



Oman franchisee of global fast food chain adopts a RFID-driven KIOSK ORDERING SYSTEM

Customer self-operated kiosks for visual menu selection
and direct order generation with time-saving convenience

RFID-enabled prepaid customer loyalty cards

Efficient menu management and order management

Customer benefits through discounts and reward points



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TECHNOLOGY

Solution:

EPC Gen2 compliant retail kiosk
and loyalty card solution

Tag Type:

Personna™ UHF Passive

Reader/Antenna:

Xtenna Hybrid™

Method:

Multiple Tracking via Integrated
Reader/Antenna modules
Single Tracking at kiosk

Integration Platform:

RFID Middleware:

Xtenna™ WebToolkit
Xtenna™ Studio

Application: Essen RFID's
Kiosk Ordering System

Database: SQL Server 2005 Exp. ed.

Tag Manufacturer/Supplier:

Essen RFID, with US based chip inlay

Reader/Antenna Manufacturer:

Essen RFID, with US based module

Systems Integrator:

Essen RFID

For further details contact:

Essen RFID

24-B, Jolly Maker II
Nariman Point
Mumbai 400021 India
www.essenrfid.com





CASE STUDY

KEY REQUIREMENTS:

The client is a franchisee for a global fast food restaurant chain and manages a large number of diverse customers every day. While some customers are regular patrons, others are casual visitors who just happen to be in the vicinity. In order to promote business and convert casual visitors into regular customers, the restaurant offers various discounts and reward points to loyal customers, in the process benefitting both restaurant as well as customer. For this purpose the restaurant required a system that would efficiently handle this process, through smart loyalty cards that would be used by customers to bypass long queues at ordering counters and instead self-operate kiosks for ordering their meals.

Main challenges are:

- Proper management of the restaurant's customer list.
- Proper management of menu items and menu schedules.
- Correct applicability of various discount schemes for different categories of eligible customers.
- Efficient order management to ensure quick deliveries to customers.
- Attract potential customers and induce them to become loyalty card holders through visible convenience and time-saving of self-operated kiosks.
- Keeping records of total revenue generated by the restaurant.

SOLUTION:

Essen RFID proposed a loyalty card solution based on RFID technology as the most effective system for running self-operated kiosks. By enabling only registered prepaid loyalty card holders to operate kiosks for ordering their meals, it encourages card membership for regular customers and ensures increased patronage as a preferred location over other competitors in the vicinity.

IMPLEMENTATION:

Loyalty cards with in-built PERSONNA™ RFID tags are provided to customers of the restaurant. The loyalty card carries information regarding customer's details, the tag ID and the NFC ID. The cards carry a prepaid amount and have to be recharged when the balance amount is exhausted. A Xtenna Hybrid™ is placed within the restaurant premises to automatically read the loyalty cards of customers. The system requires network connectivity inside the premises and uses MS SQL Server as the back-end database. The front-end is a touch-driven restaurant menu ordering system that runs on the customer-operated kiosk. The kiosk generates a printed order slip at the restaurant when an order is placed by the customer, and automatically deducts the value of the order from the prepaid loyalty card's balance amount.

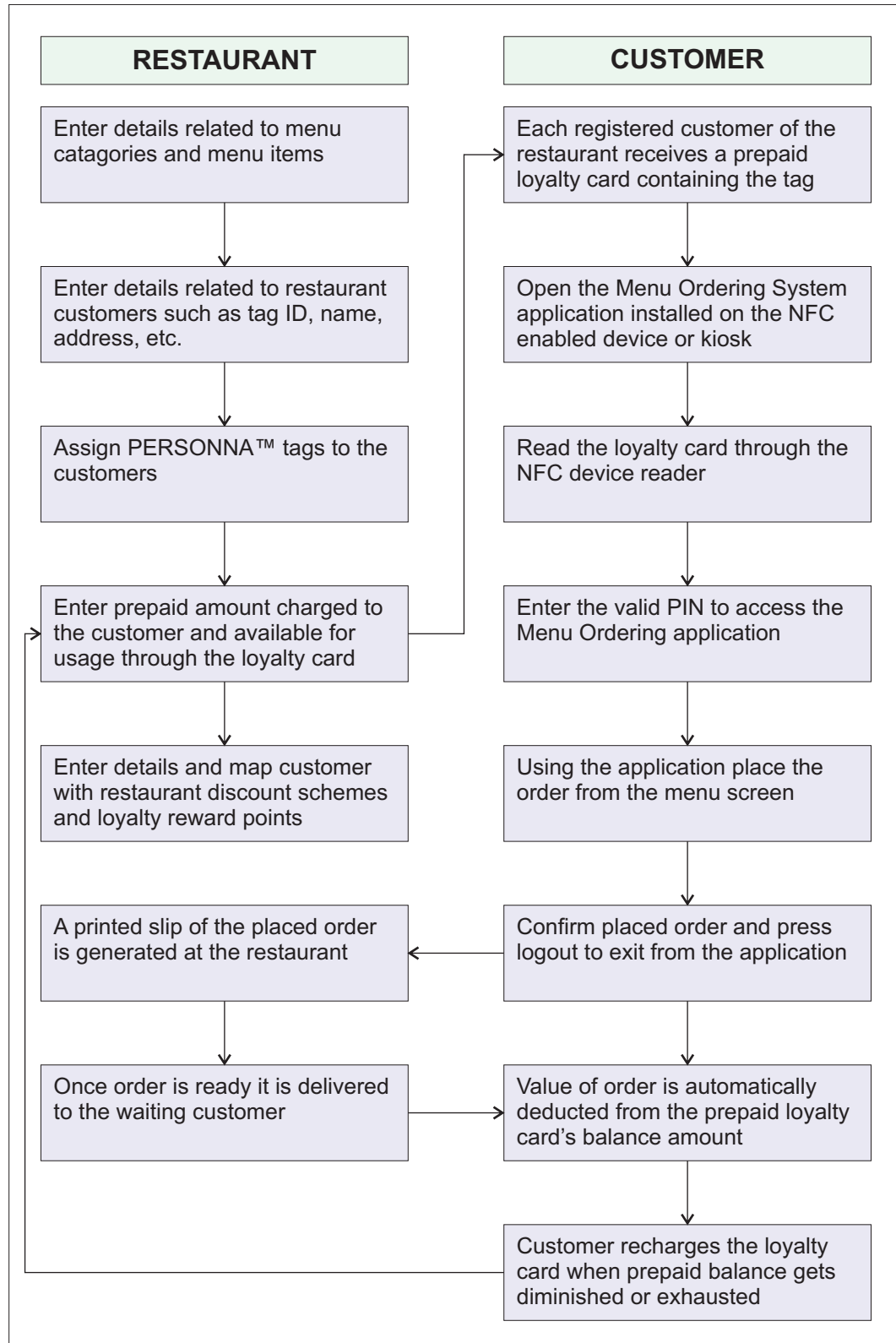


CASE STUDY

WORKING:

Essen RFID's Kiosk Menu Ordering System functions as follows:

Flow Diagram:





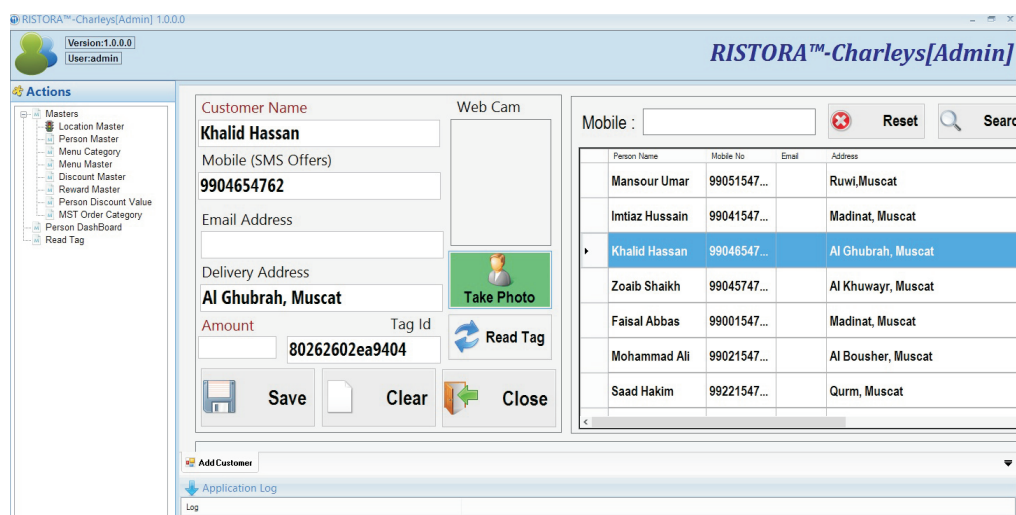
CASE STUDY

Process Flow:

1. A customer loyalty card containing a PERSONNA™ tag is provided to each registered customer. Each tag has unique tag ID and NFC ID associated with it in the database.
2. The administrator operating the Kiosk Menu Ordering System enters data into various modules of the system, such as:



Person Master: Here necessary customer details such as name, address, photograph upload, NFC ID, recharge amount, etc. are entered and saved into the database.



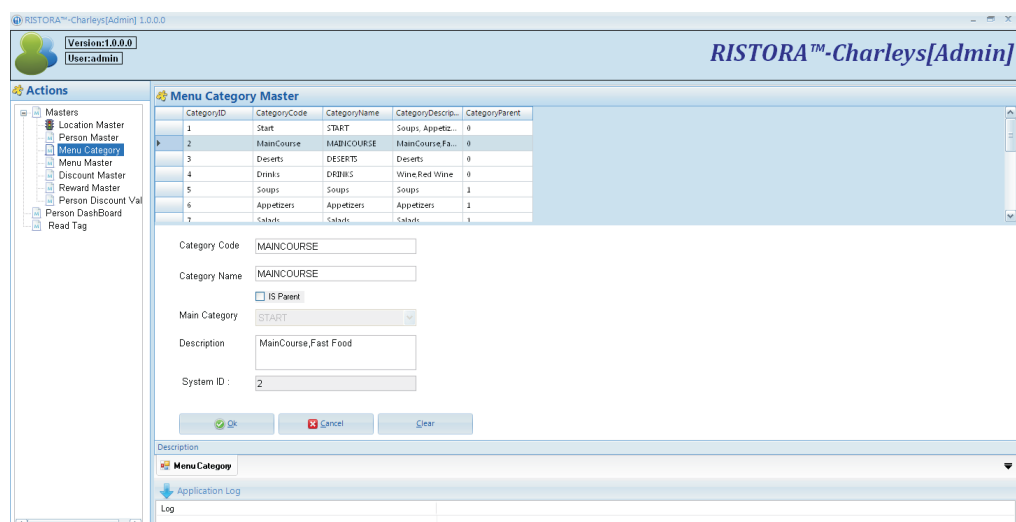
Person Master Form:

- Customer Name: Khalid Hassan
- Mobile (SMS Offers): 9904654762
- Email Address: [Empty]
- Delivery Address: Al Ghubrah, Muscat
- Amount: [Empty]
- Tag Id: 80262602ea9404
- Buttons: Save, Clear, Close, Take Photo, Read Tag

Customer List Table:

Person Name	Mobile No	Email	Address
Mansour Umar	99051547...		Ruwi, Muscat
Imtiaz Hussain	99041547...		Madinat, Muscat
Khalid Hassan	99046547...		Al Ghubrah, Muscat
Zoab Shaikh	99045747...		Al Khuwayr, Muscat
Faisal Abbas	99001547...		Madinat, Muscat
Mohammad Ali	99021547...		Al Bousher, Muscat
Saad Hakim	99221547...		Qurm, Muscat

Menu Category Master: Here the menu categories heads are created in the database, such as appetizers, main course, desserts, drinks, etc. Within these, sub-categories can also be created, e.g. desserts can have a sub-category such as ice creams.



Menu Category Master Form:

- Category Code: MAINCOURSE
- Category Name: MAINCOURSE
- IS Parent: [Checked]
- Main Category: START
- Description: MainCourse, Fast Food
- System ID: 2
- Buttons: OK, Cancel, Clear

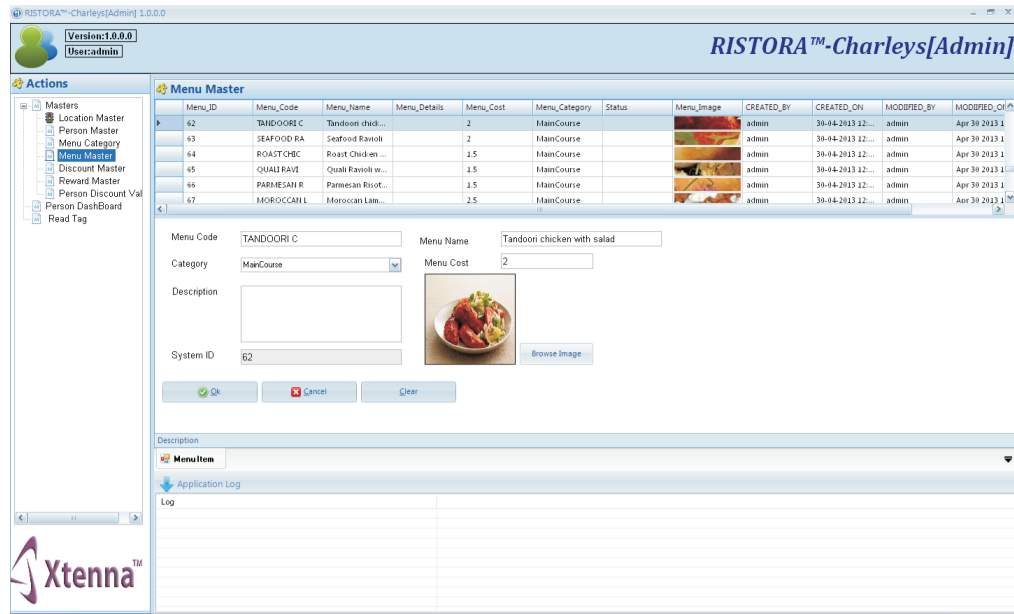
Category List Table:

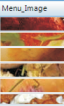





CategoryID	CategoryCode	CategoryName	CategoryDescr...	CategoryParent
1	Start	START	Soups, Appetiz...	0
2	MainCourse	MAINCOURSE	MainCourse Fa...	0
3	Desserts	DESSERT	Desserts	0
4	Drinks	DRINKS	Wine, Red Wine	0
5	Soups	Soups	Soups	1
6	Appetizers	Appetizers	Appetizers	1
7	Salads	Salads	Salads	1




CASE STUDY

Menu Item Master: Here data is entered for each menu item that will be included in the menu list of the restaurant. A menu category is selected for each menu item and then the item name, menu code, item image, etc. are entered into the system database.

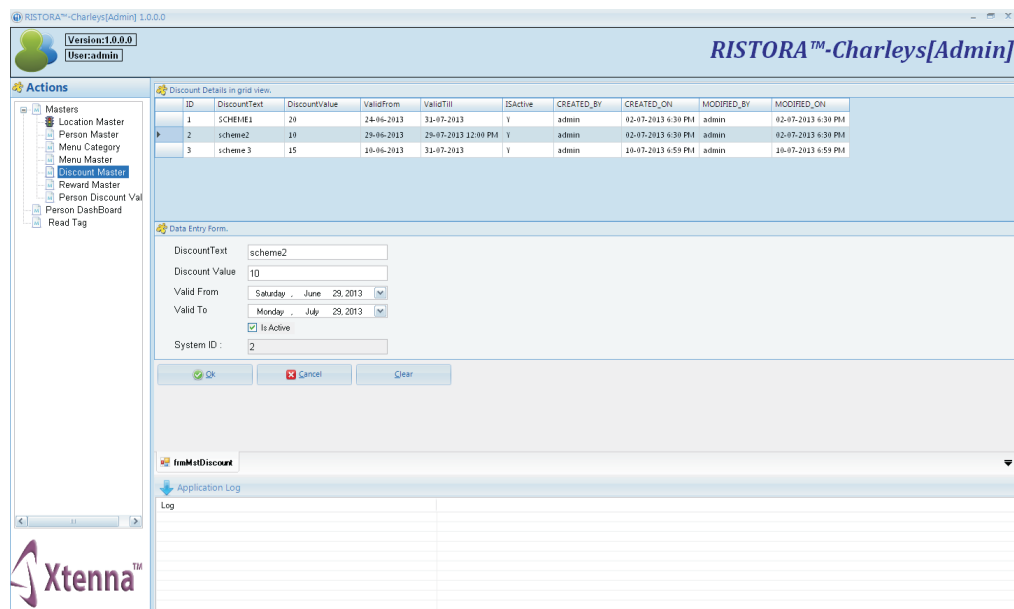


Menu_ID	Menu_Code	Menu_Name	Menu_Details	Menu_Cost	Menu_Category	Status	Menu_Image	CREATED_BY	CREATED_ON	MODIFIED_BY	MODIFIED_ON
62	TANDOORI C	Tandoori chid...		2	MainCourse			admin	30-04-2013 12:...	admin	Apr 30 2013 1...
63	SEAFOOD RA	Seafood Ravioli		1.5	MainCourse			admin	30-04-2013 12:...	admin	Apr 30 2013 1...
64	ROAST CHC	Roast Chicken		1.5	MainCourse			admin	30-04-2013 12:...	admin	Apr 30 2013 1...
65	QUALI RAVI	Quali Ravioli w...		1.5	MainCourse			admin	30-04-2013 12:...	admin	Apr 30 2013 1...
66	PARMESAN R	Parmesan Risot...		1.5	MainCourse			admin	30-04-2013 12:...	admin	Apr 30 2013 1...
67	MOROCCAN L	Moroccan Lam...		2.5	MainCourse			admin	30-04-2013 12:...	admin	Apr 30 2013 1...

Menu Code: TANDOORI C Menu Name: Tandoori chicken with salad
Category: MainCourse Menu Cost: 2
Description:
System ID: 62
 [Browse Image](#)
[OK](#) [Cancel](#) [Clear](#)

Description:
Menu Item
Application Log
Log

Discount Master: Data is entered here for various discount schemes that offered by the restaurant. These include details such as scheme name, value, discount dates, validity, etc.



ID	DiscountText	DiscountValue	validfrom	validtill	ISActive	CREATED_BY	CREATED_ON	MODIFIED_BY	MODIFIED_ON
1	SCHEME1	20	24-06-2013	31-07-2013	Y	admin	02-07-2013 6:30 PM	admin	02-07-2013 6:30 PM
2	scheme2	10	29-06-2013	29-07-2013 12:00 PM	Y	admin	02-07-2013 6:30 PM	admin	02-07-2013 6:30 PM
3	scheme 3	15	10-06-2013	31-07-2013	Y	admin	10-07-2013 6:59 PM	admin	10-07-2013 6:59 PM

Data Entry Form:
DiscountText: scheme2
Discount Value: 10
Valid From: Saturday, June 29, 2013
Valid To: Monday, July 29, 2013
☒ Is Active
System ID: 2
[OK](#) [Cancel](#) [Clear](#)

FinalistDiscount
Application Log
Log

Reward Master: This section will contain data pertaining to loyalty rewards available to eligible customers and contain details such as reward name, eligibility criteria, base value, points earning, etc.



CASE STUDY

RISTORA™-Charleys[Admin] 1.0.0.0

Version: 1.0.0.0
User: admin

Actions

- Masters
 - Location Master
 - Person Master
 - Menu Category
 - Menu Master
 - Discount Master
 - Reward Master
 - Person Discount Value
 - Person Dashboard
 - Read Tag

Reward Details in grid view:

Reward_ID	Reward_Text	MinValue	MaxValue	BaseValue	NoOfPoints	Calc_MinValue	Calc_MaxValue	Calc_BaseValue	CREATED_BY	CREATED_ON	MODIFIED_BY
1	Reward 1	3	25	2	11	3999	25999	2999	admin	03-07-2013 10:55 AM	admin
2	Reward 2	2	56	7	23	2999	56999	7999	admin	03-07-2013 10:55 AM	admin

Data Entry Form:

Reward_Text: Reward 2
Minimum Value for Discount: 2
Maximum Value for Discount: 56
Base value: 7
Total No. of Points: 23
System ID: 2

OK Cancel Clear

fromMapReward

Application Log

Log

Xtenna™

Mapping Customer Discount: Here various discount schemes are assigned to registered customers so that the discount gets automatically reflected in the bill amount charged to them.

RISTORA™-Charleys[Admin] 1.0.0.0

Version: 1.0.0.0
User: admin

Actions

- Masters
 - Location Master
 - Person Master
 - Menu Category
 - Menu Master
 - Discount Master
 - Reward Master
 - Person Discount Value
 - MST Order Category
 - Person Dashboard
 - Read Tag

Details in grid view:

ID	personName	Reward_Text	DiscountText
1	Khalid Hassan	Reward 2	SCHEME1
2	Mansour Umar	Reward 1	SCHEME1
4	Faisal Abbas	Reward 1	SCHEME1
5	Imtiaz Hussain	Reward 2	SCHEME1

Data Entry Form:

Person Name: Khalid Hassan
Discount Scheme: SCHEME1
Reward Points: Reward 2
System ID: 1

OK Cancel Clear

fromMapPersonDiscount

Application Log

Log

Xtenna™

Person Dashboard: In this screen, the administrator reads the customer's loyalty card tag and views information pertaining to that customer's order history, discounts availed and reward points earned.



CASE STUDY

Version: 1.0.0.0
User: admin

RISTORA™-Charleys[Admin]

Actions

- Location Master
- Person Master
- Menu Category
- Menu Master
- Discount Master
- Reward Master
- Person Discount Value
- MST Order Category
- Person Dashboard
- Read Tag

Data Entry Form:

Device IP: 192.168.123.147
Person Name: Khalid Hassan
Card Rfid Tag_ID: E2009150501000641140A3C4
Remaining Balance: 357.6 OMR

Read tag Search

Details in grid view:

Menu_Code	Menu_Name	Menu_Cost	Quantity	Order_Date
CT	Cheese & Tomato	1.5	1	
FV	Fresh Vaggi	1	1	
CHT	Margarita CHT	1	1	
	Grand_Total	3.5		
	Discount_Given on Order Purchase			
	Total Bill After Discount	3.5		
CBCCHT	Cheese & Bbq Chicken CHT	2.5	1	
SC	Spicy Chicken	3	1	
	Grand_Total	5.5		
	Discount_Given on Order Purchase			

Refresh Cancel Export To Excel

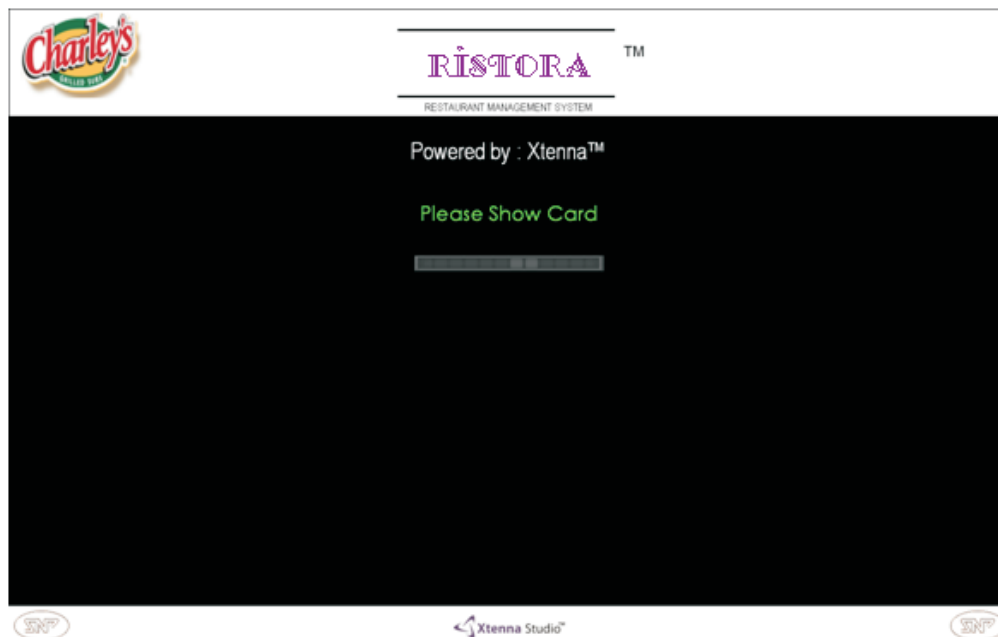
FromPersonDetails

Application Log

Log

Xtenna™

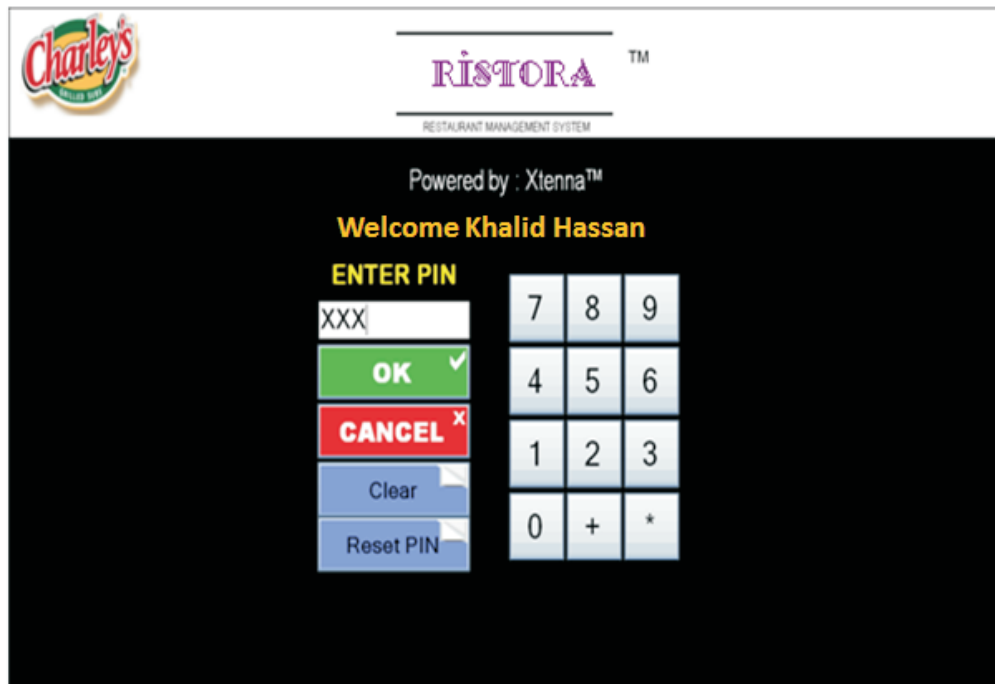
- The customer opens the Menu Ordering System application on the touch screen kiosk or portable device.



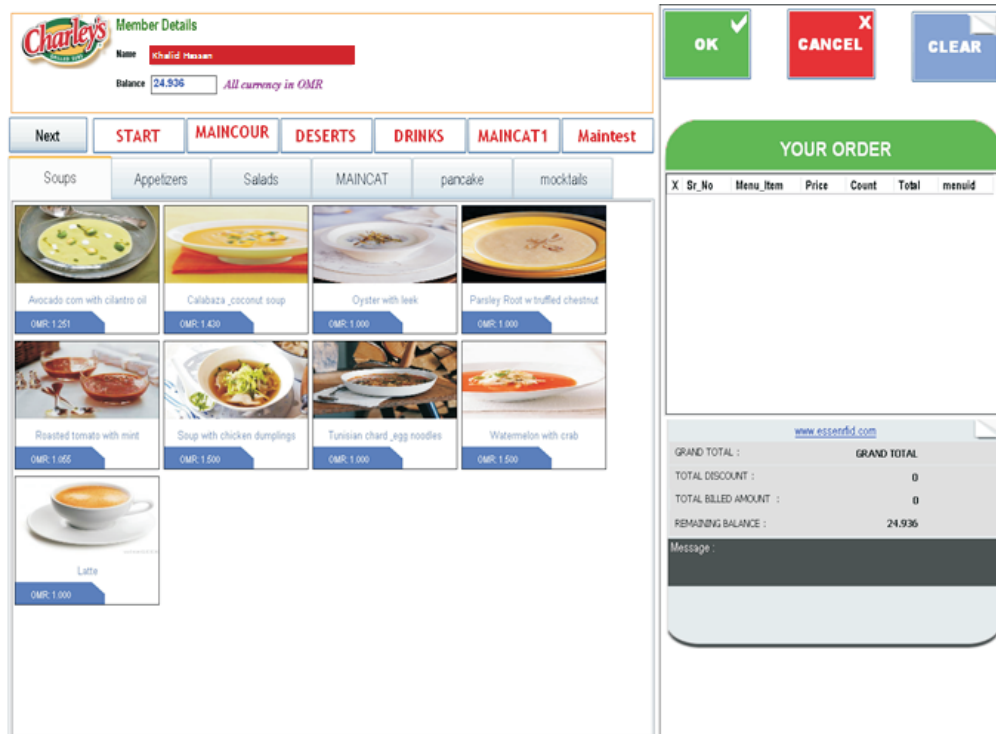
- Once the application is open, the customer has to show his card to the device. The device reads the card's ID and a customer login screen is displayed.
- The customer needs to enter a valid PIN to log in to the application.



CASE STUDY



6. If the entered PIN is valid, the main menu screen will be displayed.




7. The customer then selects items that he prefers and adds them to the order cart displayed on the screen. He can easily view all items by displaying them from within their categories and sub-categories.



CASE STUDY

8. Selected items will get displayed in the order cart to the right of the screen.

**Member Details**
Name: Khalid Hassan
Balance: 24.936 All currency in OMR

Next

START

MAINCOUR

DESSERTS


DRINKS


MAINCAT1


Maintest


ManCourse


Fast Food



Balsamic chicken w vegetables
OMR: 3.000



Beef fillet with roasted garlic
OMR: 1.000



Beef taco with Tuna tostada
OMR: 2.500



Chicken Asosette
OMR: 2.000



Chicken Ballotine
OMR: 2.500



Chicken Roulade with Pistachio
OMR: 2.000



Chicken, Zucchini, Rocket salad
OMR: 3.000



Harissa chicken with raata
OMR: 2.500



Veg lasagne with roasted tomato
OMR: 2.000



Tortellini with lemon butter
OMR: 2.000



Tandoori chicken with salad
OMR: 2.000


Seafood Ravioli
OMR: 2.000


Pasta Chicken with Chutney


Pasta Chicken with Chutney


Pasta Chicken with Chutney


Pasta Chicken with Chutney

OK

CANCEL

CLEAR

YOUR ORDER

X	Sr.No	Menu_Item	Price	Count	Total	menuid
X	1	Tandoori chi...	2	1	2	62
X	2	Harissa chic...	2.5	1	2.5	56
X	3	Beef fillet with...	1	1	1	15

www.essenfid.com
GRAND TOTAL : 5.500
TOTAL DISCOUNT : 1.100
TOTAL BILLED AMOUNT : 4.400
REMAINING BALANCE : 19.436
Message:

9. The order cart will also display the total value of the order being placed, the discount given to the loyalty card holder and the total billed amount after discount. It also displays the balance amount that will remain with the prepaid loyalty card after the order has been executed.

10. When the required menu items have been selected, the customer confirms the order by tapping the 'OK' button above the order cart. He can also edit or cancel his order by tapping on the 'Clear' or 'Cancel' buttons at any time before order confirmation.

11. Pressing logout will then exit the customer from the application.

OK

CANCEL

CLEAR

YOUR ORDER

X	Sr.No	Menu_Item	Price	Count	Total	menuid
X	1	Tandoori chi...	2	1	2	62
X	2	Harissa chic...	2.5	1	2.5	56
X	3	Beef fillet with...	1	1	1	15

www.essenfid.com
GRAND TOTAL : 5.500
TOTAL DISCOUNT : 1.100
TOTAL BILLED AMOUNT : 4.400
REMAINING BALANCE : 19.436
Order Placed Successfully
Enjoy your Meal!!
Don't Forget to take your Card



CASE STUDY

12. The system automatically generates a printed order slip in the kitchen, for the items and quantities in the order placed by the customer along with the order number and customer details.
13. When the order is ready it is delivered to the customer at the table. The prepaid loyalty card customer thus conveniently bypasses the order and payments queue.
14. The menu ordering system automatically creates transaction records for generating reports of orders executed daily as well as over a selected period of time.
15. The administrator can at any time recharge the customer's prepaid account balance from within the application.

SrN	Menu ID	Qty	Total
1	Grilled Salads	1	1.7
2	Grilled Steak	1	1.7
3	Chicken Buffalo	1	2.5
4	Double Cheese Chicken	1	2.7
5	Chicken Teriyaki	1	2.5
6	Philly Chicken	1	2.7
7	Gourmet Fries	1	0.6
8	Cheddar Cheese	1	0.6
9	Cheddar & Barbecue	1	0.8
10	Cheddar & Ranch	1	0.8
11	Buffalo & Ranch	1	0.8
Grand Total			17.6
Discount Total			7.92
Total Billed Amount			9.68

www.essenrfid.com

He first logs in to the application using the Administrator PIN. He then places the customer's card whose balance requires recharging on the reader device.

The customer's card details and remaining balance are displayed on the touch screen. The administrator presses the 'Recharge' button which displays a numeric pad on the screen.



CASE STUDY

The administrator then taps in the recharge amount and then presses 'Make Recharge' to successfully recharge the customer's prepaid account.

The screenshot shows a user interface with a header bar containing three icons: a strawberry, a person, and another strawberry. Below the header, the left panel displays customer information: a name 'Khalid Hassan', a phone number '99341681', and a balance of '1.936'. Below this information are three buttons: 'Make Recharge' (green), 'Reset' (blue), and 'Cancel Recharge' (red). A numeric keypad is visible below the buttons, with the number '23' entered. The right panel features a large green button labeled 'Place Order'. Below this button, it shows 'Today's Total Sale :' and 'Today's Total Recharge :'. A table with columns 'Date', 'Amount', 'NAME', and 'TYPE' is displayed below the recharge information.

The recharged amount is instantly updated in the daily total summary displayed at the right of the screen, along with individual entries.

The screenshot shows the same user interface as the previous one, but with updated information. The customer's balance is now '24.936'. The 'Make Recharge' button has been replaced with a 'Recharge' button. A new 'Add Customer' button (light blue) has been added below the 'Recharge' button. The 'Today's Total Recharge' is now '23'. The table below shows a single entry: '11-07-2019 1:53 PM' in the 'Date' column, '23' in the 'Amount' column, 'Khalid Hassan' in the 'NAME' column, and 'CREDIT' in the 'TYPE' column.

The system automatically generates a daily total of revenue earned as well as detailed reports for any selected period of time.



CASE STUDY

BENEFITS:

- Ease of restaurant operations and stream-lined functioning.
- Quicker and more accurate operations due to RFID based systems.
- Automated identification of regular restaurant patrons due to RFID tag ID based customer loyalty cards, without requiring showing of card to the restaurant personnel.
- Avoids time-consuming queues and congestion at the ordering counter.
- Secure usage at self-operating NFC-enabled kiosk due to entering of PIN authentication by the customer.
- Prepaid cards with auto-deduction provide greater convenience by enabling reduction in frequency of money transactions at the counter.
- Viewing of prepaid balance remaining with the customer on screen before order placement.
- Self-operated kiosks enable unsupervised order placement with lesser line-of-sight requirements.
- Enables image-based menu item selection on screen, enabling greater visual appeal for the menu offerings.
- Enables providing discounts and reward schemes to regular customers, thereby benefitting customers as well as encouraging increased patronage for the restaurant.
- Reduces manpower requirements for taking orders, enabling better focus on order execution and delivery.
- Efficient order management results in quick deliveries for customers.
- Automated generation of order slips directly at the kitchen enables reduction in manual work and paper work.
- Accurate order dispatch ensured due to automated customer identification with facility for customer's name and photograph printed on the order slip.
- Enables better category-based analysis of menu items in terms of popularity, sales and revenue.
- Enables better management of menu items and menu schedules due to computerized database and automated order processing.
- Enables easy and frequent updating of menu items for restaurant customers without incurring printing costs.
- Enables promotion of specific items in the menu due to ease in menu item and category customization.
- Provides easy recharge facility for loyalty card holding customers by the administrator within the same application.
- Enables customization of discount schemes for various categories of loyalty card customers, depending on card usage history.
- Automated history of card usage enables easy allocation of reward points to the customer.
- Automated report generation of total revenue generated over a particular period of time.



CASE STUDY

- Detailed item-wise and customer-wise reports and history features for sales and revenue.
- Promotes increased loyalty card membership for customers due to visible convenience and time-saving benefits for card-holders.
- Promotes restaurant popularity and brand value due to innovative features of the system, leading to increased foot-falls and preference over competitors.
- Easy extension of the touch-enabled self-ordering system at the kiosk into apps for the customer's own hand-held devices, enabling remote menu viewing and order placement, thereby taking the business to the next level.

LINKS:

Hardware:



Tags:



Software:



Reference Example:

<http://www.essenrfid.com/Mailer/retail-flash-demo.pdf>