.

CUSTOM ORDER PAGE

The screenshot shows the final design of the Custom Order page for Jenni Twigg Designs. At the top, the brand name "JENNI TWIGG DESIGNS" is displayed in a serif font. Below it is a navigation bar with links to Home, About, Shop, Services, Custom Order (which is the active page), and Contact. There is also a Profile link and a user icon. The main content area has a light gray background with two small green plants in white pots on either side. The title "Custom Order" is centered at the top of the form. Below it, a sub-header "Place a custom order" is followed by a note: "Send us an idea of what you want and we'll get back to you with a quote." A section titled "Contact Details" contains three input fields for Full Name, Phone Number, and Email Address. The "Order Information" section includes a dropdown menu for Product and a "Choose an option" field. Below this is a text area for "Description of your custom item." with a placeholder: "Include size, colour, fabric and any other details. Provide links to any reference images." Another section titled "Additional Information" asks for "If you have any additional information you would like to include, please do so here." with a placeholder: "Include if this item needs to be completed by a date, if it is a gift, any allergies to metals or fabrics." At the bottom of the form is a prominent "REQUEST QUOTE" button. The footer of the page is divided into three sections: "GET IN TOUCH" (with social media links for Facebook, Instagram, and Pinterest), "VISIT US" (with address: 6 Mohr Road, Tokai, 7945, Western Cape, South Africa), and "HELP" (with links to Returns, Shipping, FAQs, and Terms of Use). The footer also includes a copyright notice: "Copyright © 2018 All rights reserved." and a small logo in the bottom right corner.

Figure 40 - Screenshot of Custom Order Page Final Design.

CONTACT US PAGE

The screenshot shows the contact page of a website. At the top, the header "JENNI TWIGG DESIGNS" is centered. Below the header is a navigation bar with links: Home, About, Shop, Services, Custom Order, and Contact. To the right of the navigation bar are "Profile" and a user icon. The main content area has a light gray background with two small green plants in white pots on either side. The title "Contact" is centered above a map of a residential area. The map includes several neighborhoods like SWEET VALLEY, DENNENDAAL, TOKAI, and DREYERSDAL. A large "JT" logo is overlaid on the map. To the right of the map is a form titled "Send us your message" with fields for "Full Name", "Email Address", and "Message", followed by a "SEND" button. At the bottom of the page, there are three sections: "GET IN TOUCH" with social media links (Facebook, Instagram, Pinterest), "VISIT US" with address details (6 Mohr Road, Tokai, 7945, Western Cape, South Africa), and "HELP" with links to Returns, Shipping, FAQs, and Terms of Use. The footer contains the copyright notice "Copyright © 2018 All rights reserved." and a small "A" icon.

Figure 41 - Screenshot of Contact Us Page Final Design.

[VIEW CART PAGE](#)

The screenshot shows the final design of the View Cart Page for Jenni Twigg Designs. At the top, the brand name "JENNI TWIGG DESIGNS" is displayed in a serif font. Below it is a navigation bar with links to Home, About, Shop, Services, Custom Order, Contact, Profile, and a search icon. The main content area is titled "Cart". It features a table with three items: a Spoon Rest (R50), Earrings (R150), and a Black Dress (R200). Each item row includes a small image, the product name, price, quantity selector (set to 1), and a delete icon. Below the table are two buttons: "UPDATE CART" and "CHECKOUT". To the right of the table, the subtotal is listed as "Subtotal: R400". At the bottom of the page, there are sections for "GET IN TOUCH" (with social media links for Facebook, Instagram, and Pinterest), "VISIT US" (with address: 6 Mohr Road, Tokai, 7945, Western Cape, South Africa), and "HELP" (with links to Returns, Shipping, FAQs, and Terms of Use). The footer also includes a copyright notice: "Copyright © 2018 All rights reserved." and a small house icon.

Figure 42 - Screenshot of View Cart Page Final Design.

CHECKOUT PAGE

The screenshot shows the final design of the checkout page for Jenni Twigg Designs. At the top, the brand name "JENNI TWIGG DESIGNS" is displayed in a serif font. Below it is a navigation bar with links to Home, About, Shop, Services, Custom Order, Contact, Profile, and a search icon. The main content area features a header "Checkout" with decorative potted plants on either side. A table lists three items in the cart:

PRODUCT	PRICE	QUANTITY	TOTAL
Spoon Rest	R50	1	R50
Earrings	R150	1	R150
Black Dress	R200	1	R200

Below the cart, a section titled "SHIPPING DETAILS" contains fields for Shipping Address (Full Name, Email Address, Postal Address) and Shipping Options (In Store Collection - Free, South Africa - R100, International - R250). A large "PLACE ORDER" button is centered at the bottom of this section. The footer includes sections for "GET IN TOUCH" (with an email link and social media icons for Facebook, Instagram, and Pinterest), "VISIT US" (with address: 6 Mohr Road, Tokai, 7945, Western Cape, South Africa), and "HELP" (with links to Returns, Shipping, FAQs, and Terms of Use). The footer also contains a copyright notice: "Copyright © 2018 All rights reserved." and a small accessibility icon.

Figure 43 - Screenshot of Checkout Page Final Design.

ORDER SUCCESS PAGE

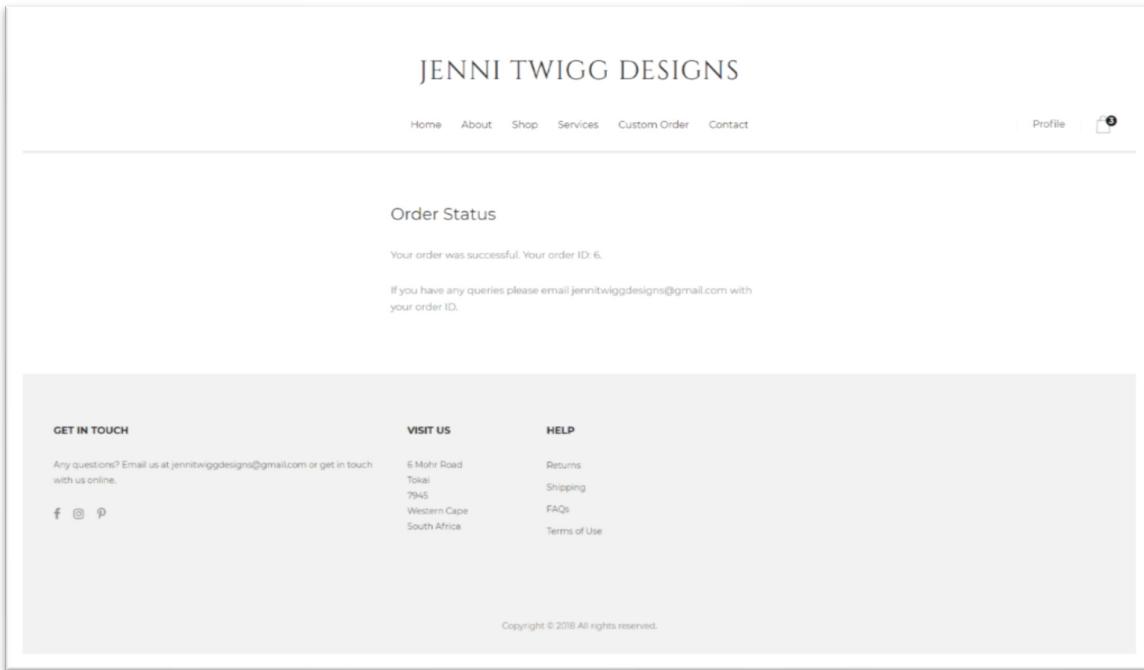


Figure 44 - Screenshot of Order Success Page Final Design.

ADMIN PAGE

JENNI TWIGG DESIGNS

[Home](#)
[About](#)
[Shop](#)
[Services](#)
[Custom Order](#)
[Contact](#)
Profile |

Stock Levels

Product ID	Name	Stock
1	Black Dress	9
2	Earrings	13
3	Spoon Rest	35
4	Crochet Blanket	2
5	Knitted Blanket	1
6	Platter	6
7	Poncho	12
8	Knitted Shawl	9

View Orders

Search by Order Number

No orders.

View Customers

Search by Customer Name

Name	Email	Phone	Address
Sydney Twigg	sydneytwigg@gmail.com	0832567264	6 Mohr Road, Tokai, Cape Town, Western Cape, 7945, South Africa
John Smith	john.smith@gmail.com	0831234567	5A Lurworth Road, Rondebosch, Cape Town, Western Cape, 7945, South Africa
Jane Smith	jsmith@icloud.com	08311115344	3 Main Road, Durban North, Kwa Zulu Natal, Durban, 4005, South Africa

View Custom Orders

Search by Order ID

Order ID	Email	Product	Description	Additional Information
1	sydneytwigg@gmail.com	Jewellery	Pair of blue and white beaded earrings with sterling silver hooks.	The item is a gift, needed before Christmas.
2	john.smith@gmail.com	Homeware	I would like a queen sized corner-to-corner crochet blanket, in 100% cotton in different shades of grey. It needs to be at least 180cm x 180cm.	Allergic to polyester.

GET IN TOUCH

Any questions? Email us at jennitwiggdesigns@gmail.com or get in touch with us online.

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Figure 45 - Screenshot of Admin Page Final Design.

DATABASE DESIGN

DATABASE PLANNING

ENTITIES

- Users
- Customers
- Orders
- Order_Items
- Products
- Featured
- Stock
- Services
- CustomOrder

The following table outlines the purpose of each entity:

Table 7 - Name and Purpose of Each Entity for the Jenni Twigg Designs E-Commerce Website.

Entity	Description
Users	Table to store the user's login details.
Customers	Table to store the user's contact details and postal address.
Orders	Table to store all orders that have been placed through the system with details of the user.
Order_Items	Table to store details on each item and quantity that has been ordered through the system.
Products	Table to store the product details of items that are available to purchase.
Featured	Table to store featured items available to purchase from the home page of the website.
Stock	Table to store how many items of each product are available.
Services	Table to store the details of the interior decorating services offered.
CustomOrder	Table to store the details of any custom orders that have been requested through the use of the website form.

PRIMARY AND FOREIGN KEYS

The tables will have the following primary and foreign keys:

Table 8 - Primary and Foreign Keys in the Jenni Twigg Designs Database.

Entity	Primary Key	Foreign Key
Users	userID	username
Customers	userID	userID, email
Orders	orderID	orderID, userID
Order_Items	ID	orderID, itemID
Products	itemID	itemID
Featured	itemID	itemID
Stock	itemID	itemID
Services	itemID	itemID
CustomOrder	custOrderID	custOrderID

STORED PROCEDURES

The following stored procedures will exist in the database:

- check_stock - this procedure takes the input of a product ID and displays to the user whether or not that product is in stock (Quackit, 2018).
- decrease_stock - this procedure decreases the stock of a product, with the input parameters being the product ID and the quantity purchased (Quackit, 2018).
- stock_level - this procedure fetches the quantity of stock per product, returning a value of 'Empty', 'Low', 'Medium', 'High', or 'Very High' dependant on the quantity (Quackit, 2018).

TRIGGERS

The following triggers will be used in the database:

- validateEmail - this trigger will be used on the creation of a new user account on table *user* to ensure that the user inputted email is the correct email format (Razzoli, 2012).
- validateEmail_customer - this trigger will be used on the creation of a new user account on table *customer* to ensure that the user inputted email is the correct email format (Razzoli, 2012).
- validatePhone - this trigger will be used on the creation of a new user account on table *customer* to ensure that the user inputted phone numbers only consists of numbers (Kozmenko, 2013).
- updateStock - this trigger calls the stored procedure *decrease_stock()* after an insert on the *orders* table (MySQLTutorial, 2018).

VIEWS

The following views will be used in the database:

- view_orders - this view displays all orders, with the order number, customer email and the date the order was created.
- view_customer_info - this view displays the customer's contact information, with their name, email, phone number and postal address.
- view_custom_orders - this view displays all custom orders that have been submitted through the site, with the customer email, what product they want, the description of the product and any additional information.
- stock_available - this view displays the quantity of stock available for each product on the website, showing the product ID, name and number of stock available.

PHYSICAL MODELLING PLANNING

The following tables are used for planning purpose for the creation of the database:

Table 9 - Details of the Users Table.

Users				
Column Name	Data Type	Key	Required	Comment
userID	INT	Primary	Yes	
username	VARCHAR(100)	Foreign	Yes	
password	VARCHAR(255)		Yes	Stored as a hashed value

Table 10 - Details of the Customers Table.

Customers				
Column Name	Data Type	Key	Required	Comment
userID	INT	Primary, Foreign	Yes	
name	VARCHAR(100)		Yes	
email	VARCHAR(100)	Foreign	Yes	
phone	VARCHAR(15)		Yes	
address	TEXT		Yes	
status	TINYINT(1)		Yes	True or false value for if the user account is valid

Table 11 - Details of the Orders Table.

Orders				
Column Name	Data Type	Key	Required	Comment
orderID	INT	Primary, Foreign	Yes	
userID	INT	Primary, Foreign	Yes	
totalPrice	DOUBLE		Yes	

Table 12 - Details of the Order_Items Table.

Order_Items				
Column Name	Data Type	Key	Required	Comment
ID	INT	Primary	Yes	
orderID	INT	Foreign	Yes	
itemID	INT	Foreign	Yes	
quantity	INT	Foreign	Yes	

Table 13 - Details of the Products Table.

Products				
Column Name	Data Type	Key	Required	Comment
itemID	INT	Primary, Foreign	Yes	
Name	VARCHAR(45)		Yes	
Description	TEXT		Yes	
Price	DOUBLE		Yes	
Image	LONGBLOB			
Category	VARCHAR(45)		Yes	

Table 14 - Details of the Featured Table.

Featured				
Column Name	Data Type	Key	Required	Comment
itemID	INT	Primary, Foreign	Yes	
Name	VARCHAR(45)		Yes	
Price	DOUBLE		Yes	
Image	LONGBLOB			

Table 15 - Details of the Stock Table.

Stock				
Column Name	Data Type	Key	Required	Comment
itemID	INT	Primary, Foreign	Yes	
stock	INT		Yes	

Table 16 - Details of the Services Table.

Services				
Column Name	Data Type	Key	Required	Comment
itemID	INT	Primary, Foreign	Yes	
packageName	VARCHAR(45)		Yes	
included	VARCHAR(500)		Yes	
price	DOUBLE		Yes	
numberRooms	VARCHAR(10)		Yes	
description	VARCHAR(200)		Yes	

Table 17 - Details of CustomOrder Table.

CustomOrder				
Column Name	Data Type	Key	Required	Comment
custOrderID	INT	Primary, Foreign	Yes	
name	VARCHAR(45)		Yes	
email	VARCHAR(100)		Yes	
phone	VARCHAR(15)		Yes	
product	VARCHAR(45)		Yes	
description	VARCHAR(300)		Yes	
additionalInfo	VARCHAR(300)		Yes	

The following ERD was generated after creation of the database using MySQL Workbench:

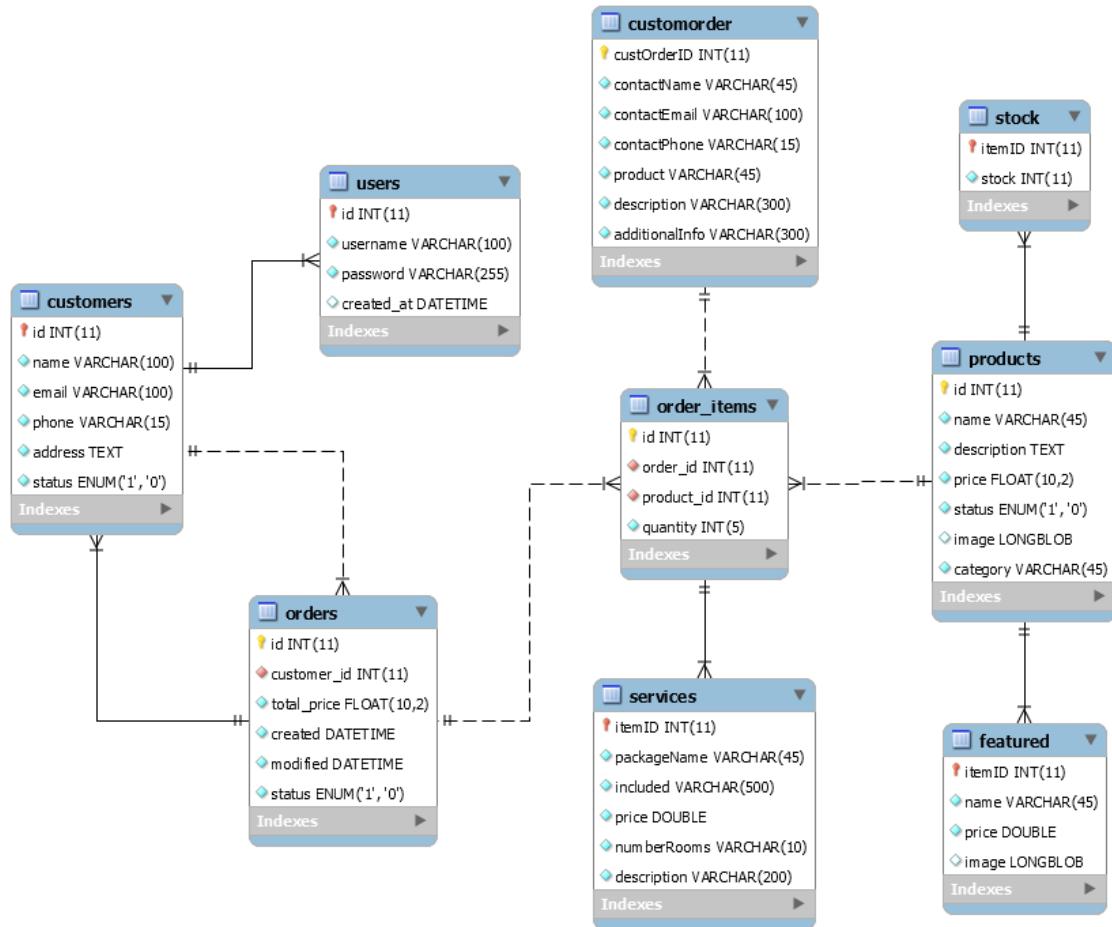


Figure 46 - Entity Relationship Diagram for the Jenni Twigg Designs Database.

DEVELOPMENT

DATABASE

The following screenshot shows all tables and views stored in the database, as seen on phpMyAdmin, which will be used to manage the database:

Table	Action	Rows	Type	Collation	Size	Overhead
customers		3	InnoDB	utf8_unicode_ci	80 Kib	-
customorder		2	InnoDB	utf8_general_ci	32 Kib	-
featured		6	InnoDB	utf8_general_ci	64 Kib	-
orders		0	InnoDB	utf8_unicode_ci	32 Kib	-
order_items		0	InnoDB	utf8_unicode_ci	48 Kib	-
products		8	InnoDB	utf8_unicode_ci	48 Kib	-
services		3	InnoDB	utf8_general_ci	32 Kib	-
stock		8	InnoDB	utf8_general_ci	32 Kib	-
stock_available		~8		---	-	-
users		4	InnoDB	utf8_unicode_ci	48 Kib	-
view_customer_info		~8		---	-	-
view_custom_order		~8		---	-	-
view_orders		~8		---	-	-
13 tables	Sum	~34	InnoDB	utf8_general_ci	416 Kib	0 B

Figure 47 - Screenshot showing all views and tables in the database.

CREATE TABLES

CUSTOMERS

```
CREATE TABLE `customers` (
  `id` int(11) NOT NULL AUTO_INCREMENT,
  `name` varchar(100) COLLATE utf8_unicode_ci NOT NULL,
  `email` varchar(100) COLLATE utf8_unicode_ci NOT NULL,
  `phone` varchar(15) COLLATE utf8_unicode_ci NOT NULL,
  `address` text COLLATE utf8_unicode_ci NOT NULL,
  `status` enum('1','0') COLLATE utf8_unicode_ci NOT NULL DEFAULT '1',
  PRIMARY KEY (`id`),
  FOREIGN KEY (`email`) REFERENCES `users`(`username`),
  UNIQUE KEY `email_UNIQUE` (`email`),
  KEY `idx_email` (`email`)
) ENGINE=InnoDB AUTO_INCREMENT=4 DEFAULT CHARSET=utf8 COLLATE=utf8_unicode_ci;
```

Figure 48 - Screenshot showing the creation of the Customer table.

USERS

```
CREATE TABLE `users` (
  `id` int(11) NOT NULL AUTO_INCREMENT,
  `username` varchar(100) CHARACTER SET utf8 NOT NULL,
  `password` varchar(255) CHARACTER SET utf8 NOT NULL,
  `created_at` datetime DEFAULT CURRENT_TIMESTAMP,
  PRIMARY KEY (`id`),
  UNIQUE KEY `username` (`username`),
  KEY `idx_username` (`username`)
) ENGINE=InnoDB AUTO_INCREMENT=7 DEFAULT CHARSET=utf8 COLLATE=utf8_unicode_ci;
```

Figure 49 - Screenshot showing the creation of the Users table.

ORDERS

```
CREATE TABLE `orders` (
  `id` int(11) NOT NULL AUTO_INCREMENT,
  `customer_id` int(11) NOT NULL,
  `total_price` float(10,2) NOT NULL,
  `created` datetime NOT NULL,
  `modified` datetime NOT NULL,
  `status` enum('1','0') COLLATE utf8_unicode_ci NOT NULL DEFAULT '1',
  PRIMARY KEY (`id`),
  KEY `customer_id` (`customer_id`),
  CONSTRAINT `orders_ibfk_1` FOREIGN KEY (`customer_id`) REFERENCES `customers` (`id`) ON DELETE CASCADE ON UPDATE NO ACTION
) ENGINE=InnoDB AUTO_INCREMENT=7 DEFAULT CHARSET=utf8 COLLATE=utf8_unicode_ci;
```

Figure 50 - Screenshot showing the creation of the Orders table.

ORDER ITEMS

```
CREATE TABLE `order_items` (
  `id` int(11) NOT NULL AUTO_INCREMENT,
  `order_id` int(11) NOT NULL,
  `product_id` int(11) NOT NULL,
  `quantity` int(5) NOT NULL,
  PRIMARY KEY (`id`),
  KEY `order_id` (`order_id`),
  KEY `fk_orderitem_idx` (`product_id`),
  CONSTRAINT `fk_cust_order` FOREIGN KEY (`product_id`) REFERENCES `customorder` (`custOrderID`) ON DELETE NO ACTION ON UPDATE NO ACTION,
  CONSTRAINT `fk_orderitem` FOREIGN KEY (`product_id`) REFERENCES `products` (`id`) ON DELETE NO ACTION ON UPDATE NO ACTION,
  CONSTRAINT `order_items_ibfk_1` FOREIGN KEY (`order_id`) REFERENCES `orders` (`id`) ON DELETE CASCADE ON UPDATE NO ACTION
) ENGINE=InnoDB AUTO_INCREMENT=7 DEFAULT CHARSET=utf8 COLLATE=utf8_unicode_ci;
```

Figure 51 - Screenshot showing the creation of the Order_Items table.

PRODUCTS

```
CREATE TABLE `products` (
  `id` int(11) NOT NULL,
  `name` varchar(45) NOT NULL,
  `description` text NOT NULL,
  `price` float(10,2) NOT NULL,
  `status` enum('1','0') NOT NULL DEFAULT '1',
  `image` longblob,
  `category` varchar(45) NOT NULL,
  PRIMARY KEY (`id`)
) ENGINE=InnoDB DEFAULT CHARSET=utf8 COLLATE=utf8_unicode_ci;
```

Figure 52 - Screenshot showing the creation of the Products table.

FEATURED

```
CREATE TABLE `featured` (
  `itemID` int(11) NOT NULL,
  `name` varchar(45) NOT NULL,
  `price` double NOT NULL,
  `image` longblob,
  PRIMARY KEY (`itemID`),
  UNIQUE KEY `itemID_UNIQUE` (`itemID`),
  CONSTRAINT `fk_products` FOREIGN KEY (`itemID`) REFERENCES `products` (`id`) ON DELETE NO ACTION ON UPDATE NO ACTION
) ENGINE=InnoDB DEFAULT CHARSET=utf8;
```

Figure 53 - Screenshot showing the creation of the Featured table.

CUSTOM ORDER

```
CREATE TABLE `customorder` (
  `custOrderID` int(11) NOT NULL AUTO_INCREMENT,
  `contactName` varchar(45) NOT NULL,
  `contactEmail` varchar(100) NOT NULL,
  `contactPhone` varchar(45) NOT NULL,
  `product` varchar(45) NOT NULL,
  `description` varchar(300) NOT NULL,
  `additionalInfo` varchar(300) NOT NULL,
  PRIMARY KEY (`custOrderID`),
  UNIQUE KEY `custOrderID_UNIQUE` (`custOrderID`)
) ENGINE=InnoDB AUTO_INCREMENT=3 DEFAULT CHARSET=utf8;
```

Figure 54 - Screenshot showing the creation of the Users table.

SERVICES

```
CREATE TABLE `services` (
  `itemID` int(11) NOT NULL,
  `packageName` varchar(45) NOT NULL,
  `included` varchar(500) NOT NULL,
  `price` double NOT NULL,
  `numberRooms` varchar(10) NOT NULL,
  `description` varchar(200) NOT NULL,
  PRIMARY KEY (`itemID`),
  UNIQUE KEY `itemID_UNIQUE` (`itemID`),
  CONSTRAINT `fk_order_item` FOREIGN KEY (`itemID`) REFERENCES `order_items` (`product_id`) ON DELETE NO ACTION ON UPDATE NO ACTION
) ENGINE=InnoDB DEFAULT CHARSET=utf8;
```

Figure 55 - Screenshot showing the creation of the Services table.

STOCK

```
CREATE TABLE `stock` (
  `itemID` int(11) NOT NULL,
  `stock` int(11) NOT NULL,
  PRIMARY KEY (`itemID`),
  UNIQUE KEY `itemID_UNIQUE` (`itemID`),
  CONSTRAINT `fk_product` FOREIGN KEY (`itemID`) REFERENCES `products` (`id`) ON DELETE NO ACTION ON UPDATE NO ACTION
) ENGINE=InnoDB DEFAULT CHARSET=utf8;
```

Figure 56 - Screenshot showing the creation of the Stock table.

VIEWS

The following views were created to provide reports for the website administrator, the functionality and purpose of each view was discussed above in the database planning:

VIEW_ORDERS

The screenshot shows the MySQL Workbench interface. At the top, there is a toolbar with various icons. Below the toolbar, a code editor window displays the SQL code for creating the view:

```
1 • CREATE VIEW view_orders
2   AS SELECT orders.id, customers.email, orders.created
3     FROM orders
4       INNER JOIN customers ON orders.customer_id=customers.id;
5
6 • select * from view_orders;
```

Below the code editor is a result grid. The grid has three columns: 'id', 'email', and 'created'. The data is as follows:

	id	email	created
▶	1	sydneytwigg@gmail.com	2018-09-13 12:24:02
	2	sydneytwigg@gmail.com	2018-09-13 12:24:42
	3	sydneytwigg@gmail.com	2018-09-13 12:34:00
	4	sydneytwigg@gmail.com	2018-09-13 12:35:37
	5	sydneytwigg@gmail.com	2018-09-13 13:08:52
	6	sydneytwigg@gmail.com	2018-09-13 16:52:50

Figure 57 - Screenshot showing the creation of view_orders view, as well as the outcome when running it.

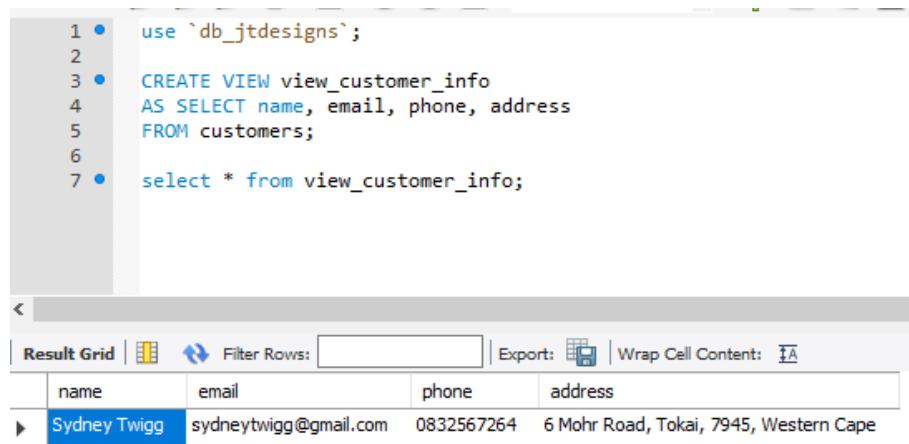
```
<?php
//SQL statement to call view_orders view.
$sql = "select * from view_orders;";
$result = $mysqli->query($sql);
if ($result->num_rows > 0) {
    echo "<table class='table-shopping-cart' id='viewOrderTable>
        <tr><th class='column-1'>Order Number</th><th>Email</th><th>Date Created</th></tr>";
    // output data of each row
    while($row = $result->fetch_assoc()) {
        echo "<tr>
            <td class='column-1'>".$row["id"]."</td>
            <td>".$row["email"]."</td>
            <td> ".$row["created"]."</td>
        </tr>";
    }
    echo "</table>";
} else {
    echo "<p class='p-1-40'>No orders.</p>";
}
?>
```

Figure 58 - Screenshot showing the view_orders view being called in the code.

View Orders		
Search by Order Number		
Order Number	Email	Date Created
1	sydneytwigg@gmail.com	2018-09-13 12:24:02
2	sydneytwigg@gmail.com	2018-09-13 12:24:42
3	sydneytwigg@gmail.com	2018-09-13 12:34:00
4	sydneytwigg@gmail.com	2018-09-13 12:35:37
5	sydneytwigg@gmail.com	2018-09-13 13:08:52
6	sydneytwigg@gmail.com	2018-09-13 16:52:50

Figure 59 - Screenshot showing the view_orders view on the website's admin panel.

VIEW_CUSTOMER_INFO



The screenshot shows a MySQL Workbench interface. In the SQL tab, the following code is run:

```
1 • use `db_jtdesigns`;
2
3 • CREATE VIEW view_customer_info
4     AS SELECT name, email, phone, address
5         FROM customers;
6
7 • select * from view_customer_info;
```

In the Results tab, the output is:

	name	email	phone	address
▶	Sydney Twigg	sydneytwigg@gmail.com	0832567264	6 Mohr Road, Tokai, 7945, Western Cape

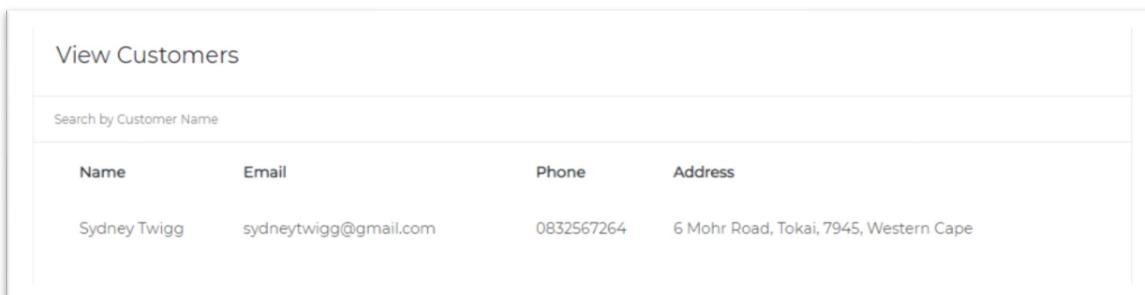
Figure 60 - Screenshot showing the creation of view_customer_info view, as well as the outcome when running it.



```
<?php
$sql = "select * from view_customer_info;";
$result = $mysqli->query($sql);

if ($result->num_rows > 0) {
    echo "<table class='table-shopping-cart' id='customers'>
        <tr><th class='column-1'>Name</th><th>Email</th><th>Phone</th><th>Address</th></tr>";
    while($row = $result->fetch_assoc()) {
        echo "<tr>
            <td class='column-1'>".$row["name"]."</td>
            <td>".$row["email"]."</td>
            <td> ".$row["phone"]."</td>
            <td> ".$row["address"]."</td>
        </tr>";
    }
    echo "</table>";
} else {
    echo "<p class='p-l-40'>No customers.</p>";
}
?>
```

Figure 61 - Screenshot showing the view_customer_info view being called in the code.



The screenshot shows a web-based application titled "View Customers". It has a search bar labeled "Search by Customer Name". Below the search bar is a table with columns: Name, Email, Phone, and Address. The table contains one row with the data: Sydney Twigg, sydneytwigg@gmail.com, 0832567264, and 6 Mohr Road, Tokai, 7945, Western Cape.

Figure 62 - Screenshot showing the view_customer_info view on the website's admin panel.

VIEW_CUSTOM_ORDERS

```

1 • use `db_jtdesigns`;
2
3 • CREATE VIEW view_custom_order
4 AS SELECT custOrderID, contactEmail, product, description, additionalInfo
5 FROM customorder;
6
7 • select * from view_custom_order;
8
9
10
11

```

The screenshot shows the MySQL Workbench interface. At the top, there is a code editor window containing the SQL code for creating a view named 'view_custom_order'. Below it is a result grid window titled 'Result Grid' showing two rows of data. The columns are labeled 'custOrderID', 'contactEmail', 'product', 'description', and 'additionalInfo'. The first row corresponds to the first entry in the code, and the second row corresponds to the second entry.

	custOrderID	contactEmail	product	description	additionalInfo
▶	1	sydneytwigg@gmail.com	Jewellery	Pair of blue and white beaded earrings with ster...	The item is a gift, needed before Christmas.
	2	john.smith@gmail.com	Homeware	I would like a queen sized corner-to-corner croc...	Allergic to polyester.

Figure 63 - Screenshot showing the creation of view_custom_order view, as well as the outcome when running it.

```

<?php
$sql = "select * from view_custom_order;";
$result = $mysqli->query($sql);

if ($result->num_rows > 0) {
    echo "<table class='table-shopping-cart' id='customOrder'>
        <tr><th class='column-1'>Order ID</th><th>Email</th><th>Product</th><th>Description</th><th>Additional Information</th></tr>";
    while($row = $result->fetch_assoc()) {
        echo "<tr>
            <td class='column-1'>$row["custOrderID"]."</td>
            <td>$row["contactEmail"]."</td>
            <td>".$row["product"]."</td>
            <td> ".$row["description"]."</td>
            <td> ".$row["additionalInfo"]."</td>
        </tr>";
    }
    echo "</table>";
} else {
    echo "<p class='p-l-40'>No custom orders.</p>";
}
?>

```

Figure 64 - Screenshot showing the view_custom_order view being called in the code.

The screenshot shows a web-based application titled 'View Custom Orders'. It has a search bar labeled 'Search by Order ID'. Below it is a table with five columns: 'Order ID', 'Email', 'Product', 'Description', and 'Additional Information'. There are two rows of data in the table.

Order ID	Email	Product	Description	Additional Information
1	sydneytwigg@gmail.com	Jewellery	Pair of blue and white beaded earrings with sterling silver hooks.	The item is a gift, needed before Christmas.
2	john.smith@gmail.com	Homeware	I would like a queen sized corner-to-corner crochet blanket, in 100% cotton in different shades of grey. It needs to be at least 150cm x 150cm.	Allergic to polyester.

Figure 65 - Screenshot showing the view_custom_order view on the website's admin panel.

STOCK_AVAILABLE

```
1 • USE `db_jtdesigns`;
2
3 • CREATE VIEW stock_available AS
4     SELECT
5         products.id,
6         products.name,
7         stock.stock
8     FROM
9         products INNER JOIN stock ON
10            products.id = stock.itemID;
11
12 •    SELECT * FROM stock_available;
```

Figure 66 - Screenshot showing the creation of stock_available view, as well as the outcome when running it.

```
<div class="container-table-cart pos-relative">
<h4 class="p-b-30 p-t-40 p-l-25">Stock Levels</h4>
<?php
//SQL statement to call stock_available view.
$sql = "select * from stock_available;";
$result = $mysqli->query($sql);

if ($result->num_rows > 0) {
    echo "<table class='table-shopping-cart'>
        <tr>
            <th class='column-1'>Product ID</th>
            <th>Name</th>
            <th>Stock</th>
        </tr>";
    // output data of each row
    while($row = $result->fetch_assoc()) {
        echo "<tr>
            <td class='column-1'>".$row["id"]."</td>
            <td>".$row["name"]."</td>
            <td> ".$row["stock"]."</td>";
        echo "</tr>";
    }
    echo "</table>";
} else {
    echo "<p class='p-l-40'>No products found.</p>";
}
?>
</div>
```

Figure 67 - Screenshot showing the stock_available view being called in the code.

Stock Levels		
Product ID	Name	Stock
1	Black Dress	9
2	Earrings	13
3	Spoon Rest	35
4	Crochet Blanket	2
5	Knitted Blanket	1
6	Platter	6
7	Poncho	12
8	Knitted Shawl	9

Figure 68- Screenshot showing the stock_available view on the website's admin panel.

STORED PROCEDURES

The following stored procedures were created to assist with providing reports to the website administrator, and to assist with stock management, the functionality and purpose of each stored procedure was discussed above in the database planning:

Name	Action	Type	Returns
check_stock	Edit Execute Export Drop	PROCEDURE	
decrease_stock	Edit Execute Export Drop	PROCEDURE	
stock_level	Edit Execute Export Drop	PROCEDURE	

Figure 69 - Screenshot showing the stored procedures that exist on the database.

CHECK_STOCK

```
1  /*Create stored procedure to check stock on order*/
2  USE `db_jtdesigns`;
3
4  • DROP PROCEDURE IF EXISTS `check_stock`;
5
6  DELIMITER //
7  • CREATE PROCEDURE `check_stock`(
8      /*product ID as parameter*/
9      IN `itemID` INT,
10     /*output*/
11     OUT inStock TINYINT(1)
12 )
13 BEGIN
14     DECLARE stockNum INT;
15     DECLARE inStock VARCHAR(5);
16     SELECT
17         stock.stock INTO stockNum
18     FROM
19         products INNER JOIN stock ON
20             products.id = stock.itemID
21     WHERE products.id = itemID;
22
23     IF stockNum < 1 THEN
24         SET inStock = 'False';
25     ELSEIF stockNum > 1 THEN
26         SET inStock = 'True';
27     END IF;
28
29     SELECT inStock;
30
31
32 • CALL check_stock(1, @inStock);
33
```

Figure 70 - Screenshot showing the check_stock stored procedure.

DECREASE_STOCK

```
/*Create stored procedure to decrease stock on order*/
USE `db_jtdesigns`;

DROP PROCEDURE IF EXISTS `decrease_stock`;

DELIMITER //
CREATE PROCEDURE `decrease_stock`(
    /*product ID and quantity as parameters*/
    IN `itemID` INT,
    IN `qty` INT
)
BEGIN
    SELECT
        stock.stock
    FROM
        products INNER JOIN stock ON
        products.id = stock.itemID
    WHERE products.id = itemID;

    UPDATE stock
    SET stock = stock - qty
    WHERE itemID = stock.itemID;
END //
```

Figure 71 - Screenshot showing the *decrease_stock* stored procedure.

STOCK_LEVELS

```
1  /*Create stored procedure to check stock numbers for reporting*/
2 • USE `db_jtdesigns`;
3
4 • DROP PROCEDURE IF EXISTS `stock_levels`;
5
6 DELIMITER //
7 • ┌ CREATE PROCEDURE `stock_level`(
8     /*product ID as parameter*/
9     IN `itemID` INT
10    )
11   ┌ BEGIN
12     DECLARE stockNum INT;
13     DECLARE stockLevel VARCHAR(10);
14     SELECT
15       stock.stock INTO stockNum
16     FROM
17       products INNER JOIN stock ON
18       products.id = stock.itemID
19     WHERE products.id = itemID;
20
21   ┌ IF stockNum < 1 THEN
22     SET stockLevel = 'Empty';
23   ELSEIF stockNum > 1 && stockNum < 5 THEN
24     SET stockLevel = 'Low';
25   ELSEIF stockNum > 5 && stockNum < 15 THEN
26     SET stockLevel = 'Medium';
27   ELSEIF stockNum > 20 && stockNum < 25 THEN
28     SET stockLevel = 'High';
29   ELSEIF stockNum > 25 THEN
30     SET stockLevel = 'Very High';
31   END IF;
32
33   SELECT stockLevel;
34 END //
35
36 • CALL stock_level(1);
37
```

Result Grid | Filter Rows: Export: Wrap Cell Content:

stockLevel
Medium

Figure 72 - Screenshot showing the stock_levels stored procedure.

TRIGGERS

The following triggers were created to assist with user input validation and stock management, the functionality and purpose of each trigger was discussed above in the database planning:

VALIDATEEMAIL_CUSTOMER

```
DROP TRIGGER IF EXISTS validateEmail_customer;

DELIMITER //
CREATE TRIGGER validateEmail_customer
    BEFORE INSERT ON customers
    FOR EACH ROW
BEGIN
    IF NEW.email NOT LIKE '%_@%._%' THEN
        SIGNAL SQLSTATE VALUE '45000'
        SET MESSAGE_TEXT = 'Email does not match the correct format.';
    END IF;
END//
```

Figure 73 - Screenshot showing the validateEmail_customer trigger.

VALIDATEEMAIL_USER

```
DROP TRIGGER IF EXISTS validateEmail_user;

DELIMITER //
CREATE TRIGGER validateEmail_user
    BEFORE INSERT ON users
    FOR EACH ROW
BEGIN
    IF NEW.username NOT LIKE '%_@%._%' THEN
        SIGNAL SQLSTATE VALUE '45000'
        SET MESSAGE_TEXT = 'Email does not match the correct format.';
    END IF;
END//
```

Figure 74 - Screenshot showing the validateEmail_user trigger.

VALIDATEPHONE

```
DROP TRIGGER IF EXISTS validatePhone;

DELIMITER //
CREATE TRIGGER validatePhone
    BEFORE INSERT ON customers
    FOR EACH ROW
BEGIN
    IF NEW.phone NOT REGEXP '^[0-9]+$' THEN
        SIGNAL SQLSTATE VALUE '45000'
        SET MESSAGE_TEXT = 'Phone number does not match the correct format.';
    END IF;
END//
```

Figure 75 - Screenshot showing the validatePhone trigger.

UPDATESTOCK

```
DROP TRIGGER IF EXISTS updateStock;

DELIMITER //
CREATE TRIGGER updateStock
    AFTER INSERT ON orders
    FOR EACH ROW
BEGIN
    Call decrease_stock();
END//
```

Figure 76 - Screenshot showing the updateStock trigger.

DATABASE CODE

DATABASE CONNECTION

The following code snippet shows the database connection code in php used throughout the project.

```
<?php
// Database credentials.
define('DB_SERVER', 'localhost');
define('DB_USERNAME', 'root');
define('DB_PASSWORD', '');
define('DB_NAME', 'db_jtdesigns');

// Attempt to connect to database
$mysqli = new mysqli(DB_SERVER, DB_USERNAME, DB_PASSWORD, DB_NAME);

// Check connection
if($mysqli === false){
    die("ERROR: Could not connect. " . $mysqli->connect_error);
}
?>
```

Figure 77 - Screenshot of code showing database connection in php.

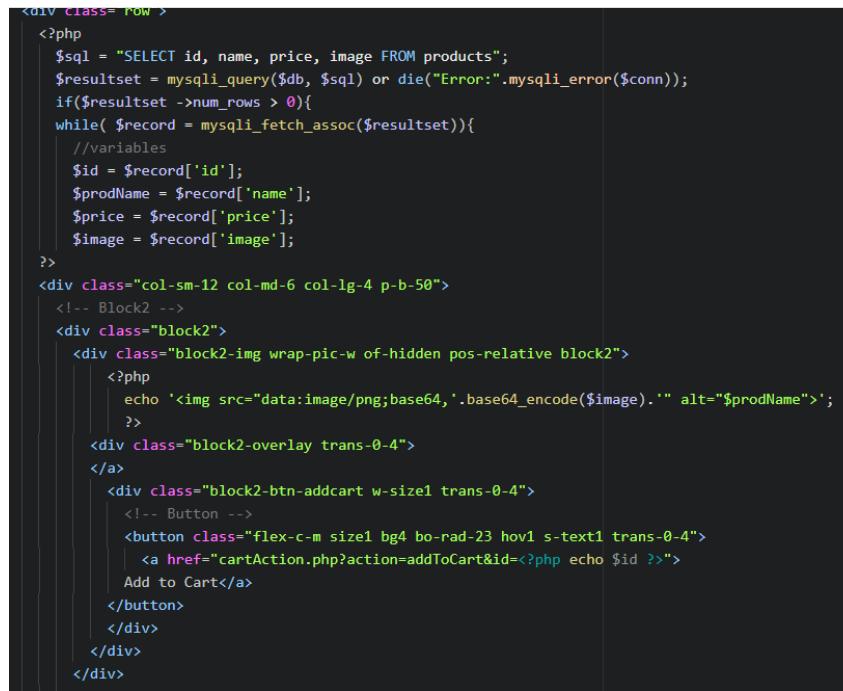
The following code snippet shows the database connection class being called into a class.

```
<?php
// Include config file
require_once "config.php";
```

Figure 78 - Screenshot of code showing the database connection being called into a class.

READING DATA FROM THE DATABASE

The following code snippet shows the use of SQL queries in conjunction with PHP to display the information pulled from the Products table to display the product details inside HTML code.

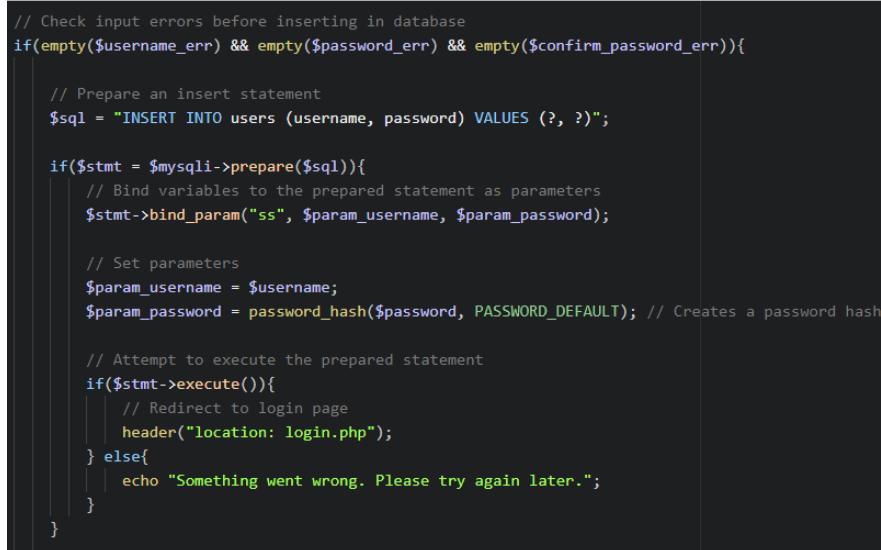


```
<div class="row">
<?php
    $sql = "SELECT id, name, price, image FROM products";
    $resultset = mysqli_query($db, $sql) or die("Error:".mysqli_error($conn));
    if($resultset->num_rows > 0){
        while( $record = mysqli_fetch_assoc($resultset)){
            //variables
            $id = $record['id'];
            $prodName = $record['name'];
            $price = $record['price'];
            $image = $record['image'];
        }
    }
    <div class="col-sm-12 col-md-6 col-lg-4 p-b-50">
        <!-- Block2 -->
        <div class="block2">
            <div class="block2-img wrap-pic-w of-hidden pos-relative block2">
                <?php
                    echo '
            <div class="block2-overlay trans-0-4">
                </div>
                <div class="block2-btn-addcart w-size1 trans-0-4">
                    <!-- Button -->
                    <button class="flex-c-m size1 bg4 bo-rad-23 hov1 s-text1 trans-0-4">
                        <a href="cartAction.php?action=addCart&id=<?php echo $id ?>">
                            Add to Cart</a>
                        </button>
                    </div>
                </div>
            </div>
        </div>
    </div>
```

Figure 79 - Screenshot showing the execution of a SQL query inside the HTML class using PHP.

INSERTING DATA INTO THE DATABASE

The following code snippet shows the database interaction using SQL and PHP to insert data into the database through the HTML interface.



```
// Check input errors before inserting in database
if(empty($username_err) && empty($password_err) && empty($confirm_password_err)){

    // Prepare an insert statement
    $sql = "INSERT INTO users (username, password) VALUES (?, ?)";

    if($stmt = $mysqli->prepare($sql)){
        // Bind variables to the prepared statement as parameters
        $stmt->bind_param("ss", $param_username, $param_password);

        // Set parameters
        $param_username = $username;
        $param_password = password_hash($password, PASSWORD_DEFAULT); // Creates a password hash

        // Attempt to execute the prepared statement
        if($stmt->execute()){
            // Redirect to login page
            header("location: login.php");
        } else{
            echo "Something went wrong. Please try again later.";
        }
    }
}
```

Figure 80 - Screenshot showing the execution of a SQL query inside the HTML class using PHP

HTML, PHP, CSS AND JAVASCRIPT USAGE

HTML USAGE

HTML was used in conjunction with CSS to create the front-end user interface of the system.

The following code shows the creation of the navigation bar menu, as well as the sub menu for the various product categories.

```
<div class="wrap_header">
    <!-- Menu -->
    <div class="wrap_menu">
        <nav class="menu">
            <ul class="main_menu">
                <li>
                    <a href="index.php">Home</a>
                </li>
                <li>
                    <a href="about.php">About</a>
                </li>
                <li>
                    <a href="product.php">Shop</a>
                    <ul class="sub_menu">
                        <li>Range</li>
                        <li><a href="product.php">View All</a></li>
                        <li><a href="product-clothing.php">Clothing</a></li>
                        <li><a href="product-jewellery.php">Jewellery</a></li>
                        <li><a href="product-ceramics.php">Ceramics</a></li>
                        <li><a href="product-homeware.php">Homeware</a></li>
                    </ul>
                </li>
                <li>
                    <a href="services.php">Services</a>
                </li>
                <li>
                    <a href="custom-order.php">Custom Order</a>
                </li>
                <li>
                    <a href="contact.php">Contact</a>
                </li>
            </ul>
        </nav>
    </div>
```

Figure 81 - Screenshot showing HTML usage throughout the system.

The following snippet shows the creation of a table that pulls items from the cart session and displays them using HTML.

```
<table class="table-shopping-cart">
  <tr class="table-head">
    <th class="column-1"></th>
    <th class="column-2">Product</th>
    <th class="column-3">Price</th>
    <th class="column-4 p-l-70">Quantity</th>
    <th class="column-5">Total</th>
    <th class="column-6"></th>
  </tr>
  <tr class="table-row">
    <?php
      if($cart->total_items()>0){
        //get cart items from session
        $cartItems = $cart->contents();
        foreach ($cartItems as $item) {
    >>
    <td class="column-1">
      <div class="cart-img-product b-rad-4 o-f-hidden">
        ">
      </div>
    </td>
    <td class="column-2"><?php echo $item['name'];?></td>
    <td class="column-3"><?php echo "$.".$item['price'];?></td>
    <td class="column-4">
      <div class="flex-w bo5 of-hidden w-size17">
        <button class="btn-num-product-down color1 flex-c-m size7 bg8 eff2" onclick="updateCartItem(this, '<?php echo $item["rowid"]; ?>')">
          <i class="fs-12 fa fa-minus" aria-hidden="true"></i>
        </button>
        <input class="size8 m-text18 t-center num-product" type="number" value=<?php echo $item["qty"]; ?>">
        <button class="btn-num-product-up color1 flex-c-m size7 bg8 eff2" onclick="updateCartItem(this, '<?php echo $item["rowid"]; ?>')">
          <i class="fs-12 fa fa-plus" aria-hidden="true"></i>
        </button>
      </div>
    </td>
    <td class="column-5"><?php echo 'R'.$.item['subtotal']; ?></td>
    <td class="column-6">
      <a href="cartAction.php?action=removeCartItem&id=<?php echo $item["rowid"]; ?>" class="btn" onclick="return confirm('Are you sure?')">

```

Figure 82 - Screenshot showing HTML usage throughout the system.

The following code snippet shows the creation of an input form using HTML.

```
<form class="leave-comment" method="POST">
  <h4 class="m-text26 p-b-36 p-t-15">
    Send us your message </h4>
  <div class="bo4 of-hidden size15 m-b-20">
    <input class="sizefull s-text7 p-l-22 p-r-22" type="text" name="name" placeholder="Full Name" required>
  </div>
  <div class="bo4 of-hidden size15 m-b-20">
    <input class="sizefull s-text7 p-l-22 p-r-22" type="email" name="email" placeholder="Email Address" id="email" required>
  </div>
  <textarea class="dis-block s-text7 size20 bo4 p-l-22 p-r-22 p-t-13 m-b-20" name="message" placeholder="Message" id="message" required></textarea>
  <div class="w-size25">
    <button class="flex-c-m size2 bg1 bo-rad-23 hov1 m-text3 trans-0-4" type="submit" value="Send">
      Send
    </button>
  </div>
</form>
```

Figure 83 - Screenshot showing HTML usage throughout the system.

CSS USAGE

Bootstrap was used for the development of this project, thus the Bootstrap CSS guidelines were followed in order to provide a fast, cross platform, responsive webpage (Bootstrap, 2018).

The following CSS features were used from the Bootstrap *util.js* class:

Padding options, such as p-t, p-b, p-l, p-r.

```
.p-t-0 {padding-top: 0px;}  
.p-t-1 {padding-top: 1px;}  
.p-t-2 {padding-top: 2px;}  
.p-t-3 {padding-top: 3px;}  
.p-t-4 {padding-top: 4px;}  
.p-t-5 {padding-top: 5px;}  
.p-t-6 {padding-top: 6px;}  
.p-t-7 {padding-top: 7px;}  
.p-t-8 {padding-top: 8px;}  
.p-t-9 {padding-top: 9px;}  
.p-t-10 {padding-top: 10px;}
```

Figure 84 - Screenshot showing Bootstrap CSS usage.

Margin options, such as m-t, m-b, m-l, m-r.

```
.m-r-0 {margin-right: 0px;}  
.m-r-1 {margin-right: 1px;}  
.m-r-2 {margin-right: 2px;}  
.m-r-3 {margin-right: 3px;}  
.m-r-4 {margin-right: 4px;}  
.m-r-5 {margin-right: 5px;}  
.m-r-6 {margin-right: 6px;}  
.m-r-7 {margin-right: 7px;}  
.m-r-8 {margin-right: 8px;}  
.m-r-9 {margin-right: 9px;}
```

Figure 85 - Screenshot showing Bootstrap CSS usage.

Flexbox layout:

```
.flex-w {  
    display: -webkit-box;  
    display: -webkit-flex;  
    display: -moz-box;  
    display: -ms-flexbox;  
    display: flex;  
    -webkit-flex-wrap: wrap;  
    -moz-flex-wrap: wrap;  
    -ms-flex-wrap: wrap;  
    -o-flex-wrap: wrap;  
    flex-wrap: wrap;  
}
```

Figure 86 - Screenshot showing Bootstrap CSS usage.

JAVASCRIPT USAGE

JavaScript was used throughout the project to provide client-side interaction and convenience features such as search, maps, and return to top button.

The following code snippet allows the map to be displayed from Google Maps, as well as have a marker with an information tooltip on click.

```
var latitude = data_map_x,
    longitude = data_map_y,
    map_zoom = 14;
var locations = [
    ['<div class="infobox"><p>Now that you visited our website, how' +
     '<br>about checking out our office too?</p></div>',
     , latitude, longitude, 2]
];
if (selector_map !== undefined) {
    var map = new google.maps.Map(document.getElementById('google_map'), {
        zoom: 15,
        scrollwheel: scrollwheel,
        navigationControl: true,
        mapTypeControl: false,
        scaleControl: false,
        draggable: draggable,
        styles: style,
        center: new google.maps.LatLng(latitude, longitude),
        mapTypeId: google.maps.MapTypeId.ROADMAP
    });
}
var infowindow = new google.maps.InfoWindow();
var marker, i;
for (i = 0; i < locations.length; i++) {
    marker = new google.maps.Marker({
        position: new google.maps.LatLng(locations[i][1], locations[i][2]),
        map: map,
        icon: img_pin
    });
    google.maps.event.addListener(marker, 'click', (function(marker, i) {
        return function() {
            infowindow.setContent(locations[i][0]);
            infowindow.open(map, marker);
        }
    })(marker, i));
}
```

Figure 87 - Screenshot showing JavaScript usage throughout the system.

The following code snippet allows the user to search a table for values using JavaScript (W3Schools, 2018).

```
<script>
  function searchFunction() {
    // Declare variables
    var input, filter, table, tr, td, i;
    input = document.getElementById("searchInput");
    filter = input.value.toUpperCase();
    tr = table.getElementsByTagName("tr");
    table = document.getElementById("viewOrderTable");
    // Loop through all table rows, and hide those who don't match the search query
    for (i = 0; i < tr.length; i++) {
      td = tr[i].getElementsByTagName("td")[0];
      if (td) {
        if (td.innerHTML.toUpperCase().indexOf(filter) > -1) {
          tr[i].style.display = "";
        } else {
          tr[i].style.display = "none";
        }
      }
    }
  }
</script>
```

Figure 88 - Screenshot showing JavaScript usage throughout the system.

PHP USAGE

PHP was used throughout the system to provide server-side functionality and interaction with the database.

The following code snippet shows the use of PHP and the PHPMailer plugin to email the inputted data from a form to the site administrator's Gmail account (Bointon, 2018):

```
<?php
//Import PHPMailer classes into the global namespace
use PHPMailer\PHPMailer\PHPMailer;
$msg = '';
if (array_key_exists('email', $_POST)) {
    require 'vendor/autoload.php';
    //Create a new PHPMailer instance
    $mail = new PHPMailer;
    //Tell PHPMailer to use SMTP - requires a local mail server
    $mail->IsSMTP(); // enable SMTP
    $mail->SMTPDebug = 1; // debugging: 1 = errors and messages, 2 = messages only
    $mail->SMTPAuth = true; // authentication enabled
    $mail->SMTPSecure = 'ssl'; // secure transfer enabled
    $mail->Host = "smtp.gmail.com";
    $mail->Port = 465; // or 587
    $mail->IsHTML(true);
    $mail->Username = "jennitwiggdesigns@gmail.com";
    $mail->Password = "Password1";
    $mail->setFrom('jennitwiggdesigns@gmail.com', 'Jenni Twigg Designs');
    $mail->addAddress('jennitwiggdesigns@gmail.com', 'Jenni Twigg Designs');
    //Put the submitter's address in a reply-to header
    if ($mail->addReplyTo($_POST['email'], $_POST['name'])) {
        $mail->Subject = '[Contact Us] New Message from Jenni Twigg Designs';
        $mail->isHTML(false);
        //Build message body
        $mail->Body = <<<EOT
Email: {$_POST['email']}
Name: {$_POST['name']}
Message: {$_POST['message']}
EOT;
        //Send the message, check for errors
        if (!$mail->send()) {
            $msg = 'Sorry, something went wrong. Please try again later.';
        } else {
            $msg = 'Message sent! Thanks for contacting us.';
        }
    } else {
        $msg = 'Invalid email address, message ignored.';
    }
}
?>
```

Figure 89 - Screenshot showing PHP usage throughout the system.

The following code snippet shows the creation of PHP sessions in order to store cart items in a PHP session (CodexWorld, 2016):

```
session_start();

class Cart {
    protected $cart_contents = array();

    public function __construct(){
        // get the cart array from session
        $this->cart_contents = !empty($_SESSION['cart_contents'])?$_SESSION['cart_contents']:NULL;
        if ($this->cart_contents === NULL){
            // initialise
            $this->cart_contents = array('cart_total' => 0, 'total_items' => 0);
        }
    }
}
```

Figure 90 - Screenshot showing PHP usage throughout the system.

The following code snippet shows a comma delimited array being split using PHP (Hossain, 2015):

```
<?php
    $splitIncluded = explode(',', $included);
    foreach ($splitIncluded as $split){
        echo '- ' . $split . '<br>';
    }
?>
```

Figure 91 - Screenshot showing PHP usage throughout the system.

The following code shows data validation using PHP, pulling the data from the input fields using POST:

```
// Validate password
if(empty(trim($_POST["password"])){
    $password_err = "Please enter a password.";
} elseif(strlen(trim($_POST["password"])) < 6){
    $password_err = "Password must have atleast 6 characters.";
} else{
    $password = trim($_POST["password"]);
}

// Validate confirm password
if(empty(trim($_POST["confirm_password"]))){
    $confirm_password_err = "Please confirm password.";
} else{
    $confirm_password = trim($_POST["confirm_password"]);
    if(empty($password_err) && ($password != $confirm_password)){
        $confirm_password_err = "Password did not match.";
    }
}
```

Figure 92 - Screenshot showing PHP usage throughout the system.

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