ONLINE SHOPPING CART - MANILAM

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Abstract

Online Shopping Cart has become a necessity rather than a luxury. Our software product is aimed at making the process of buying products online from the website as enjoyable and satisfying as the offline version . [5][6]

As part of our Database Management System (DBMS) and Software Engineering Course we are developing this mini-project to realize the above necessity.

We hope that our product can be extensively used by clients who require to sell products online and provide customer satisfaction.

Keywords used: Online Shopping Cart, DBMS, Users, Suppliers, Godowns, Offers, Orders History

1   INTRODUCTION

Online Shopping Cart Website enables Visitors to view products and Registered Users to buy products by adding their products to the online shopping cart available to them.
The online shopping cart is a user-friendly model of website which enables users to buy products in a streamlined fashion. **Users also should be able redeem coupons and get offers on products.**

1.1   What is Expected of the Software?

- A good GUI FrontEnd enabling the Users to smoothly transition across pages.
- Extensive and Sound Database Design
- Reducing Redundancy in the Data Tables.
- Options to Filter or View Entire Orders History.

1.2   What is Expected of the Project?

- To learn and understand the various process techniques involved in Software Development.
- To collabrate and work as a team for effective problem solving and high quality assurance.
- To meet the deadline by conforming to the timeframe designated for each phase.
- To do extensive testing to uncover errors and correct them.

2 SOFTWARE REQUIREMENTS SPECIFICATION

- Visitors can view products , but cannot buy them until they register as a User.

- Registered Users should be able to view and update their profile details.

- Users should be able to login in to view, add products and checkout.

- Users should also be able to avail available offers on any of the orders.

- Users should be able to view the entire transactional orders history shown in descending order.

- Users should be able to filter their transactional orders history on basis of various criteria.

- Administrator should be able to add/edit/delete products,product categories, suppliers, godowns, users.

- Administrator should be able to make buy orders from Suppliers to Godowns.

3 DESIGN

3.1 ER Modelling

3.1.1 Entities

Following are the Entities described in the ER Model :

- Users

- Products

- Category

- Suppliers

- Godowns

- Offers

3.1.2 Relationships

- Order (User-Product)

- Avail (Order-Offers)

- Has (Product-Category)

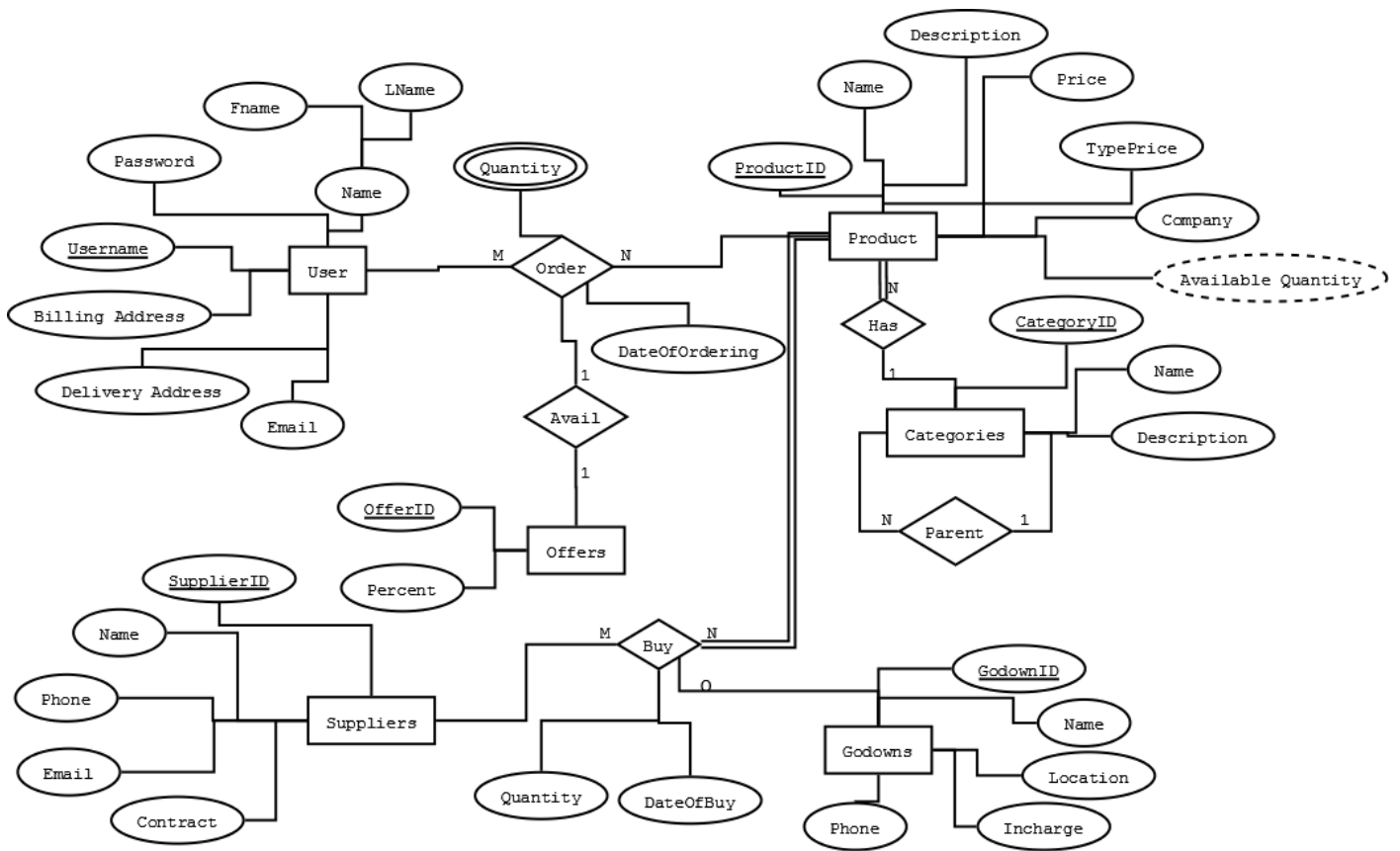- Parent (Category-Category)

- Buy (Supplier-Godown-Product)

Figure 1: ER Diagram for ONLINE SHOPPING CART MANILAM

3.2 Conversion of ER to Tables with Normalization

After converting the ER into tables we get the following tables after 1NF,2NF,3NF Normalization

- Users
  Attributes - uid varchar(50),password varchar(50),fname varchar(50),lname varchar(50),phone varchar(11),email varchar(100),billadd varchar(250),deladd varchar(250)
  Primary Key - uid

- Products
  Attributes - pid int,pname varchar(100),price int,typeprice varchar(10),company varchar(100), description text,cid int,available int
  Primary Key - pid

- Categories
  Attributes - cid int,pcid int,cname varchar(100),description text
  Primary Key - cid

- Cart
  Attributes - uid varchar(50),pid int,quantity int
  Primary Key - uid,pid

- Orders
  Attributes - tid int,uid int,orderdate timestamp,oid varchar(10)
  Primary Key - tid

- OrdersDetails
  Attributes - tid int,pid int,quantity int
  Primary Key - tid,pid

- Suppliers
  Attributes - sid int,name varchar(50),phone varchar(12),email varchar(50),contract int
  Primary Key - sid

- Godowns
  Attributes - gid int,name varchar(50),location varchar(50),phone varchar(12),incharge varchar(50)
  Primary Key - gid

- Buy
  Attributes - sid int,gid int,pid int,quantity int,dateofbuy timestamp
  Primary Key - sid,gid,pid

- Offers
  Attributes - ocode varchar(10),used int,percent int
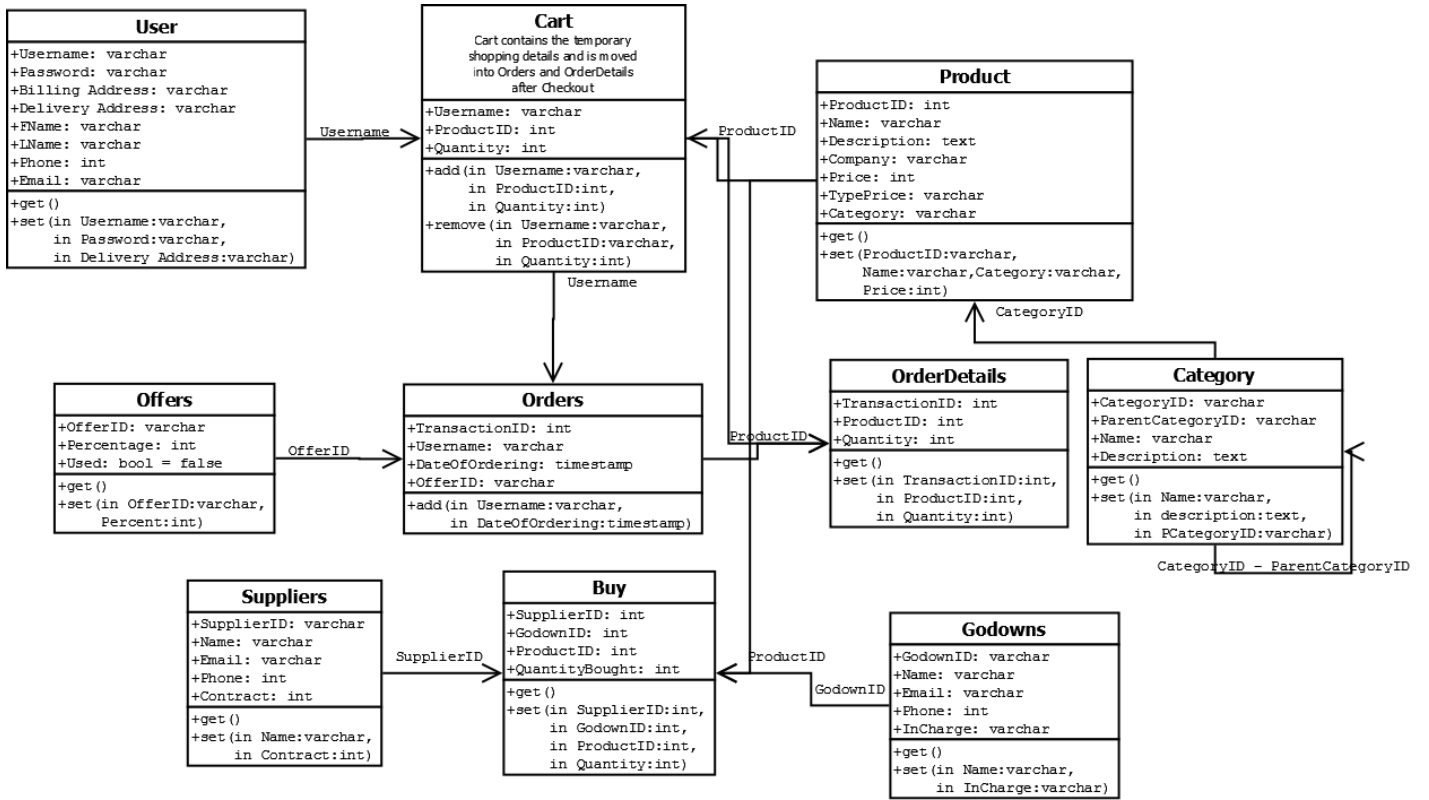 Primary Key - ocode

User

+Username: varchar
+Password: varchar
+Billing Address: varchar
+Delivery Address: varchar
+FName: varchar
+LName: varchar
+Phone: int
+Email: varchar

+get()
+set(in Username:varchar,
    in Password:varchar,
    in Delivery Address:varchar)

Cart

Cart contains the temporary
shopping details and is moved
into Orders and OrderDetails
after Checkout

+Username: varchar
+ProductID: int
+Quantity: int

+add(in Username:varchar,
    in ProductID:int,
    in Quantity:int)
+remove(in Username:varchar,
    in ProductID:varchar,
    in Quantity:int)

Product

+ProductID: int
+Name: varchar
+Description: text
+Company: varchar
+Price: int
+TypePrice: varchar
+Category: varchar

+get()
+set(ProductID:varchar,
    Name:varchar,Category:varchar,
    Price:int)

Offers

+OfferID: varchar
+Percentage: int
+Used: bool = false

+get()
+set(in OfferID:varchar,
    Percent:int)

Orders

+TransactionID: int
+Username: varchar
+DateOfOrdering: timestamp
+OfferID: varchar

+add(in Username:varchar,
    in DateOfOrdering:timestamp)

OrderDetails

+TransactionID: int
+ProductID: int
+Quantity: int

+get()
+set(in TransactionID:int,
    in ProductID:int,
    in Quantity:int)

Category

+CategoryID: varchar
+ParentCategoryID: varchar
+Name: varchar
+Description: text

+get()
+set(in Name:varchar,
    in description:text,
    in PCategoryID:varchar)

CategoryID - ParentCategoryID

Suppliers

+SupplierID: varchar
+Name: varchar
+Email: varchar
+Phone: int
+Contract: int

+get()
+set(in Name:varchar,
    in Contract:int)

Buy

+SupplierID: int
+GodownID: int
+ProductID: int
+QuantityBought: int

+get()
+set(in SupplierID:int,
    in GodownID:int,
    in ProductID:int,
    in Quantity:int)

Godowns

+GodownID: varchar
+Name: varchar
+Email: varchar
+Phone: int
+InCharge: varchar

+get()
+set(in Name:varchar,
    in InCharge:varchar)

Username   ProductID   Username   OfferID   ProductID   SupplierID   ProductID   GodownID

Figure 2: UML Class Diagram for MANILAM Shopping Cart

3.3   Normal Forms of Tables and Explanation

- All the Strong Entities were mapped to a Table.

- The Relationships which has 1:N / N:1 cardinality didn't need a new table.

- Relationships which had M:N and M:N:O cardinality required a new table.

- Orders was split into two Orders and OrdersDetails to conform with 2NF.

- TransactionID was introduced in Orders and OrderDetails for query optimization but is not necessary.

- Cart is the temporary holding place of products for each user ,not mentioned in the ER but required in the Implementation Phase.

- The conversion of ER into Relational Tables was done in Single Iteration since the project is small and simple.

4 IMPLEMENTATION

4.1 Technology and Software Tools Used

- MySQL - Database Management System (DBMS).
- PHP - Server Side Scripting Language.
- Apache2 - Web Server.
- XAMPP - Simulating Apache2, MySQL in Windows.

4.2 Pages Created and SQL Queries Used

The following pages were created in PHP Language using the free and open-source NotePad++ Editor.

4.2.1 register.php

Visitors can register themselves by providing an Username and Password. Validation is implemented.

4.2.2 index.php

The first page to be visited by the User for logging in to the Shopping Cart.The user is authenticated by requesting his Username and Password.
There are two types of Users

- **Administrator** - Username(admin) has the admin rights to add,edit,delete various parts of the online website elements like Users,Products,Categories,Suppliers,Godowns and Buy Orders from Suppliers etc.
- **Registered User** - He can view products according to their categories and view their details , add products to cart , change quantities of products and checkout for payment.

Figure 3: User Profile View and Update

4.2.3 user.php

The User profile having details like Name,.... are shown with the option of updating the profile if necessary.

Queries Used

- select * from users where uid='uid'

LogOut

Products   Categories   Godowns   Suppliers   Buy from Supplier
Edit User Profile   Display and Confirm Products   View Order History

Product

Product Name :	Cricket Shoe
Description :	Reliable and Durable
Price :	4900
Price Type (kg/piece) :	Piece
Company :	Adidas
Category :	Sports_Equipment

Add

Product Name	Description	Price	Price Type (kg/piece)	Company	Category	Edit	Delete
Micromax M456	Micromax is good and durable	5000	Piece	Micromax	Mobile Phones	Edit	Delete
Lenovo Think Pad	Good Quality,4 GB Ram,320 GB hard Disk	32000	Piece	Lenovo	Laptops	Edit	Delete
Dell Inspiron	Good Quality,4 GB Ram,320 GB hard Disk,I3 Processor	35000	Piece	Dell	Laptops	Edit	Delete
Dell	Good Quality,4 GB Ram,320 GB hard Disk	28000	Piece	Dell	Desktop	Edit	Delete
Lenovo	Good Quality,4 GB Ram,320 GB hard Disk,I3 Processor	27000	Piece	Lenovo	Desktop	Edit	Delete
Nokia 1200	Good Quality,Good Battery Back_up	1200	Piece	Nokia	Basic Model Phones	Edit	Delete
Samsung Wave 525	Good Quality,Good Battery Back_up	6200	Piece	Samsung	Touch Screen Mobiles	Edit	Delete
Pochampalli Sarees	Good Quality,Durable	2000	Piece	Pochampally Handlooms	Sarees	Edit	Delete
Denizen Jeans	Good Quality,Durable	1200	Piece	Levis	Jeans	Edit	Delete
Anarkali Chudidaars	Good Quality,Durable	700	Piece	Neerus	Chudidaars	Edit	Delete
Reebok Jeans	Good Quality,Durable	3000	Piece	Reebok	Jeans	Edit	Delete
Denizen T_Shirts	Good Quality,Durable	500	Piece	Levis	T_shirts	Edit	Delete
Reebok T_Shirts	Good Quality,Durable	700	Piece	Reebok	T_shirts	Edit	Delete
Banares Sarees	Good Quality,Durable	1300	piece	Charmas	Sarees	Edit	Delete
Toshiba	Good Quality,Durable	26000	Piece	Toshiba	Computers	Edit	Delete
Rice Cooker	Good Quality,Durable	3400	Piece	Ganga	Electronics	Edit	Delete
Salwar Kameez	Looks good on you !! Come and buy	1200	Piece	Ushars	Chudidaars	Edit	Delete

Figure 4: Product Add/Delete/Edit

4.2.4   prod.php - (Only for Administrator)

Display / Add / Edit / Delete Products and assign Product Categories

Queries Used

- insert into prod ("vl") values ("v")
- delete from prod where pid='pid'
- select * from prod where pid='pid'
- select cid,cname from categories order by cname
- select * from prod
- select cid,cname from categories where cid='cid'

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Figure 5: Category Add/Delete/Edit

4.2.5 cat.php - (Only for Administrator)

Display / Add / Edit / Delete Product Categories

Queries Used

- select cid,cname from categories where pcid='cid'

- delete from categories where cid='cid'

- select * from categories where cid='cid'

Figure 6: Supplier Add/Delete/Edit

4.2.6   suppliers.php - (Only for Administrator)

Display / Add / Edit / Delete Suppliers

Queries Used

- insert into suppliers (".vl.") values (".v.")

- delete from suppliers where sid='sid'

- select * from suppliers where sid='sid'

- select sid,cname from suppliers order by cname

- select * from suppliers

4.2.7   godowns.php - (Only for Administrator)

Display / Add / Edit / Delete Godowns

Queries Used

- insert into godowns (".vl.") values (".v.")

- delete from godowns where gid='gid'

- select * from godowns where gid='gid'

- select gid,cname from godowns order by cname

- select * from godowns

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Figure 7: Buying of Products from Supplier into Godown

4.2.8 buy.php -(Only for Administrator)

Record (Billing) the buying of products from the suppliers and placing them in the godowns.

Queries Used

- insert into buy (sid,gid,pid,quantity) values (POST[sid],POST[gid],POST[pid],POST[quantity])
- select sid,name from suppliers
- select gid,name from godowns
- select pid,pname from prod
- select s.sid,p.pid,g.gid,s.name as sname,p.pname,g.name as gname,b.quantity,b.dateofbuy from buy b join suppliers s on b.sid=s.sid join godowns g on b.gid=g.gid join prod p on p.pid=b.pid order by dateofbuy desc

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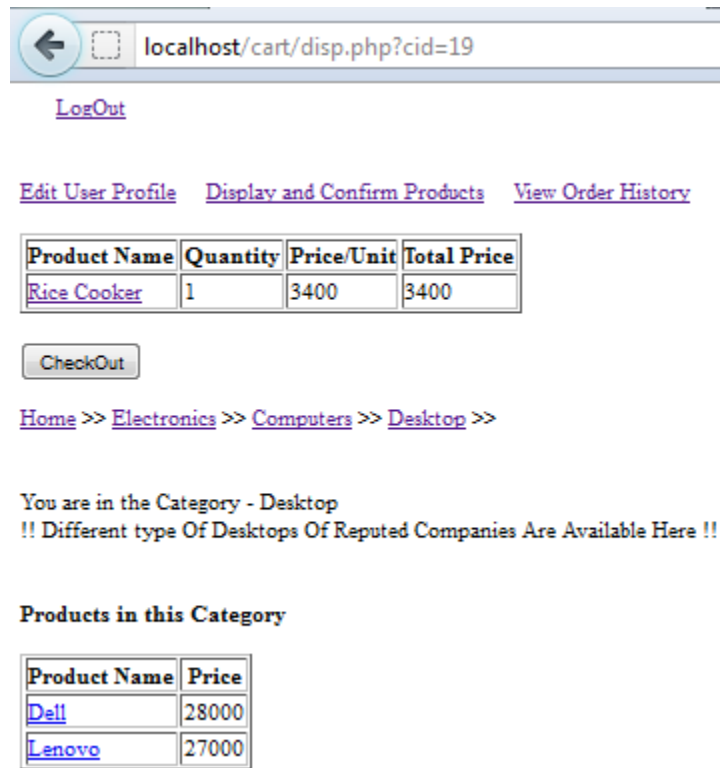
Figure 8: Display of Products with Cart

4.2.9 disp.php

Displays the various home categories where from sub-categories can be navigated or product details can be viewed and added/removed from cart for check out.

Queries Used

- insert into cart (uid,pid,quantity) values ('uid','apid','quant')

- delete from cart where uid='uid' and pid='apid'

- select p.price,p.pid,p.pname,c.quantity from cart c join prod p on c.pid=p.pid where c.uid='uid'

- select * from categories where cid='cid'

- select * from categories where pcid='cid'

- select * from categories where cid='ccid'

- select * from prod where cid='cid'

- select * from prod where pid='pid'

- select * from categories where cid='ccid'
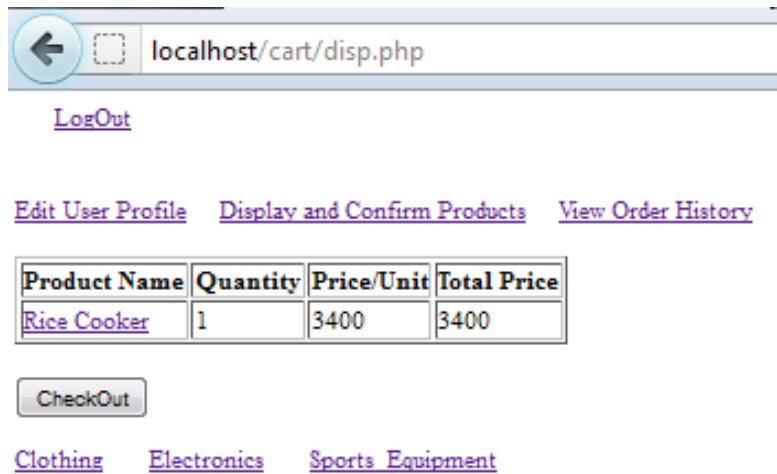
Figure 9: Cart and the Checkout Option

4.2.10 cart.php

This shows the user with the products added to the cart and the option to modify the quantities of any of the products.

Queries Used

- select p.price,p.pid,p.pname,c.quantity from cart c join prod p on c.pid=p.pid where c.uid='uid'
- select sum(c.quantity*p.price) as total from cart c join prod p on p.pid=c.pid where c.uid='uid'

4.2.11 confirmcart.php

Confirmed page notifying the user that the products will be delivered to the Delivery Address and billed at the Billing Address.

Queries Used

- select * from offers where ocode='ocode' and used=0
- select * from cart where uid='uid'
- insert into ordersdetails (tid,pid,quantity) values (tid,".mysqlresult(res,i,"pid")."', '".mysqlresult(res,i,"quantity").")
- delete from cart where uid='uid'
- select * from users where uid='uid'

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4.2.12 ordersview.php

Orders History is shown to user containing all the Orders he ordered in descending order since the creation of the user account. Users can filter the orders history based on various criteria like

- None - Show ALL the orders
- Products Only - Show orders having the selected product in them.
- Category Only - Show orders having products from that direct category in them.
- Total Cost more than Y - Show orders whose total cost of the orders is greater than Y
- Number of Items more than Y - Show orders whose total count is more than Y.

Queries Used :

- select * from prod order by pname
- select * from categories order by cname
- select * from orders o where o.uid='uid' and exists(select * from ordersdetails d where d.tid=o.tid and d.pid=val) order by o.orderdate desc
- select * from orders o where o.uid='uid' and exists(select * from ordersdetails d join prod p on p.pid=d.pid where p.cid=val and d.tid=o.tid) order by o.orderdate desc"
- select * from orders o join ordersdetails d on o.tid=d.tid join prod p on p.pid=d.pid where o.uid='uid' group by d.tid having sum(p.price*d.quantity)¿val order by o.orderdate desc
- select * from orders o join ordersdetails d on o.tid=d.tid where o.uid='uid' group by d.tid having count(*)¿=val order by o.orderdate desc
- select * from orders where uid='uid' order by orderdate desc
- select * from orders where uid='uid' order by orderdate desc
- select * from ordersdetails o join prod p on o.pid=p.pid where tid='tid'
- select sum(o.quantity*p.price) as total from ordersdetails o join prod p on o.pid=p.pid where tid='tid'

LogOut

Edit User Profile   Display and Confirm Products   View Order History

Order History Details

Filter by the following

| None ▾ |

Products Only : Anarkali Chudidaars ▾
Direct Category Only : Basic Model Phones ▾
Total Cost more than ... : 0
Order having items more than or = ... : 0

[Filter]

Order ID and Date of Ordering	Details of Ordering	Total Cost of Ordering
14 -> Ordered on 2012-04-13 15:14:11	Anarkali Chudidaars - 4 Piece - Rs.700 per Piece	2800
7 -> Ordered on 2012-04-13 02:02:02	Pochampalli Sarees - 7 Piece - Rs.2000 per Piece	14000
4 -> Ordered on 2012-04-13 01:53:20	Lenovo Think Pad - 1 Piece - Rs.32000 per Piece Samsung Wave 525 - 1 Piece - Rs.6200 per Piece Reebok Jeans - 2 Piece - Rs.3000 per Piece Reebok T_Shirts - 4 Piece - Rs.700 per Piece Rice Cooker - 1 Piece - Rs.3400 per Piece	50400

select * from orders where uid='manik' order by orderdate desc
select sum(o.quantity*p.price) as total from orders_details o join prod p on o.pid=p.pid where tid='14'
select sum(o.quantity*p.price) as total from orders_details o join prod p on o.pid=p.pid where tid='7'
select sum(o.quantity*p.price) as total from orders_details o join prod p on o.pid=p.pid where tid='4'

Figure 10: OrdersView History with None Applied Filters

LogOut

Edit User Profile   Display and Confirm Products   View Order History

Order History Details

Filter by the following

| Product Only ▾ |

Products Only : Reebok T_Shirts ▾
Direct Category Only : Basic Model Phones ▾
Total Cost more than ... : 0
Order having items more than or = ... : 0

[Filter]

Order ID and Date of Ordering	Details of Ordering	Total Cost of Ordering
4 -> Ordered on 2012-04-13 01:53:20	Lenovo Think Pad - 1 Piece - Rs.32000 per Piece Samsung Wave 525 - 1 Piece - Rs.6200 per Piece Reebok Jeans - 2 Piece - Rs.3000 per Piece Reebok T_Shirts - 4 Piece - Rs.700 per Piece Rice Cooker - 1 Piece - Rs.3400 per Piece	50400

select * from orders o where o.uid='manik' and exists(select * from orders_details d where d.tid=o.tid and d.pid=14) order by o.orderdate desc
select * from orders o where o.uid='manik' and exists(select * from orders_details d where d.tid=o.tid and d.pid=14) order by o.orderdate desc
select sum(o.quantity*p.price) as total from orders_details o join prod p on o.pid=p.pid where tid='4'

Figure 11: OrdersView History with Product Only Filter

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localhost/cart/ordersview.php

LogOut

Edit User Profile   Display and Confirm Products   View Order History

Order History Details

Filter by the following
Direct Category Only
Products Only : Anarkali Chudidaars
Direct Category Only : Basic Model Phones
Total Cost more than ... : 0
Order having items more than or = ... : 0
Filter

Order ID and Date of Ordering	Details of Ordering	Total Cost of Ordering
7 -> Ordered on 2012-04-13 02:02:02	Pochampalli Sarees - 7 Piece - Rs.2000 per Piece	14000

select * from orders o where o.uid='manik' and exists(select * from orders_details d join prod p on p.pid=d.pid where p.cid=13 and d.tid=o.tid) order by o.orderdate desc
select * from orders o where o.uid='manik' and exists(select * from orders_details d join prod p on p.pid=d.pid where p.cid=13 and d.tid=o.tid) order by o.orderdate desc
select sum(o.quantity*p.price) as total from orders_details o join prod p on o.pid=p.pid where tid='7'

Figure 12: OrdersView History with Direct Category Only Filter

localhost/cart/ordersview.php

LogOut

Edit User Profile   Display and Confirm Products   View Order History

Order History Details

Filter by the following
Total Cost More than ...
Products Only : Anarkali Chudidaars
Direct Category Only : Basic Model Phones
Total Cost more than ... : 10000
Order having items more than or = ... : 0
Filter

Order ID and Date of Ordering	Details of Ordering	Total Cost of Ordering
7 -> Ordered on 2012-04-13 02:02:02	Pochampalli Sarees - 7 Piece - Rs.2000 per Piece	14000
4 -> Ordered on 2012-04-13 01:53:20	Lenovo Think Pad - 1 Piece - Rs.32000 per Piece Samsung Wave 525 - 1 Piece - Rs.6200 per Piece Reebok Jeans - 2 Piece - Rs.3000 per Piece Reebok T Shirts - 4 Piece - Rs.700 per Piece Rice Cooker - 1 Piece - Rs.3400 per Piece	50400

select * from orders o join orders_details d on o.tid=d.tid join prod p on p.pid=d.pid where o.uid='manik' group by d.tid having sum(p.price*d.quantity)>10000 order by o.orderdate desc
select * from orders o join orders_details d on o.tid=d.tid join prod p on p.pid=d.pid where o.uid='manik' group by d.tid having sum(p.price*d.quantity)>10000 order by o.orderdate desc
select sum(o.quantity*p.price) as total from orders_details o join prod p on o.pid=p.pid where tid='7'
select sum(o.quantity*p.price) as total from orders_details o join prod p on o.pid=p.pid where tid='4'

Figure 13: OrdersView History with Total Cost Filter

localhost/cart/ordersview.php

LogOut

Edit User Profile   Display and Confirm Products   View Order History

Order History Details

Filter by the following
Orders having items more than ....
Products Only : Anarkali Chudidaars
Direct Category Only : Basic Model Phones
Total Cost more than ... : 10000
Order having items more than or = ... : 2
Filter

Order ID and Date of Ordering	Details of Ordering	Total Cost of Ordering
4 -> Ordered on 2012-04-13 01:53:20	Lenovo Think Pad - 1 Piece - Rs.32000 per Piece Samsung Wave 525 - 1 Piece - Rs.6200 per Piece Reebok Jeans - 2 Piece - Rs.3000 per Piece Reebok T Shirts - 4 Piece - Rs.700 per Piece Rice Cooker - 1 Piece - Rs.3400 per Piece	50400

select * from orders o join orders_details d on o.tid=d.tid where o.uid='manik' group by d.tid having count(*)>=2 order by o.orderdate desc
select sum(o.quantity*p.price) as total from orders_details o join prod p on o.pid=p.pid where tid='4'

Figure 14: OrdersView History with Total Count Filter

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5 TESTING

- Unit Testing
  Each individual PHP page was tested for its functionality of insert/delete/edit/view. Boundary Conditions, Error Handling Code (Database Error), User Authentication etc were checked.

- Integration Testing
  All the PHP files were put together using the Menu Bar on each page. Then the Integration Test was run. Visitors were made to register as Users , then update their profile, view products , add them to the online shopping cart, modify the quantity values of the products , checkout and view orders history. The test failed and we found some bugs like quantity value was not updating on confirmcart.php due a Global Cookie problem which was resolved and the test was run this time successfully.

6 CONCLUSIONS

- The Mini-Project shed light on the various stages involved in the Software Development Process.

- Team Effort and Work Sharing Principles was useful.

- We followed the Waterfall Model since the Project and the Requirements specification were small.

- Development Time of 2 weeks for the Analysis, Design, Implementation and Testing.

- We hope that our Online Shopping Cart Website can find its use in various areas of various fields. Our product is deemed to be successful and innovative in the field of Online Shopping bringing in huge profit to the clients using our software.

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