Eagle Athletics Database Visualizer

Team 2 - Database Boys

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Narrative Description

Eagle Athletics Database Visualizer (EADV) is a web-based application for a made-up athletic clothing company, Eagle Athletics, that visualizes stored company transaction information details for both employees and clients into their respective tables within a database. The application will keep track of information on employee sales (revenue earned, quantity of product, sold to which client, etc.)

The tables within the database will be related by common attributes. For example, the employee table will have a primary key of ‘employee_id’ and one of the columns of said table will refer to what branch of the company the employee works for titled ‘branch_id’. This branch column will serve as a foreign key to another table that contains the information on all the branches of the company. Within the branch table, there will be another foreign key column for the manager of the branch called ‘manager_id’, which corresponds with the ‘employee_id’ of the manager, thus leading back to the employee table.

Different view-accesses will be implemented so that the company heads can keep track of their employees’ sale activities, employees can keep track of transactions with their clients, and clients can order more products, view their order details and purchase history, and the employees’ information that they interact with. There will also be an option for customers to contact the company if they have any questions or concerns.

Information Needs

- Company information
    - Solid understanding of the fundamentals of our made-up company, Eagle Athletics
- Web development technologies and procedures
    - Solid understanding of both front-end and back-end development for designing and developing a UI and writing and retrieving information from a stored database

DBMS Architecture

- Three tier Client/Server Architecture, the business logic is placed in application server or webserver. Basic and two tier architecture are not going to be used because if business logic is placed in a database server or client, there will be a burden.

Entities

1. Employee
2. Department
3. Branch
4. Customer
5. Products
6. Sales Relations
7. Supplier Shipments
8. Supplier
9. Region
10. Order History

Relationships

- Each EMPLOYEE works with CUSTOMERS
- CUSTOMERS and EMPLOYEES both can view ORDER HISTORY
- Each EMPLOYEE works in BRANCH and DEPARTMENT
- Each BRANCH has DEPARTMENTS
- Each BRANCH stores PRODUCT
- Each BRANCH is located in a REGION
- Each SUPPLIER supplies PRODUCTS to BRANCH
- SUPPLIER and EMPLOYEE both view SUPPLIER SHIPMENTS
- EMPLOYEE handles SALES RELATIONS and SUPPLIER SHIPMENTS
- One EMPLOYEE supervises multiple other EMPLOYEES

- One EMPLOYEE manages a BRANCH

Possibles Informal Queries and Update Operations

- Queries
    - Checking order histories
    - Checking remaining inventory
    - Viewing previous supplier shipments
    - Checking on sales relations between employees and customers to check performance
    - Pulling up customer information and contact information
    - Pulling up a supplier's contact information
    - Pulling up an employee's information (includes all attributes such as name, age, sex, salary, branch, supervisor, and department etc…)
- Update Operations
    - Updating order history (adding new orders)
    - Updating Inventory for specific products
    - Updating supplier shipments (logging new shipments)
    - Updating the sales relations between employees and customers to track performance
    - Creating/ changing customer information for new/ existing customers
    - Creating/ changing supplier information for new/ existing suppliers
    - Creating/ changing employee information for new/ existing employees
    - Changing the price for certain products
    - Changing branch suppliers

Additional Views

- We will have three primary user groups consisting of employees, suppliers, and customers. There are base employees and supervisors. Each user group will have their own view in which they have limited access to certain parts of the database. For example, suppliers will have access to their supplier shipments but not customer order history. They same goes vice versa where customers can access their order history but not supplier shipments. The employee user group will be the only one who will be able to access all three tiers of the supply chain of information (order history, company information, and supplier information). Employees will only have access to data relating to their own work and no other employees. Only supervisors will be able to view multiple employees' information such as sales relations.

Possible Interfaces

- For the customer, they would require an application that gives them the ability to manage their orders and to contact their sales representatives.
- For the employee, they would have an application that similarly allows them to manage orders and contact customers. They would also need a similar application to manage shipments and contact suppliers.
- For the supervisor, they would have an application that allows them to view the productivity of their employees and manage products, branches, departments, and suppliers.

- For the supplier, they would require a similar application to the customer except with access to supplier shipments instead of order history.

Integrity Constraints

sex: must fit a char of either ‘M’ or ‘F’

contact_information: must be a int of index 9

price_per_unit: must not have more the two decimal places

delivery_date: must be after the order_date

Region_name: must be one of

“West”,”MidWest”,”SouthWest”,”SouthEast”,”NorthEast”

employee_id: must be unique

department_id: must be unique

branch_id: must be unique

customer_id: must be unique

product_id: must be unique

region_id: must be unique

supplier_id: must be unique

Schema Diagrams / Tables

Employee								
employee_id	first_name	last_name	birth_date	sex	salary	supervisor_id	department_id	branch_id
1001	John	Doe	04/09/1968	M	$410,000.00	NULL	0002	10
1002	James	Smith	07/22/1984	M	$120,000.00	1001	2221	12
1003	Sally	Johnson	02/15/1992	F	$52,000	1002	2222	12

Department		
department_id	department_name	department_head_id
0002	Corporate	1001
1221	Human Resources	1499
1222	Sales	1599
2221	Human Resources	2499
2222	Sales	2599

Branch			
branch_id	branch_name	branch_head_id	region_id
10	Dayton	1001	1400
20	Scranton	2001	2400

Customer				
customer_id	first_name	last_name	customer_address	contact_information
1001	Jane	Doe	1002 Neverland Rd	nsdad@yahoo.com
2002	Chris	Smith	2463 Dunken Rd	ChrisS547@hotmail.com

Supplier			
supplier_id	company_name	contact_information	address

1001	Adidas	supplier@adidasl.com	1965 Eagle Court
2002	Nike	supplies@nike.com	123 Office Row

Products			
product_id	product_name	price_per_unit	inventory
14401	Adidas hat	$15.00	1,500
14402	Nike shirt	$35.00	750

Sales Relations		
employee_id	customer_id	total_sales
1123	1001	$75.0
1124	1001	$150.0

Supplier Shipments				
branch_id	supplier_id	shipment_id	product_id	shipment_date
1001	1001	100808	1001	12/14/2021

Region		
region_id	region_name	region_sales
1	SW US	$880,888.00

Order History				
customer_id	order_id	product_id	order_date	delivery_date
1001	110080	1001	12/14/2021	12/25/2021

Possible Forms and Reports

- Forms
    - The first form would be a purchasing form where users could fill out information on what products they would like to purchase. This would change values for inventory of the products they ordered, create new entries in order history, and add on to total sales.
    - Another form would be a contact information update form, where the user can update contact information and addresses for clients/customers.
    - A third form would be used when adding a new employee to the company. This form would have text fields to enter the new employee's name, salary, and assign a supervisor. This form would also have drop downs to assign a branch and department to the employee profile. There will be a calendar option to select the employee's date of birth and a drop down menu to select their sex.
    - A form to update/change employee information, like if they move or change salary or job.
    - A form to update department head for branches.
    - A form to create new customers or update customer information inside the database.
    - A form to add new supplier or update current supplier information
    - A form to update product price
    - A form to add a new product to the database.

- Reports
    - For our reports, they will be generated by clicking on buttons through a navigable menu. For example, to generate a report containing an employee's information, the user would navigate to an employee list, find the desired employee, and click on the icon labeled, "Show Employee Information". A list of possible reports follows below

    - A report for checking order histories

    - A report to check remaining inventory

    - A report to view previous supplier shipments

- A report for checking on sales relations between employees and customers to check performance
- A report for all customer information and contact information
- A report for supplier's contact information
- A report for seeing employee's information (includes all attributes such as name, age, sex, salary, branch, supervisor, and department etc…)
- A report for employee sales within a set date window
- A report for region sales within a set date range
- A report for customer purchases within a set date range
- A report for branch sales within a set date range
- A report for products a supplier provides and information on those products

Wireframes

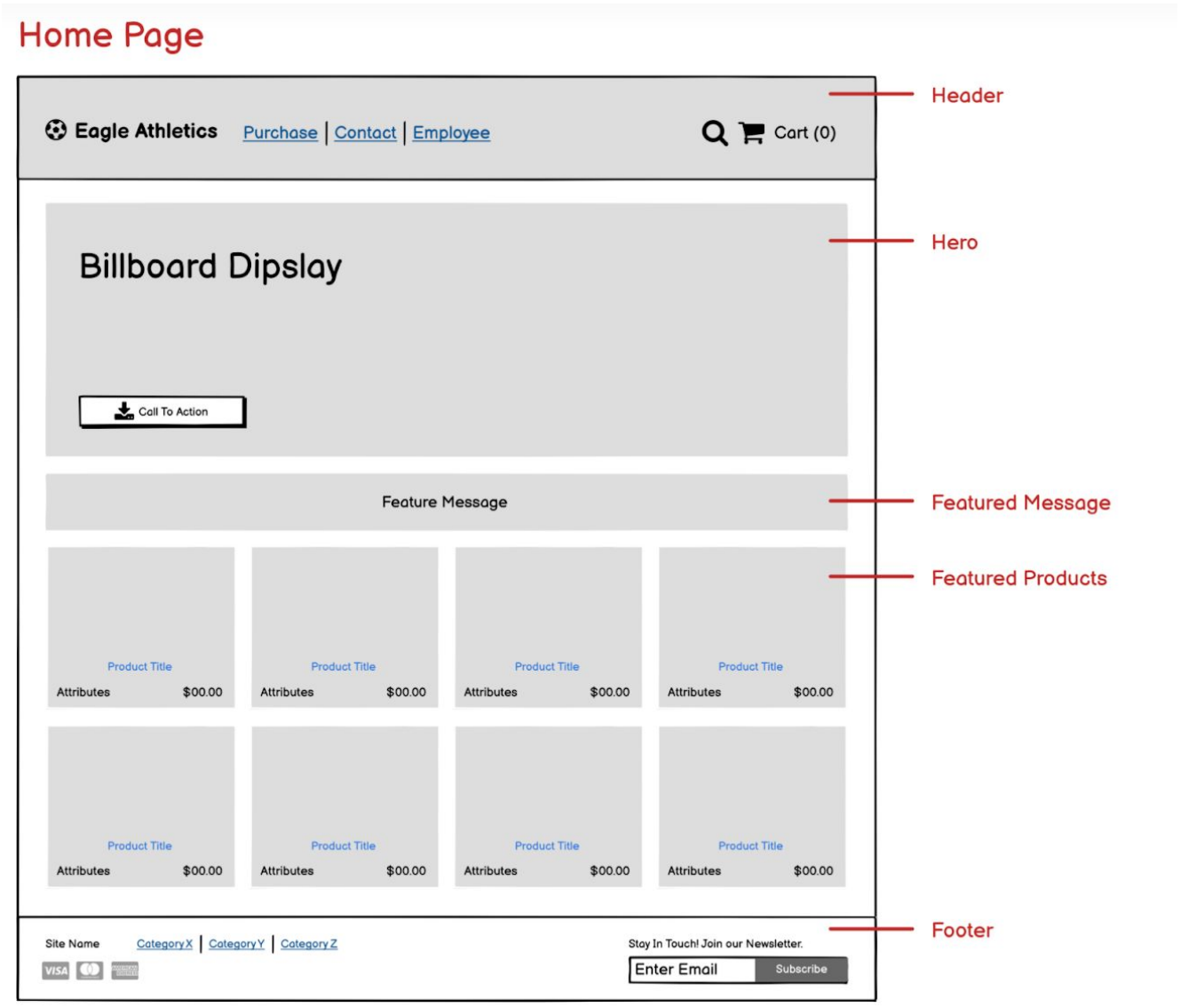


Figure 1.1 : Homepage Wireframe

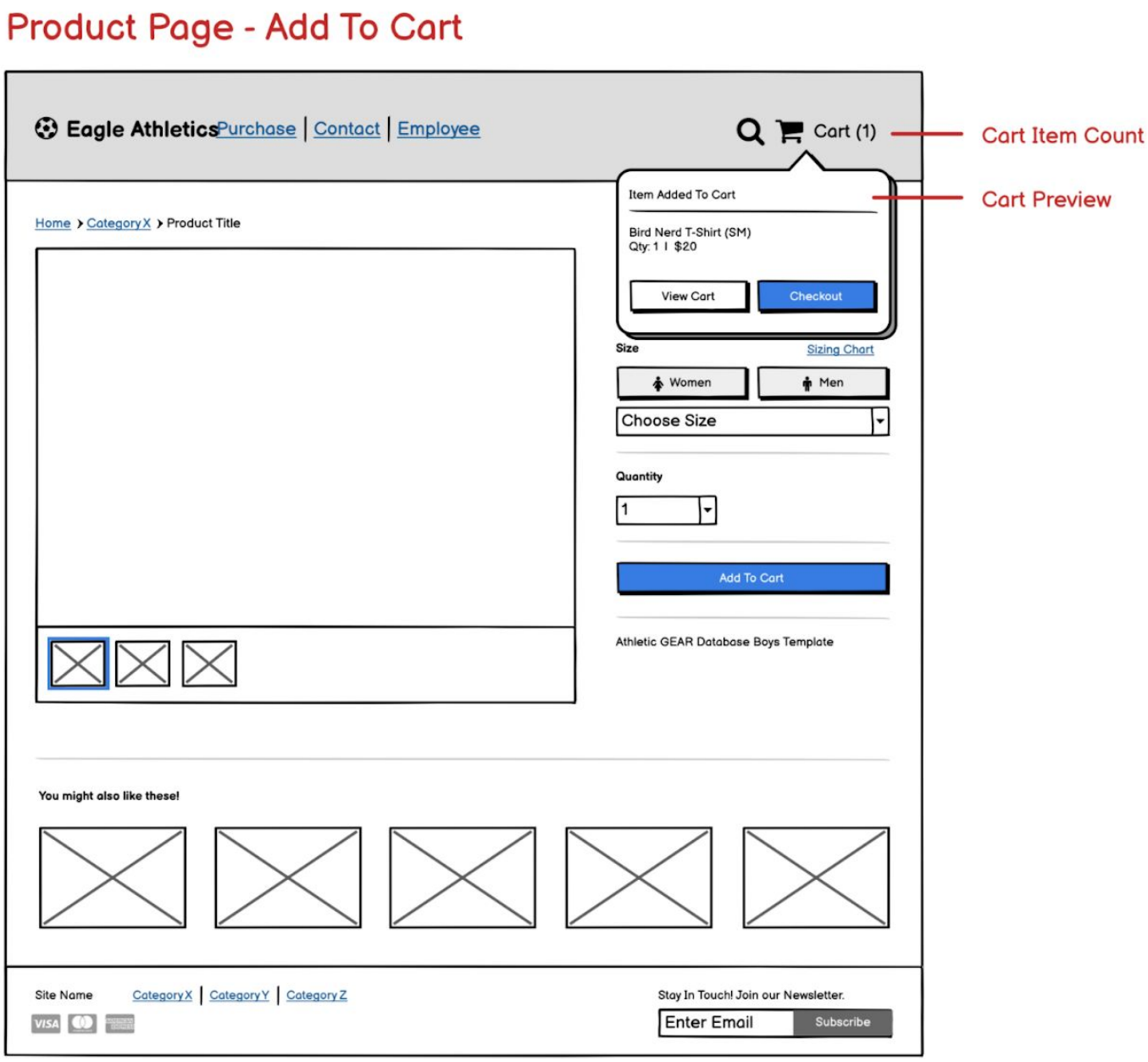


Figure 1.2 : Product Page Wireframe

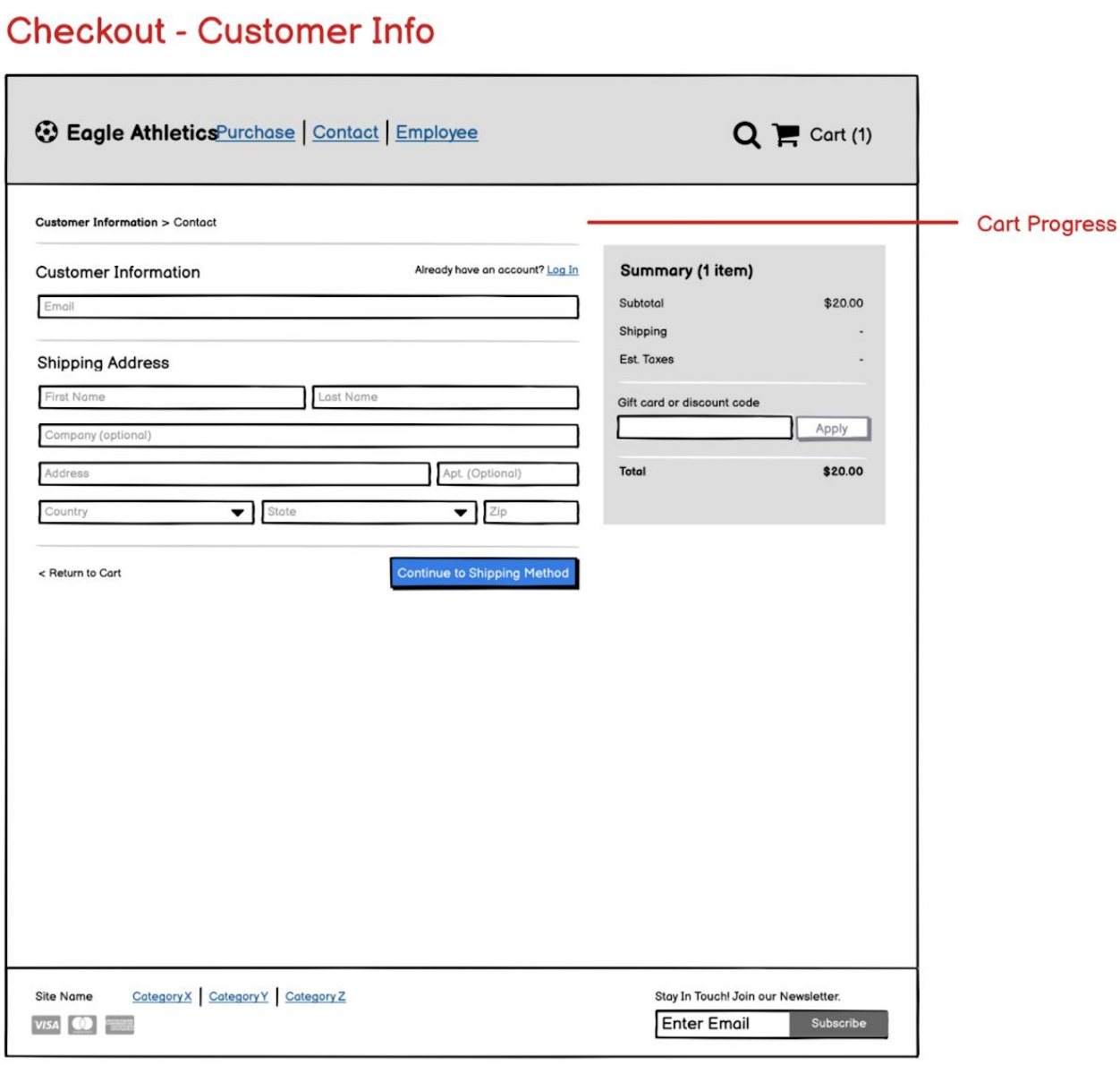


Figure 1.3 : Checkout Page Wireframe

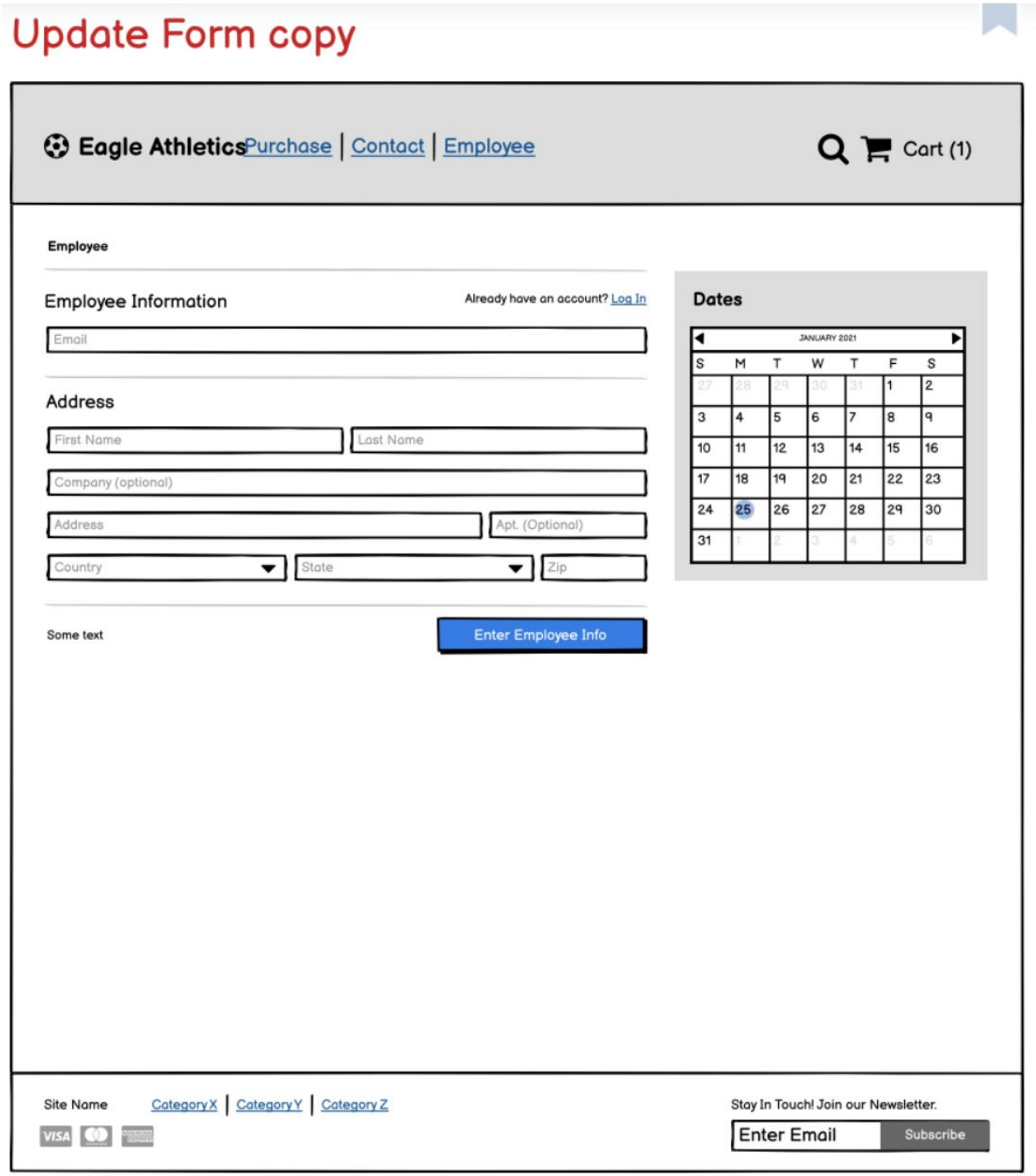


Figure 1.4 : Example Update Form Wireframe

Figure 1.5 : Add Employee Form Wireframe

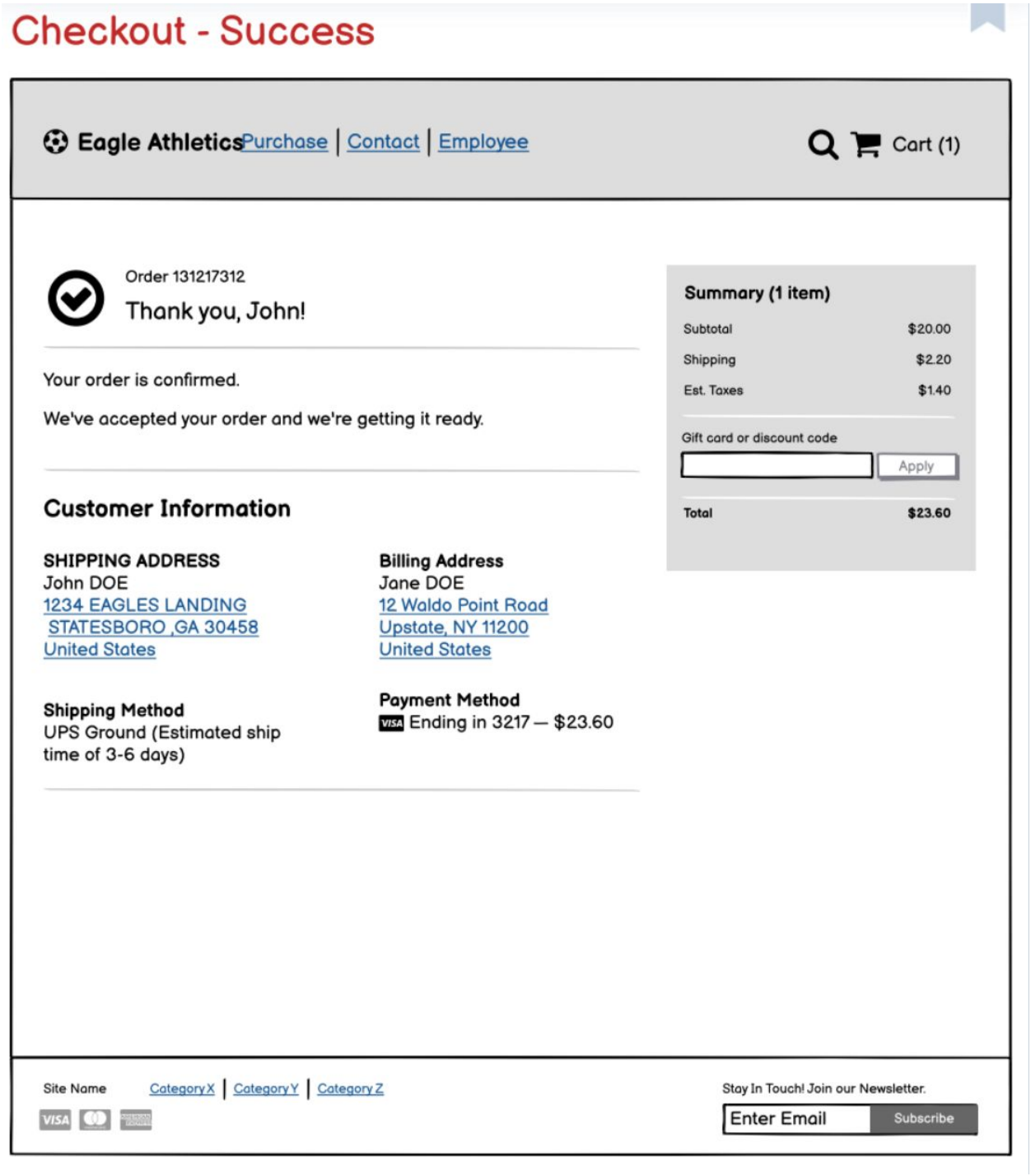


Figure 1.6 : Checkout Confirmation Page Wireframe

ER Diagram/ Conceptual Design

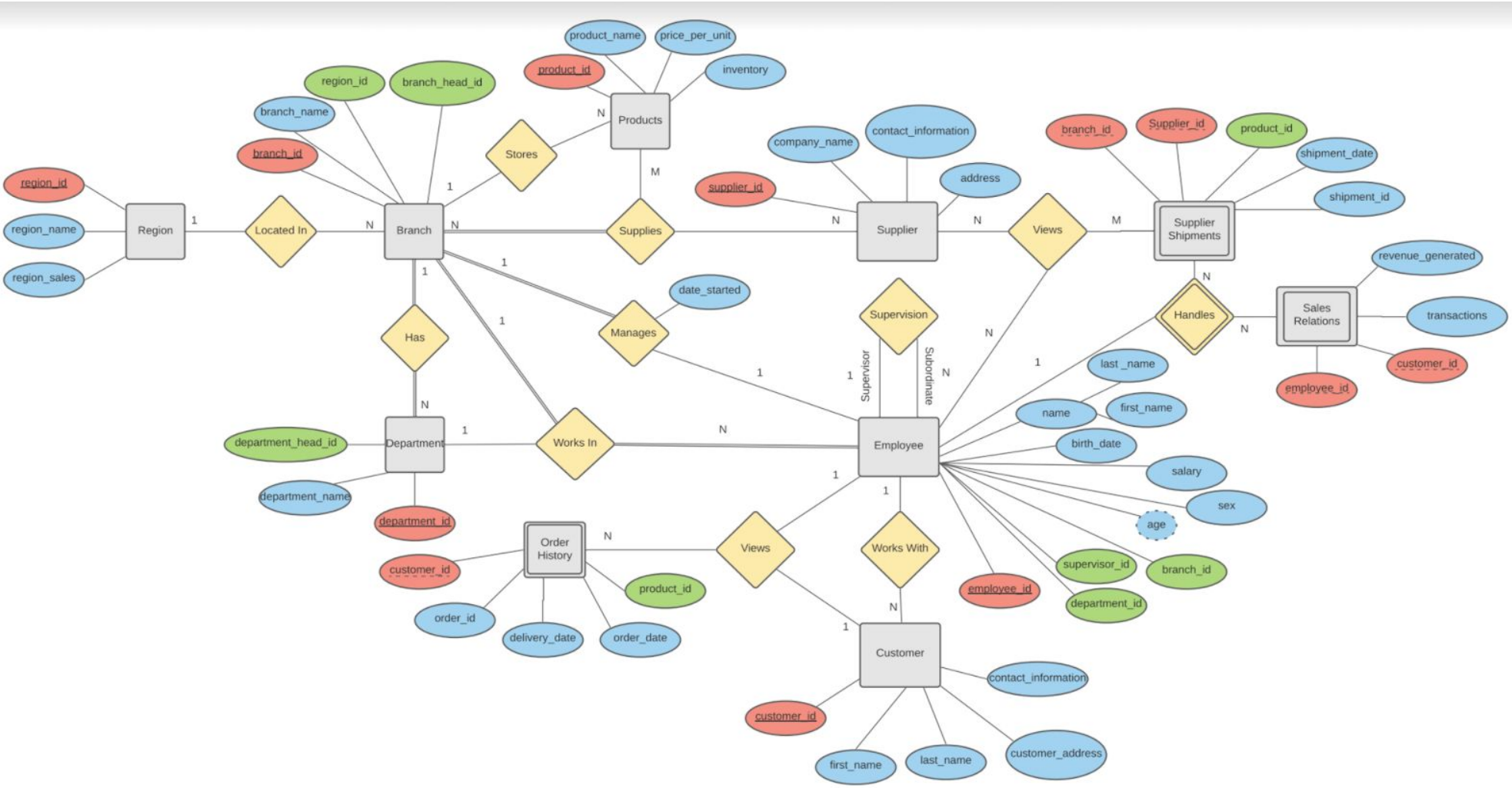


Figure 2.1 : ER Diagram for Eagle Athletics Database Visualizer

- Gray Boxes represent entities, blue ovals represent regular attributes, green are foreign keys, red are primary keys, and yellow diamonds are relationships

Logical/Physical Design

Relational functions

EMPLOYEE
Employ_id determines first_name
Employ_id determines last_name
Employ_id determines birth_date
Employ_id determines sex
Employ_id determines salary
Employ_id determines supervisor_id
Employ_id determines department_id
Employ_id determines branch_id

Emloyee_id -> {first_name, last_name, birth_date, sex, salary, supervisor_id, department_id, branch_id}

DEPARTMENT
Department_id determines department_name
Department_id determines department_head_id

Department_id -> {department_name, department_head_id}

BRANCH
Branch_id determines branch_name
Branch_id determines branch_head_id
Branch_id determines region_id

Branch_id -> {branch_name, branch_head_id, region_id}

CUSTOMER
Customer_id determines first_name
Customer_id determines last_name
Customer_id determines customer_address
Customer_id determines contact_information

Customer_id -> {first_name, last_name, customer_address, contact_information}

SUPPLIER
Supplier_id determines company_name
Supplier_id determines contact_information
Supplier_id determines address

Supplier_id -> {company_name, contact_information, address}

PRODUCTS
Product_id determines product_name
Product_id determines price_per_unit
Product_id determines inventory

Product_id -> {Product_name, price_per_unit, inventory}

SALES RELATIONS
Employee_id and customer_id determines total_sales

{Employee_id, customer_id} -> total_sales

SUPPLIER SHIPMENTS
Branch_id and supplier_id determines shipment_id
Branch_id and supplier_id determines product_id
Branch_id and supplier_id determines shipment_date

{Branch_id, supplier_id} -> {shipment_id, product_id, shipment_date}

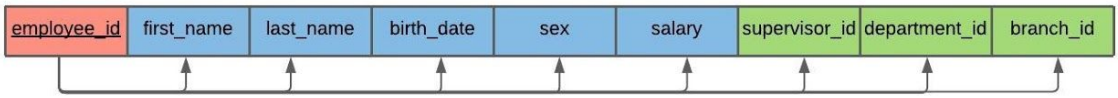
REGION
Region_id determines region_name
Region_id determines region_sales

Region_id -> {region_name, region_sales}

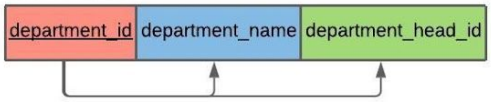
ORDER HISTORY
Customer_id determines order_id
Customer_id determines product_id
Customer_id determines order_date
Customer_id determines delivery_date

Customer_id -> {order_id, product_id, order_date, delivery_date}

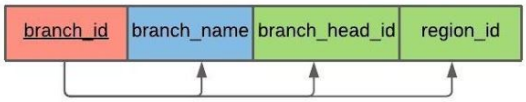
EMPLOYEE



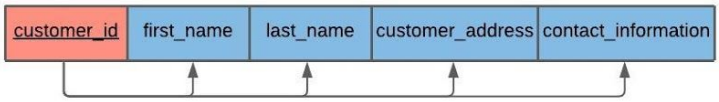
DEPARTMENT



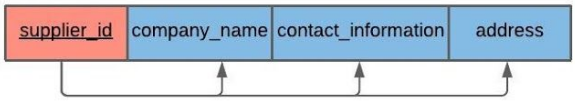
BRANCH



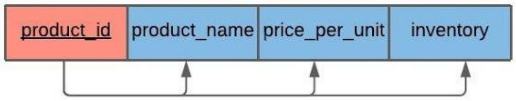
CUSTOMER



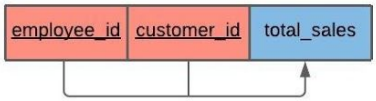
SUPPLIER



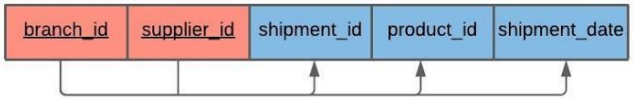
PRODUCTS



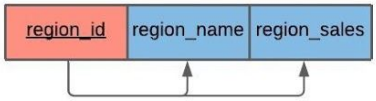
SALES RELATIONS



SUPPLIER SHIPMENTS



REGION



ORDER HISTORY