2021

Information Technology PAT

Contents

Topic

The Children's Hospital Trust is an independent and local non-profit organization situated in Rondebosch, Cape Town. It raises funds to support specific projects and programmes to help advance child healthcare through the Red Cross War Memorial Children's Hospital. The Trust raises funds for the upgrade and expansion of the Hospital's buildings, the purchase of state-of-the-art medical equipment as well as continues providing life-changing and life-saving care for children. The Trust relies on donations and fundraising events in order to fund these needs. The problem that the organization is facing is that the organization is not able to keep track of the donations received, how many volunteers have volunteered in the organization as well as the amount of money has been accumulated from the bake sale.

Solution

The management of Children's Hospital Trust has asked me to develop a software application to manage their operations (Events, Donations and Volunteers) by keeping the records of the bake sale, the donations and the information of the volunteers. This will allow all bake sale orders to be sent out on time as well. The software application will also be able to calculate the amount of money that has been accumulated from donations as well as from the bake sale.
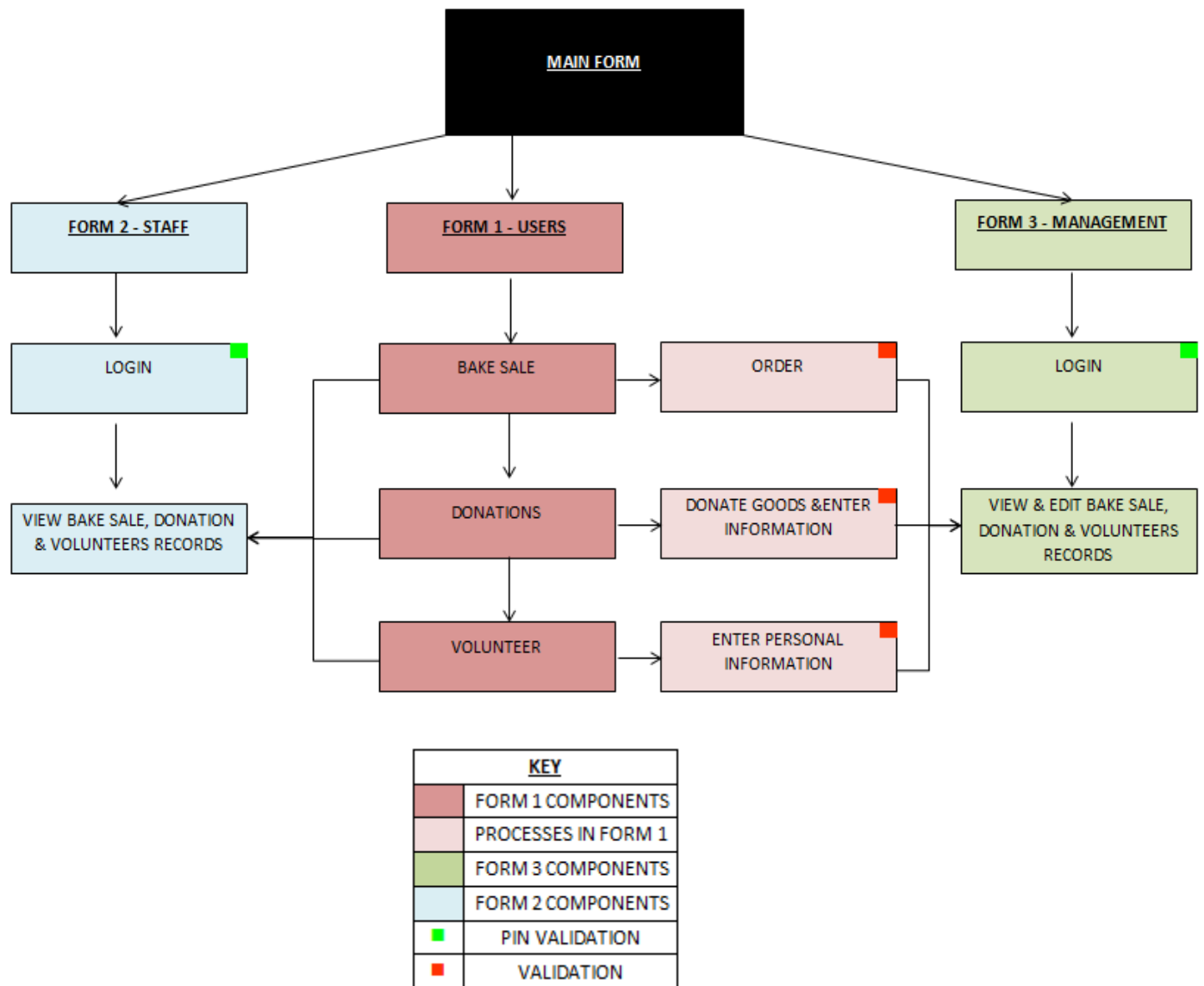
Scope

This system is designed for a locally based organization which will be used by the personnel based in Cape Town; although they may want to expand in the near future.

(207 words)

User Requirements

Role	Activity	Limitations
Client	Clients for the services offered	• Order specific baked goods • Decide whether it will be for a delivery or not • Donate money and goods • Volunteer to work for the Children's hospital programme • View the order that they have placed, view this donations that they have donated, view all the personal information they have entered to be a volunteer.	• Cannot edit other client's information
Manager	Maintain and oversee the processes that happens in the organization	• View all orders • View & edit details of the donator and donations • View & edit records about the volunteer • Delete any records about the donor, client or volunteer that is incorrect. • Add another person's record directly from the organization • Calculate how many money donations were accumulated • Calculate the amount of money the customer has to pay for the order	• No limitations
Staff	Oversee the processes that happens in the organization	• View all the orders • View all the records of the donations received • View all the volunteers records	• Cannot edit information

Navigation

MAIN FORM

FORM 2 - STAFF | **FORM 1 - USERS** | **FORM 3 - MANAGEMENT**

LOGIN | BAKE SALE | ORDER | LOGIN

VIEW BAKE SALE, DONATION & VOLUNTEERS RECORDS | DONATIONS | DONATE GOODS &ENTER INFORMATION | VIEW & EDIT BAKE SALE, DONATION & VOLUNTEERS RECORDS

VOLUNTEER | ENTER PERSONAL INFORMATION

KEY	
	FORM 1 COMPONENTS
	PROCESSES IN FORM 1
	FORM 3 COMPONENTS
	FORM 2 COMPONENTS
■	PIN VALIDATION
■	VALIDATION

Database Design

TABLE 1: BAKE SALE CUSTOMERS

This table will hold the records of all details of the customers that have placed an order.

Attributes	Data Type	Description	Example	Field Size	Constraints
CustID(PK)	Text	Uniquely Identifies a customer	BP16	4	Cannot be null
First_Name	Text	Name of Customer	Bella	20	
Contact_Number	Text	Contact number of Customer	085 452 6325	10	
Address	Text	The address of where the order needs to be delivered	16 Blue Street	30	
Delivery	Boolean: Yes/No	Whether the customer would like a delivery or not	Yes	**	
DateOfDropOff	Date/Time	The date that the order will be collected or delivered	09/05/2021	**	
Total	Text	The total of the order	R25 .00	9	

TABLE 2: ORDERS
This table will hold all the orders that the customer has placed.

This table is linked to Table 1: Bake Sale Customers, in which all orders pertaining to a certain customer will be displayed.

Attributes	Data Type	Description	Example	Field Size	Constraints
OrderID	Text	A unique Number given when an order has been placed	O10	3	No Constraints
Product	Text	The type of delicacy ordered	Chocolate Cake Rainbow Macaroons	225	
Quantity	Number	The quantity of the delicacy	2	2	
Cookie_Pack	Text	The compulsory Pack of cookies	2	2	
CustID(PK)	Text	Uniquely Identifies a customer	BP16	4	

TABLE 3: DONATIONS

This table will hold the Donations that will be received.

Attributes	Data Type	Description	Example	Field Size	Constraints
DonationCustomer(PK)	Text	Uniquely Identifies a donator	BP22	4	Cannot be null
First_Name	Text	Name of Donator	Bella	20	
Last_Name	Text	Surname of Donator	Park	20	
Contact_Number	Text	Contact number of Donator	085 452 6325	20	
Donation	Text	The donation to be donated	Clothing	15	
Other_Donation	Text	Any other non-specified donation	None	15	
Date_Of_DropOff	Text	Date for the goods to be dropped off	16/07/2021	10	

TABLE 4: VOLUNTEERS
This table will store all the information about potential volunteers

Attributes	Data Type	Description	Example	Field Size	Constraints
VolunteerID(PK)	Text	Uniquely Identifies a Volunteer	BP52	4	
First_Name	Text	Name of Volunteer	Bella	20	
Last_Name	Text	Surname of Volunteer	Park	20	
Age	Text	Age of Volunteer	18	2	
DateOfBirth	Text	D.O.B of Volunteer	16/07/2002	10	
Contact_Number	Text	Contact number of Volunteer	085 452 6325	10	
Email	Text	Email of Volunteer	BellaPark@gmail.com	20	Cannot be null
Address	Text	Address of Volunteer	162 Blue Crescent	30	
Education	Text	Education of Volunteer	Claremont High	30	
DateOfApplication	Text	Date of which the application was made	18/04/2021	10	
VolunteeringReason	Text	Reason for volunteering	Would like some volunteer experience and help the community	255	
MedicalConditions	Text	Any medical conditions of Volunteer	Asthma	255	
Medication	Text	Any current medication of Volunteer	Albuterol Inhaler	255	
PreviousVolunteerWork	Text	Any previous work of of Volunteer	None	255	

RELATIONSHIPS

Table Bake Sale Customers and Table Orders will be linked using a common field named CustID.

Parent Table: Bake Sale Customers

Child Table: Bake Sale Orders

Relationship: One - to- Many
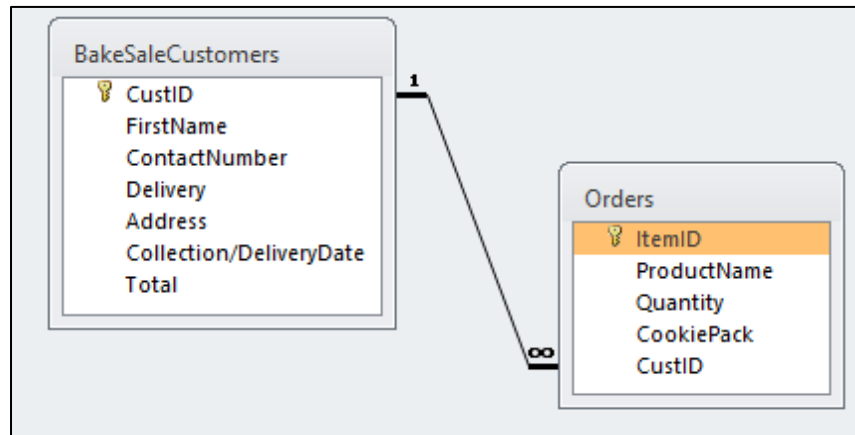
DB DIAGRAM
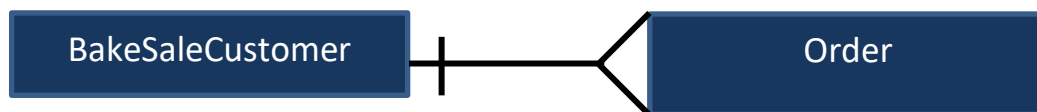
Data Dictionary

<u>Classes</u>

Form 1 - frmRedCrossChildrenHospital - clsRedCross

This will calculate the total that the Customer will have to pay according to what they order. This class will be getting the quantity of each dessert and multiply it by the price of that dessert and display the total on the form. It will instantiate the object (Total) in the class, where it will be able to be called in the main form.

TRedCross			
Attributes	- - -	fQuantity :integer fPrice :real fTotal : real	**Scope:** Private
Methods	+ + + + +	Constructor Create (iQuantity:integer, rPrice: real,rTotal:real; Function CalculateTotal:real; Function getPrice :real procedure setQuantity(iCupcakes,iMeringues,iTrifle,iMacaroons,iCake:integer) ; Function toString: string	**Scope:** Public

<u>Text Files</u>

There will be 3 text files used in the program, namely BakeSaleRecords, VolunteerRecords and DonationRecords.

BakeSaleRecords.txt	• This will effectively record all the orders placed by customers for the organization to view in case a problem occurs in the future. A problem that could occur would be the business being sued for unethical behaviour; these records will be proof of their ethicality.
VolunteerRecords.txt	
DonationRecords.txt	• These records will also be able to be accessed at any given time by the manager if the manager would like to see how many orders have been placed or how many donations were received so that he/ she may roll out a future plan for the organization in terms of improving the state of the organization. These records are static and all information cannot be edited therefore making it more accurate for referencing.

1D ARRAY

There will be a one dimensional array used to check whether the correct password was entered for a specific username. This array is in frmRedCrossStaff .

Name of Array	arrStaffPin
How many elements the array has	10
The data type of the array	String
arrStaffPin: array [1 .. 10] of string = ('RCS2001', 'RCS2002', 'RCS2003', 'RCS2004', 'RCS2005', 'RCS2006', 'RCS20007', 'RCS2008', 'RCS2009', 'RCS2010');	

2D ARRAY

Since the donation verification has been done online, a code will be generated and used to verify their donation when they drop off the donations at a site.

Name of Array	arrCode
How many elements the array has	4 in total
The data type of the array	Integer
arrCode[i, j] := Random(10);	sgdCode.Cells[i, j] := IntToStr(arrCode[i, j])
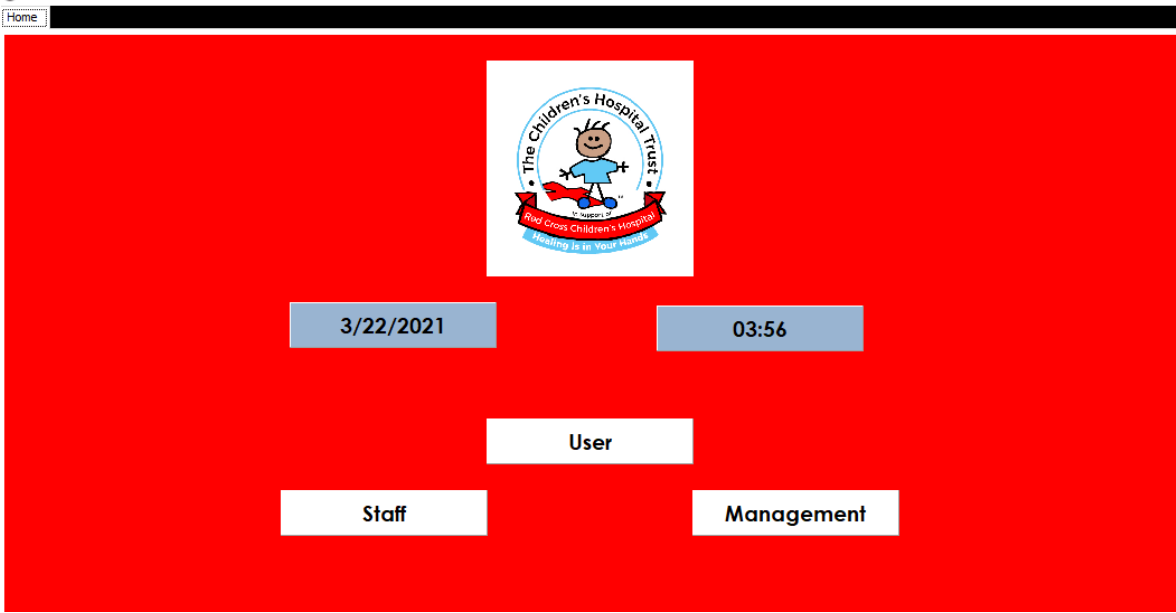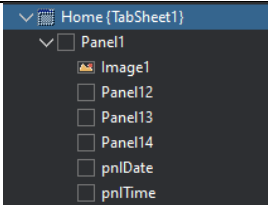
Databases

There will be 1 database (Red Cross Children's Hospital Database.mdb) with 4 tables (Bake Sale, Bake Sale Orders, Donations and Volunteers), two of which are linked using a common field being the CustID (Bake Sale & Bake Sale Orders)

The use of the databases has been explained under database design in this document (Pages: 5-9)

GUI Design

FORM 1 - USERS ONLY

Design:

Purpose/Use:	This is the main form - allowing 3 different users access

Components:	

Data Validation:	NONE

Design:

Purpose/Use:	This form is the menu for users - this allows them to either order from the bake sale, donate or volunteer
Components:	
Data Validation:	NONE

Design:

Purpose/Use:	**The different desserts the user may order**
Components:	
Data Validation:	**Validates whether a cookie pack has been selected or not** **If not selected an error message will appear**
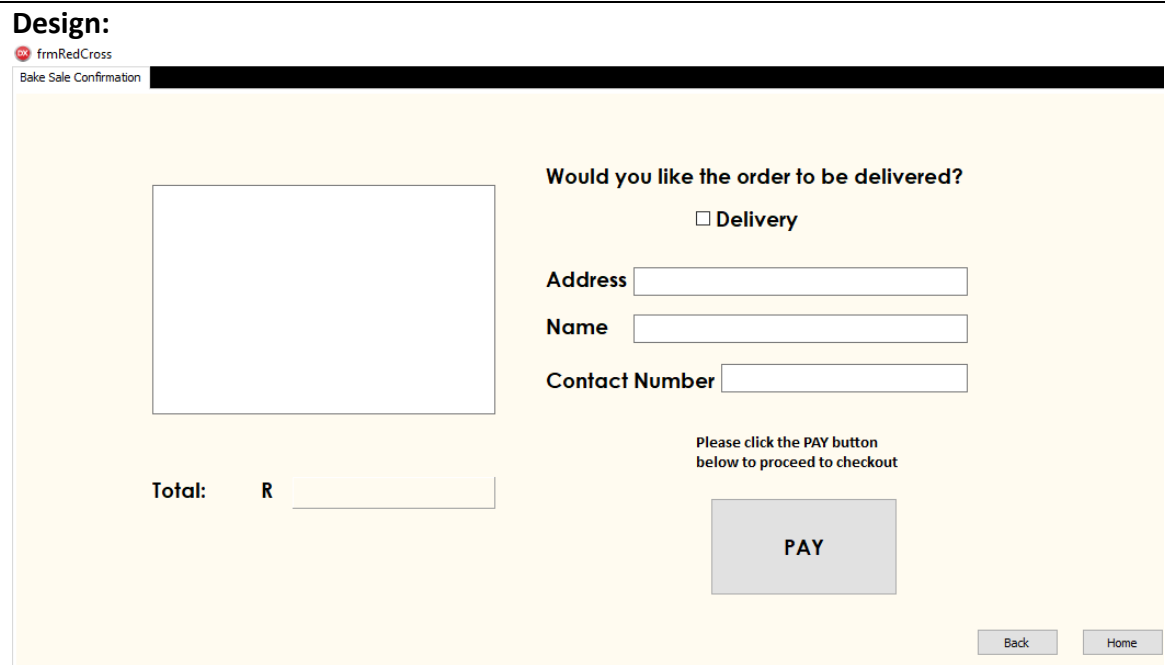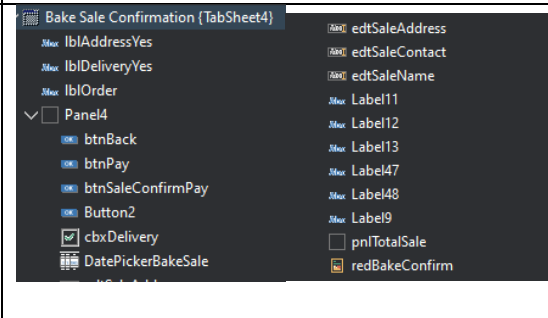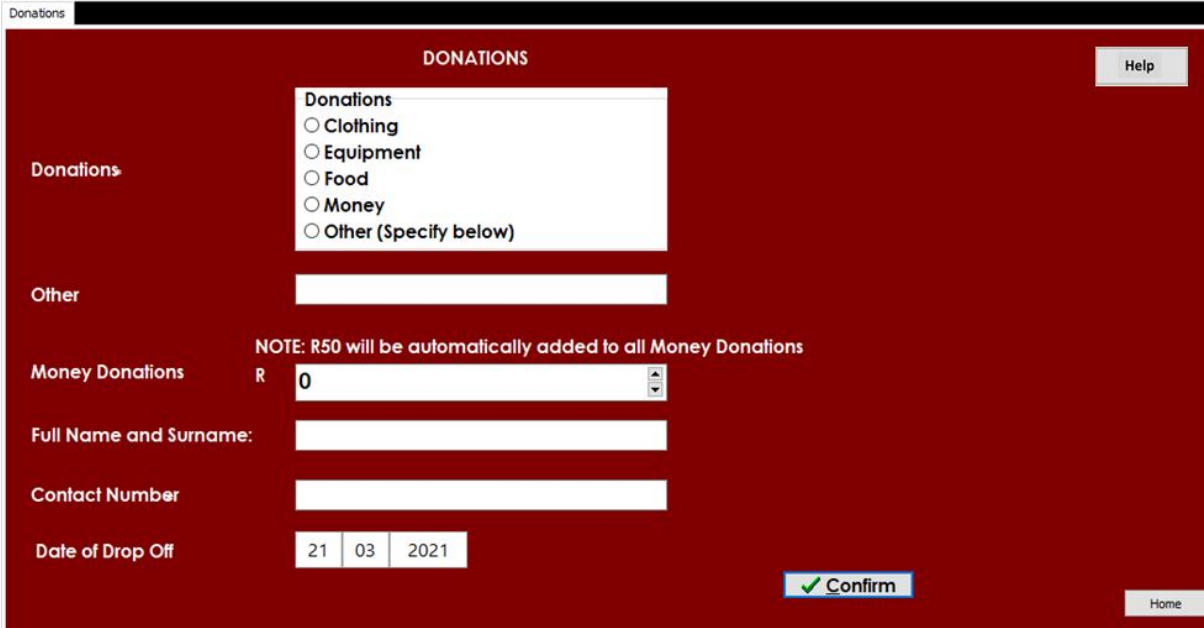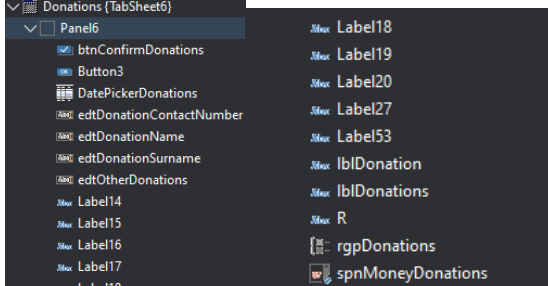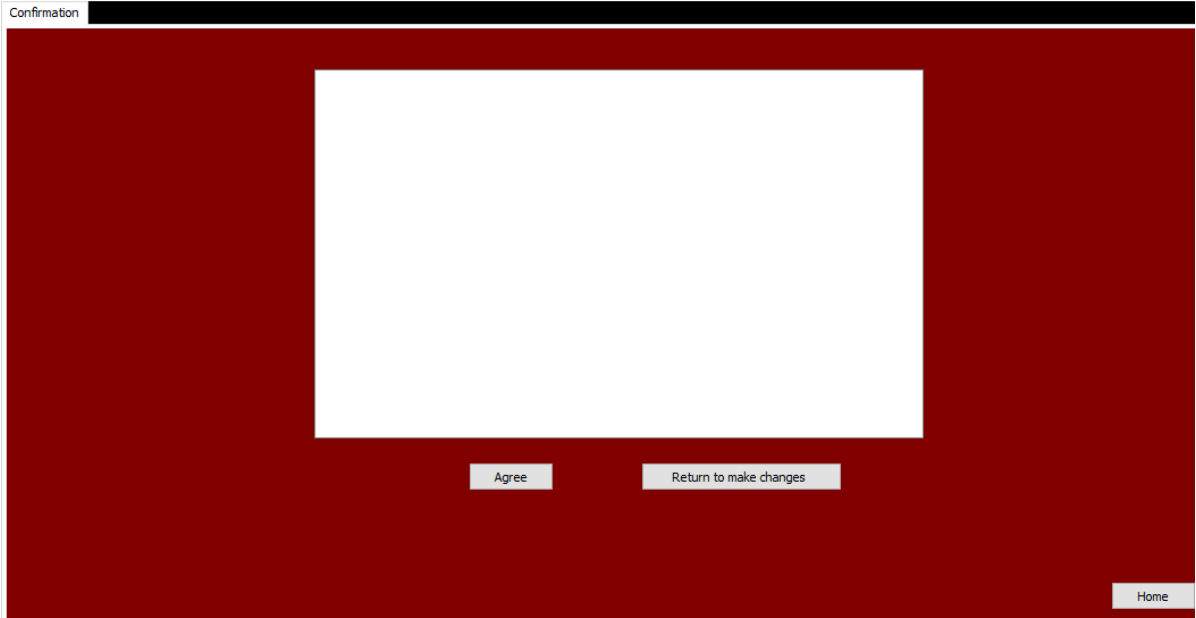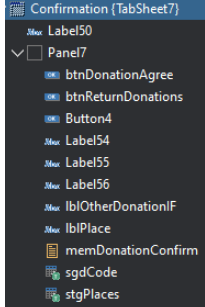
Design:

Purpose/Use:	**A confirmation tab that will appear once an order has been processed**
Components:	
Data Validation:	**Validates whether the name, contact number and address fields are entered.** **Validates that a correct bank account number has been entered.**

Design:

Purpose/Use:	This is a donation tab where users may enter what type of donations they would like to donate.
Components:	
Data Validation:	Validates that a type of donation has been chosen and that all the fields have been correctly entered. Validates that in the contact number field, only numbers may be entered

Design:

Purpose/Use:	**This is the confirmation for users to confirm their donation**
Components:	
Data Validation:	**NONE**

Design:

Purpose/Use:	This is the volunteers tab where users may enter their information if they would like to volunteer
Components:	
Data Validation:	Validates whether all the fields have been entered as well as a correct ID and Email address has been entered.
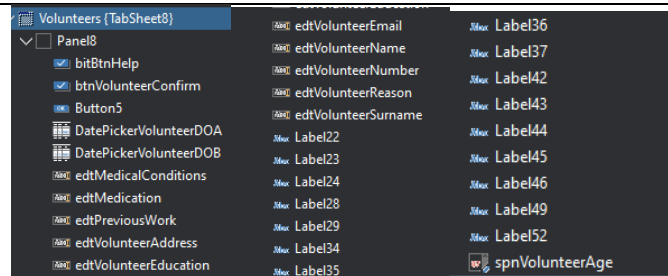
Design:

Purpose/Use:	**A confirmation tab will appear once information has been processed.**
Components:	
Data Validation:	**NONE**
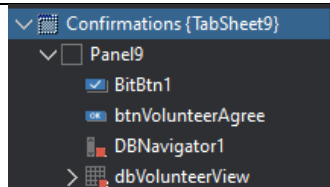
FORM 2 - STAFF ONLY

Design:

Purpose/Use:	**The log in page for staff**
Components:	
Data Validation:	**Validates that the correct password for a specific staff member has been entered**

Design:

Purpose/Use:	Staff may choose what records they would like to see
Components:	
Data Validation:	**Validates whether a password has been entered correctly or not** **If not an error message will appear until the correct password has been entered**

Design:

Purpose/Use:	The staff will be able to see the records related to the bake sale as well as find a specific record
Components:	
Data Validation:	Validates/Locates whether the name is valid and present in the table above

Design:

Purpose/Use:	The staff will be able to see the records related to the donations as well as find a specific record				
Components:					
Data Validation:	**Validates/Locates whether the name is valid and present in the table above**				

Design:

	Purpose/Use:	The above 3 forms- allow the staff to view the records of the bake sale, donations and volunteers.
	Components:	
	Data Validation:	Validates/Locates whether the name is valid and present in the table above

Design:

Purpose/Use:	**Manager Login**
Components:	
Data Validation:	**Validates that the correct password for a specific staff member has been entered**

Design:

Purpose/Use:	**Manager may choose what records they would like to see**
Components:	
Data Validation:	**Validates whether a password has been entered correctly or not** **If not an error message will appear until the correct password has been entered**

Design:

Purpose/Use:	The above 3 forms allow the manager to view and edit records.
Components:	
Data Validation:	NONE

Design:

Purpose/Use:	This form allows the manager to view all the information/records
Components:	
Data Validation:	NONE

Software Tool - IPO

TASK:	INPUT						PROCESSING		OUTPUT		
	General			Validation							
	Source (GUI Component)	Data Type	Format	What	Method	Feedback	What	How	What	Format	Object
	INTERFACE 1										
BAKE SALE	N/A								Date and Time Display	Date (dd/mm/yyyy) Time (hh:mm)	Panel
	Keyboard (Spin Edit for each delicacy)	Integer	Numeric	N/A			Stores the amount of per delicacy ordered	iDelicacy ← spnDelicacies.value	The bake sale order of the customer	Text	Memo
	Mouse Click (cbxCookiePack)	Boolean	True/False	Checked or not	if (cbxCookie1.Checked) OR	'Please select a compulsory Cookie	N/A				

				(cbxCookie2.Checked) then	Pack!'					
Mouse Click (cbxDelivery)	Boolean	True/False	N/A			Stores the name,Delivery Confirmation, contact number of the customer placing an order	sName ←edtName.text sNumber←edtNumber.text delivery ←cbx.Delivery.checked.			
Keyboard (edtAddress, edtName,edtNumber)	String	Text	Empty fields or not	If edtName. text = ' ' then	'Please fill in required fields'	The information the customer entered will be stored in a text file and database which wil be accessed by the management	Write to textfile Database.insert			
Keyboard (edtOtherDonation,edtName, edtContactNumber)	String	Text	Empty fields or not	If edtName. text = ' ' then	'Please fill in required fields'	This will save all the details about the donation in the database and textfile	Database.insert Write to textfile	Donators Information will	Text	Memo

	Mouse Click (dtpDateOfDropOff)	TDate	Regional Settings (dd/mm/yyyy)	N/A (Built in date)			N/A		be displayed	
	Mouse Click (rgpDonation)	Items	ItemIndedx	If no donation type is specified	if rgpDonations = -1 then	'Please Select a donation type'	N/A			
DONATIONS	Keyboard (spnMoney)	integer	Numeric	N/A			The amount of money donated will be calculated to be displayed at a later stage	rTotal←rTotal+rMoney	The amount that the customer has to pay	Text Currency	Panel
	Mouse Click (dtpDOB)	TDate	Regional Settings (dd/mm/yyyy)	N/A (Built in date)			N/A		N/A	N/A	N/A

	Keyboard (edtNumber, edtEmail, edtAddress, edtBackground, edtReason, edtConditions, edtMedication, edtPrevious work)										
VOLUNTEERS		String	Text	If all the fields are not entered	If edtNumber.text= ' ' then	'Please fill in all required fields'	The details of the volunteer will be stored in a textfile and database	Write to textfile Database.insert	Volunteers Information will be displayed	Text	Memo
				Validates Email Address	Loop through email to find @ then Display warning message if not found	'Please enter a correct email address!'					
INTERFACE 2											
MANAGEMENT ACCESS	Keyboard edtUsername, edtPassword)	String	Text	If password is correct	If username is incorrect then Display warning message	'Enter Correct Password !!'	N/A		Records of the bake sale, donation and volunteers	Grid	Data grid

Keyboard (sGuestPassword,sPaymentsPassword,sExtrasPassword)	String	Text	If the Bake Sale Password is correct If the Donation Password is correct If the Volunteer Password is correct	If username is incorrect then Display warning message	'Password Incorrect!!'			N/A	
NO INPUT REQUIRED						Deleting a record from the bake sale records	If sDelete = edtDelete then tblBakeSale.delete		
						Adding an Order to the Donation Records	Insert into database table		
						Determining	SELECT	Displ	Integ	Label

		how many orders for a specific day	* FROM table WHERE Date=15/06/2021	ay amo unt of order s for that day	er Valu e	