INFO 601 - Final Project Report 8

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RiverCityMusic(RCM) Venue - RVA Musical Entertainment Company

Business Scenario Introduction

Music is not only a main source of entertainment in our day-to-day lives, but also a source of true happiness when a song can put us in the right mood. People love music, and specifically live music. Richmond is growing in population by the year, about 14% over the past 10 years, so it makes sense for an investor to take advantage of RVA's music venue/scene potential. This vision prompted **RCM**, a Capital venture company looking to monopolize the concert venue market in metropolitan Richmond, VA, and start business by 2025. RCM was founded by multiple VCU alumni with serious connections to various small and large businesses in Virginia. This is a huge opportunity for RCM, being headquartered in one of the biggest and musically talented cities on the east coast lacking a proper venue setup; Another point to note, state and nationwide ticket sales & gross revenue were both record high in 2024.

To prepare for opening, RCM has hired our firm, **DataRamAnalytics (DRA)** to help install a data management system to assist with: Ticket Sales, User Profiles, Marketing, Third Party Promotions, Vendor Management, Event Scheduling, Staffing, Stakeholder relations, Billing, and ensuring shows run smoothly. DRA, like RCM, is also based out of Richmond, VA, and is led by: *****, ******, & Nolan. Three recent VCU Graduates with a passion for Data, and building a tailored database management system that will fit RCM's specific needs.

Once fully operating, there will be 7 concert venues owned by RCM in: Richmond(3x), Henrico, Midlothian, Doswell, and Colonial Heights. Each venue will be targeted towards a specific demographic and musical genre. A quality functioning data management system is critical for daily operations. Ticketmaster has a chokehold on "ticket sales" website, but our plan is to build an equally effective Business Data System that Artists will trust when coming to perform. Other than storing and managing data, DRA will build multiple reports/dashboards to track various performance metrics. The database will be the backbone of our website and marketing promotions. This is a big task, the entire multi-venue concert company is completely dependent on a functioning data system - and our job is to make that happen.

A key point of emphasis is business expansion; how do we build a database management system that can stay relevant with new business. RCM has stated they want to expand beyond music and allow venues to be used for conferences, art/dance shows, comedy,etc. The sophistication of the database needs to cover the future vision of the company.

Database Requirement Analysis

Below is a table highlighting the Data Requirements based on the primary business goal of fulfilling ticket sales.

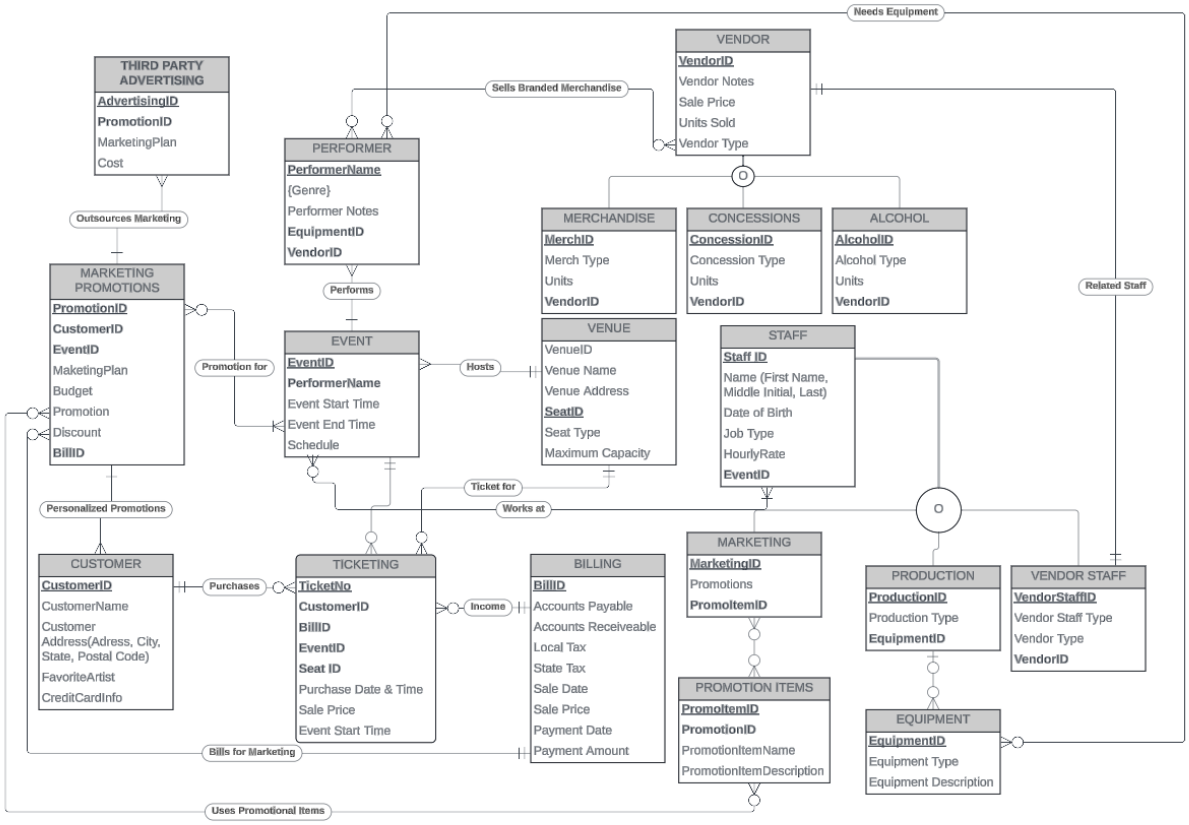
Entity	Fields in table	Purpose of Data
Customer	Basic Customer Information: Name, Address, Favorite Artist, Credit Card Info.	Maintain basic Customer Information. Favorite Artist will be used for Marketing purposes.
Ticketing	Associative IDs, Purchase Date & Time, Sale Price, Start time.	Single point of validation for ticketing. Scanners at the Front gate(s) will be synchronized with this data.
Billing	Accounting focused - houses all finance related data; Track Revenue, Expenses, Accounts Payable, Accounts Receivable, Taxes, Sales Dates, Sales Price, Payment Date, Payment Amount.	Utilized to conduct Accounting, Finance, and Tax operations. Single location of financial data.
Event	Event Start time, Event end time, Schedule.	Scheduling between Venue, Performer, and Staff; Master Scheduling, includes Start & End Times.
Performer	Performer Name, Genre, Performer Notes.	Information on performers and equipment requested, special notes will also be captured.
Venue	Venue Name, Venue Address, Seat ID/Number, Seat Type, Maximum Capacity	Venue location information, and full seating assignment by venue; Ensure proper seating. Maximum Capacity will be enforced.
Vendor	Composing of three types: Merchandise, Concessions, Staff. Vendor Notes, Sales Price, units sold	Ensure proper Vendor Management. 1 Vendor company can be multiple Vendor Types.

Merchandise	Merch Type, units in counts.	Inventory Management & Tracking.
Concessions	Units in weight or counts.	Ensure proper storage and refrigeration. Inventory Management.
Alcohol	Units in liquid-weight or counts.	Ensure proper storage and refrigeration; Ensure proper age-limitations are enforced.
Staff	Information related to: Staff Name, DOB, Wage, Schedule & composed of three main types: Marketing, Production, Vendor Staff.	Manage Staff and ensure they are paid timely. Utilized to assign to events/venues.
Marketing	Associated Promotions	Marketing Staff and their respective marketing projects.

Key Points of requirements when building the database:

· Must be able to accommodate over 1 million Users + Transactions.
· Utilize 3rd party advertising to increase brand awareness; The Martin Agency has already agreed to be our partner.
· Oracle Database will be utilized to build out business logic, and we've partnered with Amazon(AWS) on building out a website interface.
· Privacy is a key function of data management – we've partnered with IBM to ensure proper cybersecurity is enforced on our website interface.
· Built for expansion; If data size(accounts/sales) were to double or triple, our current model could accommodate. Highlighting specifically the emphasis on marketing to generate maximum sales.

ER Diagram:



Link to our LucidChat ERD: [Link]

Key highlights on ERD:

- Started small, but challenged ourselves to expand. This led us to expand on marketing and promotions initiatives and the required data for that, breakdown on vendors and staff - specify roles, and simplification of our Venue/Seating Database.
- Billing is set up to effectively capture revenue and expenses related to business. The plan is to have an aggressive marketing campaign to spread brand awareness.
- Framework for expansion; In the case for national/international business expansion - our ERD can fit and increase in venues/customers/staff/etc.
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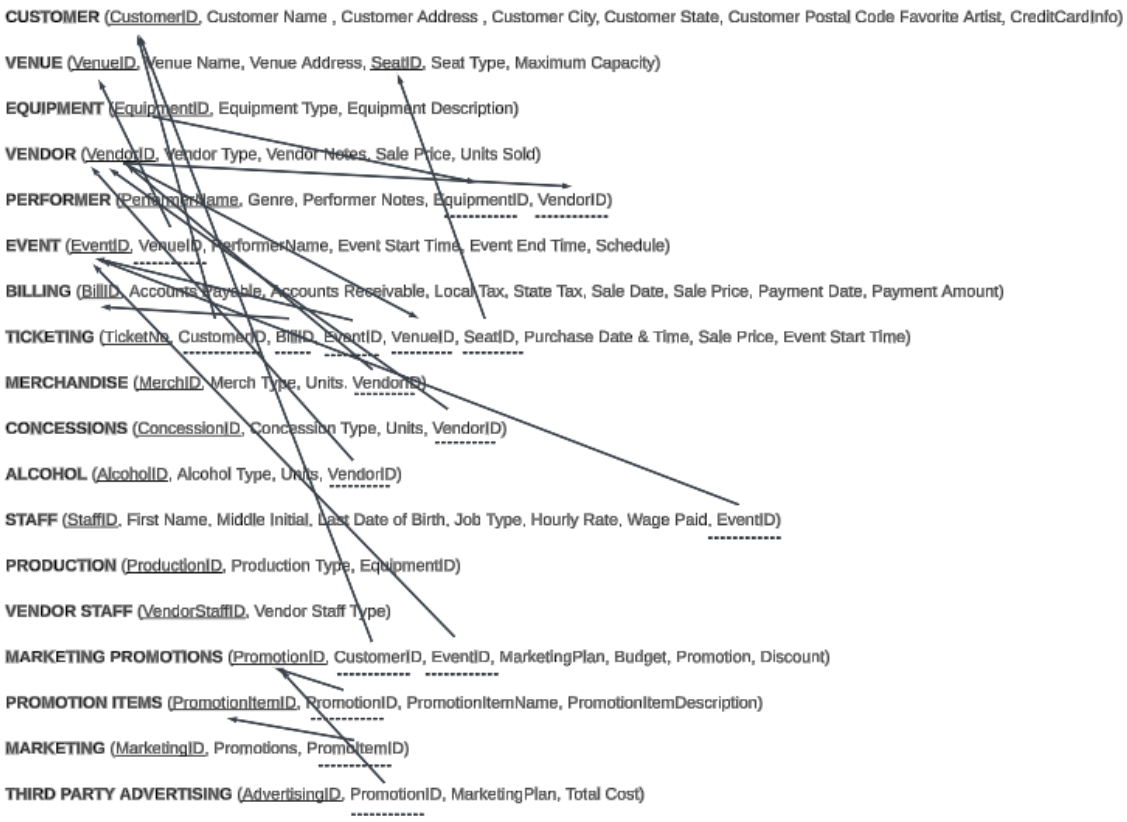
Business Database Relations:



Key highlights on Relations:

- From Top to Bottom, this is the order that RCM will create the tables. This ensures referential integrity when creating the tables.
- Through all the connections, each ticket sale means the database is provided with details about event locations, seating arrangements and information regarding our customer.
- Although Billing takes on the majority of the financial data, we also track revenues through merchandise, concessions and alcohol in their own respective tables.
- Marketing Promotions, Promotion Items, Marketing and Third Party are unique tables that are required for the different aspects of Marketing.
- Vendor Staff are the people that work in the Vendors which concern Concessions, Merchandise and Alcohol, while Staff pertains to Security, Bartenders, Stagehands, and Ticket Sellers.

Business Queries

Below, we've developed 15 Queries that show-off what our database can do. This includes tan array of: relationships of the different tables, finances, operations, and a multitude of varying SQL syntax.

Query 1: How much money did each Concession Food or Drink draw in?

```
SELECT
    VENDOR.VENDORTYPE AS "Vendor Type",
    CONCESSIONS.CONCESSIONTYPE AS "Concession Food or Drink",
    SUM(CONCESSIONS.UNITS * VENDOR.UNITSSOLD) AS "Amount of Money"
FROM VENDOR
JOIN CONCESSIONS ON VENDOR.VENDORID = CONCESSIONS.VENDORID
GROUP BY VENDOR.VENDORTYPE, CONCESSIONS.CONCESSIONTYPE
ORDER BY "Amount of Money" DESC;
```

Vendor Type	Concession Food or Drink	Amount of Money
Concessions	Popcorn	100000
Concessions	French Fries	60000
Concessions	Sprite	60000
Concessions	Cheese Pizza	60000
Concessions	Maruchan	54000
Concessions	Nachos	31500
Concessions	Coke	30000
Concessions	Hotdog	30000
Concessions	Skittles	24500
Concessions	Cookies	21000

10 rows returned in 0.00 seconds Download

- With this Query, we connect the Concessions with the Vendor table to show us how much money each concession food or drink item made for us. RCM can use this information to see which food items were most popular and least popular.

Query 2: How much is each Staff member making for the hours they work?

```
SELECT
    STAFF.STAFFID AS "Staff ID",
    STAFF.EVENTID AS "Event ID",
    STAFF.HOURLYRATE AS "Hourly Rate",
    CASE
        WHEN EVENT.SCHEDULE = '1pm-10pm' THEN 9
        WHEN EVENT.SCHEDULE = '2pm-9pm' THEN 7
    END AS "Hours Working",
    (STAFF.HOURLYRATE *
        CASE
            WHEN EVENT.SCHEDULE = '1pm-10pm' THEN 9
            WHEN EVENT.SCHEDULE = '2pm-9pm' THEN 7
        END) AS "Payment Amount"
FROM STAFF
LEFT OUTER JOIN EVENT
ON EVENT.EVENTID = STAFF.EVENTID;
```

Staff ID	Event ID	Hourly Rate	Hours Working	Payment Amount
6700	504001	15.5	9	139.5
6715	504001	17.25	9	155.25
6701	504002	18	9	162
6716	504002	16.25	9	146.25
6702	504003	20	9	180
6717	504003	18.75	9	168.75
6703	504004	16	9	144
6718	504004	21	9	189
6719	504005	16	9	144
6704	504005	14	9	126
6705	504006	19	9	171
6720	504006	14.5	9	130.5
6706	504007	21.5	9	193.5

- Using this Query, we connect the Staff Table and Event Table to see how many hours each Staff member is working and how much they will earn based on their hourly rate.
- The table gives us a total of 21 rows.

Query 3: How much do we pay each Staff Job Type in Total? Security? Stagehand? Bartender? Ticket Seller?

```
SELECT
    STAFF.JOBTYPE AS "Job Type",
    COUNT(STAFF.STAFFID) AS "Number of Workers",
    SUM(
        STAFF.HOURLYRATE *
        CASE
            WHEN EVENT.SCHEDULE = '1pm-10pm' THEN 9
            WHEN EVENT.SCHEDULE = '2pm-9pm' THEN 7
        END
    ) AS "Total Payment Amount"
FROM STAFF
LEFT OUTER JOIN EVENT
ON EVENT.EVENTID = STAFF.EVENTID
GROUP BY STAFF.JOBTYPE
ORDER BY "Total Payment Amount" DESC;
```

Job Type	Number of Workers	Total Payment Amount
Security	6	841.5
Stagehand	5	839
Bartender	5	750.25
Ticket Seller	5	632.25

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- This Query connects the Staff Table and the Event Table to determine which Job Type does RCM pay the most. From this RCM can have a better idea of our payroll and understand how the budget is split.

Query 4: What are our Totals for Accounts Receivable and Accounts Payable?

```
SELECT
SUM(BILLING.ACCOUNTSPAYABLE) AS "Accounts Payable",
SUM(BILLING.ACCOUNTSRECEIVABLE) AS "Accounts Recievable"
FROM
BILLING
```

Accounts Payable	Accounts Recievable
56124	71919

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- Our Query pulls data from the Billing Table where we see what our total Accounts Payable and Accounts Receivable are.

Query 5: How Much Money Did Each Vendor Draw in?

```
SELECT
    VENDOR.VENDORTYPE AS "Vendor Type",
    SUM(VENDOR.SALEPRICE * VENDOR.UNITSSOLD) AS "Amount of Money"
FROM VENDOR
GROUP BY VENDOR.VENDORTYPE;
```

Vendor Type	Amount of Money
Merchandise	284350
Concessions	20700
Alcohol	39900

- RCM will use this Query to know how much each of three Vendor Types made in total. From this, we could determine that alcohol draws in the most money.

Query 6: What are the different Marketing Promotions for Event 504001?

```
SELECT
   mp.PromotionID,
   mp.MarketingPlan,
   mp.Budget,
   mp.Promotion
FROM
   MARKETINGPROMOTIONS mp
JOIN
   EVENT e
ON
   mp.EventID = e.EventID
WHERE
   mp.EventID = 504001;
```

PROMOTIONID	MARKETINGPLAN	BUDGET	PROMOTION
102	Customer-Centric	10000	Buy Three Tickets Get one Free
101	Customer-Centric	10000	Buy Three Tickets Get one Free
103	Customer-Centric	10000	Buy Three Tickets Get one Free

3 rows returned in 0.00 seconds Download

- This query allows RCM to evaluate the effectiveness of different promotional strategies for an event and adjust future marketing plans accordingly.

Query 7: Who are our Customers favorite Artists?

```
SELECT
   c.CustomerID,
   c.CustomerName,
   c.FavoriteArtist
FROM
   CUSTOMER c;
```

CUSTOMERID	CUSTOMERNAME	FAVORITEARTIST
1	John M. Parker	Rema
2	Sarah L. White	Burna Boy
73	Jackson Davis	BTS
37	Matthew Moore	Billie Eilish
38	Natalie Young	Bruno Mars
39	Dylan Brown	Cardi B
41	Samuel Walker	Travis Scott
44	Lucas Harris	Ariana Grande
46	Nathan Lee	Post Malone
47	Victoria Wright	Billie Eilish

More than 10 rows available. Increase rows selector to view more rows.

- This data enables RCM to tailor marketing campaigns to specific customer preferences, improving customer engagement and increasing ticket and merchandise sales.

Query 8: How total tickets did we sell for Event 504001?

```
SELECT
   t.EventID,
   COUNT(t.TicketNo) AS Tickets_Sold,
   SUM(t.SalePrice) AS Total_Sales
FROM
   TICKETING t
WHERE
   t.EventID = 504001
GROUP BY
   t.EventID;
```

EVENTID	TICKETS_SOLD	TOTAL_SALES
504001	2	723

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- By analyzing ticket sales data, RCM can assess event profitability, identify trends, and make informed decisions about future ticket pricing and event planning.

Query 9: What Equipment do we need for each event?

```
SELECT
   eq.EquipmentID,
   eq.EquipmentType,
   eq.EquipmentDesc,
   p.PerformerName
FROM
   EQUIPMENT eq
```

```
JOIN
   PERFORMER p
ON
   eq.EquipmentID = p.EquipmentID;
```

EQUIPMENTID	EQUIPMENTTYPE	EQUIPMENTDESC	PERFORMERNAME
5001	Sound System	High-quality sound system for concerts	Bobby Johnson
5002	Lighting	LED stage lighting for concerts and events	Beyonce
5003	Microphone	Wireless microphone for performers	Olivia Rodrigo
5005	Stage Platform	Modular stage platform for event setups	Dua Lipa
5006	Speakers	Heavy-duty outdoor speakers for large venues	Ed Sheeran
5007	Camera	Professional video camera for live recordings	Billie Eilish
5008	Smoke Machine	Creates smoke effects for stage performances	The Weeknd
5009	DJ Console	Console for live DJ performances	Taylor Swift
5010	Lighting Controller	Controller for managing stage lighting effects	Bad Bunny

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- Understanding the equipment used for each event helps RCM ensure proper equipment management, maintenance, and future event preparations.

Query 10: How many Units Sold did each Vendor Type Draw ?

```
SELECT
   v.VendorID,
   v.VendorType,
   v.UnitsSold
FROM
   VENDOR v
WHERE
   EXISTS (
       SELECT 1
       FROM MERCHANDISE m
       WHERE v.VendorID = m.VendorID
   )
OR
   EXISTS (
       SELECT 1
       FROM CONCESSIONS c
       WHERE v.VendorID = c.VendorID
   );
```

VENDORID	VENDORTYPE	UNITSSOLD
1	Merchandise	40
2	Merchandise	150
3	Concessions	600
4	Concessions	350
7	Concessions	1000
8	Merchandise	300
10	Concessions	450
11	Merchandise	550
12	Merchandise	50
13	Merchandise	150

More than 10 rows available. Increase rows selector to view more rows.

- By reviewing vendor performance, RCM can optimize partnerships and inventory, ensuring it provides the most popular products and services at events.

Query 11: How many Events has each Staff Member worked?

```
SELECT s.FirstName,
      s.LastName,
      COUNT(E.EventID) AS Number_of_Events_Worked
FROM Customer cu
LEFT JOIN Ticketing t ON cu.CustomerID = t.CustomerID
LEFT JOIN Event E ON t.EVENTID = E.EVENTID
LEFT JOIN Staff s ON s.EventID = E.EVENTID
Where s.FirstName is not null
GROUP BY s.FirstName, s.LastName
ORDER BY Number_of_Events_Worked Desc
```

FIRSTNAME	LASTNAME	NUMBER_OF_EVENTS_WORKED
Mia	Perez	2
Ethan	Thomas	2
Benjamin	Gonzalez	2
Sophia	Martinez	2
Emily	Williams	2
John	Doe	2
James	Garcia	2
Amelia	Martin	2
Lucas	Wilson	2
David	Brown	2

More than 10 rows available. Increase rows selector to view more rows.

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- This information enables RCM to assess staff involvement in events, helping with performance evaluation, resource planning, and identifying staff who may need additional training or support for future events.

- **Query 12: What are the different Product types between ProductID 201 and 210?**

```
SELECT p.ProductionID, p.ProductionType, e.EquipmentDesc
FROM PRODUCTION p
JOIN EQUIPMENT e ON p.EquipmentID = e.EquipmentID
WHERE p.ProductionID BETWEEN 201 AND 210;
```

PRODUCTIONID	PRODUCTIONTYPE	EQUIPMENTDESC
201	Sound System	High-quality sound system for concerts
202	Lighting	LED stage lighting for concerts and events
203	Microphone	Wireless microphone for performers
204	Projector	Projector for visual effects and presentations
205	Stage Platform	Modular stage platform for event setups
206	Speakers	Heavy-duty outdoor speakers for large venues
207	Camera	Professional video camera for live recordings
208	Smoke Machine	Creates smoke effects for stage performances
209	DJ Console	Console for live DJ performances
210	Lighting Controller	Controller for managing stage lighting effects

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- This Query displays the different descriptions for all the product types between ProductID 201 and 210. If RCM needs to check over their Production Equipment then this is one way to look over it.

Query 13: How many Total Sales did each Performer draw in?

```
SELECT
  e.PerformerName,
  SUM(t.SalePrice) AS Total_Sales
FROM
```

```
  TICKETING t
JOIN
  EVENT e
ON
  t.EventID = e.EventID
GROUP BY
  e.PerformerName
ORDER BY
  Total_Sales DESC;
```

PERFORMERNAME	TOTAL_SALES
Taylor Swift	2753
Billie Eilish	2354
Dua Lipa	2017
Ed Sheeran	1961
Bad Bunny	1790
The Weeknd	1207
Beyonce	723
Olivia Rodrigo	352
Bobby Johnson	351

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- This information allows RCM to identify top-performing artists, enabling better decision-making for future events, optimizing booking strategies, and increasing revenue by focusing on high-demand performers.

Query 14: When and where will Beyonce perform?

```
SELECT
   e.performername,
   e.eventID,
   e.eventstarttime,
   e.eventendtime,
   e.schedule,
   v.venuename,
   v.venueaddress
FROM
   EVENT e
JOIN
   TICKETING t ON e.eventID = t.eventID
JOIN
   VENUE v ON t.seatID = v.seatID
WHERE
   e.performername = 'Beyonce';
```

PERFORMERNAME	EVENTID	EVENTSTARTTIME	EVENTENDTIME	SCHEDULE	VENUENAME	VENUEADDRESS
Beyonce	504001	01/15/2024	01/15/2024	1pm-10pm	Altria Theatre	100 Salisbury St
Beyonce	504001	01/15/2024	01/15/2024	1pm-10pm	Paramount Theatre	350 Broadway Ave

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- This Query connects the Event Table to the Ticketing Table to the Venue Table to tell us when and where Beyonce will be performing for us.

Query 15: Which Venue(s) sold the most tickets?

```
SELECT
  v.VenueID,
  v.VenueName,
  COUNT(t.TicketNo) AS Tickets_Sold
FROM
  TICKETING t
JOIN
  EVENT e
ON
  t.EventID = e.EventID
JOIN
  VENUE v
ON
  t.SeatID = v.SeatID
GROUP BY
  v.VenueID, v.VenueName
ORDER BY
  Tickets_Sold DESC;
```

VENUEID	VENUENAME	TICKETS_SOLD
2	Orpheum Theatre	7
1	Altria Theatre	7
3	Paramount Theatre	7
5	Palace Theatre	6
6	Roxy Theatre	6
4	Fox Theatre	5
7	Majestic Theatre	4

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- This information helps RCM identify the top-performing venues, allowing for strategic planning in event scheduling, optimizing venue usage, and enhancing marketing efforts for future high-demand locations.