

## Optimizing Restaurant Revenue: A Customer Segmentation Strategy (RFM)

*Tool used : SQL (PostgreSQL), Excel, Python, Power Bi*

### **How can we leverage upselling in The Goose Pub customer base?**

In this analysis I will build RFM segmentation to identify the behavioral drivers of customers and design targeted upselling strategies to transition them into 'Higher-spend-tier', from 4 different definite groups.

I was able to identify a 'hidden-gem' (Group 3) representing 12% of the sale from the summer season in only 4 weeks. And a 'volume-trap' (Group 2) requiring operational efficiency.

**Recommendation:** Shift from a generic service model to a segment-specific protocol

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### **Introduction**

*\*\*To protect client confidentiality, all data used in this analysis has been anonymized, and any names or identifying information related to the business have been removed or modified.\*\**

For this case study I'm working with The Goose Pub, a restaurant from a small town in Canada. To optimize their sales they ask me to provide a plan to help optimize the revenue by table through analysis and visualization.

Stakeholders :

**Joseph**, FOH manager, provided me with access to their POS system so I could access the data I needed. I will communicate the recommendation I will find to his team.

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### **Data cleaning and preparation**

**Data Engineering Methodology** To overcome the limitations of the legacy Veloce POS system (proprietary export format), I engineered a **Python-based ETL pipeline**. This process parsed converted PDF reports, validated the data against control totals to ensure integrity, and loaded the dataset into a structured [PostgreSQL](#) relational database.

*For a detailed breakdown of the PDF parsing script and database schema, please refer to the [\[Data Cleaning Documentation\]](#).*

The necessary data includes the full summer season of 2025 from mid-june to mid-september, which form the basis of this analysis.

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### **Methodology**

I choose to use the RFM method because it lets me track behavioral patterns in customers in detail, letting me find personnel recommendations for segmented groups.

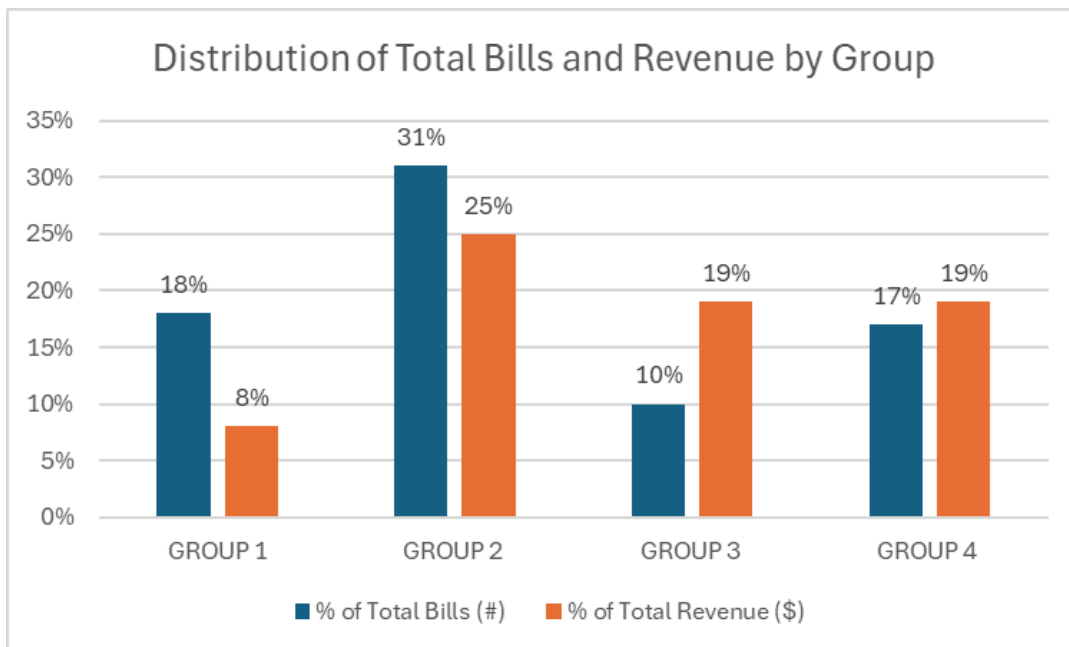
I **realized** the data **doesn't have** any record of customers id so I didn't have any data to track Recency (R) or Frequency (F) so I built an alternative FRM customer classification.

With these 3 categories :

1. **Party size Small vs Big** (with no customer count, I made an alternative way to track this, appetizer = 1 point, and main course = 2 points)
2. **Food/Drink ratio**
3. **Spend Tier Low / Medium / High**

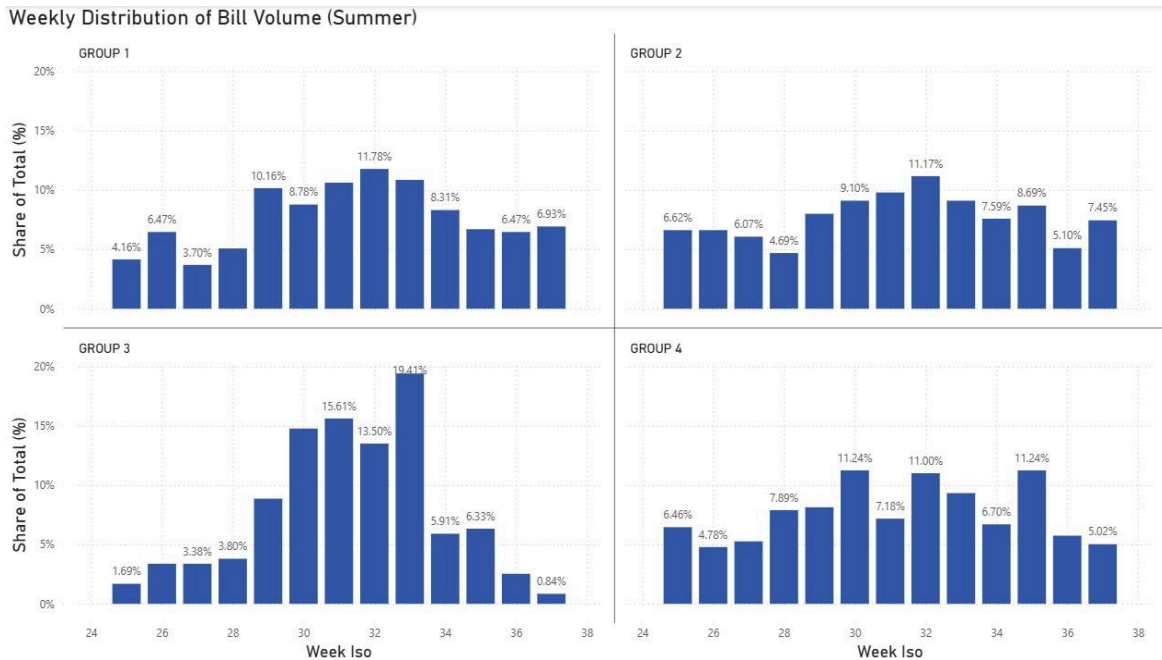
The process has a total of 12 categories. After combining the time bin for early and late. I kept 4 categories to look at because they represent 73% of the traffic by number of bills and 71% of the restaurant revenue.

- GROUP 1 : **SLF** : Small group/Low spend/Food heavy.
- GROUP 2 : **SMF** : Small group/Medium spend/Food heavy
- GROUP 3 : **BMF** : Big group/Medium spend/Food heavy
- GROUP 4 : **Model** : Small group/high spend/drink heavy



## ANALYSIS

### A. The "Predictable Core" (Groups 1, 2)



- **Profile:** The operational backbone. These groups provide stability but lower margins.
- **The Volume/Value Gap:** Together 1 & 2 consume **49% of table resources** (bill count) but generate only **33% of total sales**. This indicates a "High Effort / Low Yield" operational cost.
- **Strategy: "The Growth Focus."** Since their presence is consistent from Week 25–37, they are the prime targets for a sustained, season-long upselling protocol to close the gap between volume and value.

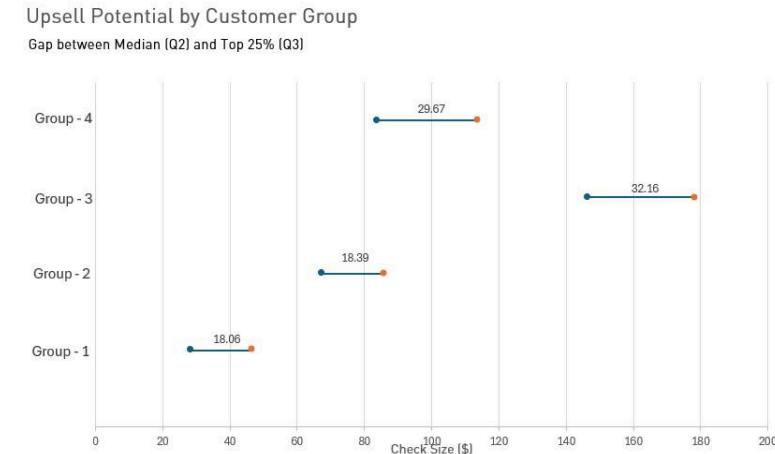
### B. The "High-Impact Wildcard" (Group 3)

- **Profile:** Medium-spend, high-volatility.
- **The Power Window:** Highly seasonal. Their activity peaks strictly between **Weeks 30–33**, yet in that short window, they generate **12% of total summer revenue**.
- **Strategy:** During this small window high focus to upsell

### C. The "Self driving" (Group 4)

- **Profile:** Stability medium margin
- This group is stable during the summer.

## 2.Upsell Potential (Based on Spending Variance)



By isolating the upper-quartile variance (Q2–Q3), this section quantifies the Upside Potential of each dining group to determine where consumer spending is most elastic.

- **Group 1 - 2(Lower Potential):** Rigid spenders. Strategy: Prioritize speed over upselling.
- **Groups 3 & 4 (High Potential):** Flexible budgets. These are high-opportunity targets for premium drink and dessert sales.

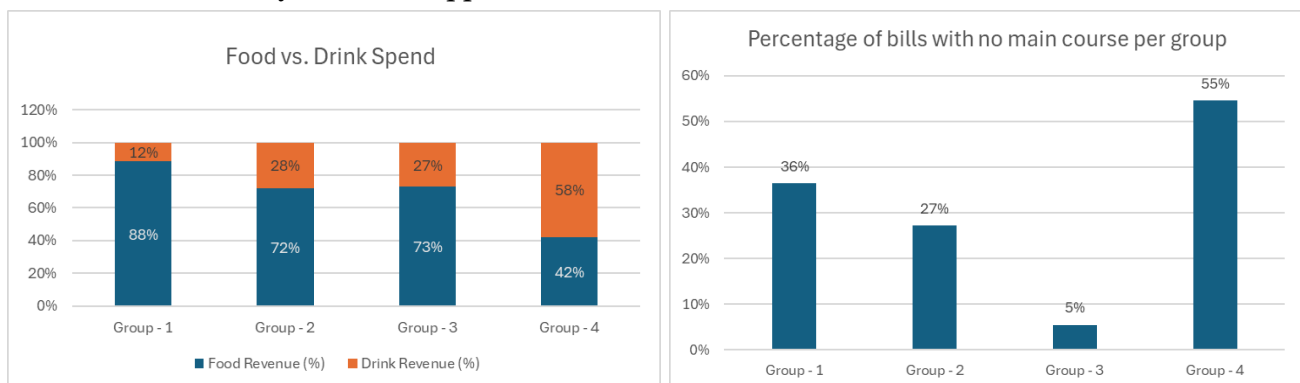
## 3. Food Vs Drink distribution

**Group 1: 88% Food Spend.** 36% order no main course, preferring appetizers.

**Group 2 : 72% Food Spend** and 27% of the bills have no main course.

**Group 3: The "Big Table" Segment.** Match Group 2's **72% Food Spend**. The main difference is that only 5% of the bill does not order the main course.

**Group 4: Happy Hour Crowd 42% Food Spend.** No main course. Food spend is low (42%) and dominated by shareable appetizers.



While Group 1 has a high appetizer-to-main ratio, this is misleading as they often skip the main course entirely. The true opportunity lies with **Group 2 and 3**: they consistently order Main Courses but show a low Appetizer Ratio Group 2 (0.58) and Group 3 (0.64). This appetizer gap is a major increase opportunity.

#### 4. Alcohol Vs Soft Drinks

##### SOFT DRINKS :

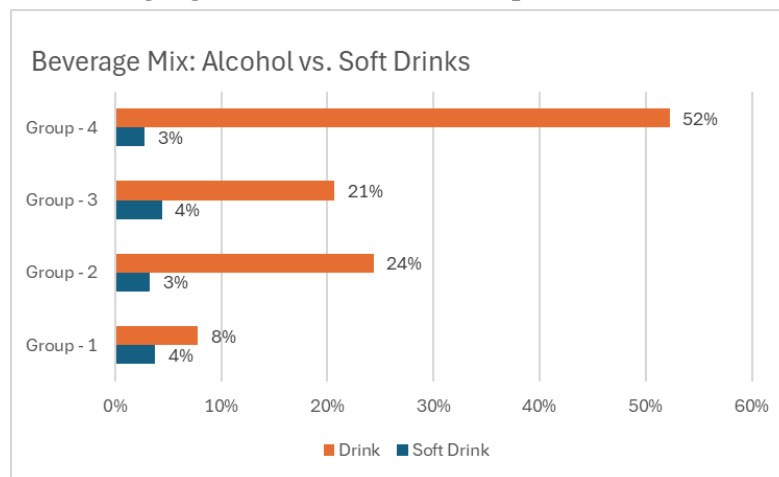
Each group spends about the same amount of their budget on soft drinks, between 2 and 4 %.

##### ALCOHOL :

**Group 1** : A small fraction of their budget is spent on alcoholic beverages 7%.

**Group 2 and 3** : Ready to spend a good amount of their budget on alcohol, 20-24% – a good upselling opportunity.

**Group 4** : Half of their budget goes to alcohol, hard to upsell further.



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### ACT AND RECOMMENDATION

#### Group 1: The Summer Casuals

- **Profile:** Food-Focused (88% spend) | **36% order No Main Course.**
- **Strategy (Low Upsell Potential):**
  - **Slow Nights: Stagger Service.** Offer pauses between courses to keep them seated longer, increasing the chance of a drink order.
  - **Busy Nights: Prioritize Speed.** Since they resist upselling, turn the table quickly to free up capacity for Group 2 or 3.

#### Group 2: The "Date Night" Socials

- **Profile:** 72% Food Spend | **Strong "Tapas" Behavior (27% No Main).**
- **Strategy (Medium Upsell Potential):**

- **Menu: Pitch "Sharing."** Use the low appetizer ratio (0.58) to explicitly sell sharing platters.
- **Spend Tier Switch :** By focusing on premium drink, wine bottle instead of glass, cocktail and even mocktails to this group.
- **Risk: The Volume Trap.** If they resist the first upsell, pivot immediately to efficiency. Don't let low-spenders camp.

### Group 3: The "High-Impact" Wildcards

- **Profile:** Peak Weeks 30-33 | **Large Tables (High Drink Volume).**
- **Strategy (High Upsell Potential):**
  - **Service: "The Hover."** Servers must remain visible during kitchen delays to capture 2nd and 3rd drink rounds.
  - **Beverage: Bottle Service.** Shift alcohol orders from "By the Glass" to "By the Bottle" and upsell soft drinks to Mocktails.
  - **Appetizer ratio :** The ratio of appetizer by main (0.64) should be an easy focus point.
  - **Gold mine.** This group is highly present during 4 weeks and represents 12% of the sale of the summer during those weeks. By focusing on efficient staffing the revenue increase could be major.

### Group 4: The "Happy Hour" Grazers

- **Profile:** 54% No Main Course | **Grazing Behavior (42% Food Spend).**
- **Strategy (Maintenance Mode):**
  - **Approach: Passive Service.** This group already spends heavily on alcohol. Aggressive sales tactics risk disrupting their experience. However, if an upsell opportunity is detected, it should be taken, as Group 4 still presents a high upsell potential.
  - **Prioritization:** Treat as **"Self-Sustaining."** Reserve operational energy and sales pitches for Groups 2 and 3 where the gap between potential and actual revenue is wider.

**Projected Revenue Impact:** By targeting a modest **15% increase in average check size** specifically for Groups 2 and 3 (equivalent to selling just one shared appetizer, dessert, or drink upgrade per bill), we project a total restaurant revenue lift of **6.6%**.

I have included a 'Rapid Identification Guide' in the appendix. This tool gives service staff a way to recognize high-potential segments within the first minutes of interaction.

*Rapid Identification Guide' delivered to the client contains proprietary operational details. To respect client confidentiality and anonymity, this specific document has been excluded from this public portfolio.*