Requirements Definition – Financial Newsletter Publication System

Project name: Financial Publication Company

Date: 06/25/2020

# **Requirements Summary**

Abc Publishing company requires a deeper insight into all its newsletter services and their performance from profitability perspective. Studying their performance would greatly help the business decision makers in focusing on the high revenue generating products more than the others. In addition, as the company publishes different types of the newsletters, the prices of each of them varies significantly. Therefore, they intend to upsell some of the existing customers to opt for higher valued publications. Also, to ensure the customers are able to access their subscribed publication online, an authentication and authorization system needs to be built. The database would enable the company to have all of the above capabilities.

# **Database Overview - Entity and Attribute Description**

First of all, the database tables or entities need to be defined. As part of this project, the data about the customer or the reader, related subscriptions, payment methods, invoices, and payments need to be stored. Here is the detailed list of the basic entities that are required for the application.

## *Entity description:*

|  |  |  |  |
| --- | --- | --- | --- |
| **Entities** | **Primary Keys** | **Foreign Keys** | **Foreign Key Parent** |
| Customer | CustomerId |  |  |
| Subscription | SubscriptionId | CustomerId | Customer |
| PaymentMethod | PaymentMethodId | CustomerId | Customer |
| Invoice | InvoiceId | SubscriptionId | Subscription |
| Product | ProductId | SubscriptionId | Subscription |
| ProductCharge | ProductChargeId | ProductId | Product |

*Attribute description:*

1. Customer: REGULAR ENTITY: Customer information are maintained in this entity

CustomerId: [PK] ATTRIBUTE Type: NUMERIC Length= Width=, Primary Column, denotes unique customer record

FirstName: ATTRIBUTE Type: VARCHAR Length=100, First name of the customer

LastName: ATTRIBUTE Type: VARCHAR Length=100, Last name of the customer

Email: ATTRIBUTE Type: VARCHAR Length=100, Stores Email of the customer

PhoneNumber: [ALLOW NULL] ATTRIBUTE Type: INTEGER, Phone number of the customer

Autopay: ATTRIBUTE Type: BOOLEAN, Denotes if the customer opted Autopay or not.

CreatedDate: ATTRIBUTE Type: TIMESTAMP, Created date of customer

UpdatedDate: ATTRIBUTE Type: TIMESTAMP, Last updated date of the customer

Address1: ATTRIBUTE Type: VARCHAR Length=100, Address 1 of the customer

Address2: [ALLOW NULL] ATTRIBUTE Type: VARCHAR Length=100, Address 2 of the customer

City: ATTRIBUTE Type: VARCHAR Length=100, City of customer

Country: ATTRIBUTE Type: VARCHAR Length=100, Country of the customer

PostalCode: ATTRIBUTE Type: INTEGER, Postal code of the customer

1. PaymentMethod: REGULAR ENTITY: Payment Method for the customer is maintained in this entity

PaymentMethodId: [PK] ATTRIBUTE Type: NUMERIC Length= Width=, Primary key column of payment method is stored here.

Name: ATTRIBUTE Type: VARCHAR Length=100

CCNumber: ATTRIBUTE Type: INTEGER, Credit card number is stored here

CCType: ATTRIBUTE Type: VARCHAR Length=10, credit card type like Visa, Amex is maintained here.

Address1: ATTRIBUTE Type: VARCHAR Length=100, address 1 of credit card is stored here.

Address2: [ALLOW NULL] ATTRIBUTE Type: VARCHAR Length=100, Address 2 is optional.

City: ATTRIBUTE Type: VARCHAR Length=100, City information is stored here

PaymentRefId: ATTRIBUTE Type: INTEGER, Id representing credit card is store here. So, no credit card is required to charge the customer again for auto pay and so on.

CreatedDate: ATTRIBUTE Type: TIMESTAMP, Payment method created date

UpdatedDate: ATTRIBUTE Type: TIMESTAMP, Last updated date of Payment method

CCExpiryMonth: ATTRIBUTE Type: INTEGER, Holds Expiry Month of credit card.

ExpiryYear: ATTRIBUTE Type: INTEGER, Holds Expiry Year.

1. ProductCharge: REGULAR ENTITY: Product charges are maintained in this entity

ProductChargeId: [PK] ATTRIBUTE Type: NUMERIC Length= Width=, Primary key column for product charge is stored here.

Amount: ATTRIBUTE Type: DECIMAL Length=2 Width=2, Charge amount is stored in dollar.

CreatedDate: ATTRIBUTE Type: TIMESTAMP, the Created date for product charge is stored here.

UpdatedDate: ATTRIBUTE Type: TIMESTAMP, Last updated date of the product charge is maintained here.

Taxable: ATTRIBUTE Type: BOOLEAN, Is Product taxable or not is stored here.

ChargeType: ATTRIBUTE Type: VARCHAR Length=100

Invoice: REGULAR ENTITY, Invoice information for the subscription is maintained in this entity

InvoiceId: [PK] ATTRIBUTE Type: NUMERIC Length= Width=, Primary column for the invoice, maintains uniqueness for the invoice table.

Amount: ATTRIBUTE Type: DECIMAL Length=2 Width=2, Amount in dollars

BalanceAmount: ATTRIBUTE Type: DECIMAL Length= Width=, Balance amount for the invoice is maintained here.

TaxAmount: ATTRIBUTE Type: DECIMAL Length= Width=, The Tax amount for the invoice amount is maintained here.

UpdatedDate: ATTRIBUTE Type: TIMESTAMP, Last updated date of Invoice

CreatedDate: ATTRIBUTE Type: TIMESTAMP, Invoice created date

1. Subscription: REGULAR ENTITY: Subscription information of the customer is maintained in this entity.

SubscriptionId: [PK] ATTRIBUTE Type: NUMERIC Length= Width=, Primary key column for the subscription.

TermStartDate: ATTRIBUTE Type: TIMESTAMP, Term Start date for the subscription is maintained here.

TermEndDate: ATTRIBUTE Type: TIMESTAMP, Term End Date for the subscription is maintained here.

TermType: ATTRIBUTE Type: VARCHAR Length=, Term type, can be lifetime or Termed.

Name: ATTRIBUTE Type: VARCHAR Length=, Name of the subscription.

CreatedDate: ATTRIBUTE Type: TIMESTAMP

UpdatedDate: ATTRIBUTE Type: TIMESTAMP, Last updated date of subscription.

1. Product: REGULAR ENTITY: Product information offered are maintained in this entity

ProductId: [PK] ATTRIBUTE Type: NUMERIC Length= Width=, Holds primary column of product.

ProductName: ATTRIBUTE Type: VARCHAR Length=255, Name of the product.

ProductDescription: ATTRIBUTE Type: VARCHAR Length=255, Holds product description

CreatedDate: ATTRIBUTE Type: TIMESTAMP, Product created date is stored here

UpdatedDate: ATTRIBUTE Type: TIMESTAMP, Last updated date of product is stored here.

SKU: ATTRIBUTE Type: VARCHAR Length=50, SKU is code to determine the product.

# **Relationships and Business Rule**

As the above entities are defined with the attributes and the key definition, the following relationships are built. These relationships can either be optional or mandatory.

|  |  |  |
| --- | --- | --- |
| **Relationship Name** | **Relationship Type** | **Business Rule** |
| Customer – PaymentMethod | Customer ONE OPTIONAL to PaymentMethod MANY MANDATORY | A customer can be created without a payment method associated. A payment method can be created only for a customer. More than one payment method can be created for a given customer. |
| Customer – Subscription | Customer ONE OPTIONAL to Subscription MANY MANDATORY | A customer can be created without a subscription. A subscription must be created for a given customer. Subscription can be created one or more for a customer. |
| Subscription – Product | Subscription ONE MANDATORY to Product MANY OPTIONAL | One subscription should have a mandatory product.  A product can have many, zero, or one subscription. |
| Subscription – Invoice | Subscription ONE OPTIONAL to Invoice MANY MANDATORY | A subscription can have many invoices.  And each invoice can have only one subscription. |
| Product – ProductCharge | REGULAR RELATIONSHIP Product ONE OPTIONAL to ProductCharge MANY MANDATORY | A product can have one or more product charges. And each charge can have only one product. |

# **Assumptions and Special Considerations**

Since this e-commerce project may become complicated with payment and invoices involved, here are a few assumptions and special considerations are taken for this project.

* I have added Autopay at the customer object, rather than at each subscription. That means if a customer has opted for autopay, then it is for all the subscriptions for the account, instead of maintained at individual subscriptions.
* Each Product can have many charges, like one-time, recurring payment, free trials or late payment, etc. Thus, the product charges are 1:M relations with the product instead of having price at the Product table.
* Balance Amount in Invoice amount is used, so the subscription can handle installment payments.
* Payment ref id on the Payment method is used as a token for autopay.