

Assignment 1 - 2204972

by Elisedd Evans

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Assignment 1: Introduction to Web and
Database Concepts - ACCA4023

Design and Implementation of a Relational
Database System

Elisedd Evans - 2204972

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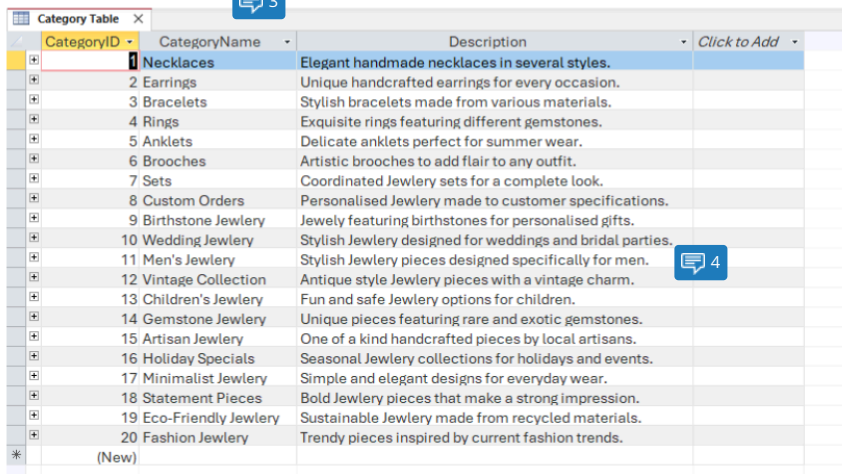


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The director of Craft Gem has asked me to create a robust database solution using Microsoft Access. Right now, the company is handling its operations manually, and they want to improve efficiency with a more organized, automated system. My task is to design and implement a database that will manage key aspects of the business,  2 including inventory, customer information, and orders. Additionally, the system needs to generate reports that can help the team make more informed decisions. By developing this database, I'll be helping streamline their processes, track stock levels, maintain accurate customer records, and ensure smooth order management, ultimately making the business operations more efficient and effective.

Database Design and Implementation

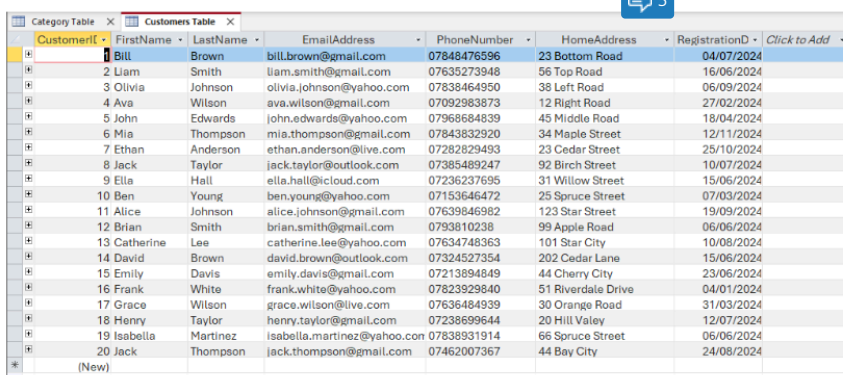
Creating Category Table



CategoryID	CategoryName	Description	Click to Add
1	Necklaces	Elegant handmade necklaces in several styles.	
2	Earrings	Unique handcrafted earrings for every occasion.	
3	Bracelets	Stylish bracelets made from various materials.	
4	Rings	Exquisite rings featuring different gemstones.	
5	Anklets	Delicate anklets perfect for summer wear.	
6	Brooches	Artistic brooches to add flair to any outfit.	
7	Sets	Coordinated Jewellery sets for a complete look.	
8	Custom Orders	Personalised Jewellery made to customer specifications.	
9	Birthstone Jewellery	Jewelry featuring birthstones for personalised gifts.	
10	Wedding Jewellery	Stylish Jewellery designed for weddings and bridal parties.	
11	Men's Jewellery	Stylish Jewellery pieces designed specifically for men.	
12	Vintage Collection	Antique style Jewellery pieces with a vintage charm.	
13	Children's Jewellery	Fun and safe Jewellery options for children.	
14	Gemstone Jewellery	Unique pieces featuring rare and exotic gemstones.	
15	Artisan Jewellery	One of a kind handcrafted pieces by local artisans.	
16	Holiday Specials	Seasonal Jewellery collections for holidays and events.	
17	Minimalist Jewellery	Simple and elegant designs for everyday wear.	
18	Statement Pieces	Bold Jewellery pieces that make a strong impression.	
19	Eco-Friendly Jewellery	Sustainable Jewellery made from recycled materials.	
20	Fashion Jewellery	Trendy pieces inspired by current fashion trends.	
*	(New)		

In this screenshot, you can see that I have created a category table for my database. I decided to implement this feature because I believed it would make it much easier for staff to navigate and manage the inventory. By organizing the jewellery into distinct categories, it helps users quickly identify the different types of jewellery we have in stock. Additionally, including visual representations or images of each category alongside the names will make it even more intuitive for staff to understand what each category looks like briefly. This structure will not only streamline inventory management but also improve overall efficiency by providing a clear, organized view of the products.

Creating Customers Table



CustomerID	FirstName	LastName	EmailAddress	PhoneNumber	HomeAddress	RegistrationD	Click to Add
1	Bill	Brown	bill.brown@gmail.com	07848476596	23 Bottom Road	04/07/2024	
2	Liam	Smith	liam.smith@gmail.com	07635273948	56 Top Road	16/06/2024	
3	Olivia	Johnson	olivia.johnson@yahoo.com	07638464950	35 Left Road	06/09/2024	
4	Ava	Wilson	ava.wilson@gmail.com	07692983873	12 Right Road	27/02/2024	
5	John	Edwards	john.edwards@yahoo.com	07968684839	45 Middle Road	18/04/2024	
6	Mia	Thompson	mia.thompson@gmail.com	07843832920	34 Maple Street	12/11/2024	
7	Ethan	Anderson	ethan.anderson@live.com	07282829493	23 Cedar Street	25/10/2024	
8	Jack	Taylor	jack.taylor@outlook.com	07385489247	92 Birch Street	10/07/2024	
9	Ella	Hall	ella.hall@icloud.com	07236237695	31 Willow Street	15/06/2024	
10	Ben	Young	ben.young@yahoo.com	07153646472	25 Spruce Street	07/03/2024	
11	Alice	Johnson	alice.johnson@gmail.com	07639846982	123 Star Street	19/09/2024	
12	Brian	Smith	brian.smith@gmail.com	0793810238	99 Apple Road	06/06/2024	
13	Catherine	Lee	catherine.lee@yahoo.com	07634748363	101 Star City	10/08/2024	
14	David	Brown	david.brown@outlook.com	07324527354	202 Cedar Lane	15/06/2024	
15	Emily	Davis	emily.davis@gmail.com	07213894849	44 Cherry City	23/06/2024	
16	Frank	White	frank.white@yahoo.com	07823929840	51 Riverdale Drive	04/01/2024	
17	Grace	Wilson	grace.wilson@live.com	07636484939	30 Orange Road	31/03/2024	
18	Henry	Taylor	henry.taylor@gmail.com	07238699644	20 Hill Valley	12/07/2024	
19	Isabella	Martinez	isabella.martinez@yahoo.com	07838931914	66 Spruce Street	06/06/2024	
20	Jack	Thompson	jack.thompson@gmail.com	07462007367	44 Bay City	24/08/2024	
(New)							

In this screenshot, you can see that I have now created a customer's table. I made sure to include key details such as the customer's first name, last name, email, phone number, address, and registration date. This ensures that all important customer information is easily accessible in one place. Additionally, by incorporating a unique customer ID for each entry, it allows for a more streamlined and organized way of tracking customer orders. The customer ID acts as a reference point, making it easier for users to link specific customers to their orders and view all relevant details briefly. This setup enhances the ability to quickly retrieve customer information, track their purchasing history, and provide better service overall.

Creating Inventory Table

Category Table		Customers Table		Inventory Table	
InventoryID	ProductID	QuantityInStocks	LastRestockDate	Click to Add	
1	1	10	01/09/2023		
2	2	5	15/08/2023		
3	3	15	10/10/2023		
4	4	7	20/08/2023		
5	5	12	09/10/2023		
6	6	8	25/09/2023		
7	7	20	30/07/2023		
8	8	18	12/09/2023		
9	9	6	05/09/2023		
10	10	9	01/10/2023		
11	11	4	15/09/2023		
12	12	11	05/10/2023		
13	13	13	10/08/2023		
14	14	16	22/09/2023		
15	15	2	25/08/2023		
16	16	14	15/10/2023		
17	17	10	20/09/2023		
18	18	6	30/08/2023		
19	19	9	12/10/2023		
20	20	7	18/09/2023		
*	(New)	0			

I thought it would be a good idea to also include a separate Inventory table to keep track of how much stock we have for each specific product we sell. In this table, I made sure to include the Inventory ID, Product ID, the quantity we currently have in stock, and the last restock date. This setup will make it easier for users to quickly assess the availability of products, ensuring that they know exactly how much inventory is on hand at any given time. With the addition of the Product ID, users can easily cross-reference stock levels with the product catalogue, which helps prevent issues such as overselling or running out of stock unexpectedly. Including the last restock date is also helpful, as it gives users insight into when the item was last replenished and can assist in planning future orders or restocking efforts. Overall, this table will significantly improve inventory management, provide transparency, and help staff make informed decisions about stock levels.

Creating Orders Table

Category Table		Customers Table	Inventory Table	Orders Table				
	OrderID	CustomerID	ProductID	Quantity	OrderDate	Status	TotalAmount	Click to Add
+	1	1	1	4	13/11/2024	Pending	£240.00	
+	2	2	2	3	23/11/2024	Completed	£195.00	
+	3	3	3	3	10/07/2024	Pending	£300.00	
+	4	4	4	2	13/07/2024	Cancelled	£1,000.00	
+	5	5	5	5	02/08/2024	Completed	£150.00	
+	6	6	6	2	09/03/2024	Completed	£75.00	
+	7	7	7	5	02/04/2024	Pending	£275.00	
+	8	8	8	2	31/05/2024	Pending	£500.00	
+	9	9	9	6	26/05/2024	Pending	£480.00	
+	10	10	10	2	24/04/2024	Completed	£190.00	
+	11	11	11	6	03/02/2024	Completed	£540.00	
+	12	12	12	3	27/01/2024	Pending	£255.00	
+	13	13	13	3	13/04/2024	Cancelled	£450.00	
+	14	14	14	2	03/04/2024	Pending	£400.00	
+	15	15	15	9	26/01/2024	Cancelled	£1,170.00	
+	16	16	16	8	21/04/2024	Pending	£360.00	
+	17	17	17	4	29/08/2024	Completed	£200.00	
+	18	18	18	3	31/10/2024	Completed	£420.00	
+	19	19	19	3	11/07/2024	Pending	£330.00	
+	20	20	20	4	02/08/2024	Cancelled	£700.00	
*	(New)	0	0				£0.00	

For my orders table, I thought it would be important to display all relevant IDs (OrderID, CustomerID, and ProductID) so that users can easily identify which customer has ordered which products. Including these IDs not only helps with tracking but also makes it clear which products are associated with each order. The OrderID is useful for organizing and managing orders, allowing staff to quickly identify which orders need to be prepared or processed.

In addition to these identifiers, I included the quantity of products each customer has requested, as well as the order date, status, and total amount. The status field is particularly helpful, as it enables staff to easily prioritize orders based on their current state. For instance, completed purchases can be prioritized over pending orders, helping to manage workflow efficiently and ensure timely fulfilment of customer requests. This structure allows for better visibility and smoother management of the order process.

Creating Payments Table

Category Form	Customers Form	Inventory Form	Orders Form	Products Form	
Payments	OrderID	PaymentDate	Amount	PaymentMethod	Click to Add
	1	14/11/2024	£240.00	Cash	
	2	23/11/2024	£195.00	Credit/Debit Card	
	3	10/07/2024	£300.00	Online Payment	
	4	13/07/2024	£1,000.00	Credit/Debit Card	
	5	02/08/2024	£150.00	Gift Card	
	6	09/03/2024	£75.00	Mobile Payment	
	7	20/04/2024	£275.00	Buy Now, Pay Later	
	8	06/06/2024	£500.00	Mobile Payment	
	9	30/05/2024	£480.00	Cash	
	10	24/04/2024	£190.00	Cash	
	11	03/02/2024	£540.00	Credit/Debit Card	
	12	31/01/2024	£255.00	Credit/Debit Card	
	13	13/04/2024	£450.00	Mobile Payment	
	14	12/04/2024	£400.00	Gift Card	
	15	26/01/2024	£1,170.00	Online Payment	
	16	30/04/2024	£360.00	Buy Now, Pay Later	
	17	29/08/2024	£200.00	Online Payment	
	18	31/10/2024	£420.00	Cash	
	19	27/07/2024	£330.00	Cash	
	20	02/08/2024	£700.00	Credit/Debit Card	
*	(New)	0	£0.00		

I also created a Payments table to ensure that every customer's payment is properly tracked, even if the payment is made later than when the order was placed. Payments can sometimes be delayed, especially if customers use different payment methods, so it's important to have a clear record of each transaction. To accommodate this, I included a *payment method* field, which specifies how the payment was made (e.g., credit/debit card, gift card, online payment etc.). This allows staff to easily track payment statuses and verify that all orders have been fully paid, even if there are delays or multiple payment methods involved. This added layer of detail helps maintain accurate financial records and ensures smooth order processing.

Creating Products Table

CategoryID	ProductID	ProductName	Description	Price	StockQuant	CategoryID	Click to Add
	1	Amethyst Pendant	Amethyst Stone on a silver chain	£55.00	10	1	
	2	Gold Hoop Earrings	Classic gold hoop earrings	£120.00	5	2	
	3	Silver Ring	Sterling silver with intricate design	£45.00	15	3	
	4	Pearl Necklace	Elegant Pearl Necklace	£250.00	7	4	
	5	Gemstone Bracelet	Assorted Gemstones with elastic band	£65.00	12	5	
	6	Crystal Choker	Choker with small crystals	£80.00	8	6	
	7	Gold Chain	Simple gold chain	£100.00	20	7	
	8	Handmade Anklet	Anklet with unique handwoven beads	£30.00	18	8	
	9	Ruby Stud Earrings	Ruby studs with gold backing	£150.00	6	9	
	10	Emerald Pendant	Emerald on a silver chain	£130.00	9	10	
	11	Opal Necklace	Opal pendant with silver accents	£200.00	4	11	
	12	Silver Cuff Bracelet	Cuff bracelet in sterling silver	£90.00	11	12	
	13	Rose Gold Ring	Rose gold with custom engraving	£75.00	13	13	
	14	Beaded Necklace	Handmade beaded necklace	£50.00	16	14	
	15	Diamond Pendant	Diamond pendant with platinum chain	£500.00	2	15	
	16	Sapphire Ring	Sapphire ring with silver band	£175.00	14	16	
	17	Turquoise Bracelet	Turquoise stones on a bracelet	£85.00	10	17	
	18	Topaz Earrings	Topaz earrings with silver clasps	£110.00	6	18	
	19	Lapis Lazuli Ring	Lapis Lazuli ring with gold band	£95.00	9	19	
	20	Citrine Pendant	Citrine Pendant in a gold frame	£140.00	9	20	
	(New)			£0.00		0	

For this table, I thought it would be beneficial to include crucial information such as the product ID, name, description, and prices for each item. I also included stock amount and category ID to help users understand what's available and group comparable products together. This allows consumers to rapidly find the information they need without having to dig through irrelevant details. This structured presentation makes the data more user-friendly and accessible. Overall, it improves the purchasing experience by delivering all necessary information.

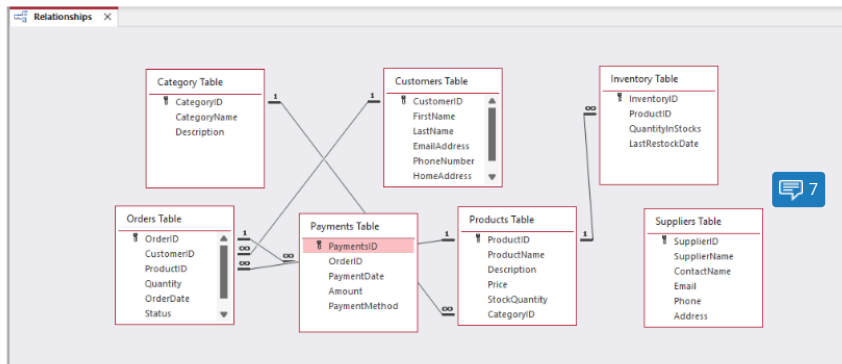
Creating Suppliers Table

SupplierID	SupplierName	ContactName	Email	Phone	Address	Click to Add
1	Gemstone Supply Co.	Jane Doe	jane@gemstonesupply.com	07427364589	12 Gem Street	
2	Precious Gems Ltd	John Smith	john@preciousgems.com	07028374659	56 Jewel Road	
3	Artisan Stones Inc	Emily Johnson	emily@artisanstones.com	07893927848	89 Stone Avenue	
4	Luxury Jewels	Michael Brown	michael@luxuryjewels.com	07838392913	21 Diamond Boulevard	
5	Quality Crafts	Sarah White	sarah@qualitycrafts.com	07363829342	54 Silver Street	
6	Elegant Beads	Robert Green	robert@elegantbeads.com	07953298742	87 Pearl Lane	
7	Unique Creations	Linda Blue	linda@uniquecreations.com	07893920473	59 Amber City	
8	Natural Treasures	Chris Red	chris@naturaltreasures.com	07903392034	53 Quartz Road	
9	Timeless Designs	Anna Black	anna@timelessdesigns.com	07923939202	52 Opal Boulevard	
10	Crystal Clear Gems	Paul Grey	paul@crystalclear.com	07293294983	58 Crystal Drive	
11	Ethereal Jewels	Sophie White	sophie@etherealjewels.com	07030398203	35 Opal City	
12	Artisan Gemworks	Kevin Black	kevin@artisangemworks.com	07090329849	68 Jewel Boulevard	
13	Sapphire & Co.	Laura Green	laura@saphireco.com	07939330290	89 Sapphire Street	
14	Mystic Stones	Thomas Blue	thomas@mysticstones.com	07939023038	52 Diamond Avenue	
15	Precious Metal Works	Nancy Brown	nancy@preciousmetalworks.com	07939292793	63 Silver Boulevard	
16	Brilliant Gems	Bruce Yellow	bruce@brilliantgems.com	07938392398	41 Gold Road	
17	Gemmy Creations	Kelly White	kelly@gemmycreations.com	07937363398	58 Gem Avenue	
18	Artisan Jewellery Supply	George Green	george@artisanjewellery.com	07567329398	56 Crystal Drive	
19	Rare Finds Co.	Helen Pink	helen@rarefinds.com	07983829398	69 Treasure Boulevard	
20	Elegant Jewels	Olivia Black	olivia@elegantjewellers.com	07909928398	51 Elegance Street	
(New)						

For this table, I choose to include the suppliers' names, contact information, email, phone number, and addresses. I believed this would be useful for people because it would assist us in replenishing products or resolving concerns. Having this information readily available promotes effective communication and deepens our relationships with

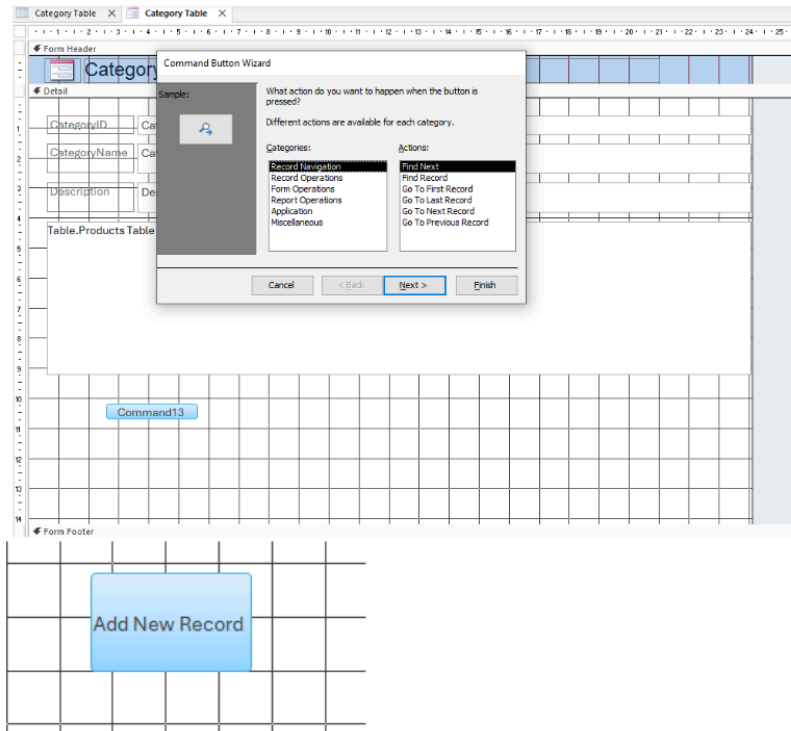
vendors. It also makes it easy to organize orders and keep track of crucial contacts from one location. Overall, this coordinated strategy has the potential to significantly improve supply chain efficiencies.

Creating Relationships between Tables



In this screenshot, I started creating associations between all the prior tables I had established. By doing so, I may create unambiguous relationships that improve data integrity and consistency across the database. Each relationship contributes to defining how distinct entities interact with one another, making it easier to query and retrieve relevant information. Furthermore, these linkages will allow for more efficient data updates and reporting, as changes in one table will automatically reflect in others where appropriate. Overall, this technique establishes a solid foundation for a well-organized and functional database.

Adding Buttons to Forms



In these screenshots, you can see how I began adding buttons to my forms to improve the user experience. These buttons will make it easy for users to create new records, save current ones, and delete undesired ones. By including these functional aspects, I hope to streamline the data entering process, making it more intuitive and efficient for users.

Category Table

CategoryID

CategoryName

Description

ProductID	ProductName	Description	Price	StockQuant
1	Amethyst Pendant	Amethyst Stone on a silver chain	£55.00	10
(New)			£0.00	

Records: 1 of 1

No Filter

Search

Add New Record

Delete Record

Save Record

Here you can see all the buttons that I successfully created; I integrated these into all the other forms I created to ensure the user experience was consistent throughout the program.

Creating Reports and Queries

Report Header

MemberInfoQuer

Date

Time

Page Header

Customer

First Name

Last Name

Email Address

Phone Number

Home Address

Detail

Customer

First Name

Last Name

Email Address

Phone Number

Home Address

Page Footer

Page " & (Page)

Report Footer

Member information report

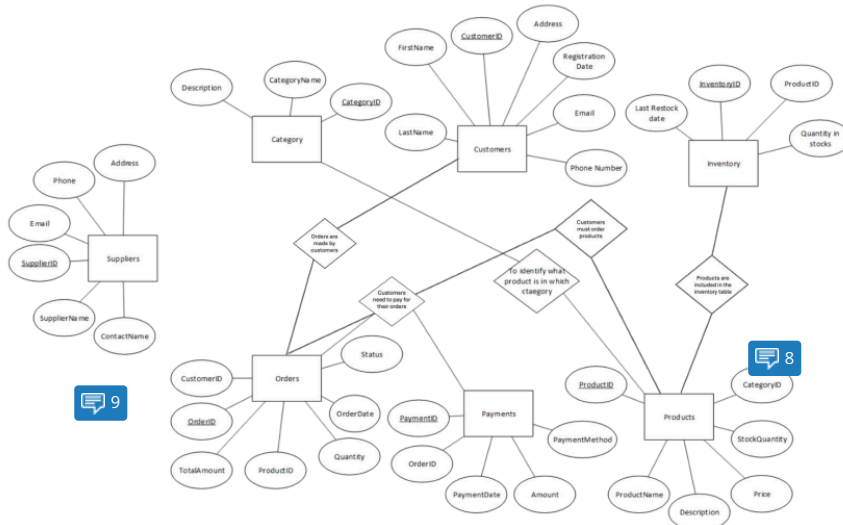
All the buttons that I was successful in creating are shown here. I integrated these into all the other forms I created to ensure the user experience was consistent throughout the program.

Memberships

[illegible]

14

Entity Relationship Diagram (ERD)



An Entity-Relationship Diagram is a visual tool for illustrating the relationships between different entities in a database, such as categories and payments tables in a transactional system. An ERD helps you comprehend the data structure and underlying relationships by displaying how these entities interact. For example, payment records are related to specific orders via foreign keys. This visualization helps database designers and developers uncover potential redundancies, optimize data integrity, and improve query performance. Furthermore, it streamlines stakeholder communication by helping them to quickly grasp complicated data relationships and ensuring that everyone is on the same page about the system's architecture. Overall, an ERD improves the development process by making it easier to design, build, and maintain a stable and organized database system.

Reports and Queries

Report Header
MemberInfoQuer
Page Header
[Customers Table].Customer [Customers Table].First Name [Customers Table].Last Name [Customers Table].Email Address Phone Number Home Address
Detail
[Customers Table].Customer [Customers Table].First Name [Customers Table].Last Name [Customers Table].Email Address Phone Number Home Address
Page Footer
Page Number
Report Footer
Member Information report.

Creating reports on key business goals is critical for making informed decisions and managing operations effectively. The three reports I created serve diverse functions, providing useful insights into various elements of the organization.

This report measures the effectiveness of marketing activities, outreach initiatives, and overall business interest by measuring how many people registered with the company in the previous month. A surge in registrations may suggest successful promotional activities, but a fall may need a reconsideration of strategy.

Analysing the number of orders placed in the last month offers information on sales success and customer purchasing habits. This report can help detect peak periods, allowing for improved inventory management and personnel considerations. It also helps with financial forecasting because trends in order volume might show whether cash flow is stable or fluctuating.

The member Information report compiles key information about registered members, including demographics, preferences, and purchase habits. Understanding the membership base allows more targeted marketing, tailored communication, and better customer service. It can also help loyalty programs by highlighting high-value customers or segments who could benefit from personalized offers.

Overall, these reports not only provide an overview of current business performance, but also enable stakeholders to make strategic, data-driven decisions that promote growth, improve customer experience, and optimize operations.

References

[1]

DeepAI, "ChatGPT," OpenAI. [Online]. Available: <https://chat.openai.com/>. [Accessed: Oct. 2023].

Assignment 1 - 2204972

GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

62/100

PAGE 1

PAGE 2



Comment 1

clear ToC. good job

PAGE 3

PAGE 4



Comment 2

well explained

PAGE 5



Comment 3

typo found. proof reading is advised before submission



Comment 4

Great effort in giving a description about the products

PAGE 6



Comment 5

screenshots which identifies the datatypes of attributes could have been included

PAGE 7

PAGE 8



Comment 6

well done

PAGE 9

PAGE 10

**Comment 7**

most of the relationships are well identified. However the supplier table doesn't seem to have any other entities related

**Comment 8**

most of the entities along with primary key well identified

**Comment 9**

cardinality between entities are not mentioned

GRADING FORM: DC_IWD

ELISEDD EVANS**62****ENG. WITH LITERATURE SKILLS***Materials to support the development of the database system*

The report could be improved by incorporating more academic references (e.g., textbooks, peer-reviewed articles) to strengthen the theoretical underpinnings of the database design.

2**KNOWLEDGE&UNDERSTANDING SKILLS***ERD Description of tables with field names, datatypes, and constraints*

A deeper focus on normalization would help reduce redundancy, particularly in the customer

and order tables.

Exploring more complex relationships, such as Many-to-Many between Orders and Products using junction tables, could improve scalability for future growth.

22

PRACTICAL APPLICATION SKILLS

populate database, Implementation with primary key, foreign key, Validation rules Forms Queries Reports



User-friendly forms and well-organized reports demonstrate thoughtful design, making it easy to navigate the database. Adding data validation in forms (e.g., preventing negative stock levels or incorrect inputs) would enhance the system's reliability and data accuracy.

30

TRANSFERRABLE SKILLS

• Readability of the report. • Written quality, including spelling and grammar and the use of appropriate formal language. • Structure and presentation including screenshots of the report. • Critical evaluation of the selected database methods, tools and techniques and their deployment.



The report is well-structured however practical application of database management techniques, such as conditional formatting, could reflect a solid understanding of real-world business challenges.

8