



ISTN3AS MAJOR PROJECT


MILESTONE 1

GROUP 2:


CODENAME: DEVELOPERS NEXT DOOR



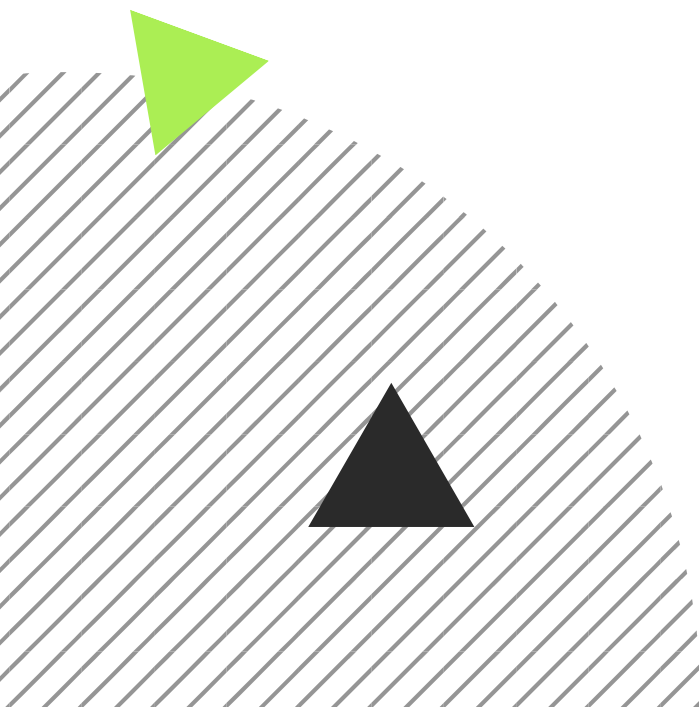
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Information Technology becomes ever more prevalent in today's world, characterised by mobility, communication and connectivity. Information systems can play a role in improving efficiency and supporting decision across all sectors.

After approaching many businesses, ranging in various sizes, we were able to have *Dimension Data*, a South African based IT company, facilitate our group and play the role of the client in the major project development effort.

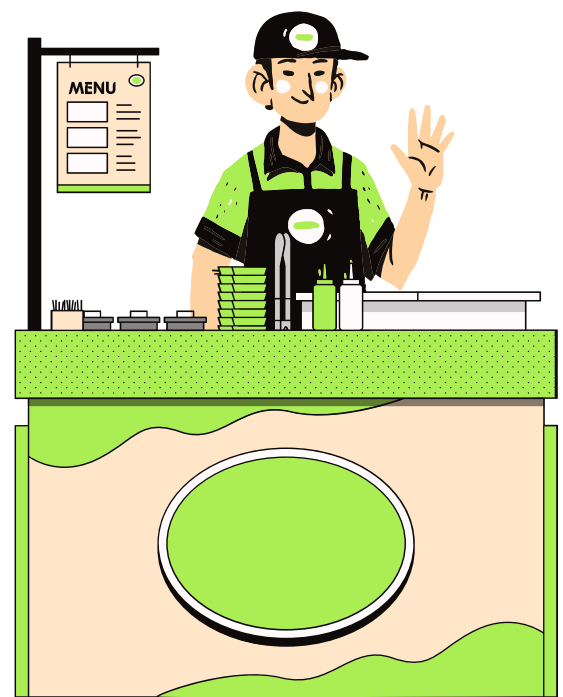
We spoke with one of their operational managers to run over some areas of the company where a yet to be implemented Information System would prove useful in their daily operations. After a lengthy discussion we landed on the idea of a *canteen system* that the company was looking to implement in the future.

Brief overview of the current canteen operation:

Employees would head down to the canteen where they would place an order with one of the available canteen staff members. The staff member would then look up the pricing of those items and provide the employee with a receipt. The order would be vocally relayed back to the chef and the employee would wait to receive their order.

Main reasons underpinning the development of the system:

- Lengthy waiting times during peak hours
- Lack of decision-making support
- Lack of access card integration
- No employee credit scheme
- Covid-19 Protocols
- General inefficiencies and errors resulting from mostly manual procedures



Proposed solution and benefits:

We believe a self-service kiosk system will be perfect to help mitigate these issues, as well as provide value to the business and enhance employee experience by providing:

REDUCED WAITING TIMES

A set of kiosks stationed around the canteen will be able to handle the peak time crowds and service employees faster than manual procedures. This eliminates the chances of canteen servicing members from not being available. Canteen workers can now assist the chef on a more frequent basis and help prepare meals in advance.

INCREASED FREEDOM OF CHOICE AND CONTROL

Employees can see exactly what items are available, as well as having complete control over what extras (toppings, sides etc.) they would like with their item. There is also a guaranteed accuracy when ordering as employees get the chance to review their orders.

GREATER DECISION-MAKING SUPPORT

The kiosk system will provide decision makers with accurate and informative reports. Information will also always be up to date and timely. This will help support managerial decisions regarding, chiefly, credit limits and item stocking.

ACCESS CARD INTEGRATION

By integrating the access cards into the ordering process there is an added layer of security. In the final system implementation employees could swipe their cards and use biometric information to access the system. This provides better organizational cohesiveness

EMPLOYEE CREDIT SCHEMES

An organization wide credit limit will be set to provide free food and drink items up to the value specified by the limit when ordering from the kiosk. Exceeding the credit limit will result in the employees having to pay the excess amount.

CONTACTLESS OPERATION AND MOBILITY

As a result of COVID-19, strict protocols were set in place to enforce social distancing. The kiosk aligns itself with these protocols allowing employees to place orders without interacting with another human. Not only does this reduce the chances of infection, but also prevents the interpretation of orders when handling with other human being. The porting of the system to a web-based application also supports contactless operations.

WE HOPE TO DEVELOP A SYSTEM THAT WILL PROVIDE VALUE TO VARIOUS ASPECTS OF THE CANTEEN AT DIMENSION DATA AND OVERCOME THE AFOREMENTIONED ISSUES. WE HOPE TO EMPLOY ALL OF THE THEORETICAL KNOWLEDGE THAT WE HAVE BUILT UP IN INFORMATION SYSTEM DEVELOPMENT AND APPLY IT WITHIN A PRACTICAL DOMAIN.

CLIENT INFORMATION

Company Name: Dimension Data

Website: <https://www.dimesiondata.com>

Physical Address: No 06 - The Boulevard, Westway Office Park, Westville 3635

Phone number: 031 204 8400

REFERENCES

Lisha Sewnarain

Title: PMO and AI Operations Manager

Email: Lisha.Sewnarain@dimensiondata.com

Thivashen Naidoo

Title: Managed Service Operations Manager

Email: Thivashen.Naidoo@dimensiondata.com

BUSINESS AREA

Dimension Data is a South African based IT company with over 30 years of experience in the industry. They were founded in 1983 and has expanded their operations globally, offering smart solutions in all inhabitable continents while operating as a subsidiary of the Nippon Telegraph and Telephone (NTT) group. Dimension Data provides services to clients in all sectors including the financial, health, telecommunications, manufacturing and government sectors. The company is also the official technology partner for the Tour de France and Vuelta a España.

Being an IT company, Dimension Data is always looking for ways to improve not only their customers' operations but also their own. The canteen system is one of their internal operations that they were looking to enhancing and provides us with a unique opportunity to propose a solution to meet those requirements. The realization of this solution is with a self-service kiosk.

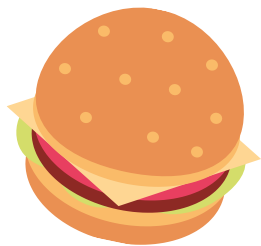


CURRENT CANTEEN OPERATIONS

The canteen is staffed by 6 people comprised of 2 baristas, 1 head chef and 3 members who rotate roles between servicing the employees and assisting the chef. The canteen plays an important role of providing nourishment to all employees at the Westville branch. The canteen has an 8-hour operational window starting from 8am on Monday to Friday. There is a breakfast and lunch time menu as well as some support for any ADHOC requests between these times. One of the canteen workers sends out an email every Sunday listing the food and drink items that will be available for that particular week. The system currently in place is limited in both scope and functionality. The system provides the servicing staff member with a list of prices for the food and drink items and independent receipt producing support.

Ordering Process:

1. Employee finds available servicing staff member
2. Employee places order
2. The staff member looks up the price of the item(s)
3. The staff member generates a receipt and presents it to the employee
4. The order information is vocally relayed back to the chef
5. The employee waits for the meal and the next employee is serviced



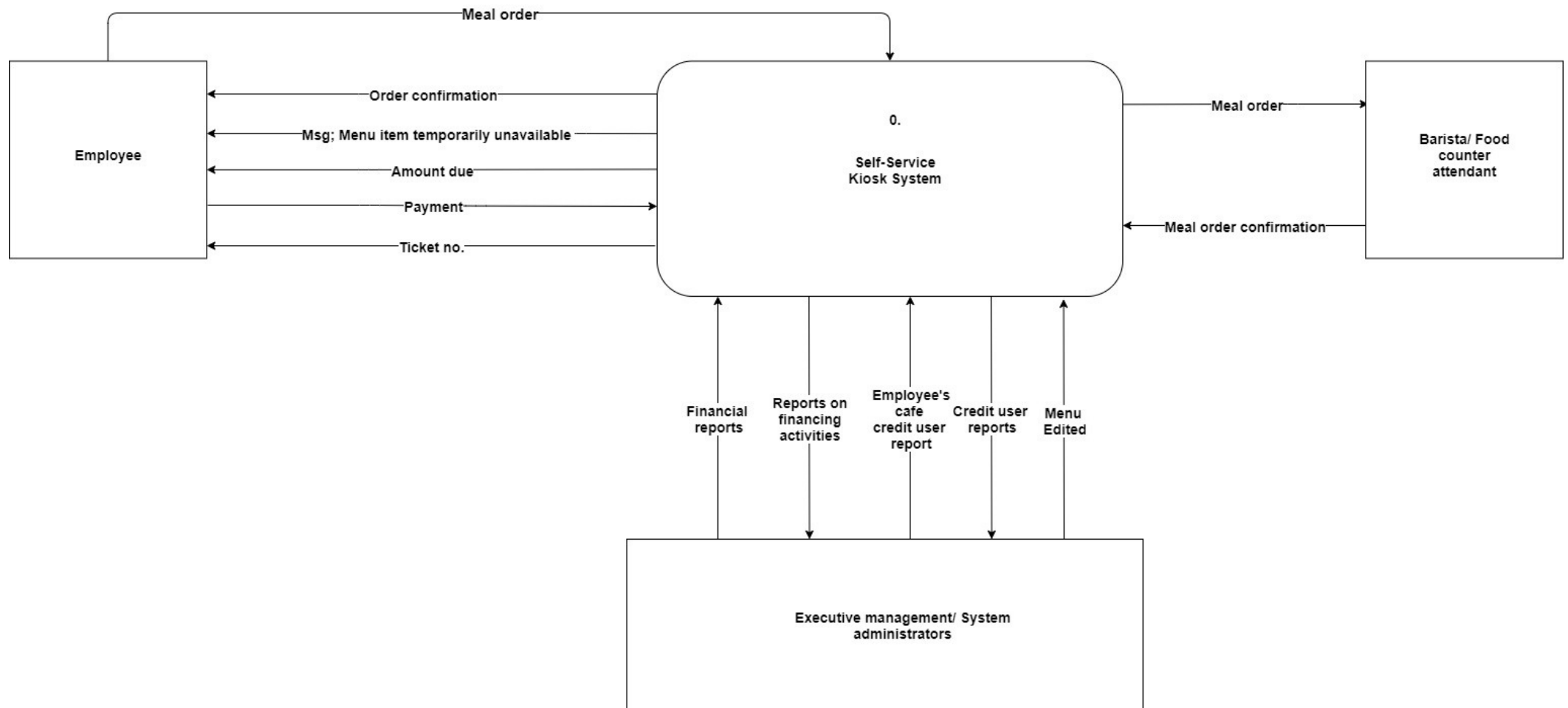
CONTEXT-LEVEL DIAGRAM

NARRATIVE

Dimension Data's very own on-the-move café provides its employees with light "mouth-watering meals" and a range of beverages to quench their every thirst. When employees place their meal orders on the self-service kiosk system; the system checks the availability of the menu item. The system sends the employee an order confirmation message or sends the employee a message that the menu item is temporarily unavailable. The system tells the employee the amount due and the employee then makes the payment for the meal order. The system then sends the meal order to the Barista/Food counter attendant who then fills the order and sends a confirmation to the system that the order has been processed and shipped(posted/delivered) to the employee. On receipt of the meal order confirmation, the system generates a ticket no. for the employee. The system administrators have authorization and can edit the menu in terms of adding or deleting menu items as well as request financial reports of the café and their employee's café credit user report from the system. The system sends detailed reports of the café's financing activities and the employee's café credit user reports.



DIAGRAM



LEVEL-0 DFD**NARRATIVE**

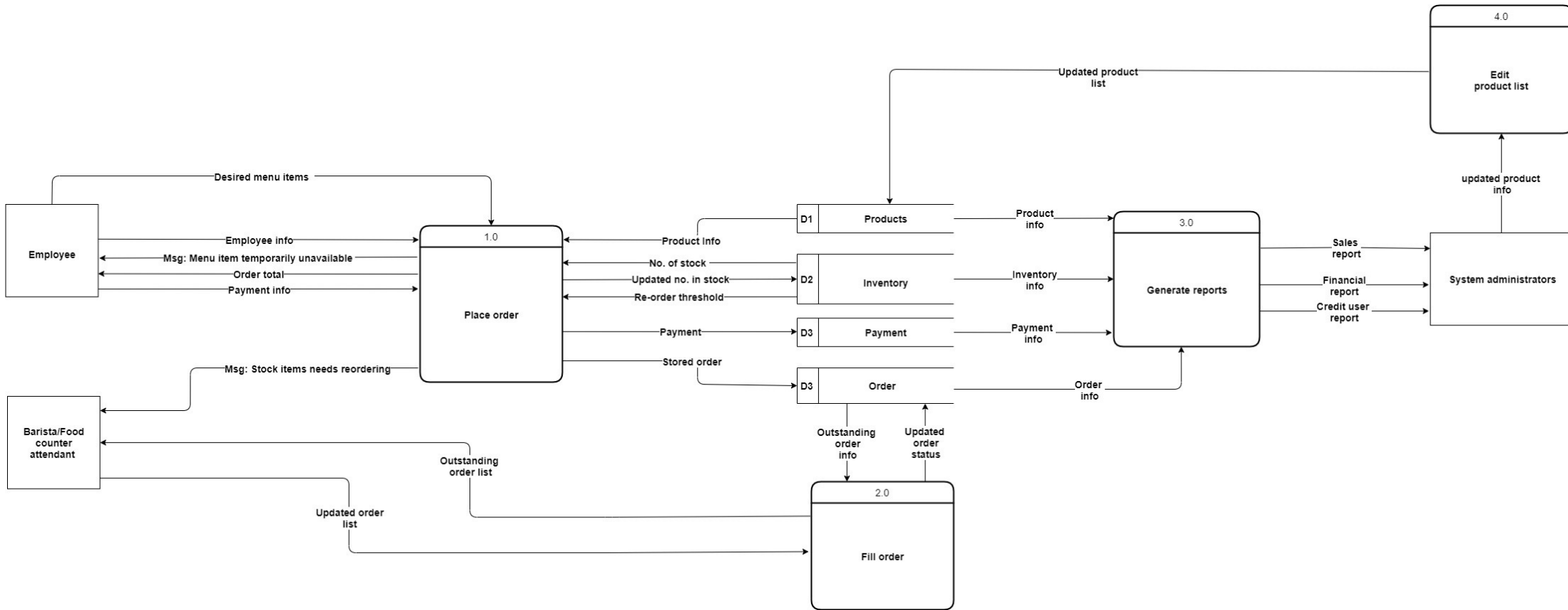
Employees who place orders for menu items from Dimension Data's café; provide the order clerk with a list of menu items they would like to order. The self-service kiosk system reads the menu item's information from the products database. An Employee cannot place orders for menu items that are currently not in stock. The system checks the number of ingredients or units available in inventory. If the menu item is currently not in stock, then the order clerk informs the employee that the menu item is temporarily unavailable. The system calculates the order total, and the employee makes payment for the order. The system stores the employee's payment and updates the amount of stock available. If the stock level decreases below the re-order threshold then the system sends a message to the Barista/Food counter attendant that stock must be re-ordered.

When filling the order, the Barista/Food counter attendant reads the list of outstanding meal orders. When an employee's order is shipped, the Barista/Food counter attendant updates the status of the meal order to "filled".

The product data, the inventory data, the payment data and the order data are used to generate reports such as the sales report, the financial report and the credit user report. These reports will then be accessed by the authorized system administrator. When editing the product list of Dimension Data's café, the order clerk provides the system administrator with a list of menu items to read. The system administrator is enabled to update the product list and the updated list is then stored in the products' database.



DIAGRAM



ENTITY RELATIONSHIP DIAGRAM

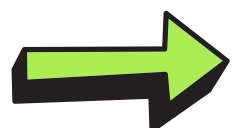
NARRATIVE

The Employee Entity has the primary key, Employee_ID, which serves to uniquely identify the employee and contains attributes such as Name, Surname and Department. The kiosk system is completely cashless; therefore, credits serve as a form of currency. Each employee is granted a set number of credits each month in which to transact.

The attribute Credit_Balance tells the system the amount the employee has to purchase items at the kiosk. The credit system works such that should an employee not have sufficient funds on his/her Credit_Balance, he/she is still able to purchase items at the kiosk and won't go hungry. However, this deficit of credits will have to be accounted for and will be taken out of the Employees next paycheck. Once the order has been processed the Employee is issued a Ticket_No to collect their order at the food counter. The relationship between Employee and Order is such that one Employee can place zero or many orders whilst one Order can be placed by one and only one Employee at a time.

The Order Entity has primary key Order_No, which serves to identify each order processed by the system. The Order entity also has attributes of other entities required to provide a complete picture when developing the database table. These Foreign Key attributes are Employee_ID and Product_ID. The function of the Order Entity is to consolidate the various items (products) that the employee has the option of choosing from and has added to his/her cart and does this by the attribute Order_Items. Each product itself is referenced and checked with the foreign key Product_ID, however the Order_Items attribute is a complete view of every item purchased.

Similarly, Order_Cost is associated to the Product Entity, where the total cost of each item to be purchased is added to the Order_Cost attribute so as to show the total value of the order. The Order_Date and Order_Time are recorded for administrative purposes and a Ticket_No is generated to guide the employee to the collection of their order. The Order_Time also serves to notify the employee when their order should be ready for collection.



The Payment Entity has a Composite Primary Key of Order_No and Employee_ID and this serves to link the Payment process to the 'Places Order Relationship' to complete the transaction process between Employee and Order. Under this Entity, the Product_ID is identified as a Foreign Key to serve in the database table as a reference to the items purchased.

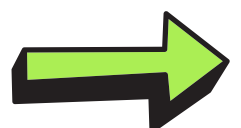
This Payment Entity also serves as to aid the deficit feature added to the Kiosk System as a whole. It works such that, the Credit_Amount (or amount the order is totaling) is checked with the Employee_Credit_Balance. Should the credit balance exceed the order cost, the process works as a normal transaction would – ie. Payment is made and the order is received.

However, should the Credit_Amount be greater than the Employee_Credit_Balance, the self-service kiosk interface will prompt the user with a warning indicating that they have placed an order which exceeds their credit balance and asks if they wish to proceed with the transaction or exit the interface. Should an employee choose to proceed with this transaction knowing they do not have sufficient funds, the system changes the status of the Overdraft_Applied attribute to true.

When this occurs, the system automatically deducts the deficit amount from the employees next paycheck and then resumes the transaction in the traditional manner. The Payment Entity is a link/extension of the 'Place Order relationship'.

The Product Entity is where the full, finished product to be served is stored. There are various products that are eligible to be sold and each of them have a unique Product_ID. Their attributes also include, Name and the Quantity available to be sold – of the finished good. As well as a list of Ingredients that are used to make the product – for user notification purposes. The Item_Cost and Availability status (of the finished product) are also included to give the user a notification when an item is temporarily unavailable. The Product Entity is linked to the Order Entity by means of one Order can consist of one or more Products and one Order can contain zero or more of one particular Product.

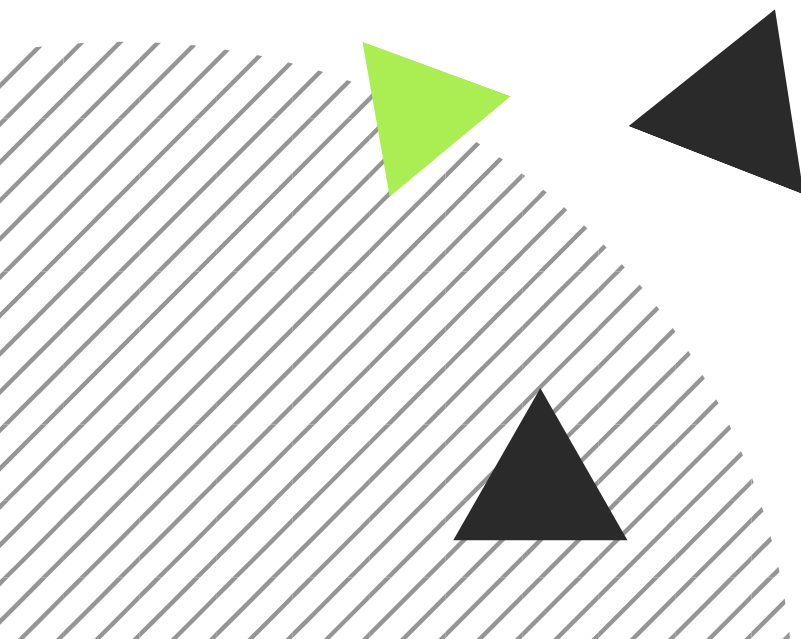
Under the Inventory is where raw materials used to make a finished Product fall. These items are given an Item_ID as their primary key and are linked to the Product Entity by means of Foreign Key association. Each item has a Name, Item_Cost, Expiration_Date and a Re-Order_Threshold to ensure that only fresh products are used in Product preparation and that these raw materials do not reach critically low levels. (Not inventory control). The relationship between Inventory and Product is that one Product can be comprised of one or more Inventory Items and again one Inventory item can be used to make one or more Products.



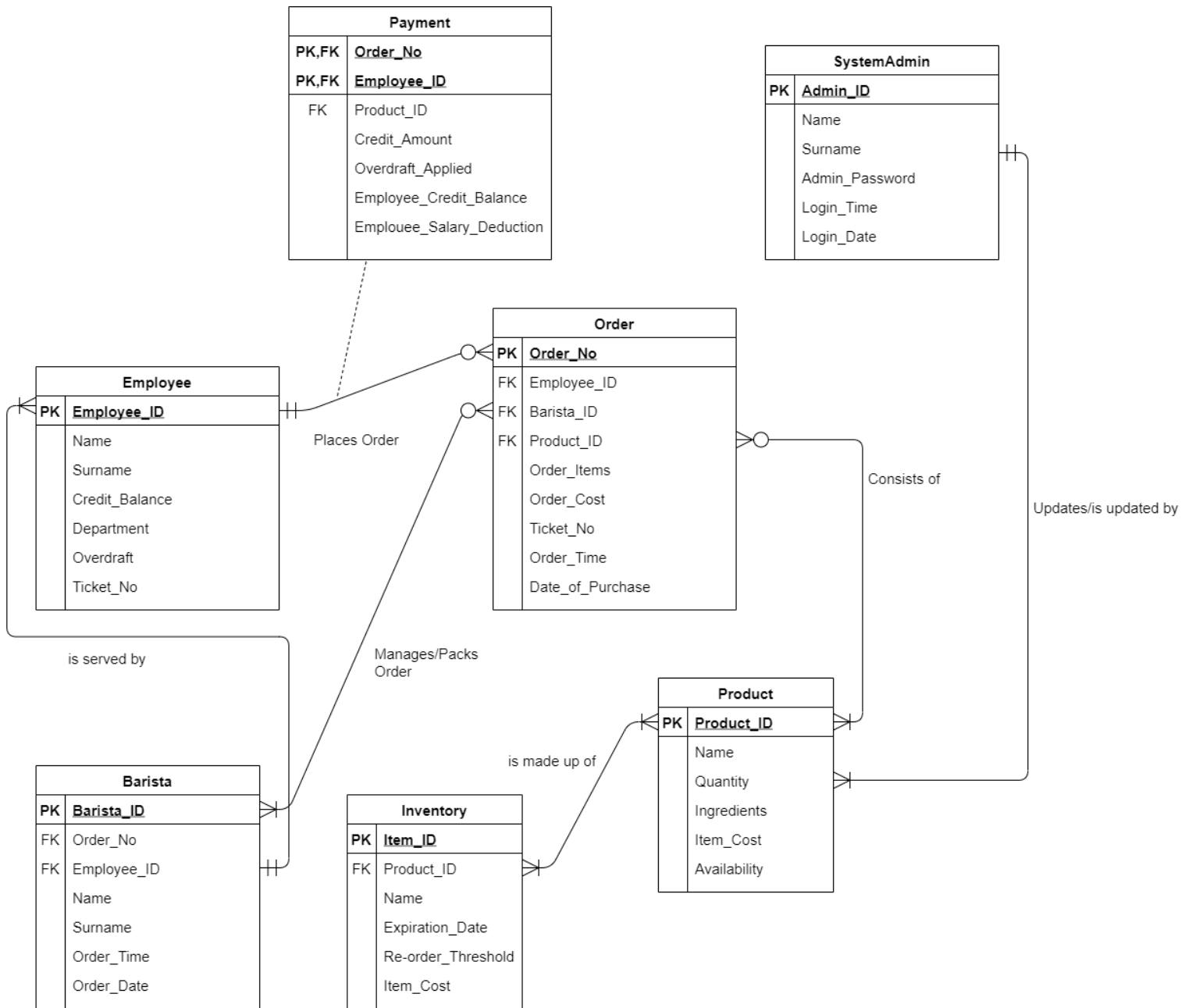
Once processed, a Barista will serve the order to the Employee and will be identified by their Barista_ID. Foreign key associations being Order_No and Employee_ID – indicating which order and which employee they were associated to. The Order_Time and Order_Date serve administrative purposes should an external entity request it. The barista's Name and Surname are also included as attributes. The relationship between Barista and Employee is such that, an Employee can be served by one and only one Barista, however a Barista can serve more than one Employee.

The SystemAdmin Entity is used for administrative purposes and has more specialized access to features and resources that the user (Employee) does not - Justifying a unique key, Admin_ID. Details such as their Name and Surname are captured for completion purposes and an Admin_Password grants the system administrator access to the complete system where they can update and remove Product items from the product list as well as perform other maintenance and update features.

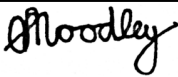



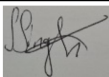
The relationship between SystemAdmin and Products is such that, one SystemAdmin can update the Product information of one or many Products, but one and only one SystemAdmin can update the product's information so as to reduce redundancy and fraudulency from occurring.

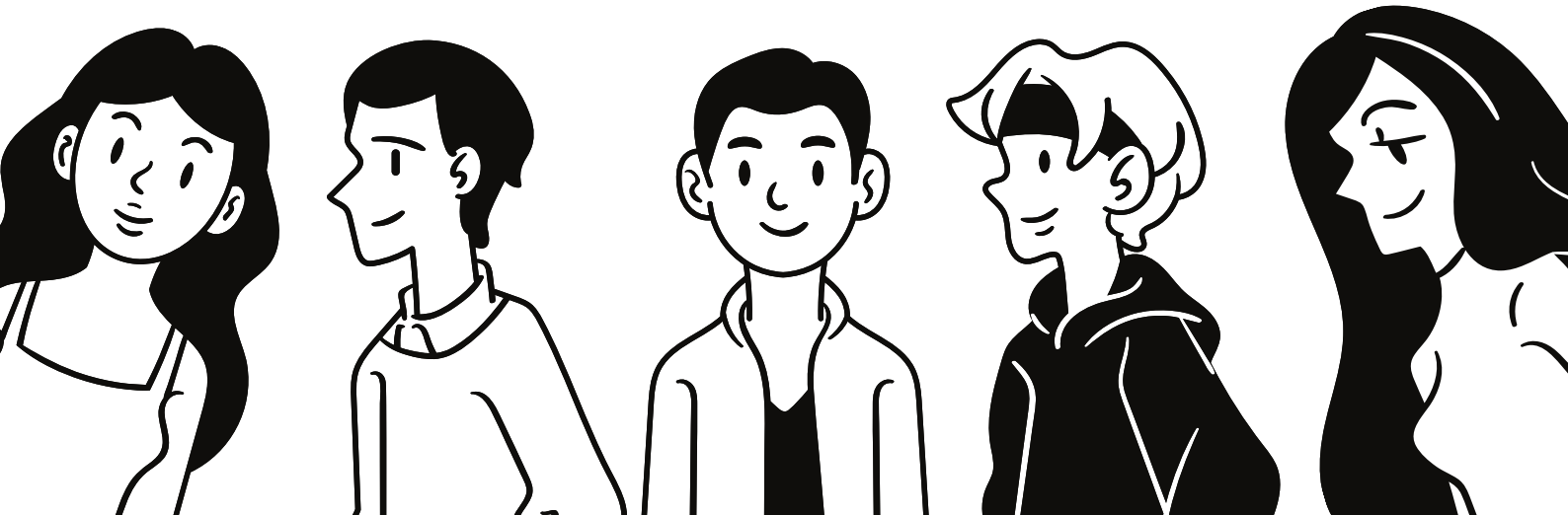


DIAGRAM



INDIVIDUAL CONTRIBUTION TABLE

No	Group Member's Student Number	Group Member's Name and Surname	% Estimated Contribution to M1	Signature
1	219006946	Sashen Moodley	20	
2	219002425	Denita Ruth Pillay	20	
3	219032871	Kalen Naidoo	20	
4	219001721	Sadikha Maharaj	20	
5	217008024	Shridhar Singh	20	



FEATURE LIST

Feature Description	User Profile	Priority	Time
Login into kiosk	Employee, System Admin & Barista/Canteen Service Worker	High	1 day
View all available products	Employee	High	2 day
Select food and/or drink item(s)	Employee	High	1 days
View list of ingredients	Employee	High	1 day
Add/remove product ingredients	Employee	High	2 days
Review order	Employee	High	1 day
View of product image	Employee	High	1 day
Generate Ticket	Employee	High	1-2 days
Set/Change global credit limit	System administrator	Medium	1 day
Apply overdraft and deduct salary	System administrator	Medium	1-2 days
Add new product item	System administrator	Medium	1 day
Remove Item	System administrator	Medium	1 day
Update product details	System administrator	Medium	1 day
Update item availability	Barista & Canteen worker	Medium	1 day
Get order list	Barista & Canteen worker	Medium	2 days
Generate Reports	System administrator	Medium - low	2-3 days
Change system language	Employee	Very Low	3-4 days

Ordered by priority and serving main functional areas



USER STORIES

Title: Ordering	Priority: High
As a company employee who regularly uses the canteen I want to place an order digitally so that I don't have to spend more than 2 minutes in a queue.	
<u>Acceptance Criteria:</u> <ul style="list-style-type: none"> • I should be able to select food and drink items by category • I should be able to choose some of the toppings/extras • I should be able to review my order 	

Title: Credit Limits	Priority: High
As a system administrator I want to set/change the monthly credit limit so that the credit limit always aligns with company policies.	
<u>Acceptance Criteria:</u> <ul style="list-style-type: none"> • I should be able to change global credit limit for all employees • I should be able to view credit balances 	

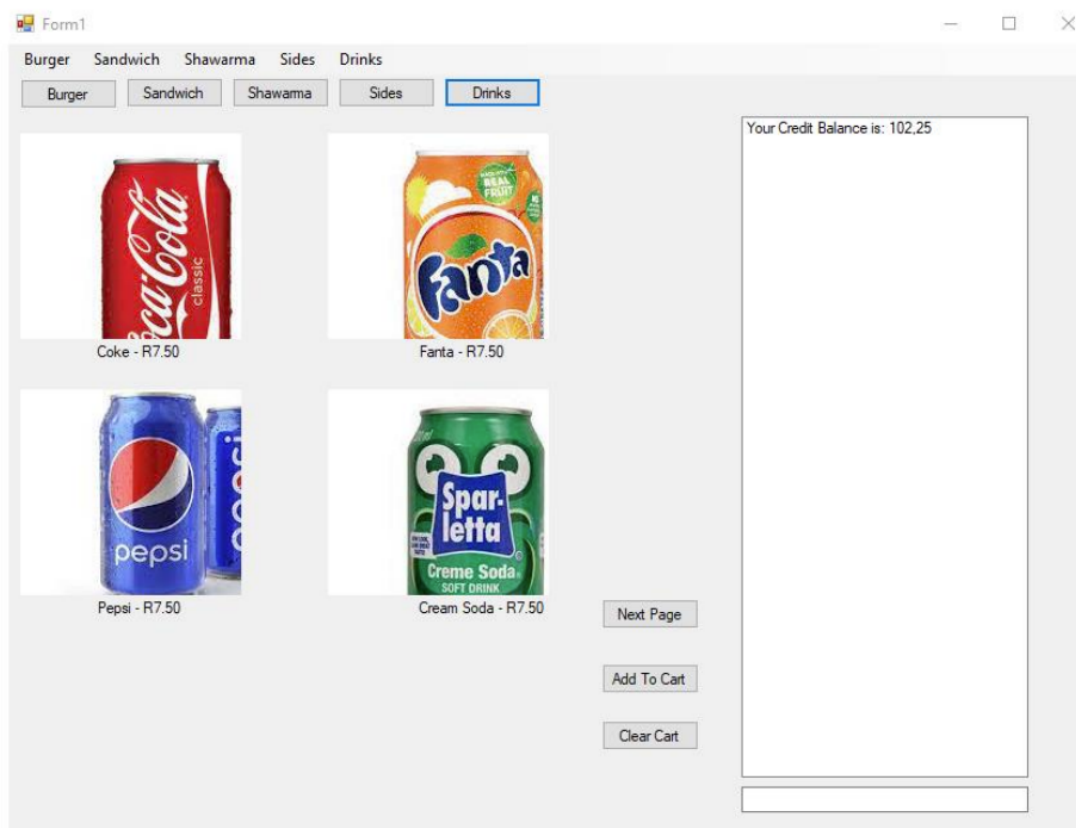
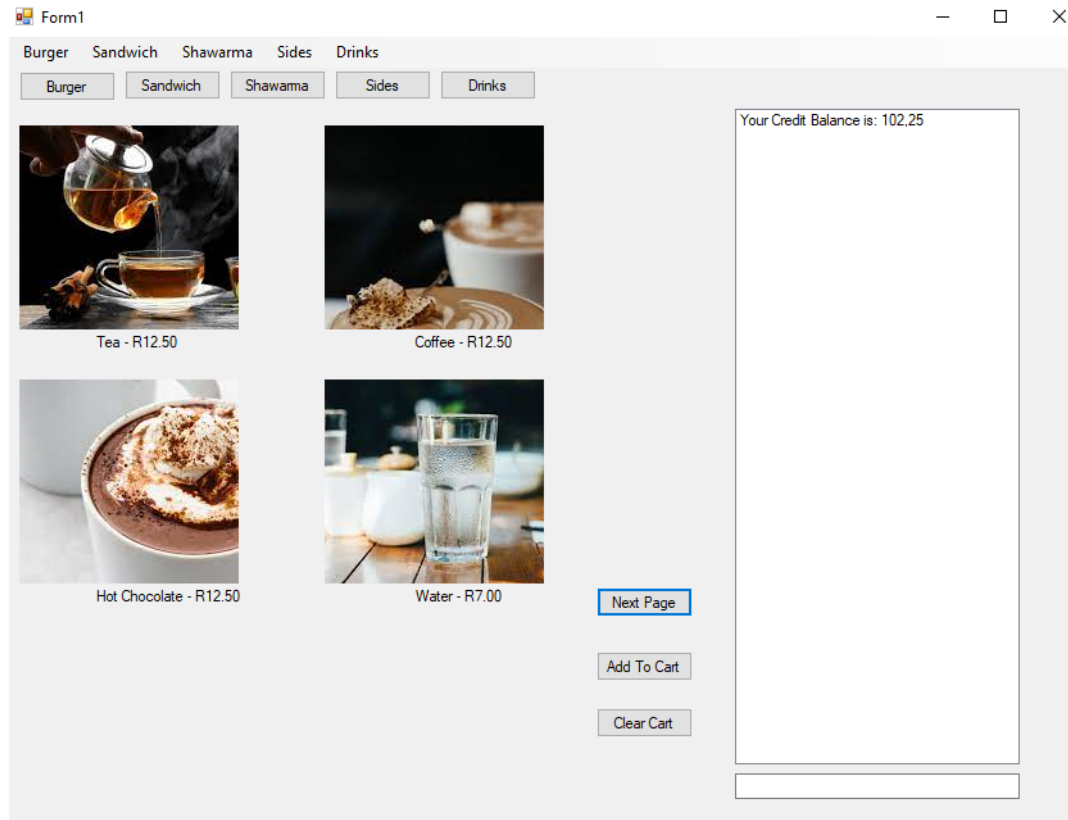
Title: Reports	Priority: Medium
As a system administrator I want to generate monthly reports so that it may be used to support managerial decisions.	
<u>Acceptance Criteria:</u> <ul style="list-style-type: none"> • Should be accurate • Should be timely • Should provide information on credit amounts • Should provide information on item quantities 	

Title: Item Availability	Priority: Medium
As a member staff who works in the canteen I want to change the availability of an item so employees are made aware of current item availability.	
<u>Acceptance Criteria:</u> <ul style="list-style-type: none"> • I should be able to change the item availability status • I should be able to change status throughout the day • It should update across all kiosks 	

Title: Active Order List	Priority: Medium
As a member staff who works in the canteen I want to receive a list of active orders so I know what food and drink items to prepare.	
<u>Acceptance Criteria:</u> <ul style="list-style-type: none"> • Should be able to view all active orders • Should be able to mark order as completed 	




MENU PROTOTYPE





Form1


Burger Sandwich Shawarma Sides Drinks

Burger Sandwich Shawarma Sides Drinks

 Chips - R15

 Plain Veg Salad - R15

 Feta and Greek - R17.50

 Chicken Salad - R17.50

Add To Cart


Clear Cart


Your Credit Balance is: 102.25


Form1

Burger Sandwich Shawarma Sides Drinks

Burger Sandwich Shawarma Sides Drinks

 Cheese and Tomato - R20

 Chicken and Mayo - R25

 Chicken and Cheese - R35

Add To Cart

Clear Cart


Your Credit Balance is: 102.25




Form1

Burger Sandwich Shawarma Sides Drinks


Burger Sandwich Shawarma Sides Drinks



Cheeseburger - R45



Chicken Burger - R40



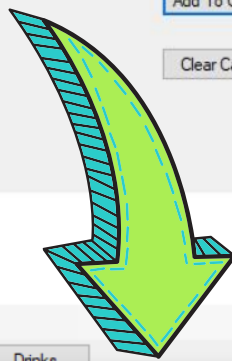
Veg Burger - R35

Add To Cart

Clear Cart

Your Credit Balance is: 102,25
CheeseBurger 40


Total: 40




Form1

Burger Sandwich Shawarma Sides Drinks

Burger Sandwich Shawarma Sides Drinks



Cheeseburger - R45



Veg Burger - R35

SecondaryUserInterface

Ingredients:

- Chicken Patty
- Bun
- Mayo
- Cheese
- Lettuce
- Tomato

Add To Cart

Exit

Your Credit Balance is: 102,25