



CSD 310

Group 5

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Bacchus Case Study

Stan and Davis Bacchus inherited the family business, Bacchus Winery. These brothers are eager to modernize the business and enhance product quality and customer service.

The winery produces Merlot, Cabernet, Chablis, and Chardonnay wines. Facing challenges in supply management, the new co-owners seek efficient methods for tracking and ordering supplies, contemplating internet-based solutions.

As the yearly business snapshot approaches, the owners require insights into supplier reliability, wine distribution performance, and employee working hours. Key questions include the timeliness of supplier deliveries, wine sales analysis, and employee work hours over the past four quarters.

The case study emphasizes the need for a comprehensive database system to streamline operations, monitor supply chains, enhance distributor interactions, and assess employee productivity.



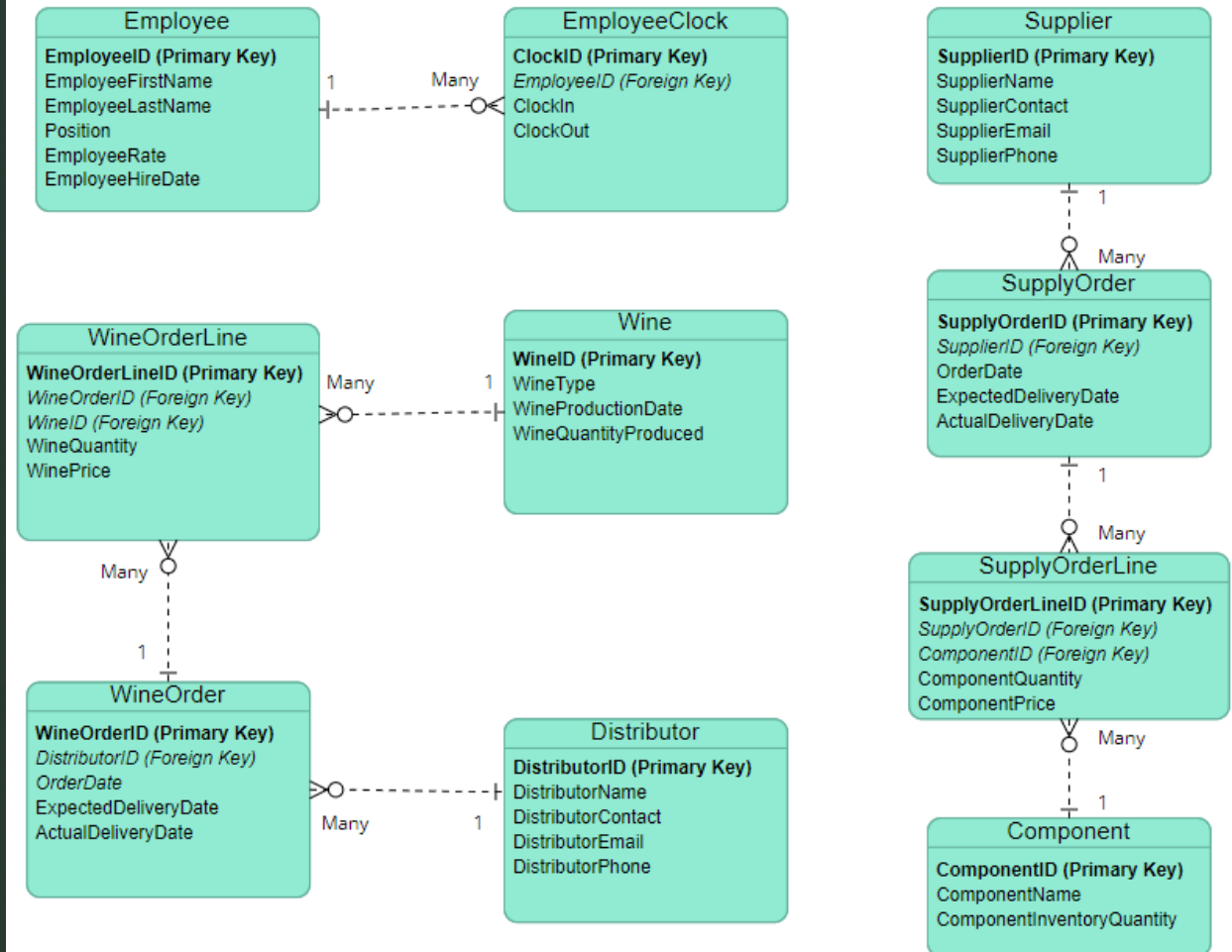
Entity Relationship Diagram

Based on the needs stated, the database can be broken down into three main areas: employees, suppliers, and wines.

On the employee side, we maintain an employee and a clock-in table that can be queried to form time sheets and pull labor costs.

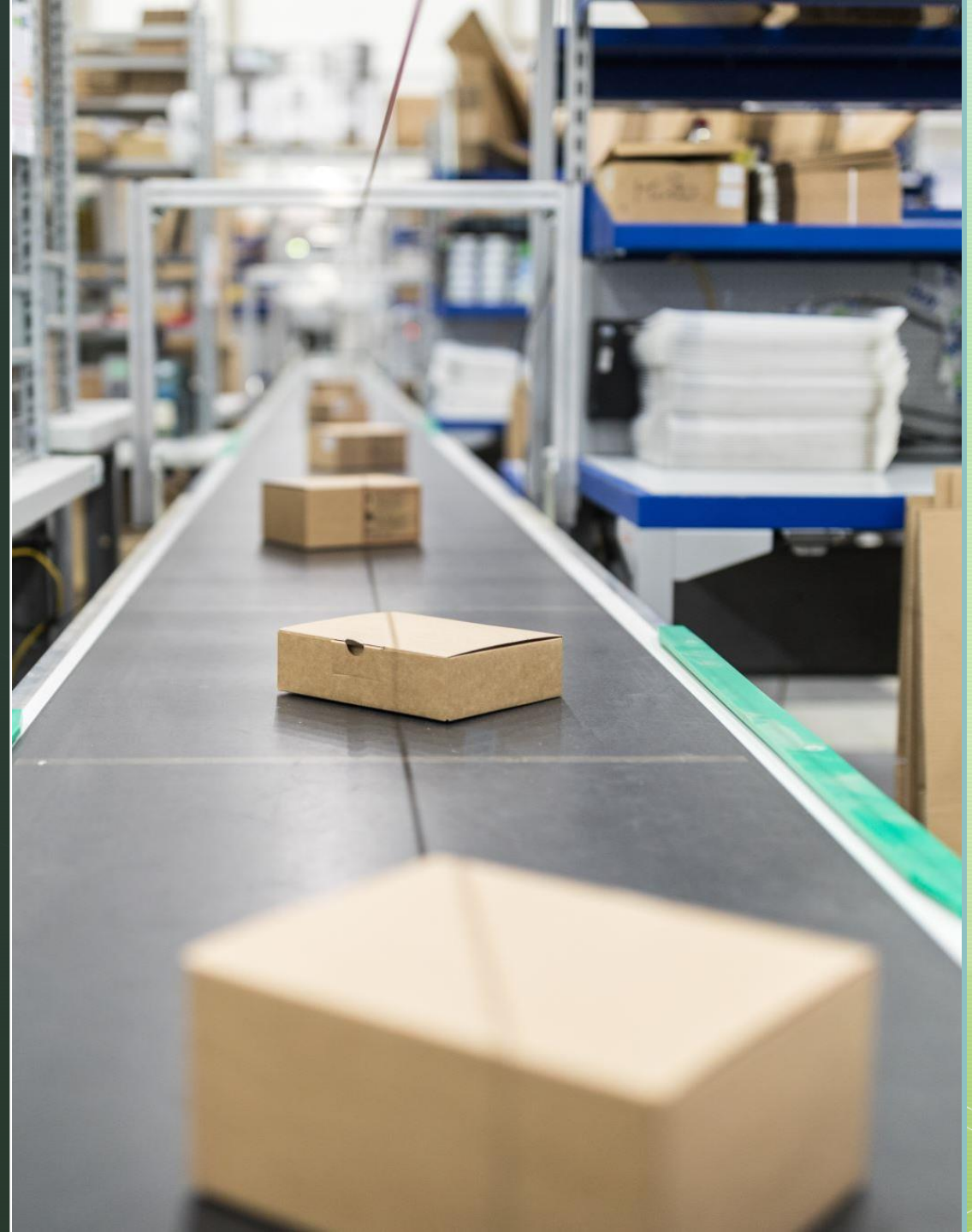
The supplier tables allow tracking of supply orders as well as components on-hand.

Finally, the wine tables track wines from production through the shipment process to our distributors.



ERD Continued

- Using this database design, we intended to address the employee's time or yearly snapshot, wine deliveries, and supply deliveries.
- We purposely made our ERD more granular to track line items in wine orders and supplies. This also follows good database design.





Assumptions

We structured our ERD in a way that line items being cancelled wouldn't impact the database.

An expected delivery schedule is communicated to vendors and buyers to establish an on-time delivery threshold.

An online system will streamline the tracking and ordering process, providing real-time updates on inventory levels and facilitating efficient ordering.

Implementing an online ordering system for distributors will enhance communication and streamline the distribution process.

Accurate timekeeping systems are in place, and employee work hours directly contribute to payroll, production, and overall business operations.

TABLE_NAME	COLUMN_NAME	DATA_TYPE	COLUMN_TYPE	ORDINAL_POSITION
component	component_id	int	int	1
component	component_name	varchar	varchar(75)	2
component	component_inv_qty	int	int	3
distributor	distributor_id	int	int	1
distributor	distributor_name	varchar	varchar(75)	2
distributor	distributor_contact	varchar	varchar(75)	3
distributor	distributor_email	varchar	varchar(75)	4
distributor	distributor_phone	varchar	varchar(15)	5
employee	emp_id	int	int	1
employee	emp_first	varchar	varchar(50)	2
employee	emp_last	varchar	varchar(50)	3
employee	emp_position	varchar	varchar(50)	4
employee	emp_rate	decimal	decimal(6,2)	5
employee	emp_hire_date	date	date	6
employee_clock	clock_id	int	int	1
employee_clock	emp_id	int	int	2
employee_clock	clock_in	datetime	datetime	3
employee_clock	clock_out	datetime	datetime	4
supplier	supplier_id	int	int	1
supplier	supplier_name	varchar	varchar(75)	2
supplier	supplier_contact	varchar	varchar(75)	3
supplier	supplier_email	varchar	varchar(75)	4
supplier	supplier_phone	varchar	varchar(15)	5
supply_order	supply_order_id	int	int	1
supply_order	supplier_id	int	int	2
supply_order	order_date	date	date	3
supply_order	expected_delivery	date	date	4
supply_order	actual_delivery	date	date	5
supply_order_line	supply_order_line_id	int	int	1
supply_order_line	supply_order_id	int	int	2
supply_order_line	component_id	int	int	3
supply_order_line	component_quantity	int	int	4
supply_order_line	component_price	decimal	decimal(8,2)	5
wine	wine_id	int	int	1
wine	wine_type	varchar	varchar(75)	2
wine	wine_production_date	date	date	3
wine	wine_qty_produced	int	int	4
wine_order	wine_order_id	int	int	1
wine_order	distributor_id	int	int	2
wine_order	order_date	date	date	3
wine_order	expected_delivery	date	date	4
wine_order	actual_delivery	date	date	5
wine_order_line	wine_order_line_id	int	int	1
wine_order_line	wine_order_id	int	int	2
wine_order_line	wine_id	int	int	3
wine_order_line	wine_quantity	int	int	4
wine_order_line	wine_price	decimal	decimal(8,2)	5

Table Creation

This table describes our entire database with data types. Relationships as seen in the ERD are maintained with foreign key constraints.

Sample Data and Relationships

wine_id	wine_type	wine_production_date	wine_qty_produced
1	Chardonnay	2023-09-15	300
2	Chablis	2023-08-15	300
3	Merlot	2023-08-30	300
4	Cabernet	2023-09-05	300
5	Red Blend	2023-08-20	300
6	White Blend	2023-10-01	300

wine_order_line_id	wine_order_id	wine_id	wine_quantity	wine_price
1	1	1	120	24.50
2	2	2	24	24.50
3	3	3	60	24.50
4	4	4	100	24.50
5	5	5	72	24.50
6	6	6	96	24.50

Here are the data relationships for the wine production data. Wine batches are bottled in bulk and sold until they go to the distributors below. Supply side is modeled similarly while shifts are tied to employee data.

wine_order_id	distributor_id	order_date	expected_delivery	actual_delivery
1	1	2023-11-02	2023-11-09	2023-11-10
2	2	2023-11-04	2023-11-11	2023-11-12
3	3	2023-11-04	2023-11-08	2023-11-08
4	4	2023-11-11	2023-11-17	2023-11-17
5	5	2023-11-02	2023-11-07	2023-11-07
6	6	2023-11-30	2023-12-03	NULL

distributor_id	distributor_name	distributor_contact	distributor_email	distributor_phone
1	Ben's Distribution Co	Jeff Stevens	jstevens@bensdistco.com	6884598764
2	Larry's Liquor Store	Larry Jones	NULL	6235761234
3	Betty's Wine and Spirits Wholesale	Jessica Lee	jlee@bettyswinenspirits.com	6665551234
4	Cask and Cork Wine Distribution	Sam Rogers	srogers@caskncork.com	3654511572
5	Wine World	Jeff Goldblum	jeff.goldblum@wineworld.com	8887776543
6	In Vino Veritas	Vicki Vivacious	v.vivacious@invinoveritas.com	6055558888

Business Reports

Based on the case study, we put together reports that would be meaningful to Bacchus Winery. These include:

- Total Sales By Wines
- Late Orders
- Wine Type by Distributor
- Employee Time Report



▀ Total Sales by Wine Report

```
Database user: database_user connected to the
-- Total Orders and Sales by Wine Type --
Wine: Chablis
Quantity: 24
Total Sales: 588.00

Wine: Merlot
Quantity: 60
Total Sales: 1470.00

Wine: Red Blend
Quantity: 72
Total Sales: 1764.00

Wine: White Blend
Quantity: 96
Total Sales: 2352.00

Wine: Cabernet
Quantity: 100
Total Sales: 2450.00

Wine: Chardonnay
Quantity: 120
Total Sales: 2940.00

Press Enter to Exit...□
```

This Python script generates a report that provides information on total wine sales by type.

It achieves this by retrieving data from the `wine_order_line` and `wine` tables through SQL joins. The report displays the Each type of wine, quantity sold and the calculated sales for that wine. The report is sorted by lowest sales to highest.

This report can be used by the owners to understand which wines are performing the lowest and which wines are selling well.

Late Orders Report

This report pulls up every delivery where the actual delivery happened after the expected delivery.

This pulls up every delivery within the sample data but could be easily adjusted into a front end where managers can enter specific periods that would be fed into a WHERE statement to narrow down results.

```
-- LATE WINE ORDERS --  
Distributor: Ben's Distribution Co  
Order Date: 2023-11-02  
Expected vs. Actual Delivery: 1 day(s) late  
  
Distributor: Larry's Liquor Store  
Order Date: 2023-11-04  
Expected vs. Actual Delivery: 1 day(s) late  
  
-- LATE SUPPLY ORDERS --  
Supplier: Wine Time  
Order Date: 2023-11-01  
Expected vs. Actual Delivery: 1 day(s) late  
  
Supplier: Wine Time  
Order Date: 2023-11-05  
Expected vs. Actual Delivery: 1 day(s) late  
  
Supplier: Brewing Buds  
Order Date: 2023-11-03  
Expected vs. Actual Delivery: 1 day(s) late
```

Wine Types by Distributor Report

```
-- DISTRIBUTOR AND WINE INFORMATION --  
Distributor: Ben's Distribution Co  
Wine Type: Chardonnay  
  
Distributor: Larry's Liquor Store  
Wine Type: Chablis  
  
Distributor: Betty's Wine and Spirits Wholesale  
Wine Type: Merlot  
  
Distributor: Cask and Cork Wine Distribution  
Wine Type: Cabernet  
  
Distributor: Wine World  
Wine Type: Red Blend  
  
Distributor: In Vino Veritas  
Wine Type: White Blend
```

This Python script generates a report that provides information on which distributor carries which wine.

It achieves this by retrieving data from the `wine_order_line`, `wine_order`, `distributor`, and `wine` tables through SQL joins. The report displays the distributor name along with the corresponding wine types they carry.

This information is crucial for business decisions, as it allows the winery owners to understand the distribution network and popularity of different wines among distributors.


```
--DISPLAYING Shift RECORDS --  
Employee Name: Debrah Messing  
Pay Rate: 18.00  
Shift Day: Mon Nov 11  
Shift Length: 8.00 hours  
  
Employee Name: Brad Pitt  
Pay Rate: 20.00  
Shift Day: Mon Nov 11  
Shift Length: 8.00 hours  
  
Employee Name: Tina Fey  
Pay Rate: 17.00  
Shift Day: Mon Nov 11  
Shift Length: 8.00 hours  
  
Employee Name: Debbie Reynolds  
Pay Rate: 18.00  
Shift Day: Mon Nov 11  
Shift Length: 8.00 hours  
  
Employee Name: Alec Baldwin  
Pay Rate: 18.00  
Shift Day: Mon Nov 11  
Shift Length: 8.00 hours  
  
Employee Name: Amy Poehler  
Pay Rate: 23.00  
Shift Day: Mon Nov 11  
Shift Length: 8.00 hours  
  
Total labor cost: $912.00  
Press Enter to Exit...|
```

Employee Time Report

This report will draw up all shift records for a range of time periods.

Although this is just one iteration of the script, it shows the flexibility of our database design. For example, as it's written, this script pulls up all the shift records for the one day of sample data we have. However, the `BETWEEN` statement could be attached to a front-end where a custom time-period could be pulled up.

Additionally, a `HAVING` statement could be added to isolate a single employee for a payroll report.



Conclusions

The Bacchus Winery was a great example of the challenges facing a growing production company. Reputation and on-time deliveries are balanced with costs of materials and labor. All these factors must be tracked and examined as time goes on.

Our design incorporates these challenges. By breaking down these flows to their most basic elements, we've built a database that can grow with Bacchus. The work we've done in these short two weeks lays the groundwork for an employee clock system, an order tracking system, and an inventory management that compares wine sold vs wine produced. With this information, Bacchus can continue doing what they love: making great wine!