# Brewing Resilience: A Case Study in Adapting Small Business Strategy with Systems Thinking

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# Abstract

This thesis explores how systems thinking—a methodology often reserved for large organizations—can be effectively applied to small businesses facing complex challenges. Using Lamplighter Brewing Co., an independent microbrewery in Cambridge, Massachusetts, as a case study, the research examines how the brewery adapted to the disruptions of the COVID-19 pandemic and the evolving economic landscape that followed. It documents the iterative application of systems thinking principles to identify root causes, leverage points, and actionable solutions to address issues such as declining revenue, rising costs, and misaligned organizational structures.

Lamplighter's interventions ranged from restructuring its management and marketing teams to pivoting its sales and production strategies. By leveraging tools such as causal loop diagrams and stock-and-flow models, the brewery uncovered systemic dynamics driving its performance. The research highlights the importance of iterative learning, targeted interventions, and holistic analysis in fostering resilience and sustainability in resource-constrained environments.

While focused on the craft brewing industry, the findings offer transferable insights for small businesses in similarly dynamic sectors, demonstrating that systems thinking can empower smaller organizations to navigate complexity, adapt strategically, and thrive amidst uncertainty.

Thesis supervisor: Joan Rubin

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# Chapter 1: Introduction

## 1.1 Background

Small businesses are the backbone of global economies, driving innovation, employment, and community development. Yet their size and limited resources often make them highly vulnerable to disruption. The COVID-19 pandemic underscored this vulnerability, as businesses reliant on local, in-person engagement—such as breweries, restaurants, and retail operations—faced steep declines in sales, disrupted supply chains, and rapidly shifting consumer behaviors. While some adapted and survived, many were unable to navigate these challenges, leading to widespread closures.[i]

Even as public health restrictions eased, the recovery period introduced a fundamentally altered economic environment. Rising inflation, restructured supply chains, and lasting changes in consumer behavior made pre-pandemic strategies obsolete for many businesses.[ii] Success in this new landscape required more than resilience—it demanded a rethinking of operational strategies and the ability to address complex, interconnected challenges.

This thesis argues that systems thinking, a tool traditionally applied most often at large organizations or in engineering contexts, can be utilized effectively by businesses of all sizes to navigate complexity and uncertainty. Through a case study of Lamplighter Brewing Co., it examines how even the smallest organizations can use systems thinking to great effect.[1]

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## 1.2 Lamplighter Brewing Co. as a Case Study

Lamplighter Brewing Co., an independent microbrewery in Cambridge, MA, provides a practical demonstration of how small businesses can use systems thinking to navigate complexity and uncertainty. Known for its innovative beers and strong community presence, Lamplighter had established itself as a leader in the local craft beer market in the years before 2019. However, like many small businesses, it faced significant disruption during the COVID-19 pandemic and its aftermath.

While the brewery adapted successfully to the immediate impacts of the pandemic, the post-pandemic period brought more insidious challenges. Pre-pandemic strategies that once worked well—such as heavy reliance on taproom sales and constantly producing new and novel products—failed to deliver results in a fundamentally changed environment. It quickly became clear that these new challenges could not be solved with incremental adjustments alone.

To face this new reality, Lamplighter turned to systems thinking. Examining this deliberate application in a time of rapidly changing circumstances provides an ideal opportunity to explore the practical use of these principles by a small business in a real-world context. Through a structured and iterative approach, the brewery analyzed its operations holistically, identified key leverage points, and implemented targeted

[1] Language edited throughout thesis for style and grammar by ChatGPT.

interventions, demonstrating how systems thinking can help businesses navigate complexity, adapt to change, and build resilience.[2]

## 1.3 Thesis Statement

This thesis argues that iterative systems thinking is an underutilized tool for small businesses navigating complexity in dynamic environments. Systems thinking has significant potential to help small businesses address evolving conditions and unforeseen challenges. By adopting a systems mindset and approach, small businesses can more completely understand the behavior that arises from the inherent structure of their business, intelligently refine their strategies over time, and utilize an in-depth understanding of key feedback loops and leverage points to adapt and thrive in times of uncertainty and changing conditions.

## 1.4 Scope and Limitations

This thesis uses Lamplighter Brewing Co. as a case study. It examines how efforts to apply the key principles of systems thinking helped management address novel challenges caused by rapidly changing economic conditions. While the findings are rooted in the craft brewing industry, the broader applicability of these principles may offer insights for small businesses in similarly dynamic and resource-constrained environments.

The study examines the underlying conditions, initial systemic analysis and targeted interventions that were born from the deliberate application of systems thinking within a single organizational context. A craft brewery is an appropriate example of a complex system, due to its relatively complicated departmental structure, reliance on multiple sales channels, and rapidly changing environment caused by the significant disruptions during and after the COVID-19 pandemic.

This study has several limitations. As a single case study, the findings may not be fully generalizable across industries. While the principles discussed are broadly applicable, the specific dynamics and outcomes may vary depending on industry, region, or organizational scale. The analysis draws heavily on qualitative data from Lamplighter's financial records, but also utilizes management team perspectives, introducing an element of subjectivity shaped by their interpretations.

The scope is also limited to a defined period of intervention and iteration at Lamplighter Brewing Co., focusing on immediate and short-term outcomes rather than long-term effects. Additionally, the findings are influenced by the specific cultural, economic, and operational context of a small business in Massachusetts, which may limit their transferability to other businesses with different regional or industry conditions.

This thesis emphasizes internal systems and dynamics within Lamplighter Brewing Co., with external factors like market trends, inflation, and broader economic forces considered only in terms of their immediate impact on the business. These external influences are not extensively modeled or quantified.

By concentrating on a single organizational context, this thesis provides an in-depth, reflective exploration of systems thinking in real-world practice. It highlights the challenges of navigating complexity in resource-constrained environments and acknowledges the limitations inherent in subjective decision-making during periods of uncertainty. Future research could expand on these findings by

[2] This thesis incorporates data and analysis based on the author's review of Lamplighter Brewing Co.'s internal financial records from 2014 to 2024, which are proprietary and not publicly available.

examining iterative systems thinking across multiple industries, examining the bigger picture causes of the relevant economic conditions, or by following up on the long-term impacts.

# Chapter 2: Systems Thinking Methodology

## 2.1 Introduction

Systems thinking is a methodology designed to analyze and understand the behavior of complex systems.[iii] Instead of examining individual components in isolation, it emphasizes a holistic perspective that considers the system's structure, relationships, and dynamics.[iv] As Crawley, Cameron, and Selva note, systems thinking allows for the explicit identification of interrelated entities and their interactions, enabling better decision-making and more effective design of interventions.[v] By framing problems as systemic,, and with a holistic understanding of the system in question as a whole, systems thinking provides a structured methodology for identifying leverage points, ultimately for the purpose of enacting change.[vi]

This chapter introduces the core concepts and tools of systems thinking that were employed by Lamplighter Brewing Co. in combination with traditional financial metrics to understand the causes of changing company performance. The process focused first on gaining a complete understanding of how the company functioned, identifying what caused it to stop functioning effectively, and determining where potential leverage points existed - and understanding where they did not - with the goal of crafting and deploying interventions to address its challenges.

## 2.2 Foundations of Systems Thinking

### Defining Systems Thinking

Systems thinking, as defined by Crawley et al., is “thinking about a question, circumstance, or problem explicitly as a system—a set of interrelated entities”[vii] This approach frames problems in terms of their underlying structures, relationships, and emergent properties,[viii] and focuses on building a holistic understanding of the situation at hand to understand how a system’s components interact to produce outcomes.

When system complexity makes it difficult to intuitively grasp how elements interact or predict the outcomes of interventions, systems thinking becomes essential. It enables a deeper examination of relationships, feedback loops, and emergent behaviors, providing the clarity needed to make more informed and strategic decisions.[ix]

For Lamplighter Brewing Co., this level of analysis was critical. Under pressure to transform the business with limited resources, there was little margin for error.

## The Tasks of Systems Thinking

Crowley, Cameron, and Selva (2016) outline 4 tasks in comprehensively thinking about a system.[x]

### Task 1: Identify the System, Its Form, and Its Function

The first task in systems thinking is to define the system itself, along with its form and function. This provides a clear and actionable starting point for analysis.[xi]

1. Define the System: Clearly articulate what the system is. This involves identifying its boundaries and distinguishing it from the broader environment.
2. Form: Determine what the system is—its physical or conceptual structure. This includes elements like departments, facilities, equipment, or infrastructure that enable its operation.
3. Function: Establish what the system does—its purpose or actions. This can be broken down further into:

    Process: The transformation or activities the system performs.

    Operand: The object or material the system transforms or acts upon.

### Task 2: Identify the Entities of a System, Their Form, and Their Function

Once the system has been identified, the next step is to break it down into its constituent entities.[xii] Each entity represents a component or subsystem that contributes to the overall function of the system. To systematically analyze these entities, the same structured approach used for the system as a whole can be applied at the entity level, breaking down each identified entity into Form (what the entity *is*), and Function (what the entity *does*) Function is further broken into Process and Operand as described in Task 1.[xiii]

By the end of this process, the system should be decomposed into a comprehensive list of its entities, with each one clearly defined in terms of its form and function.

### Task 3: Identify the Relationships among the Entities

After identifying the entities of a system, the next step is to map out the relationships between them. These relationships define how entities work together to achieve the system's overall purpose, providing insight into the connections and interactions that drive the behavior of the system.[xiv]

A practical way to map these relationships is by using a structural diagram, such as an OPM (Object Process Methodology) diagram. An OPM diagram is particularly useful because it integrates objects (the system's entities, represented by rectangles) and processes (the activities or transformations they undergo, represented by ovals) into a single, unified framework, and characterizes their relationships using different arrows. By combining structural and behavioral aspects and their relationships, OPM diagrams enable the visualization and understanding of the connection and behavior between and among entities, providing a clear representation of how they interact and contribute to the system's overall function.[xv] The end result of this step is a clear map of the system's entities and their relationships.

Task 4: Predict Emergence

The fourth task in systems thinking focuses on predicting emergence—the behaviors and outcomes that arise when the components of a system interact.[xvi] Emergence occurs at the system level, resulting in properties or behaviors that cannot be understood by looking at individual parts alone. These outcomes may include both desired effects, like improved efficiency, and unintended consequences, like bottlenecks or failures.[xvii]

Predicting emergence is complex because interactions between entities often produce nonlinear results.[xviii] Systems thinkers approach this challenge through precedent (drawing on similar past systems), experimentation (testing interactions in controlled environments), and modeling (using tools to simulate and analyze system behavior).[xix]

System Dynamics

System dynamics is a methodology for understanding and modeling the behavior of complex systems over time, focusing on feedback loops, accumulations, and time delays to reveal how changes in one part of a system influence the whole.[xx] System dynamics tools, such as stock and flow models, causal loop diagrams, and leverage point analysis, offer a structured framework for visualizing these interactions. By mapping system behavior, these tools enable systems thinkers to anticipate emergent properties, identify underlying dynamics, and design targeted interventions that (hopefully) create predictable changes in behavior.[xxi]

Alternative Architectures

The act of generating alternative architectures is a tool utilized in systems design to explore and evaluate different system configurations. Generating multiple architectures or proposed configurations to a system allows for the comparison of various designs based on factors such as functionality, efficiency, cost, and feasibility.[xxii] The process encourages creative problem-solving, highlights trade-offs, and ensures that the chosen architecture aligns with the system's purpose and constraints.

These tasks and tools formed the approach used by Lamplighter Brewing Co. to systematically analyze its operations, uncover systemic challenges, and develop strategies for meaningful transformation.

# Chapter 3: Thinking about the Business

## 3.1 Introduction

By the end of 2022, Lamplighter Brewing faced a troubling financial picture. Traditional financial reporting revealed underwhelming revenue numbers, soaring costs, declining sales in every revenue stream, and two years in a row of negative operating income. (Figure 1) For a company used to robust profits from opening day in 2014 through the start of the COVID-19 pandemic in Q1 of 2020, the situation was clearly an existential one.

| | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|
| **Total Sales - Wholesale** | $ 1,894,536.01 | $ 2,139,432.30 | $ 2,522,590.60 | $ 2,477,328.16 | $ 2,347,515.03 |
| **Total Sales - On-Site** | $ 2,554,457.20 | $ 2,735,913.07 | $ 2,292,358.25 | $ 2,116,688.86 | $ 3,632,442.94 |
| **Total Income** | $ 4,594,453.55 | $ 5,005,564.09 | $ 4,903,525.88 | $ 4,865,081.17 | $ 6,174,907.86 |
| | | | | | |
| **Total Cost of Goods Sold** | $ 2,369,523.14 | $ 2,569,020.68 | $ 2,728,707.00 | $ 3,124,863.79 | $ 3,780,382.33 |
| **Total Expenses** | $ 1,390,098.01 | $ 1,884,305.76 | $ 1,603,858.23 | $ 1,934,314.94 | $ 2,509,887.14 |
| **Total COGS + Expenses** | $ 3,759,621.15 | $ 4,453,326.44 | $ 4,332,565.23 | $ 5,059,178.73 | $ 6,290,269.47 |
| | | | | | |
| **Gross Profit** | $ 2,224,930.41 | $ 2,436,543.41 | $ 2,174,818.88 | $ 1,740,217.38 | $ 2,394,525.53 |
| **Net Operating Income** | $ 834,832.40 | $ 552,237.65 | $ 570,960.65 | $ (194,097.56) | $ (115,361.61) |
| **Net Income** | $ 829,391.52 | $ 540,965.55 | $ 927,376.98 | $ 146,228.40 | $ (137,906.96) |

*Figure 1. Abbreviated Lamplighter P+L, 2018- 2022*

In Q2 2022, Lamplighter's made the decision to begin a systems-based approach to analyze what had changed and what could be done.

This section presents the results of that analysis, working through the primary "Tasks" of systems thinking as outlined by Crowley, Cameron, and Silva (2016). The chapter details Lamplighter's entities, their forms and functions, interconnections, influencing factors, and the emergent properties of the system, starting with the company as it existed in 2019, examining the acute impacts of the pandemic years of 2020 and 2021, and finally to the situation as it existed at the time of the analysis, with the hope of using that understanding to modify operations to return to profitability. The company employed OPM diagramming to map structural elements and relationships, stock and flow charts to capture processes, and causal loop diagrams to examine feedback mechanisms within the system.

Many of the figures included in this section were created during this period by the Lamplighter management team as practical tools for decision-making. They reflect the brewery's efforts to understand the company's evolving challenges and to identify actionable solutions in a highly dynamic environment.

## 3.2 The Pre-Pandemic System

### Tasks 1 and 2: Lamplighter Brewing Co, 2019

Lamplighter Brewing Co.'s pre-pandemic operations were very similar to those of the thousands of other craft breweries in business in 2019.

| **Department** | **Entity** | **Form(s)** | **Function** | |
|---|---|---|---|---|
| | | | *Process* | *Operand* |
| Production | Production | Brewery Equipment, Brewery Team | Brews | Product |
| | Warehouse | Forklifts, Cold Rooms, Warehouser | Moves and Stores | Product |
| Marketing | Marketing | Marketing Team, Marketing Materials | Promotes | Product |
| Taproom | Taproom | Taproom Space, Retail Counter, Taproom Team, Taproom Inventory | Sells On-Site | Product |
| Sales + Distribution | Sales | Head of Sales, Wholesale Inventory | Sells Off-Site | Product |
| | Distribution | Delivery Driver, Delivery Vans | Delivers Off-Site | Product |
| Admin | Administration | Administration Team | Manages | Company |

*Figure 2. Brewery Departmental Entities, Form and Function*

At the core of Lamplighter Brewing's operations was the production department, tasked with brewing and packaging the brewery's core products. Like other manufacturing businesses, the production team took in raw ingredients and crafted Lamplighter's products. Once production was complete, the finished products were transitioned into the general working inventory, where it was allocated to two primary sales channels: Taproom (On-Site) Sales and Wholesale (Off-Site) Distribution. (Figure 3)

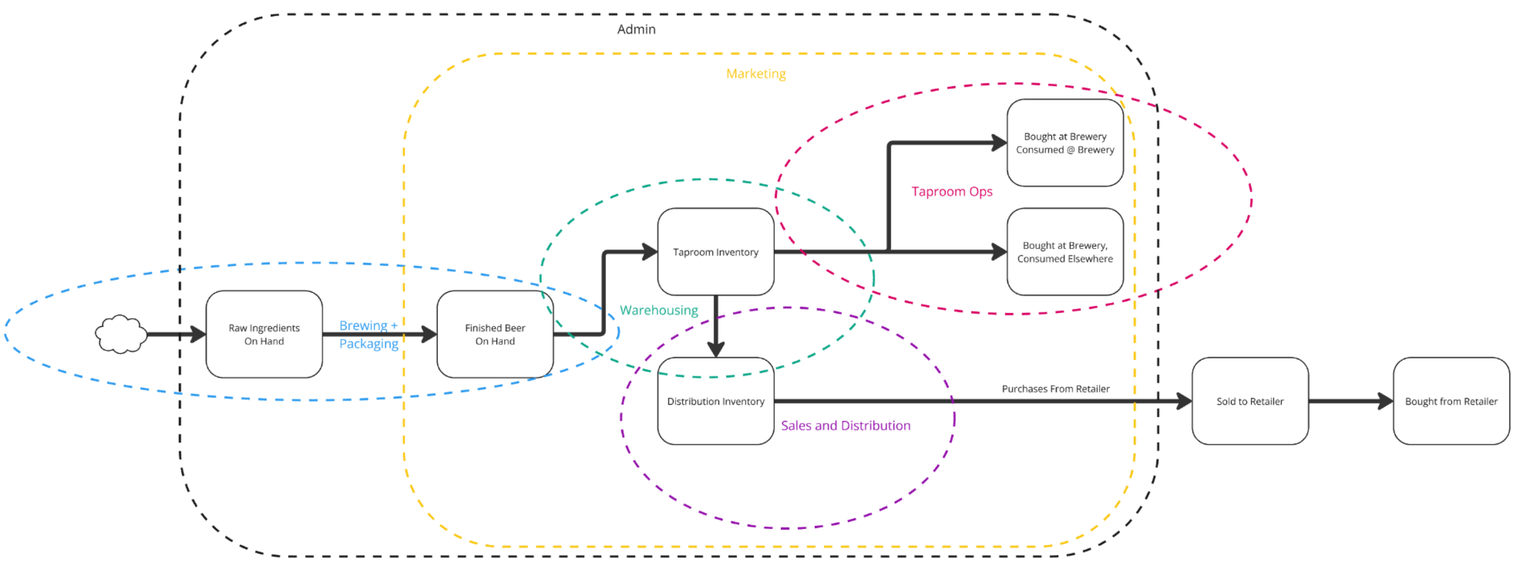


*Figure 3. Brewery operations stock-and-flow diagram with department system boundaries.*

The taproom was the first destination for available inventory, due to its status as the highest margin sales channel, and served both on-site consumption and retail-to-go sales. (Figure 3) As a main revenue driver and community hub, the taproom played a pivotal role in establishing Lamplighter's identity as a local institution.

The remaining inventory was directed toward wholesale off-site distribution, supplying local liquor stores, bars, and restaurants. As the B2B component supplying resellers, margins were slimmer but volumes were larger. Managed by the sales and distribution department, this channel expanded Lamplighter's reach beyond the taprooms.

Marketing efforts played a vital role in driving both taproom and off-premises sales by leveraging social media, events, and community outreach to stimulate demand both on and off site. The warehousing function ensured seamless coordination of inventory between the production floor, taproom, and delivery vans (and therefore third party wholesale accounts), maintaining a steady flow of products to meet customer needs. Finally, the administrative team provided oversight and alignment, financial direction, personnel management, and coordinated the demands of production schedules, inventory management, and sales strategies with the brewery's financial goals and operational capacity.

## Task 3: Mapping the Relationships

### Production

At the most basic level, a brewery is a manufacturing business, turning raw materials into wort (unfermented "pre"-beer), beer, and finally into packaged finished products for sale. (Figure 4)

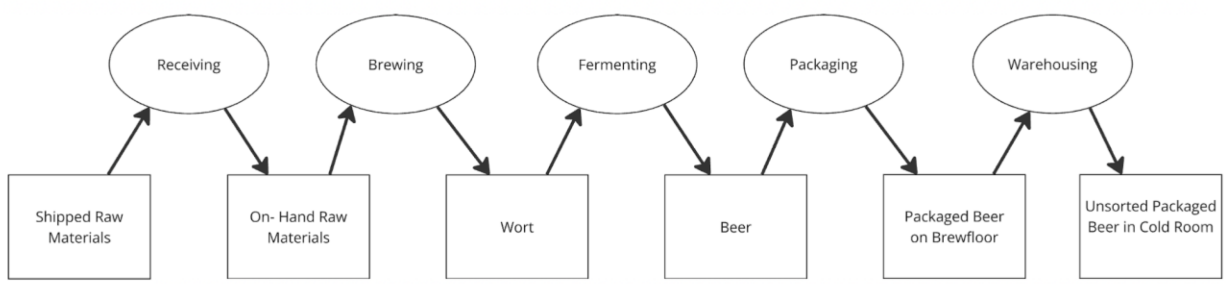


*Figure 4 Brewing Process OPM.*

At Lamplighter, this process was handled by the production team, under the intellectual leadership of the Master Brewer and the day-to-day operational expertise of the Head Brewer. (Figure 5) Lamplighter's product line and production decisions were defined by flexibility and creativity rather than standardization. The brewery prioritized producing fun, innovative, and exciting beers over maintaining a consistent flagship lineup. This approach catered to the demand for novelty that defined the 2019 craft beer market, and helped Lamplighter stand out in a crowded field. It also reflected the era's high-demand environment, where nearly every batch sold out within days of release.

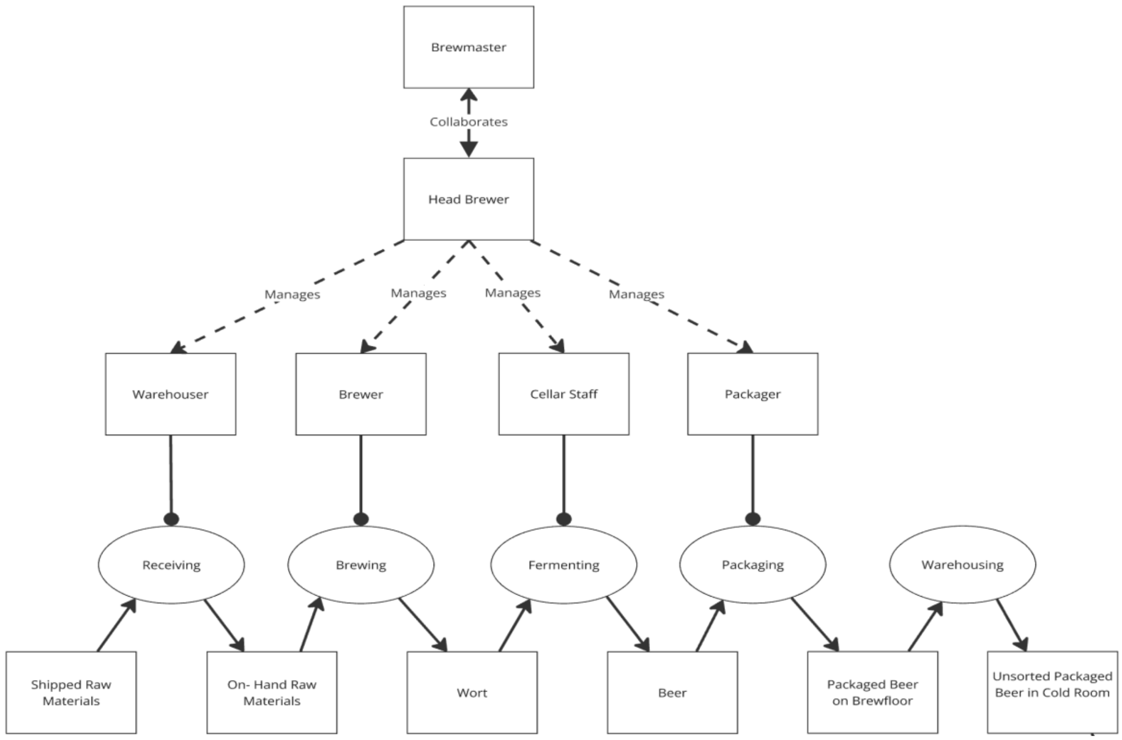


*Figure 5 Production Department OPM*

## On-Site Taproom Sales

Lamplighter's sales channels were divided into two main categories: Taproom On-Site Sales and Wholesale Off-Site Sales. The taproom represented the heart of Lamplighter Brewing Co.'s operations, not just as a primary revenue driver but as a cornerstone of its brand identity. Contributing the largest share of revenue with the highest margins, the taproom was a dual-purpose hub for on-site consumption and retail-to-go purchases. (Figure 6)

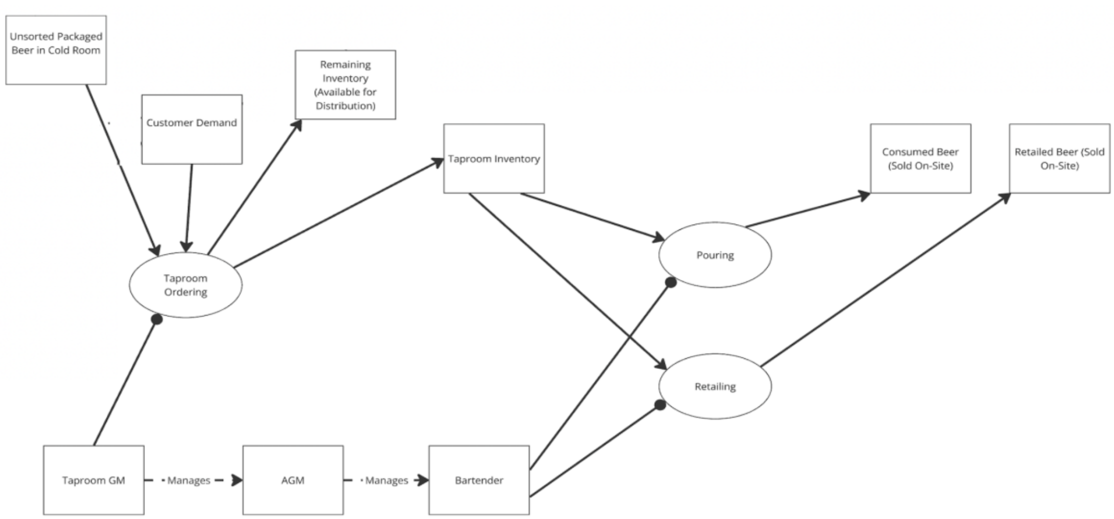


*Figure 6 Taproom Operations OPM Diagram*

The taproom's primary revenue driver was the sale of beer by the pint to patrons for consumption on-site. Customers filled the mid-Cambridge taproom location on Broadway, often reaching full capacity on weekends, drawn by the opportunity to enjoy freshly brewed beer in a lively and social environment.

The taproom also served as a convenient point for customers to purchase cans, growlers, bottles and other take-home options. This revenue stream complemented on-site consumption, allowing Lamplighter to capture higher margins for retail purchases by selling directly to their consumers.

Led by the Taproom General Manager, the importance of the taproom extended beyond immediate revenue. It played a pivotal role in building and sustaining the brewery's brand identity. As a neighborhood staple in Cambridge, the Broadway taproom created steady foot traffic, repeat customers, and strong word-of-mouth referrals.

## Off-Site Wholesale Sales

Lamplighter off-site sales utilized a somewhat unusual self-distribution model. Two delivery vans serviced retail liquor stores and local bars/restaurants. While margins were tighter than those in the taproom, this channel was a significant revenue generator and provided a reliable outlet for packaged beer, with demand consistently outstripping supply. (Figure 7)

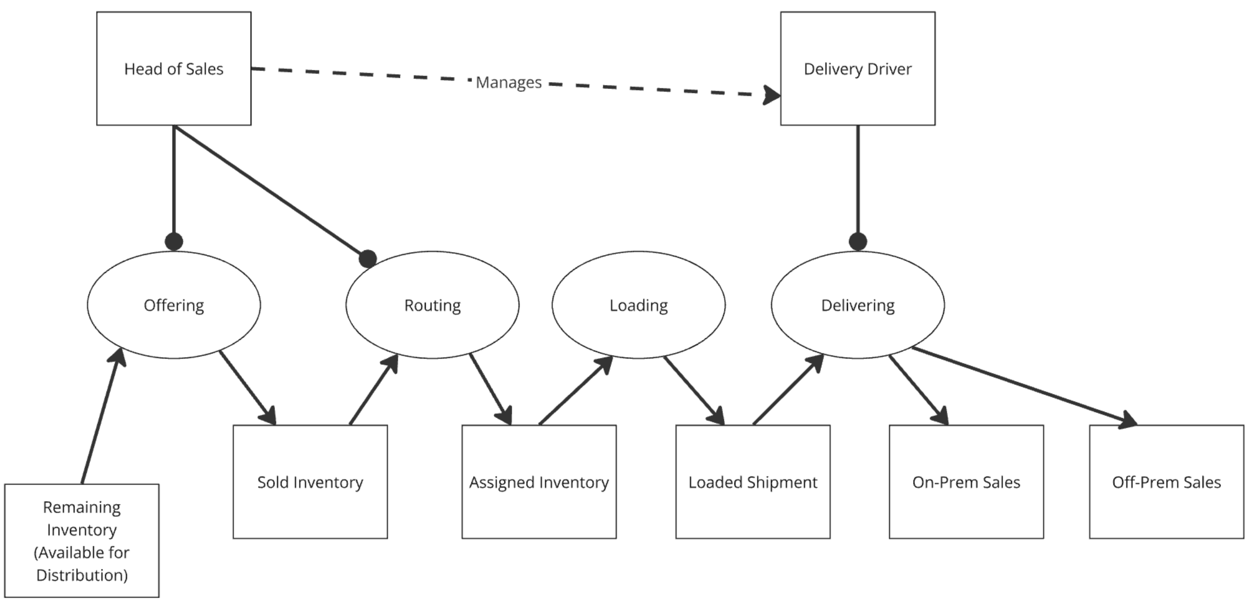


*Figure 7 Sales department OPM Diagram*

Unlike most breweries of its size, which relied on distributors to manage wholesale sales, Lamplighter handled its distribution internally. This approach allowed the brewery to retain a significantly larger margin per case of beer, as distributors typically take a sizable cut in exchange for their services. By maintaining direct relationships with retailers, Lamplighter also retained control over account management, pricing, and brand representation, ensuring that their products were well-positioned and aligned with the brewery's goals. This direct distribution model provided a degree of flexibility, control, and greater per unit profit that would have been possible via traditional means.

The self-distribution workflow was highly profitable in its own right, but significantly more labor-intensive than the traditional distributor model. Wholesale orders from each individual retail account were processed via email, with the Head of Sales digitally managing a large account base and scheduling and routing delivery drivers to retail accounts across the state.

Wholesale sales, despite their secondary allocation priority, were an important part of Lamplighter's revenue model, responsible for 42% of revenue in 2019, and accounting for more than two thirds of the brewery's production volume.

Inventory Prioritization

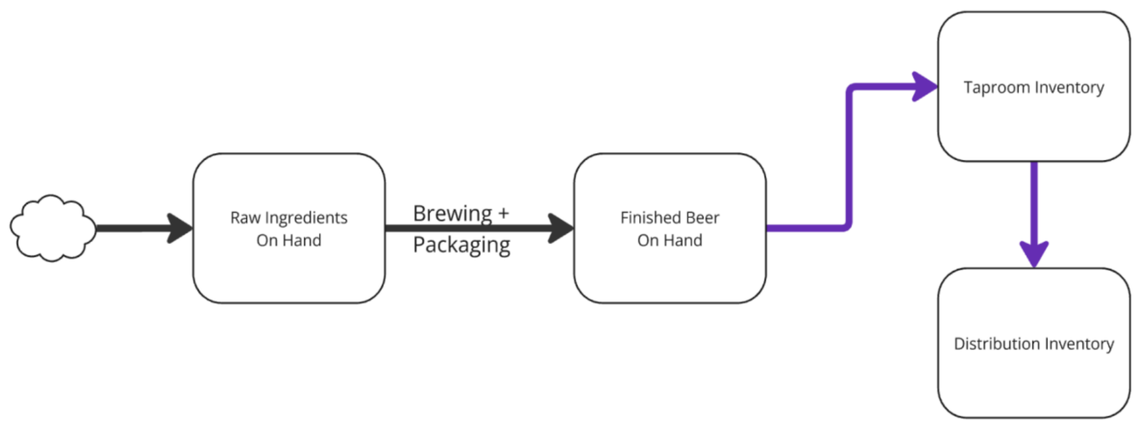


*Figure 8 Simplified Inventory Stock and Flow depicting sales channel prioritization*

To maximize profitability, the brewery prioritized inventory allocation first for on-site taproom operations, where margins were significantly higher. Packaged beer for off-premises sales was distributed only after taproom needs were met, limiting the volume available for wholesale accounts. (Figure 8) While this approach ensured the taproom remained a priority, it left some wholesale demand unfulfilled.

## The Marketing Department

Lamplighter Brewing Co.'s marketing department served as a critical driver of customer demand and community engagement. Under the direction of the Head of Marketing, the department was structured to manage three key areas: social media coordination, community partnerships, and events. Each of these areas contributed to building relationships with customers and driving demand for Lamplighter's products, both on-site and off-site. (Figure 9)

The Head of Marketing orchestrated the department's efforts, overseeing the Social Media Coordinator, the Partnerships and Community Engagement Lead, and the Events Manager. (Figure 9). This role also directed new product branding efforts, ensuring consistency and alignment with Lamplighter's image.

The Social Media Coordinator was responsible for creating and managing marketing materials, which were critical for maintaining an active online presence and promoting Lamplighter's offerings. Through the development of digital content, this role directly influenced customer awareness and reinforced the brewery's identity across platforms.

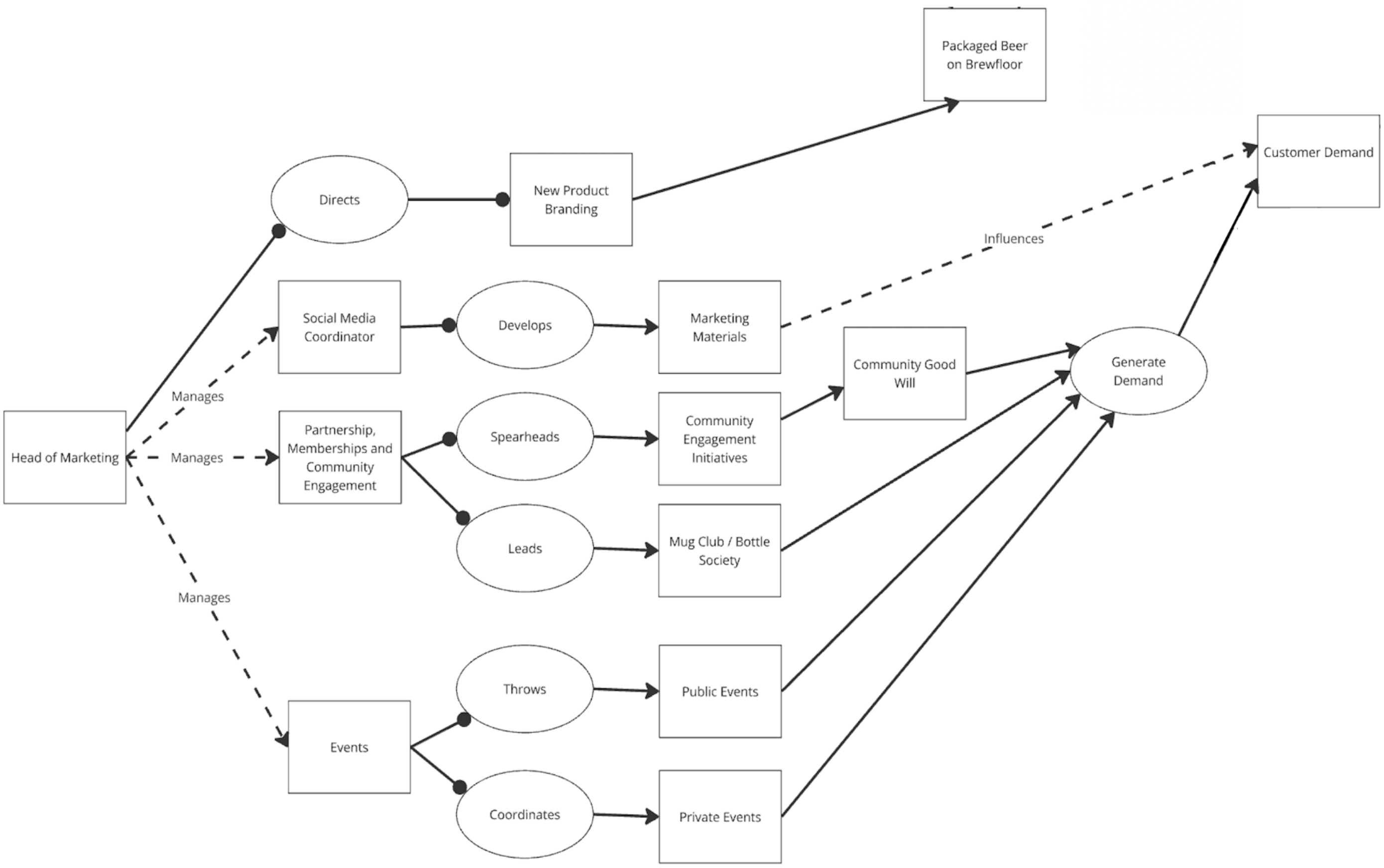


*Figure 9 Marketing Department OPM diagram.*

The Partnerships and Community Engagement Lead spearheaded initiatives to strengthen Lamplighter's ties to its local audience. This included leading membership programs like the Mug Club and Bottle Society, as well as managing collaborations and broader community outreach efforts. These initiatives played a vital role in fostering goodwill and customer loyalty, translating into repeat visits and positive word-of-mouth.

The Events Manager coordinated a robust events calendar, encompassing both public and private gatherings. Public events reinforced Lamplighter's status as a community hub, while private events generated additional revenue streams. Together, these activities leveraged Lamplighter's physical spaces to create unique customer experiences and encourage foot traffic to the taproom.

Altogether, the departments at Lamplighter Brewing Co. formed an interconnected structure that worked cohesively to transform raw materials into finished products, meet customer demand, and sustain the operational flow of the business. (Figure 10) Production served as the engine of the operation, creating the brewery's core products, while the taproom functioned as a key driver of on-site sales and direct customer engagement. Sales and distribution extended the brewery's reach off-site, ensuring that packaged products made their way to retailers, bars, and restaurants. Marketing amplified demand across all channels, leveraging branding, events, and community engagement to attract new and returning customers. Meanwhile, the administrative team provided the coordination and oversight necessary to align all these efforts with the brewery's overarching goals.

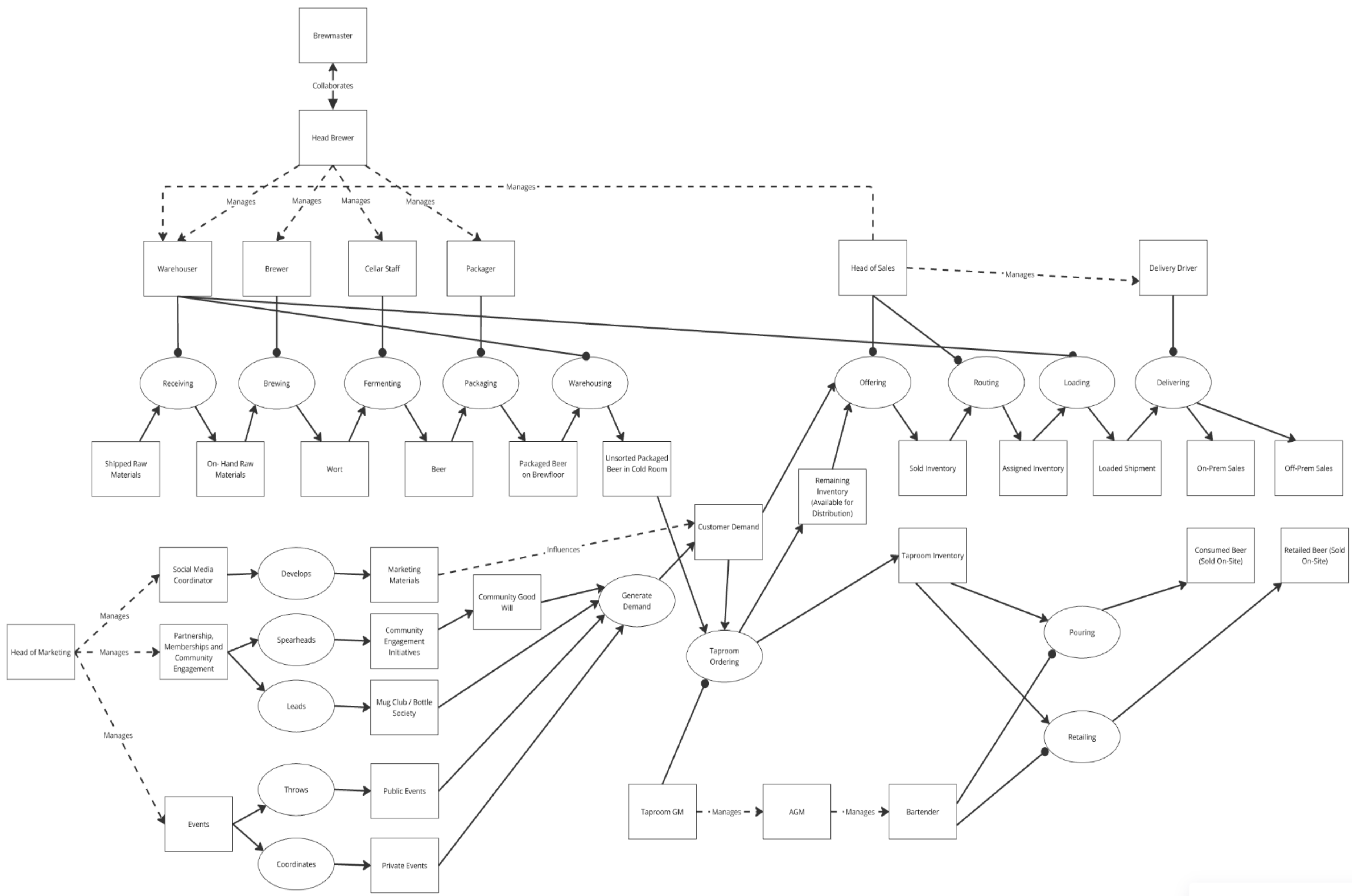


*Figure 10 Brewery OPM Diagram, illustrating the form and function and mapping the relationships of the departmental structure and operational flow from raw ingredients to sold, finished product*

## Task 4: Emergent Properties + System Dynamics

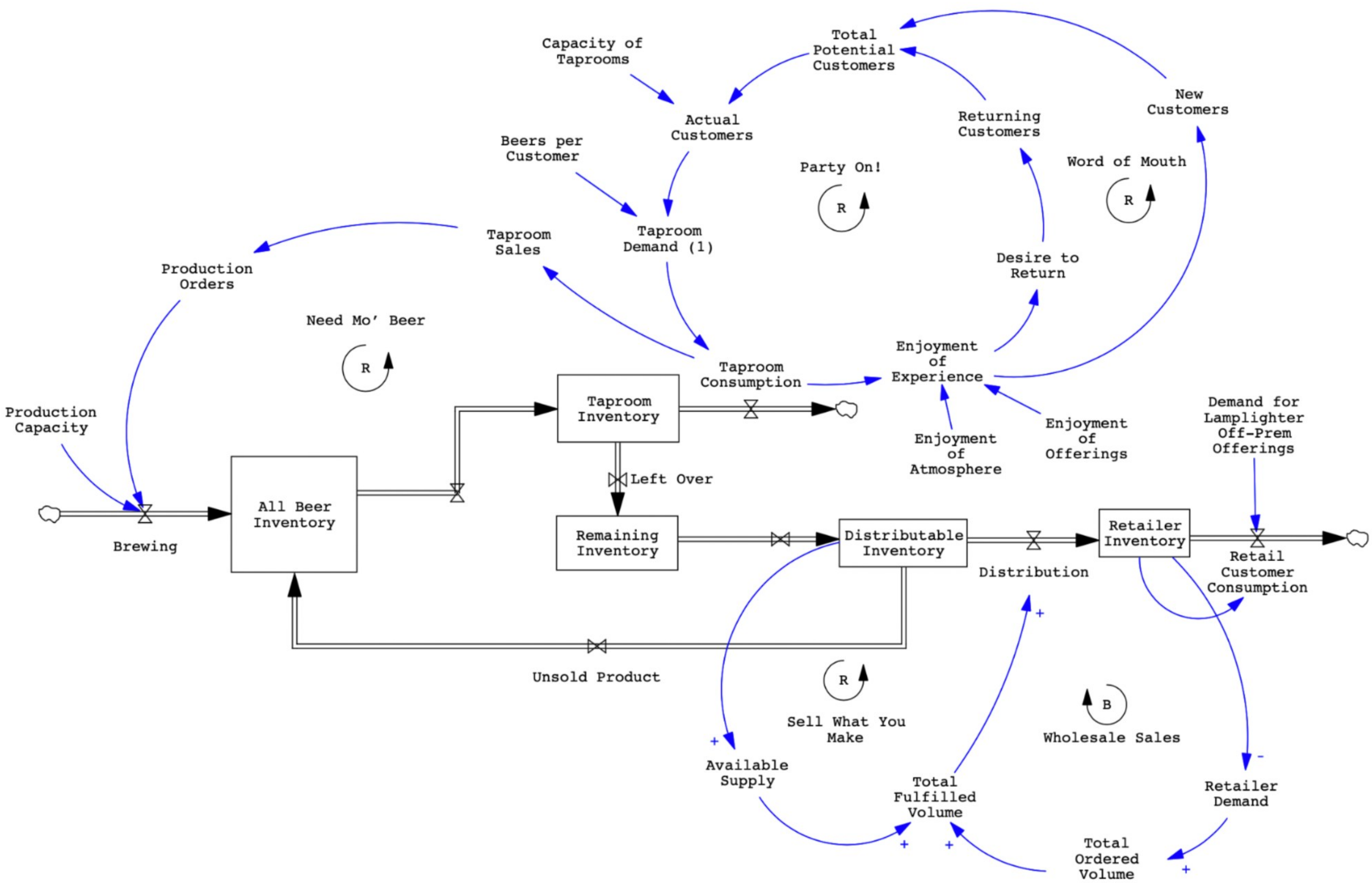


*Figure 11 Causal Loop Diagram: Pre-Pandemic Dynamics.*

Examining the behavior of the brewery through a System Dynamics lens provided insight into the way the various elements came together, and the various factors that influenced the performance of the company.

### Taproom Dynamics

Lamplighter Brewing Co.'s taproom sales were the cornerstone of its business model in 2019, providing the highest margins and serving as a hub for brand-building and customer loyalty. Analyzed through the system dynamics causal loop diagram depicted in Figure 11, this system was governed by two key reinforcing loops—"Party On!" and "Word of Mouth"—that created a self-sustaining cycle of customer attraction and retention, and a third reinforcing loop, "Need Mo' Beer" that connected taproom sales with demand to manufacture more product.

The “Party On!” loop captures the dynamic interaction between the taproom atmosphere and customer behavior. As Actual Customers increase, the capacity of the taproom would often be reached, especially on weekends. The vibrant and lively atmosphere generated by a full taproom enhanced the Enjoyment of the Atmosphere for patrons, which, in turn, drove Demand and increased the number of Returning Customers.

This loop was essential to Lamplighter’s brand identity and a key driver of profitability. The taproom was not merely a sales channel; it was a key marketing asset. Enjoyment of their experience at the brewery drew customers back and encouraged them to bring friends and family. This dynamic worked to sustain customer retention and drive new customer acquisition, creating a reinforcing cycle of growth.

Complementing the “Party On!” reinforcing loop was the “Word of Mouth” reinforcing loop, which leveraged customer satisfaction to drive broader awareness and interest in the Lamplighter brand. Positive experiences at the taproom translated into high levels of customer advocacy, with satisfied patrons recommending the brewery to friends, colleagues, and online audiences. This loop fed directly into the brewery’s ability to attract new customers, ensuring a steady inflow of fresh Demand.

This dynamic was especially effective in 2019, when the craft beer market in Massachusetts was experiencing robust growth. Lamplighter’s unique positioning as a Cambridge-based community brewery gave it a competitive edge, which the “Word of Mouth” loop amplified.

While the two reinforcing loops drove customer acquisition and retention, the taproom’s physical capacity and operational limits capped potential upside. As demand exceeded capacity, the taproom often reached its limits, leaving some customers unable to fully experience the vibrant atmosphere. This dynamic created a delicate equilibrium, where the taproom was consistently full but unable to grow beyond its physical constraints.

## Wholesale Dynamics

The performance of Lamplighter Brewing Co.’s self-distribution system was ultimately shaped by a set of systemic constraints that governed its potential for growth. The interaction of two key loops—“Sell What You Make” and “Wholesale Sales” dictated the behavior of Lamplighter’s wholesale operations.

At the heart of Lamplighter’s wholesale system was the reinforcing “Wholesale Sales” loop, which governed the interaction between retail accounts and Lamplighter’s distribution system. As Retail Customer Consumption increased, Retailer Inventory levels dropped, prompting additional orders from Lamplighter.

Complementing the “Wholesale Sales” loop was the balancing loop, “Sell What You Make.” With production prioritizing the taproom due to its higher margins and constrained by Lamplighter’s relatively small production capacity, a somewhat limited level of inventory was made available for wholesale accounts. As Distributable Inventory increased, wholesale activity rose, but this very activity reduced the stock available for further distribution, creating a self-limiting dynamic.

Ultimately, the full potential of the “Wholesale Sales” loop was moderated by the constraints of the “Sell What You Make” loop. While demand for Lamplighter’s products was consistently high, the brewery’s ability to fulfill orders depended entirely on its limited production capacity. The reinforcing pull of retail demand was therefore tempered by the balancing effect of supply limitations, creating a system where wholesale operations remained stable but limited in potential upside.

### Emergence

The emergent properties, the outcomes and behaviors that arose from the interactions of the system's components, of Lamplighter Brewing Co.'s system become evident when viewed through the causal loop diagram.

For the taproom, the emergent property was a self-reinforcing cycle of vibrant customer engagement, where the atmosphere, customer retention, and word-of-mouth advocacy created a dynamic and thriving community hub. This not only sustained the taproom's position as a revenue driver but also reinforced Lamplighter's identity as a cornerstone of the local craft beer scene.

In wholesale operations, the emergent property was the system's natural ability to balance supply and demand dynamically. Despite being constrained by production capacity, Lamplighter's wholesale activities achieved stability, ensuring consistent relationships with retail accounts while prioritizing the taproom's profitability.

Overall, the emergent behaviors of Lamplighter's system—its ability to generate demand, maintain customer loyalty, and sustain profitability—were a direct result of the careful alignment between its components and their interactions. Altogether, the structure and dynamics of the Lamplighter system were perfectly suited to the environment in which it operated, and the company was robustly healthy, thriving and profitable.

## 3.3 Impact of the Pandemic

The COVID-19 pandemic threw Lamplighter Brewing Co. into a state of upheaval, forcing the brewery to abandon the stable system that had served it so well before 2020. Virtually overnight, the dynamics that had driven its growth unraveled. Taproom sales—the backbone of Lamplighter's revenue—disappeared entirely as public health restrictions closed on-premises dining and drinking. Meanwhile, wholesale channels saw mixed impacts: bars and restaurants were shuttered, but demand for retail liquor stores surged as consumers adapted to life under lockdown. What followed was a chaotic and immediate rebalancing of Lamplighter's operational priorities and revenue streams.

### Immediate Effects

With the closing of taprooms and the cessation of keg sales to bars and restaurants, two of Lamplighter's most profitable channels were eliminated overnight. For a business built on the energy and margins of its taproom, this was a devastating blow. Taproom consumption, previously a major driver of revenue in the brewery's system, fell to zero. Similarly, bar and restaurant sales—a critical component of the wholesale side—vanished. For months, there was no outlet for kegged beer at all.

On the other hand, off-premises sales saw robust growth. With fewer options for socializing, consumers turned to buying beer for home consumption. Lamplighter's hastily assembled "retail window," designed to sell beer to customers maintaining social distance on the sidewalk, became an unexpected success. Meanwhile, liquor stores saw robust demand for packaged beer providing a lifeline for the brewery's wholesale operations. Volume that had previously been allocated for the taprooms was newly freed up, providing the volume needed for expansion, and partly compensating for the losses in other revenue streams.

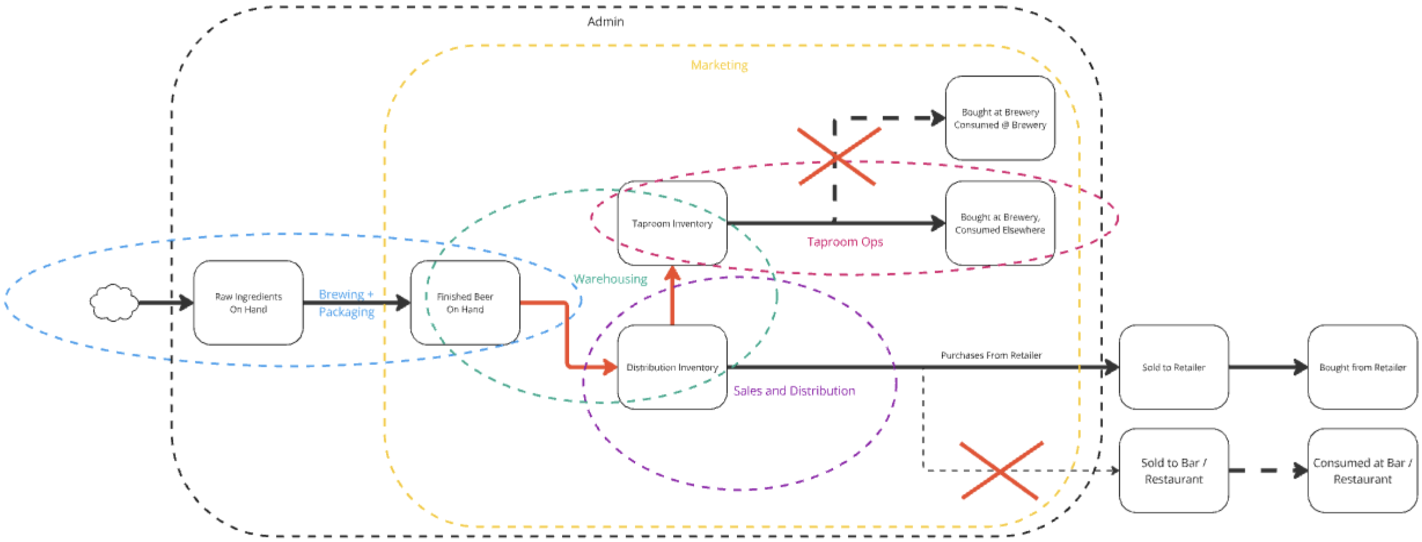


*Figure 12 Changes to the inventory stock and flow diagram due to pandemic closures.*

## Operational Adjustments and Challenges

The shift to primarily off-premises retail wholesale sales simplified Lamplighter's operations in some ways but introduced new challenges in others. With no taproom or bar distribution to manage, the brewery could focus exclusively on packaging beer and fulfilling wholesale orders.

| | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|
| **Total Sales - Wholesale** | $ 1,894,536.01 | $ 2,139,432.30 | $ 2,522,590.60 | $ 2,477,328.16 |
| **Total Sales - On-Site** | $ 2,554,457.20 | $ 2,735,913.07 | $ 2,292,358.25 | $ 2,116,688.86 |
| **Total Income** | $ 4,594,453.55 | $ 5,005,564.09 | $ 4,903,525.88 | $ 4,865,081.17 |
| | | | | |
| **Total Cost of Goods Sold** | $ 2,369,523.14 | $ 2,569,020.68 | $ 2,728,707.00 | $ 3,124,863.79 |
| **Total Expenses** | $ 1,390,098.01 | $ 1,884,305.76 | $ 1,603,858.23 | $ 1,934,314.94 |
| **Total COGS + Expenses** | $ 3,759,621.15 | $ 4,453,326.44 | $ 4,332,565.23 | $ 5,059,178.73 |
| | | | | |
| **Gross Profit** | $ 2,224,930.41 | $ 2,436,543.41 | $ 2,174,818.88 | $ 1,740,217.38 |
| **Net Operating Income** | $ 834,832.40 | $ 552,237.65 | $ 570,960.65 | $ (194,097.56) |
| **Net Income** | $ 829,391.52 | $ 540,965.55 | $ 927,376.98 | $ 146,228.40 |

*Figure 13 Lamplighter Abbreviated P+L, 2018-2021*

### Financial Impacts

During the pandemic years of 2020 and 2021, Lamplighter Brewing experienced significant shifts in its profit and loss dynamics. (Figure 13) Surprisingly, total income in 2020 was within $100,000 of 2019 levels. While taproom sales declined by $500,000, they *only* declined by $500,000, showcasing the massive increase in retail-to-go sales the company experienced via the sidewalk retail window. Wholesale sales made up for much of this decrease, growing by more than $400,000 from 2019 to 2020.

In 2021, sales revenue by both channels declined, with on-site sales falling an additional $165,000 compared to 2020, and Wholesale sales declining by $50,000. More notably, though, was the increase in costs in 2021.

COGS rose from $2.73M in 2020 to $3.12M in 2021, while total expenses grew from $1.60M in 2020 to $1.93M in 2021. These increases eroded gross profit, which fell from $2.17M in 2020 to $1.74M in 2021. Consequently, net income, which had surged to $927K in 2020 due to effective cost controls and government support, dropped dramatically to $146K in 2021.

The system had been forced into survival mode, and with it into a structure built from necessity instead of intention. Fortunately, the need to operate in such a dramatically restricted manner was relatively short lived. The company survived, and 2022 marked the much-anticipated reopening of the taprooms and a return to its pre-pandemic business model. With both the Broadway taproom and a new taproom built over the course of 2021 at Cambridge Crossing (CX) open to the public, the brewery resumed its core operations: on-site sales, retail-to-go offerings, and self-distribution to bars and restaurants, restoring the system to an almost identical configuration to that of 2019. This return to normalcy brought renewed optimism as the brewery reestablished the familiar patterns and strategies that had driven its success in the years leading up to the COVID-19 disruptions.

## 3.4 Post-Pandemic Financial Situation

By the end of 2022, however, Lamplighter Brewing's financial picture had grown increasingly troubling. Cash flow reports and traditional financial modeling revealed underwhelming revenue numbers, soaring costs, declining wholesale sales, and a net income that had failed to recover from the lows of 2021 (Figure 14).

| | **2021** | **2022** | **% Change** |
|---|---|---|---|
| Total 4110 Sales - Wholesale | $2,477,328.16 | $2,347,515.03 | -5.24% |
| Total 4200 Sales - On-Site | $2,116,688.86 | $3,632,442.94 | 71.61% |
| Total Income | $4,865,081.17 | $6,174,907.86 | 26.92% |
| Total Cost of Goods Sold | $3,124,863.79 | $3,780,382.33 | 20.98% |
| Total Expenses | $1,934,314.94 | $2,509,887.14 | 29.76% |
| Total COGS + Expenses | $5,059,178.73 | $6,290,269.47 | 24.33% |
| Gross Profit | $1,740,217.38 | $2,394,525.53 | 37.60% |
| Net Operating Income | -$194,097.56 | -$115,361.61 | -40.57% |
| Net Income | $146,228.40 | -$137,906.96 | -194.31% |

*Figure 14 Abbreviated Lamplighter P+L and % Change, 2021 and 2022.*

## Decline in On-Site Sales

On-site sales, historically Lamplighter Brewing's flagship revenue driver, grew to $3.63M in 2022, a substantial recovery from $2.11M in 2021, when pandemic restrictions severely constrained taproom operations (Figure 12). However, this increase was primarily driven by the addition of a second taproom, and per-taproom sales told a very different story.

In 2019, Lamplighter's sole Broadway taproom generated $2.74M in on-site sales. By 2022, total on-site revenue was spread across two locations, with the Broadway location contributing $1.33M and the newly opened CX location generating $0.89M. This resulted in an average of $1.11M per taproom—a 37% decline in per-taproom revenue compared to 2019. Figures 13, 14 and 15 showcase the dramatic difference in taproom performance of the pre and post pandemic eras.

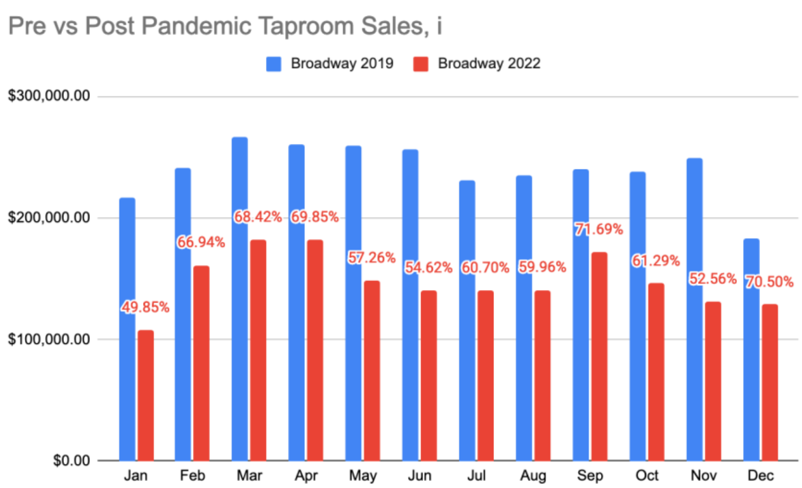


*Figure 15. Pre and Post Pandemic Taproom Sales, comparing Broadway taproom performance, 2019 and 2022*

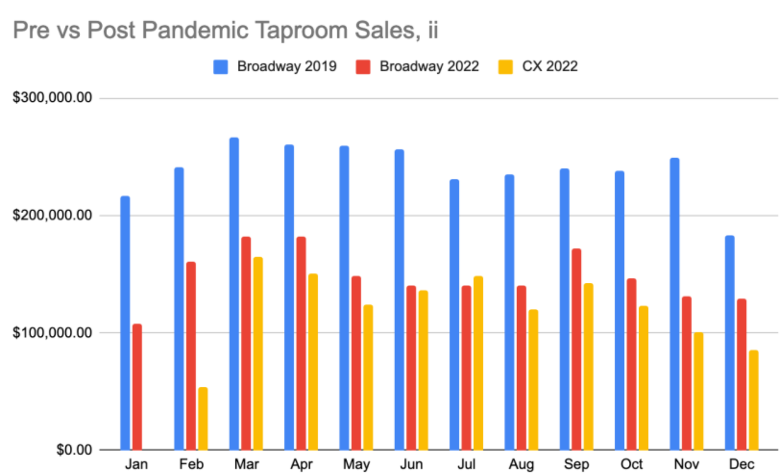


*Figure 16. Pre and Post Pandemic Taproom Sales, ii, comparing Broadway 2019 sales with Broadway and CX taproom sales in 2022.*

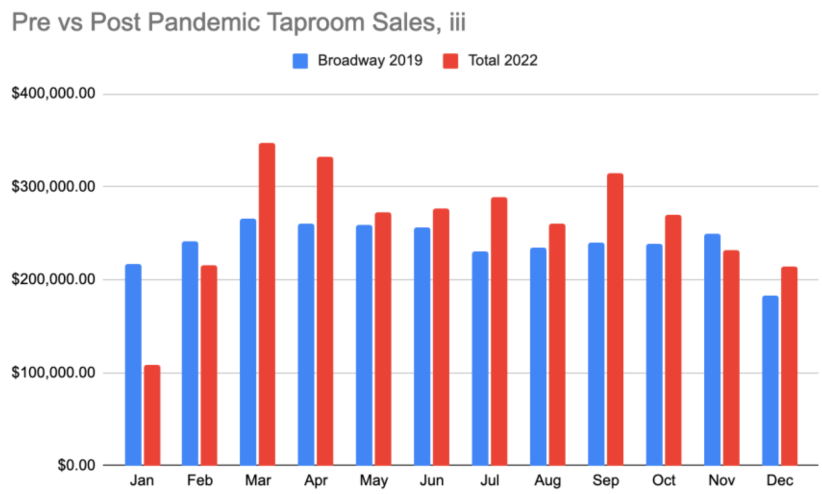


*Figure 17 Pre and Post Pandemic Sales iii, comparing Broadway 2019 and Total 2022 Taproom Sales.*

## Plateaued Off-Site Sales

Wholesale revenue in 2022 totaled $2.35M, showing a slight decline from $2.48M in 2021 and a more significant drop from the $2.52M recorded in 2020. (Figure 18). While sales were moderately higher than the $2.14M recorded in 2019, this decline marked a clear shift from the more robust figures of 2020 and 2021, when wholesale sales were buoyed by increased off-premises demand during the pandemic.

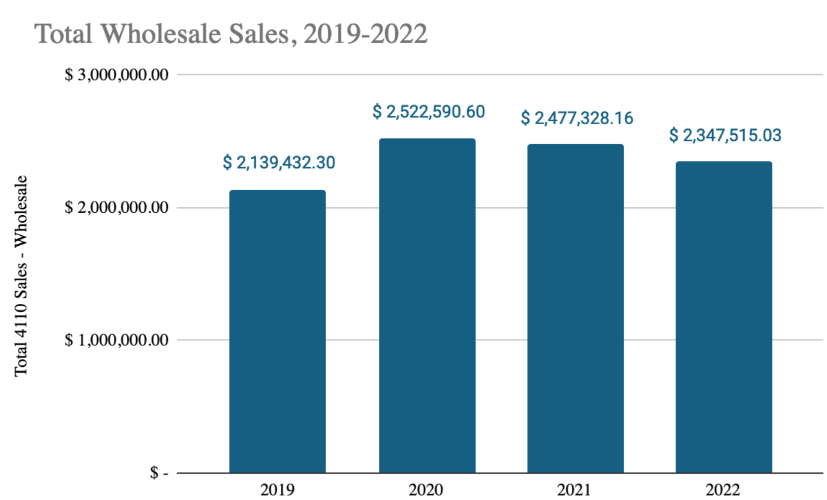


*Figure 18 Lamplighter total wholesale sales, 2019-2022*

## Increased COGS

Inflationary pressures drove substantial increases in Lamplighter's cost of goods sold (COGS), which climbed from $2.57M in 2019 to $3.78M in 2022—a 47% increase. Ingredient costs rose significantly, increasing by 31% over the same period, while labor-related costs within COGS more than doubled, rising from $366K to $738K.

The proportion of revenue absorbed by COGS also grew, with COGS as a percentage of revenue increasing from 51.3% in 2019 to 61.2% in 2022. Labor costs also surged, with labor-related COGS increasing by 102%, climbing from $366K in 2019 to $738K in 2022, further intensifying financial strain. Gross profit margins fell sharply, declining from 48.7% in 2019 to 38.8% in 2022, underscoring the eroding profitability caused by rising costs outpacing revenue growth.

### Increased Fixed Costs

Fixed costs further compounded Lamplighter's financial challenges in 2022. Rent expenses increased by 34% with the addition of the CX taproom, rising from $221K in 2019 to $296K in 2022. Utilities saw a 17% increase, growing from $47K in 2019 to $55K.

# Chapter 4: Post-Pandemic Systems Analysis

With the financial performance of 2022 clearly understood and the structure and dynamics of the previous, volatile years mapped, Lamplighter Brewing Co. faced a critical need to understand how changing circumstances had fundamentally altered the underlying drivers of its business and operations. The brewery's leadership continued to utilize systems thinking techniques to attempt to grasp the interconnected factors shaping its current landscape, identify the root causes of its challenges and uncover leverage points for strategic intervention.

The first step was to reexamine the changing conditions and update the models previously developed to match the new reality.

The expanded causal loop diagram in Figure 18 was developed, building upon the previous, simpler diagram, and introduced new variables and feedback loops that reflected the pressures Lamplighter Brewing Co. now faced. The backbone of the structure remained, but new variables had revealed important new factors impacting the existing dynamics.  Finally, the OPM diagrams of the departmental structure, in particular the various roles and responsibilities of the team, was re-examined with an eye toward the current demands of the company.

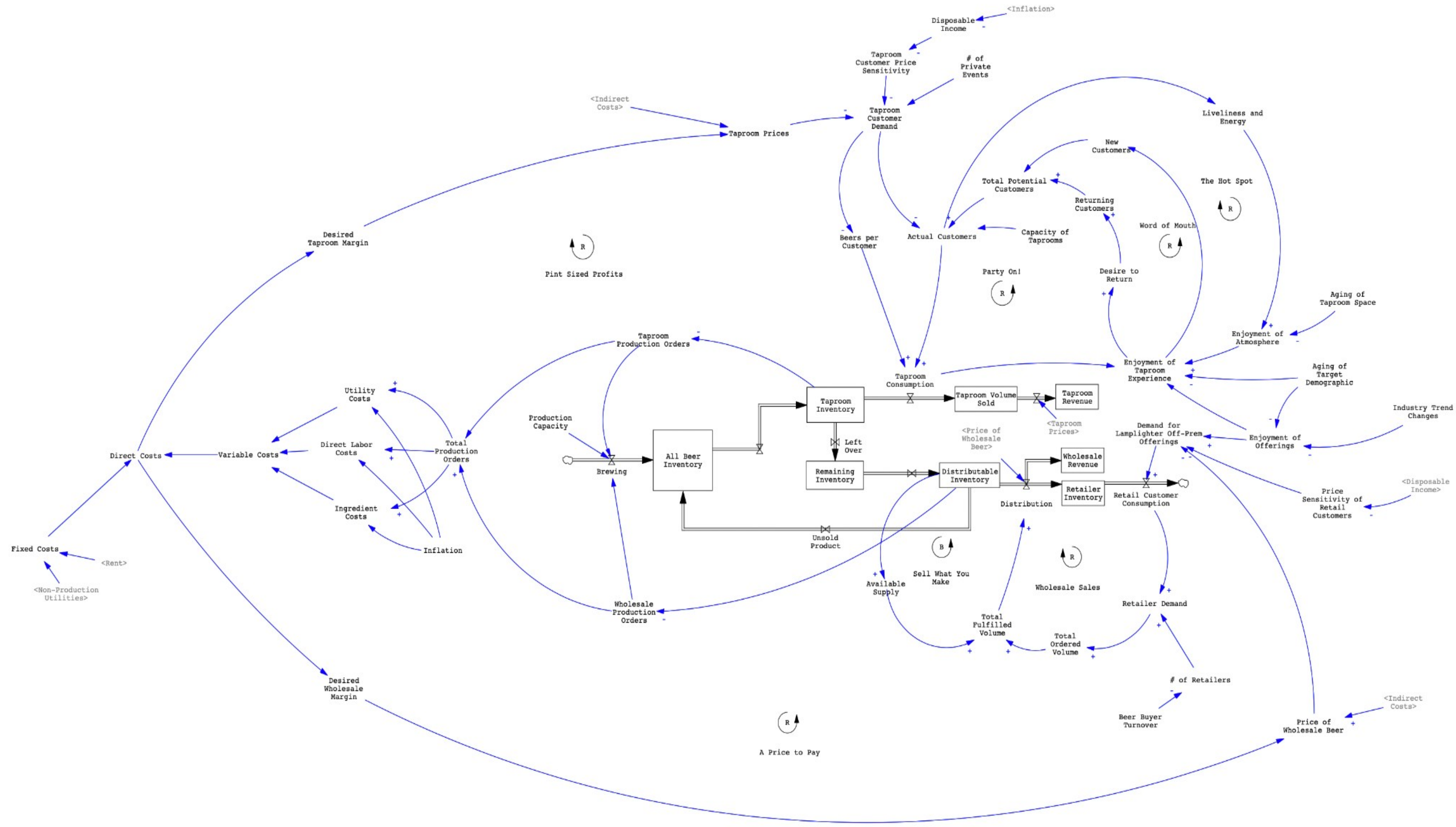


*Figure 19 Updated Causal Loop Diagram reflecting updated understanding of key drivers of Lamplighter's systemic environment.*

## 4.2 Declining Demand

### On-Site Sales Decline

The performance of Lamplighter Brewing's on-site taproom sales, once the cornerstone of its revenue model, reflected significant structural challenges in 2022.

### Inflation and Disposable Income

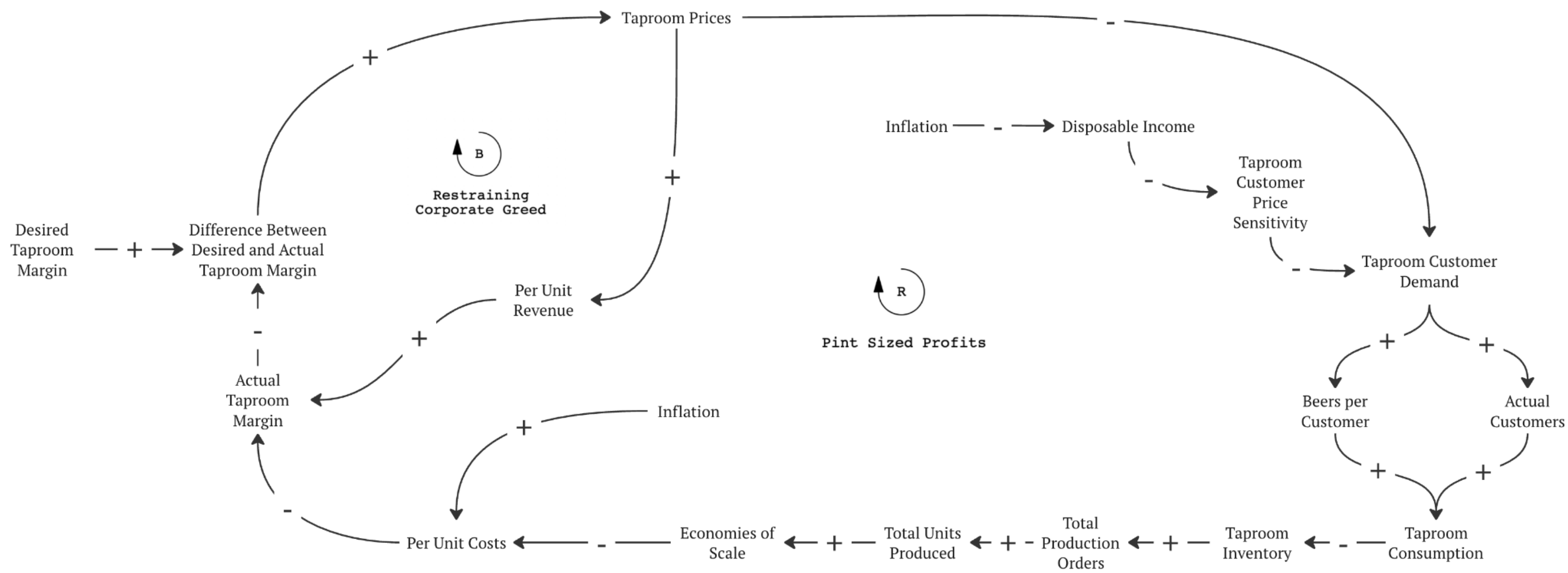


*Figure 20 Subsection of holistic causal loop diagram depicting balancing loop, "Restraining Corporate Greed" and reinforcing loop "Pint Sized Profits"*

The reinforcing loop "Pint Sized Profits" illustrates how Inflation disrupted the system's positive dynamic and tipped it into a negative cycle. (Figure 21) Running in a positive direction, this loop explains how economies of scale increase both Actual Margins and Demand. However, rising costs for ingredients, utilities, and labor, driven by Inflation, increase Per Unit Costs, necessitated increased Taproom Prices to maintain margins. These higher prices softened Demand as customers, increasingly price-sensitive due to reduced Disposable Income, weighed discretionary spending decisions. The willingness to purchase premium-priced craft beer declined, contributing to fewer Beers per Customer and Actual Customers, reducing Total Production Orders. Lower production volumes eroded Economies of Scale, further increasing Per-Unit Costs and perpetuating the need for price increases, deepening the cycle of declining demand and worsening margins.

### Shifts in Consumer Behavior

Pandemic-era caution also fundamentally altered consumer preferences, and the reinforcing loops "Party On!" "Word of Mouth" and a newly identified loop "The Hot Spot" - previously key drivers of vibrant taproom dynamics—began to run in reverse. (Figure 22) In the pre-pandemic environment, higher customer turnout increased Liveliness and Energy which enhanced the Enjoyment of Atmosphere and created positive "Word of Mouth" drawing more visitors. Post-pandemic, however, declining attendance and reluctance to jam into crowded spaces meant that fewer customers experienced the social vibrancy that once defined Lamplighter's taproom experience. This reduction in Enjoyment of Atmosphere further diminished the appeal of on-site consumption, creating a self-reinforcing decline in Demand.

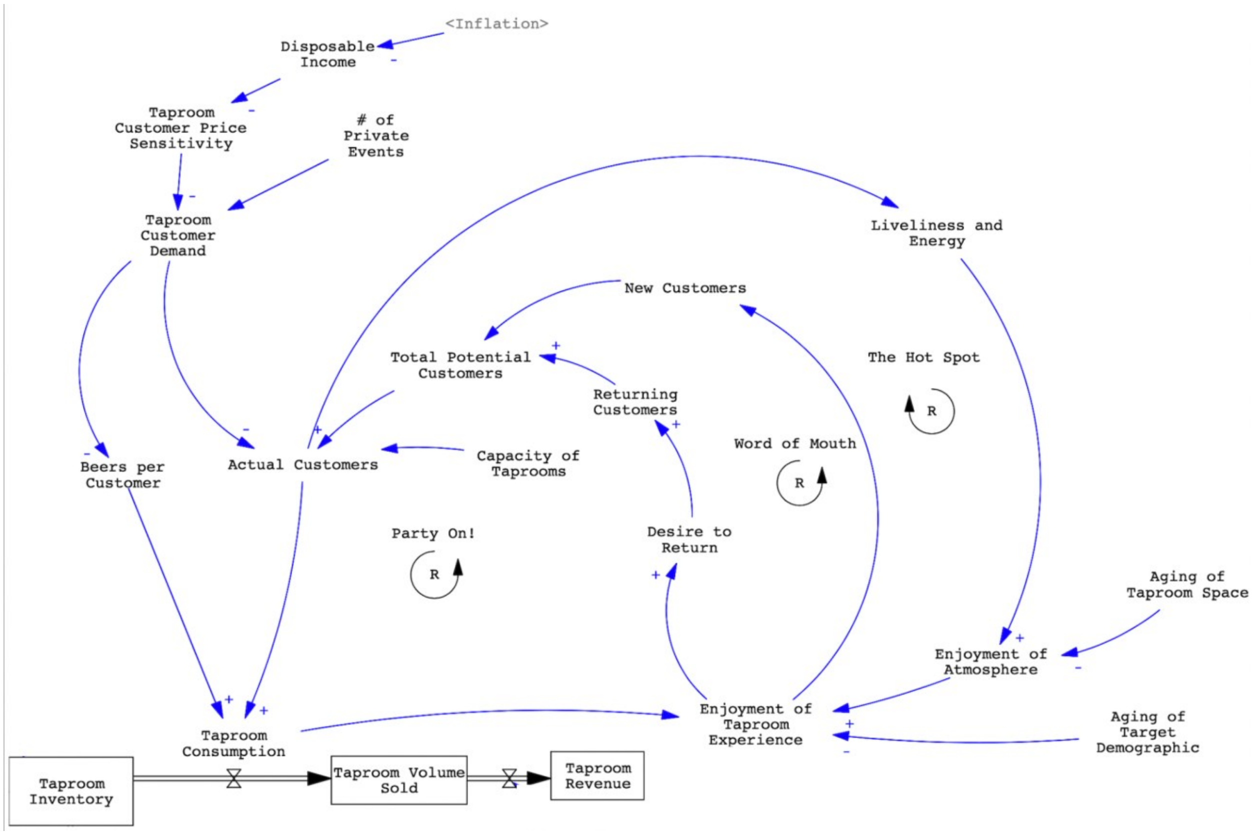


*Figure 21 Causal Loop Diagram depicting reinforcing loops and variables impacting on-site sales in the Lamplighter taprooms*

Demographic and Structural Changes

Additional pressures on on-site demand came from demographic shifts within Lamplighter's core customer base, captured in the variable Aging of Target Demographic. Key segments of the brewery's loyal audience aged out of their party years, and younger consumers as a whole displayed less interest than previous generations in craft beer. Moreover, Aging of Taproom Space, another new variable in the causal loop diagram, compounded the issue by reducing the overall appeal of Lamplighter's physical locations. The taprooms, which once thrived as modern and attractive spaces, struggled to compete with newer, shinier competitors. These subtle structural declines had a cascading effect on Enjoyment of Atmosphere further reducing customer retention and new customer acquisition.

## Off-Site Sales Plateau

Lamplighter Brewing's off-site sales, a historically stable revenue channel, experienced a milder but still noticeable decline in 2022 as the dynamics of wholesale sales shifted in the post-pandemic environment. The causal loop diagram highlights several key factors that contributed to the plateau in off-site sales. (Figure 23)

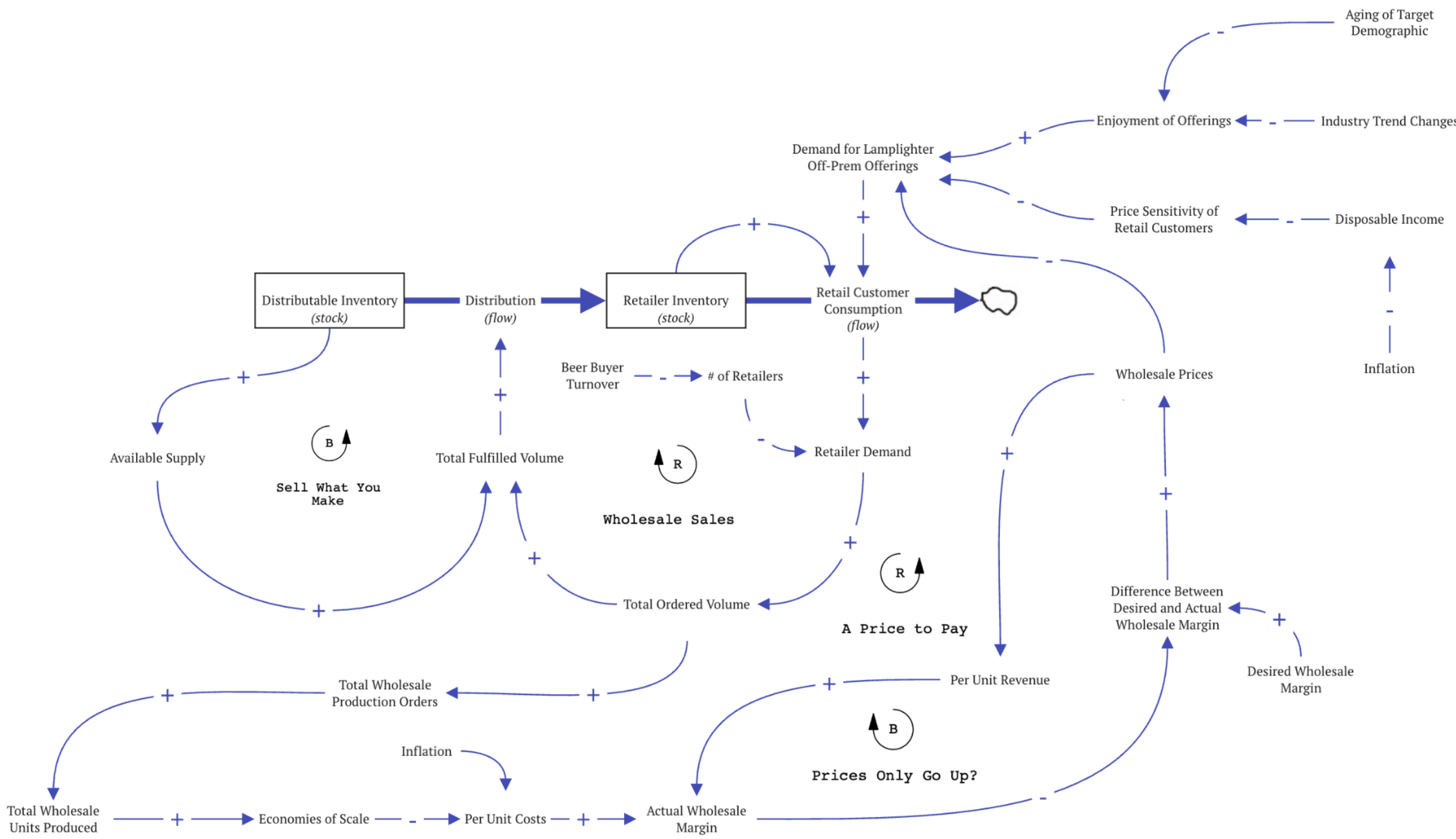


*Figure 22 Updated causal loop diagram focusing on wholesale sales and outlining the new Reinforcing loop "A Price to Pay" and Balancing loop "Prices Only Go Up?"*

## Erosion of Account Relationships

A critical factor in Lamplighter's wholesale challenges was the gradual erosion of retail account relationships, captured by the variables Beer Buyer Turnover and # of Retailers. Lamplighter's reliance on a digital, email-based sales approach had been effective in the high-demand pre-pandemic environment. However, in the 2022 market, where consumer demand was significantly lower than in 2019, this strategy proved inadequate.

Without effective mechanisms to identify and onboard new buyers, Lamplighter experienced gradual account attrition as buyers left their positions at retail accounts and contact was lost. This issue weakened Retailer Demand and disrupted the "Wholesale Sales" reinforcing loop, reducing its ability to drive growth, even with volume newly available for distribution due to reduced on site consumption.

Market Trends and Increased Competition

Broader industry trends also played a role in limiting Lamplighter's growth in the wholesale channel. The updated diagram in Figure 23 introduces the new variable Industry Trend Changes, which captures the shift in consumer preferences toward ready-to-drink cocktails, hard seltzers, and other alternative alcoholic beverages. These trends increased competition for limited shelf space and taps. Retailers, responding to these preferences, diversified their product offerings, reducing demand for Lamplighter's products. Further, Aging of Target Demographic reduced the overall volume and enjoyment of Lamplighter's offerings, further negatively impacting demand.

The variable Price Sensitivity of Retail Customers further constrained "Wholesale Sales" in the same way price sensitivity impacted taproom sales, reducing demand for high price-point products. As inflationary pressures lowered disposable income, financially strained customers increasingly opted for lower-priced alternatives, amplifying the challenges in maintaining and growing wholesale sales.

Impact of Inflation on "A Price to Pay"

Inflation also disrupts the reinforcing loop "A Price to Pay," which, under stable conditions, would amplify growth. (Figure 23) When inflation is low, stable input costs enable lower Per Unit Costs, which improve Actual Wholesale Margin and decrease the gap between Desired and Actual Wholesale Margin. This allows for competitive Wholesale Prices, stimulating Retailer Demand and driving higher Total Ordered Volume. Increased production volumes improve Economies of Scale, further reducing Per Unit Costs and reinforcing the cycle in a positive direction.

However, with high inflation, this loop reverses. Rising input costs increase Per Unit Costs, compressing margins and widening the gap between desired and actual margins. To compensate, Wholesale Prices rise, reducing Retailer Demand and Total Ordered Volume. Lower production erodes Economies of Scale, further increasing Per Unit Costs and perpetuating a downward spiral of worsening margins, higher prices, and declining demand. Inflation transforms this loop from a growth engine into a vicious cycle of margin compression and market contraction.

## 4.3 Rising Costs

By 2022, Lamplighter Brewing faced escalating cost pressures that significantly impacted profitability.

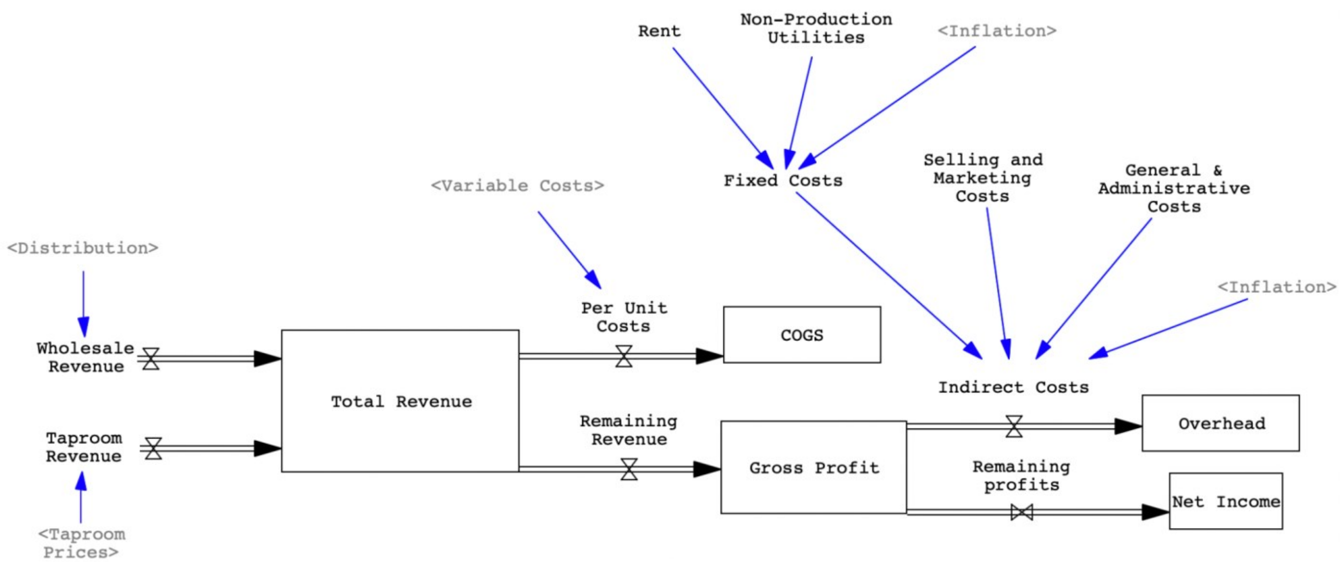


*Figure 23 Brewery Financial Stock and Flow Diagram*

### Inflation and Rising Input Costs

One of the most dramatic increases in costs was an increase in the Cost of Goods Sold (COGS). A primary driver of increased COGS was Inflation, which created upward pressure on Per Unit Costs by driving up Ingredient Costs, Utility Costs and Direct Labor. These three together flow into Variable Costs which reduce taproom consumption via price increases and customer price sensitivity through the reinforcing loop “Pint Sized Profits,”

These cost increases significantly reduced the amount of Remaining Revenue able to become Gross Profit, a dynamic depicted in the stock and flow diagram depicted in Figure 24.

### Increased Fixed Costs

The addition of a second taproom in 2022 significantly increased Lamplighter Brewing’s fixed costs, including Rent, and Non-Production Utilities. While this expansion was intended to grow revenue and capitalize on Lamplighter’s strong brand, it coincided with a sharp decline in average per-taproom performance due to the drivers previously discussed. This mismatch—between the costs of operating two locations and the revenue they generated—led to a dramatic reduction in taproom margins compared to the pre-pandemic era.

The data reveals the extent of this imbalance. Rent expenses rose by 34%, climbing from $221K in 2019 to $296K in 2022. Meanwhile, Direct Labor Costs, which include staffing for both taprooms, more than doubled as wages rose in an attempt to keep up with dramatically reduced Disposable Income.

Had the taprooms performed at 2019 levels, these added costs would have been easily sustainable. However, with total taproom revenue failing to match expectations, the second taproom's incremental costs disproportionately impacted profitability. Average revenue per taproom fell by 37%, from $1.77M in 2019 to $1.11M in 2022, greatly reducing the revenue remaining to cover the expanded cost base. As a result, gross profit margins shrank by nearly 10 percentage points, and net income similarly struggled, as previously outlined in Figure 14.

## 4.4 People and Roles

The next stage of the analysis shifted to an abbreviated OPM approach, focusing on the brewery's corporate structure.

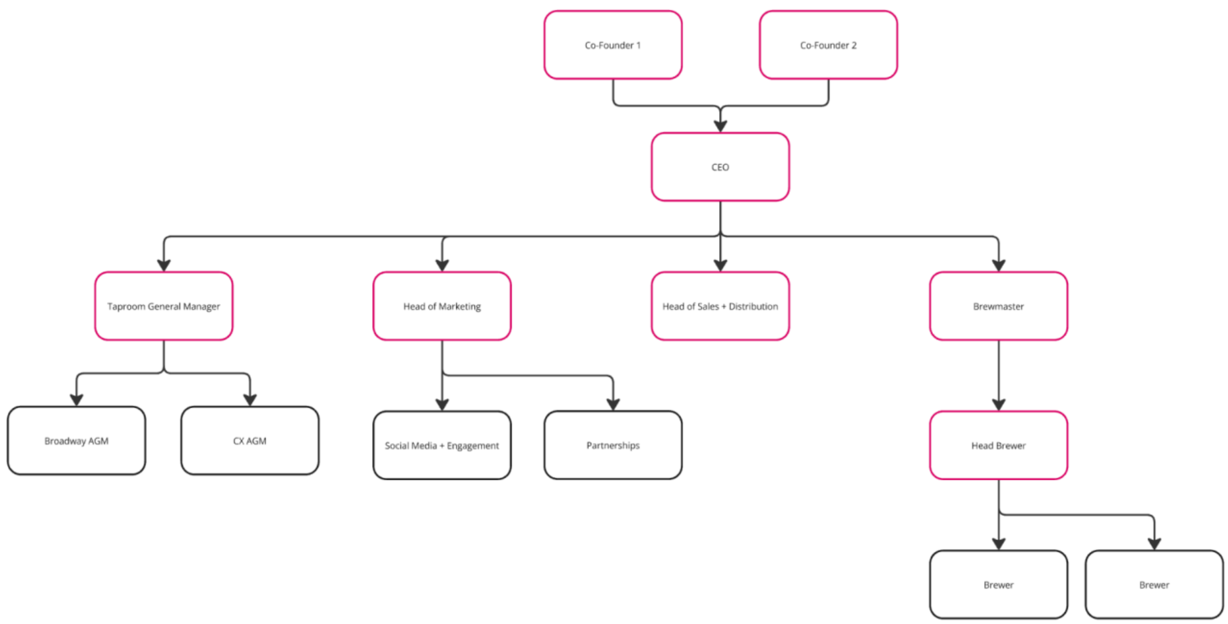


*Figure 24 High-Level Organizational Structure of Lamplighter Brewing Co., January 2022. Positions with compensation over $85,000 per year highlighted in red.*

### Labor Costs and Organizational Misalignment

During the pandemic, Lamplighter's reduced operational complexity and furloughing of most employees left department heads performing much of their departments' day-to-day work themselves. This leaner, flatter structure was a survival-focused adaptation, aligning with the constrained resources and immediate demands of the time. Without large teams to manage, department heads became task-oriented operators, a model well-suited to the challenges of the pandemic era.

However, as Lamplighter reopened in 2022 and attempted to reinstate its pre-pandemic structure, the misalignment between its organizational design and operational needs became clear. The company's growth-era model, built for profitability and expansion, was ill-suited to a post-pandemic landscape of stagnant growth. Department heads, originally hired to oversee large teams and ambitious initiatives, now managed small groups or individual contributors, rendering their roles disproportionately expensive relative to their reduced scope of work. For example, the Head of Marketing, once responsible for a multiperson team, oversaw just two contributors in 2022, making the role costly and misaligned with the company's shrinking revenue. This pattern extended across the organization, with General & Administrative wages increasing 25.5% from $255K in 2019 to $320K in 2022, even as team sizes diminished. (Figure 26)

This misalignment was exacerbated by a lack of operational visibility that stemmed from the brewery's pre-pandemic success. High profitability during growth years left little incentive to scrutinize departmental outputs or address inefficiencies. As growth stalled, this lack of institutional knowledge hindered leadership's ability to evaluate roles, identify inefficiencies, and implement necessary changes, compounding the company's operational challenges.

Financial and Operational Impact

The financial consequences of this misalignment were significant. Labor-related COGS saw a staggering 101% increase, rising from $366K in 2019 to $738K in 2022. (Figure 26) Guaranteed payments to key employees surged 175%. Together, total wages and guaranteed payments across all categories climbed 39% during this period, growing from $1.35M in 2019 to $1.88M in 2022. Even when adjusted for the added CX taproom wages, labor costs still grew by 25.8%, significantly outpacing the company's revenue growth.

| | **2019** | **2022** | **% Change** |
|---|---|---|---|
| 5250 Salary & Wages - COS | $366,788.19 | $737,914.32 | **101.18%** |
| 6450 Salary & Wages - G & A | $255,281.19 | $320,443.67 | **25.53%** |
| 8250 Salary & Wages - Selling & Marketing | $454,780.84 | $449,955.37 | **-1.06%** |
| Total 5455 Guaranteed Payment - COS | $65,587.27 | $180,817.14 | **175.69%** |
| Total 6455 Guaranteed Payment - G & A | $207,789.26 | $188,892.79 | **-9.09%** |
| Total Salary, Wages and Guaranteed Payments | $1,350,226.75 | $1,878,023.29 | **39.09%** |
| Adjustment for CX Wages | | $180,000.00 | |
| Adjusted Totals | $1,350,226.75 | $1,698,023.29 | **25.76%** |

*Figure 25 Changes in salaries and wages by category, 2019 to 2022.*

## Conclusion

Lamplighter Brewing Co.'s post-pandemic challenges highlight the complexity of operating in a drastically altered business environment. While the brewery successfully navigated the immediate demands of the pandemic through survival-focused adaptations, the transition back to a pre-pandemic model exposed structural inefficiencies, operational misalignments, and market pressures that had been masked during years of rapid growth. Rising costs, declining demand, and a mismatch between organizational design and current needs compounded these challenges, creating a system in which profitability and agility were significantly constrained.

The analysis that clearly outlined these issues also provided the visibility needed to identify key leverage points where these challenges could be addressed and reversed.

## 4.5 Systemic Insights and Leverage Points

After performing the analysis and crafting a holistic understanding of the situation the company was in, and the dynamics of the system responsible for creating that situation, the management team began to identify leverage points in the system that might prove fruitful targets for interventions to change the company's trajectory back in a more positive direction.

## Wholesale Pricing

One significant opportunity lay in wholesale beer pricing, which had not kept pace with inflationary pressures. Between 2019 and 2022, wholesale prices rose modestly from $65 per case to $72 per case, an 11% increase. However, inflation-adjusted pricing during this period would have needed to rise to $80–$85 per case to maintain margins and offset rising costs.[xxiii] This lag in pricing adjustments contributed to a decline in wholesale beer gross profit margins from an estimated 60% in 2019 to 50% in 2022, leaving a critical gap in profitability.

The decision not to raise prices more aggressively originally was heavily influenced by external economic conditions and market dynamics captured in Figures 22 and 23. Retail Customer Price Sensitivity was a key driver of the company's hesitation: as inflation reduced Disposable Income, both end customers and Lamplighter's retail partners became more sensitive to price increases. Lamplighter's third-party retail partners, facing their own rising costs and shifting consumer demand, resisted significant price adjustments, making it difficult for Lamplighter to pass on rising costs. Instead, the brewery absorbed these costs through higher COGS, which squeezed margins.

Lamplighter's premium pricing strategy also complicated efforts to raise prices. Positioned at the upper end of the craft beer market, the brewery already commanded a higher price point than many competitors. In an inflationary environment, this further limited pricing flexibility, as retail buyers and consumers were less willing to pay even higher prices for premium products, often shifting toward more affordable, macro-produced options. This created additional risks of losing shelf space or customer loyalty if pricing adjustments were too aggressive.

Yet, the interplay of economic pressures, heightened Retail Customer Price Sensitivity, and delayed pricing adjustments also highlighted a potential leverage point for improving company performance. While the decision to absorb rising costs helped preserve sales volumes in the short term, aligning pricing more closely with inflation could present an opportunity to restore margins.

## Beer Buyer Turnover

Another potential leverage point identified in the causal loop diagram was Beer Buyer Turnover, which subtly but significantly impacted wholesale sales. Turnover often became apparent only after buyers stopped responding to emails, creating delays in identifying and addressing changes in account relationships. This disruption weakened Lamplighter's ability to maintain continuity with retail partners, leading to lost sales.

## Liveliness, Energy and Taproom Demand

The causal loop diagram further highlighted Liveliness and Energy in the taproom as a potential leverage point in driving customer engagement and performance. This energy is shaped by the Number of Customers in the space, which enhances the Atmosphere and contributes to a more enjoyable experience. A lively environment strengthens reinforcing loops like "The Hot Spot," and "Party On!", attracting new customers through positive "Word of Mouth" and encouraging repeat visits. Finding some way to revitalize the flagging taproom Liveliness and Energy could put the reinforcing loops back on track, and the company with them.

Leverage Point: Restructuring

The analysis revealed corporate restructuring and reining in labor costs as a significant potential leverage point. Originally designed for a period of rapid growth, the existing structure had become an operational burden, with top-heavy management roles adding costs without delivering proportional value. Streamlining this structure and realigning roles to match the brewery's post-pandemic needs could reduce expenses, improve decision-making, and enhance the company's adaptability.

Leverage Point: COGS

The analysis identified Cost of Goods Sold (COGS) as a crucial leverage point for improving the brewery's financial performance. Rising input costs, driven by inflation, significantly increased Per Unit Costs, squeezing margins across both taproom and wholesale channels. Small reductions in COGS could have an outsized impact on margins, providing much-needed financial relief.

Leverage Point: Changing Industry Trends

Changing Industry Trends was another potential leverage point. Shifts in consumer preferences, particularly among younger demographics, reduced demand for traditional craft beer and reshaped the competitive landscape. Recognizing and finding a way to address these changes offered an opportunity to adapt operations and align with evolving market realities.

Leverage Point: Aging of the Taproom Space

The final identified leverage point was the Aging Taproom Space, which had a subtle yet significant impact on customer retention and new customer acquisition. However, this leverage point presented one of the most challenging areas to address, as the financial resources required for substantial revitalization were scarce, leaving only limited opportunities for incremental improvements.

# Chapter 5: Interventions

With a clear understanding of the company's structure and the root causes of its challenges, informed by comprehensive modeling and analysis, Lamplighter Brewing was ready to begin ideating and implementing targeted interventions. By utilizing the structure of the system and the identified leverage points, management had a reasonable chance of anticipating the emergent behavior that they could expect to see from changes to the system. The interventions were executed in stages, reflecting the iterative nature of systems thinking, the capacity of the individuals involved and the company itself, and the evolving insights into the brewery's operations.

The initial analysis phase discussed in the previous chapters took place during Q1 and Q2 of 2023, laying the groundwork for action. The first round of interventions, implemented in Q3 and Q4 of 2023, focused on restructuring the company and making foundational changes to the sales and product strategy. The second round, spanning the first half of 2024, concentrated on refining the product strategy and overhauling the manufacturing approach. Finally, the third round, begun in Q3 and launched at the start of Q4 2024, involved a significant pivot in the sales structure to address lingering challenges.

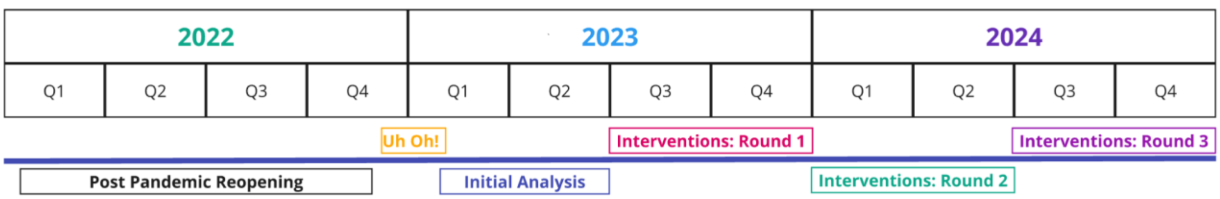


*Figure 26 Timeline covering the intervention time period outlined in the thesis.*

## 5.1 First Round of Interventions, Q3-Q4, 2023

The first round of interventions focused primarily on people, their roles, and the company structure. Informed primarily through OPM diagramming and traditional financial analysis, this intervention's primary drive was to refocus and realign how Lamplighter's resources were allocated to reduce costs, improve efficiency, and deliver a better product and experience for the company's customers.

### Labor Changes: Taprooms

OPM diagramming revealed that the Taproom General Manager's primary task was heavily focused on hands-on management of the Assistant General Managers (AGMs) and taproom staff (Figure 6)—an approach that had become redundant as the AGMs matured in their roles and required less direct oversight. The other responsibilities of the General Manager, such as product ordering, scheduling, and overall operational oversight, could be redistributed among the AGMs with some adjustments to their workload. The Taproom General Manager was one of the most highly compensated employees at the brewery, and the burden of overall taproom management's compensation to revenue was at more than twice its 2019 levels.

The first intervention involved eliminating the expensive General Manager position and reallocating responsibilities. The AGMs were given greater autonomy, dividing among them the managerial tasks previously handled by the GM. To support this shift, their bartending shifts were eliminated, allowing them to focus exclusively on overseeing operations. Additional bartenders covered their hours at a lower cost, ensuring day-to-day staffing needs were met. Direct oversight of the AGMs was shifted to the CEO. (Figure 28).

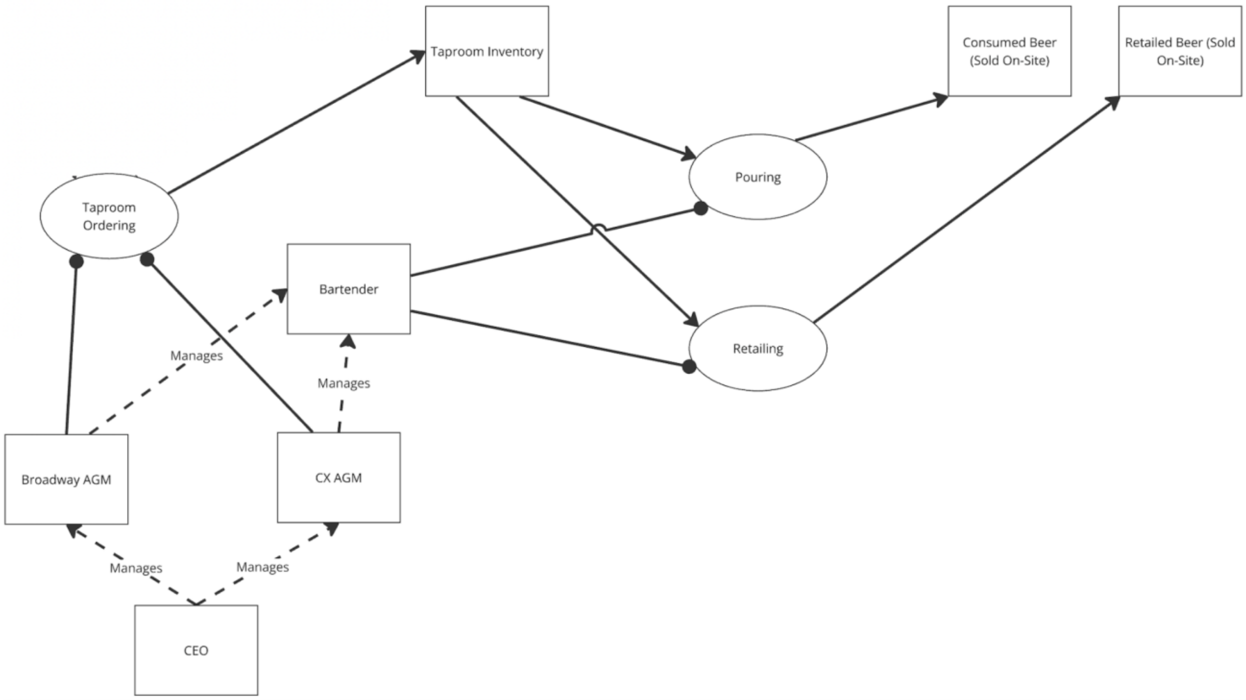


*Figure 27 Restructured Taproom Management and Responsibilities OPM Diagram*

This was a relatively straightforward change, as in a significantly slower taproom environment the demands on the Taproom GM and AGMs were significantly less than had been anticipated. Small raises in compensation for the AGMs to reflect their new levels of autonomy offset some of the savings provided in reducing the overall size of the management department, but only fractionally.

## Labor Changes: Marketing and Events

A more involved intervention focused on addressing inefficiencies within the marketing department. The Head of Marketing position, like the Taproom General Manager position, was identified as being unnecessary in the current environment. The Head of Marketing was currently primarily responsible for managing the marketing team and directed branding and design efforts, but the individual contributors who reported to them—the Social Media Coordinator, the Partnership, Membership and Community Engagement Coordinator, and the Events Coordinator—were capable of executing most of their responsibilities autonomously, without an intermediary layer of management between them and the CEO.

The Head of Marketing role was eliminated, with responsibility for direct oversight of the individual contributors taken over by the CEO. Then, to better align the day-to-day responsibilities of the individual contributors, their tasks were reassessed and redistributed, emphasizing high-impact, revenue-generating activities while reducing focus on tasks that added little to the bottom line.

Marketing and Events: Restructuring the Creative and Marketing Function

The non-management responsibilities previously handled by the Head of Marketing were absorbed and combined with the responsibilities of the Social Media Manager in a restructured position: the Creative and Brand Specialist. (Figure 29). This role was responsible for managing all social media and direct marketing efforts, bringing in-house many simpler graphic design tasks that had previously been outsourced to an external design firm.

By shifting certain responsibilities internally, Lamplighter reduced outsourcing costs and streamlined branding workflows. The in-house execution of simpler tasks allowed for greater control over timelines and improved efficiency. For larger projects requiring specialized expertise, the Creative and Brand Specialist served as the liaison with external firms, ensuring brand consistency and alignment with strategic goals.

This restructuring allowed the brewery to execute marketing initiatives with greater agility and focus, ensuring resources were directed toward high-impact campaigns. The Creative and Brand Specialist also took ownership of content production and direct marketing campaigns, ensuring that marketing efforts supported revenue-generating objectives. Like with the AGMs, this position was given more responsibility and a higher salary, reflecting the increased expectations and autonomy of the newly formed position.

Reprioritizing Events to Maximize Revenue

To further optimize the department, the Membership and Community Engagement Coordinator and Events Coordinator roles were consolidated into a single position. (Figure 29) This combined role prioritized private, on-site events in combination with direct management and responsibility for Lamplighter's two membership organizations, the Luminary Bottle Society and the Mug Club. These three channels were identified as key revenue drivers that could benefit from one individuals' direct and undivided attention. Further, compensation for this role was linked to the success of these programs through a commission based structure to further incentivize their growth and success.

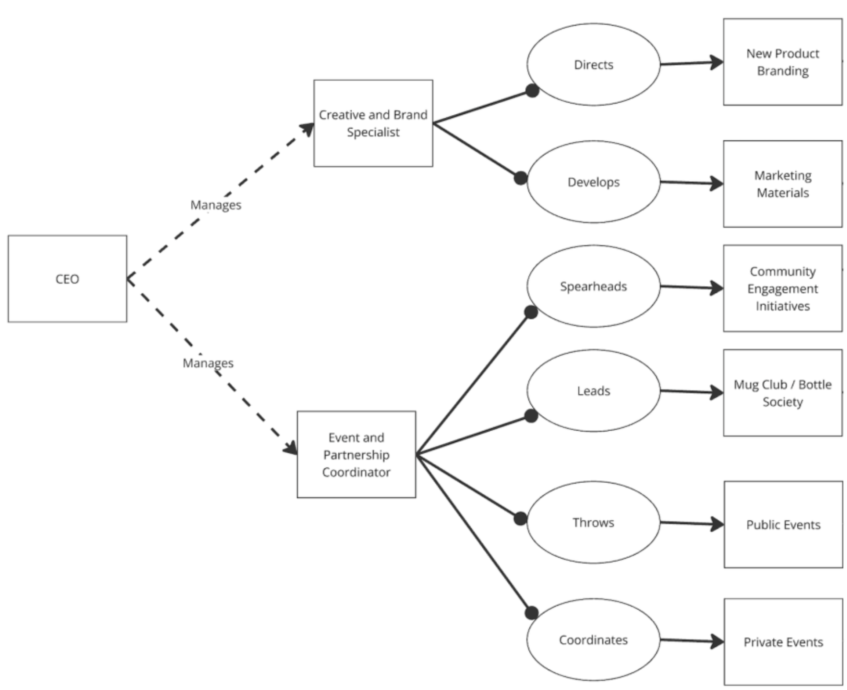


*Figure 28 Restructured Marketing Department OPM Diagram*

The Events position previously existed but was a part time role with little emphasis. However, private events were identified as a way to increase Taproom Customer Demand, outside of the loops driven by foot traffic, word of mouth, and the popularity of the taproom spaces. (Figure 30)

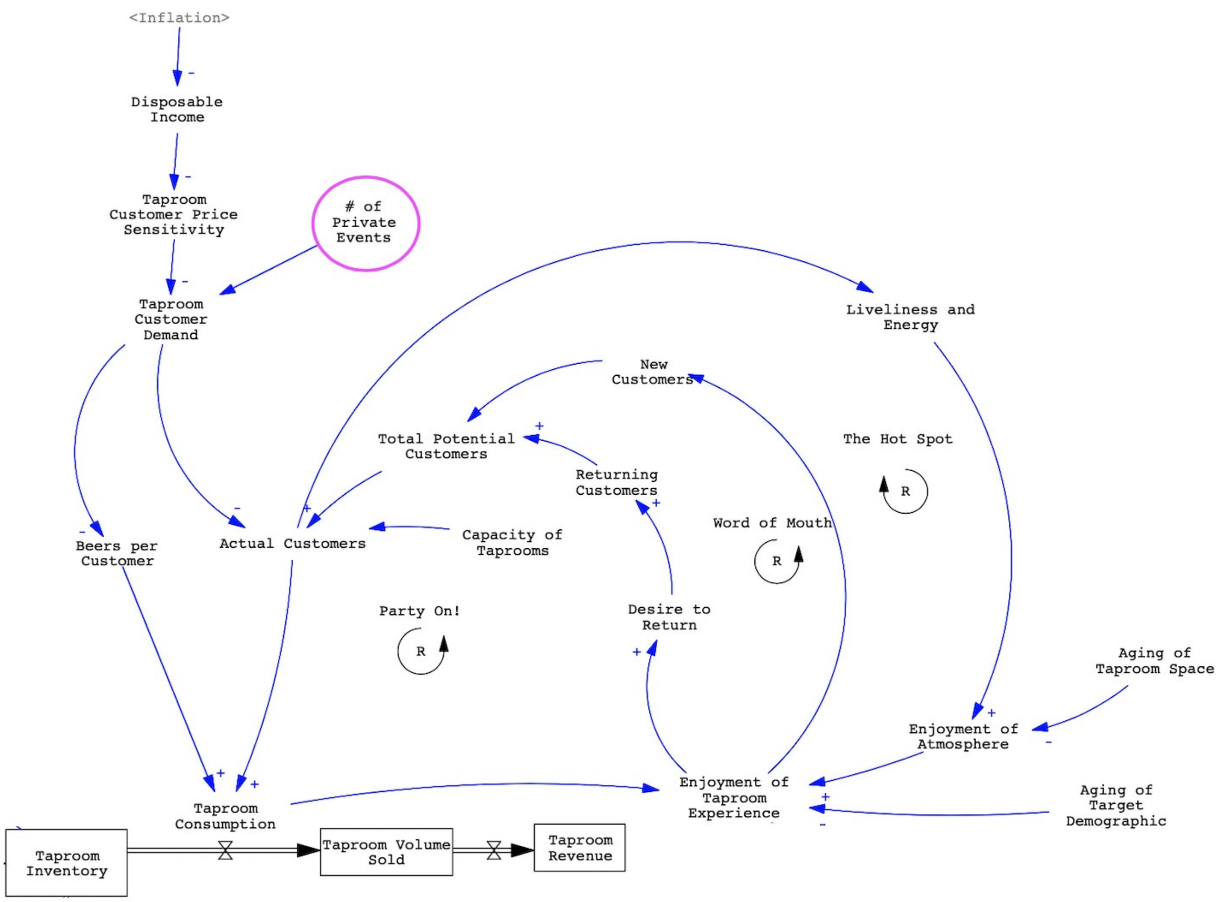


*Figure 29 Private Events Impact on Taproom Demand, Causal Loop Diagram*

Corporate clients, such as office managers booking team-building events or corporate gatherings, were identified as a price-insensitive audience always looking for places to hold office get-togethers. The underutilized taproom spaces, freed up by declining foot traffic, could function as attractive venues for these bookings.

Management, responsibility and oversight for events and the Event position were previously split between the Head of Marketing and the Taproom Manager. With both of those positions removed, responsibilities had to be mapped out and reassigned to clarify ownership among the new management roles to ensure that the core responsibilities were adequately accounted for. (Figures 31 and 32)

The consolidation also reduced the overall salary burden, as one position was eliminated entirely. However, the individual taking on the combined role was offered a higher salary to reflect the expanded responsibilities. This approach maintained employee satisfaction and ensured effective execution of the new priorities. Like with the AGMs, “Fewer positions, higher average salary, more responsibility” became the guiding philosophy for management throughout the restructuring.

Smaller public events, while still part of the brewery's offerings, were deprioritized to reduce resource investment in less profitable activities, while more attention and effort was directed toward fewer, larger and more profitable celebrations. This reemphasis aimed to ensure that staff time and infrastructure were focused solely on high-value opportunities.

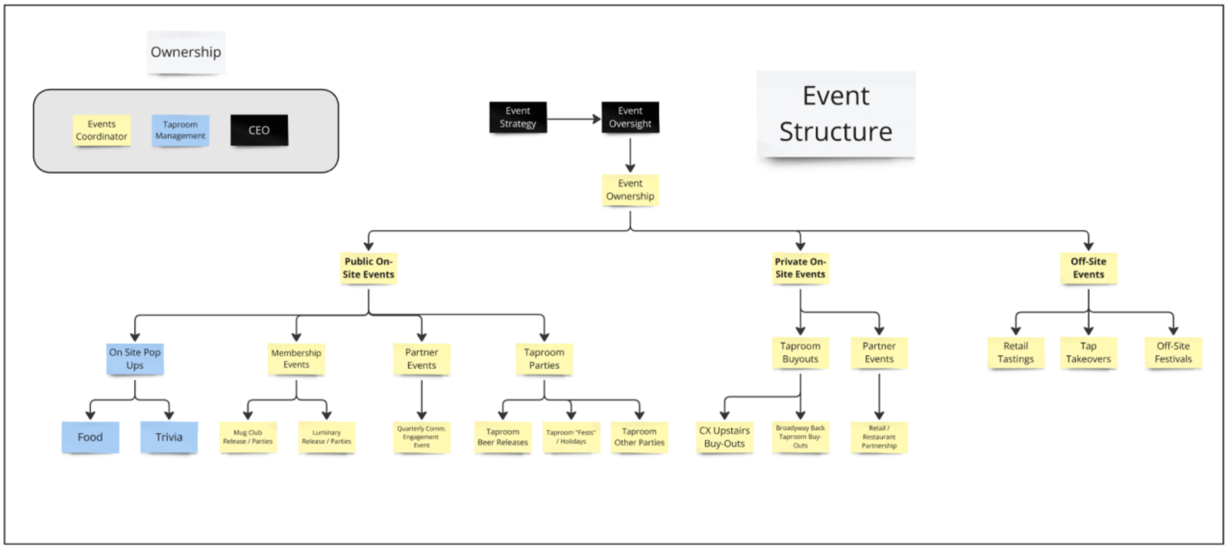


*Figure 30 "Event Structure" Diagram created by Lamplighter Management while restructuring the marketing department.*

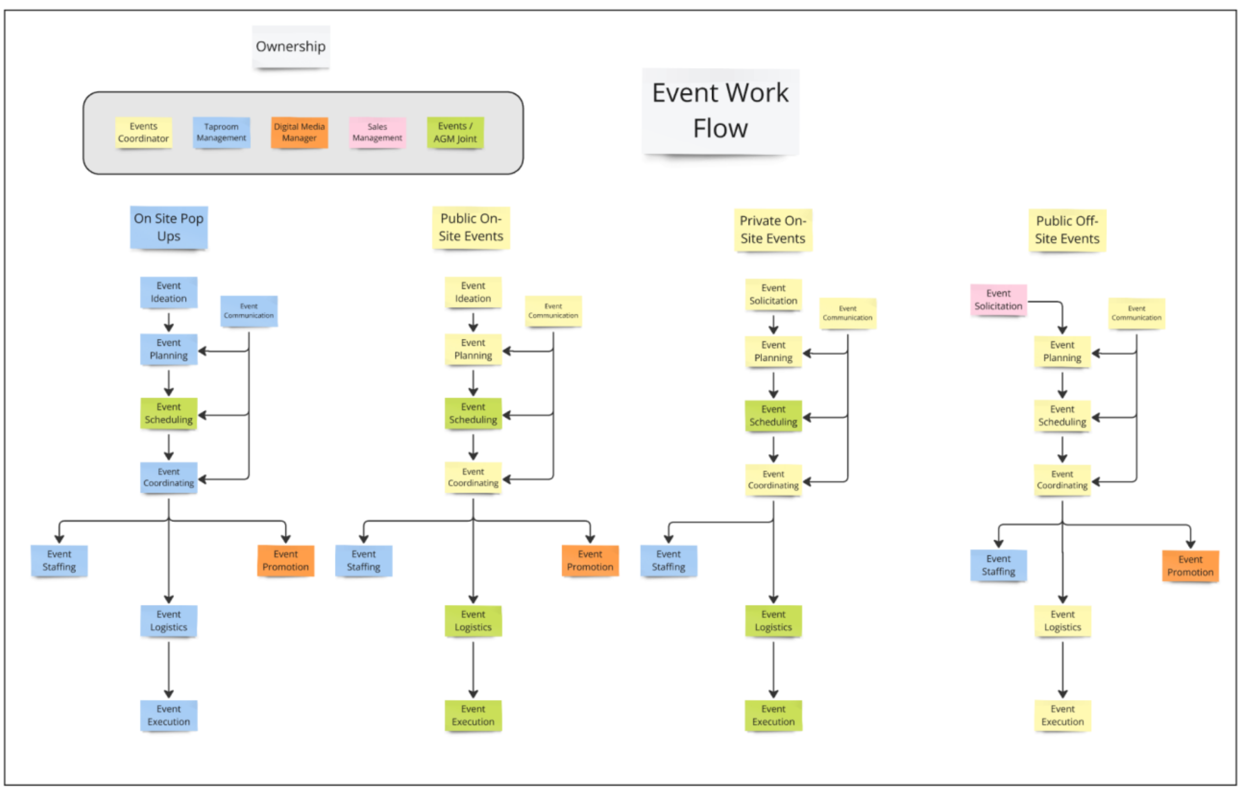


*Figure 31 "Event Workflow and Responsibility" Diagram created by Lamplighter Management while restructuring the marketing department.*

Labor and Strategy Changes: Sales

The sales department required a different approach, as causal loop analysis had revealed a critical lever for increasing wholesale sales: expanding the number of retail accounts.

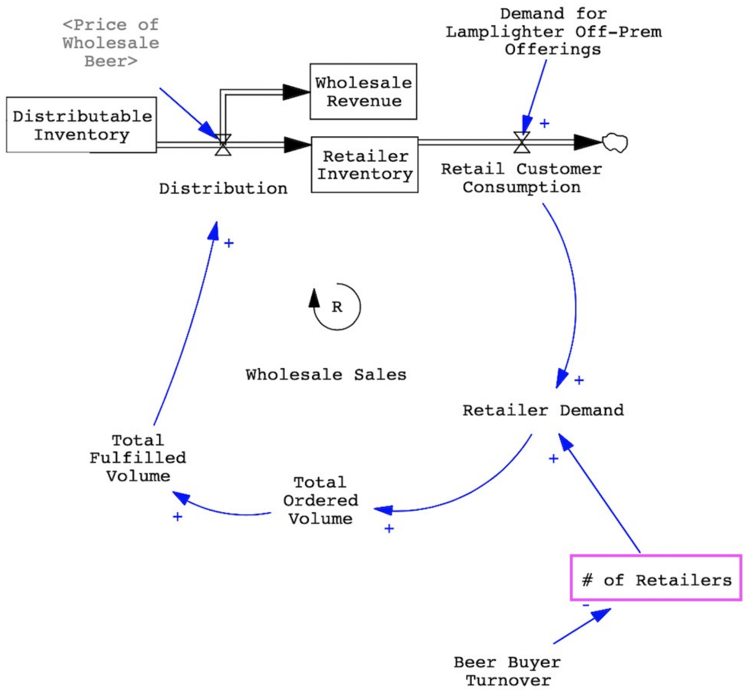


*Figure 32 Causal Loop Diagram: Impact of # of Retailers on Wholesale Sales.*

Lamplighter's wholesale model relied on an email-based ordering system, which had been sufficient in a high-demand environment where retailers proactively sought the brewery's products. However, as market demand softened, this passive model failed to retain accounts at the same rate, with gradual attrition as beer buyers changed positions or moved on. The declining Number of Accounts directly impacted wholesale sales, making it clear that a more proactive approach was needed. (Figure 33)

To address this, Lamplighter implemented a major adjustment to the strategy: hiring a dedicated salesperson whose primary responsibility was to expand the account base. This individual's role was to engage in direct, in-person sales to identify, pitch to, and onboard new accounts. Once onboarded, these accounts would transition into the existing email-based ordering system, allowing the salesperson to continue focusing on signing new accounts rather than managing ongoing orders. This model aimed to reignite growth in the Number of Accounts and, by extension, wholesale revenue.

The management structure of the department was also streamlined. The Head of Sales role, previously occupied by a senior manager, became vacant when the individual in that position accepted another opportunity. Rather than hiring a direct replacement, Co-Founder #1 stepped into the role, eliminating a third high salary, further reducing the frequency of decision-making layers, and ensuring more efficient management of the sales team. (Figure 34) This change also facilitated a division of responsibilities between the brewery's highest level of leadership: the CEO took direct management of the restructured Marketing and Taproom departments, while Co-Founder #1 focused on hands-on oversight of the Sales team. This division allowed for greater focus and more effective leadership across all restructured departments.

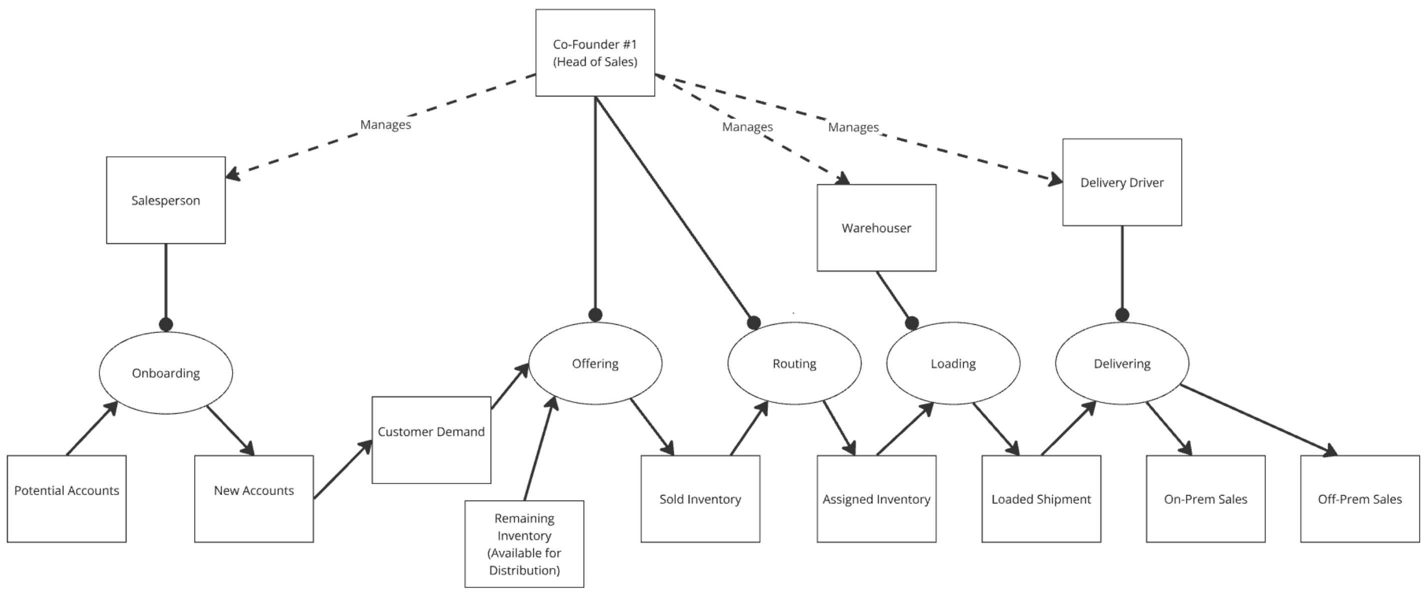


*Figure 33 Restructured Sales Department OPM Diagram*

With the dedicated salesperson focused on growing the account base and onboarding new retailers into the ordering system, Lamplighter aimed to reverse the attrition of accounts, expand its wholesale footprint, and strengthen the department's contribution to overall revenue growth.

## Labor Changes: Production

In the production department, it became evident that the brewery, operating at less than full capacity, no longer required its previous staffing levels. Two production positions were eliminated as part of this restructuring. To accommodate the reduction, the Head Brewer and Master Brewer absorbed more of the day-to-day production responsibilities, allowing the team to maintain efficiency with fewer resources. Unlike other departments, no significant structural changes were necessary within production, as this intervention was focused solely on reducing the number of staff, not altering the roles or responsibilities.

## Conclusion: Labor Changes

The process of restructuring and reducing staff was undoubtedly challenging, particularly when it came to laying off production employees. These individuals were handled with care, receiving a traditional layoff process that included severance packages to ease the transition.

Fortunately, the departures of the Head of Marketing, Taproom Manager, and Head of Sales were much easier. These roles were closely tied to the organizational direction led by Co-Founder #2, who had originally hired and managed each of these individuals during their tenure before and during the pandemic as the co-founder most involved in daily operations. The ongoing interventions spearheaded by Co-Founder #1 represented a decisive pivot from the prior leadership's methods, and each of these individuals ultimately chose to pursue new opportunities elsewhere. Their voluntary departures minimized the disruption typically associated with such significant structural changes, and had the added benefit of not involving severance payments at a time of financial crunch.

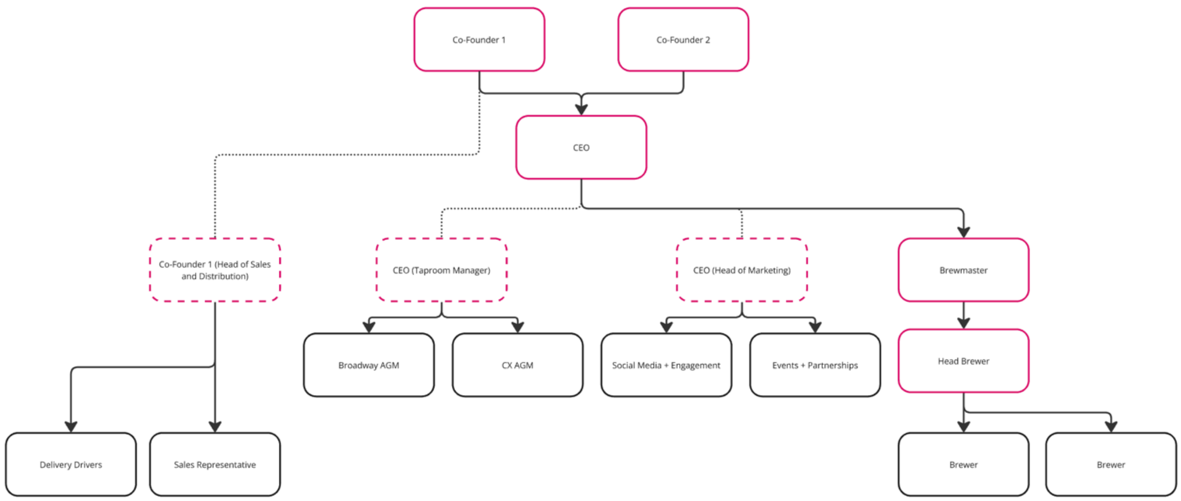


*Figure 34 Corporate Structure After Labor and Restructuring Interventions*

## Non-Labor COGS Changes

In addition to the labor-related cost increases, non-labor cost of goods sold (COGS) was revealed to be a significant contributor to Lamplighter Brewing's declining profit margins. Rising input costs due to inflation, combined with inefficiencies in product offerings, highlighted the need for a more strategic approach to ingredient and recipe management.

A systematic review of the brewery's recipe portfolio was conducted to address this issue. Each beer recipe was evaluated not only for its profitability but also for its alignment with changing consumer preferences. Recipes that failed to meet a predetermined profitability threshold were eliminated from the rotation. Additionally, recipes with only mediocre performance, even if marginally profitable, were removed to ensure that production resources were focused on higher-performing beers. This approach aimed to streamline ingredient usage, reduce waste, and optimize production costs.

Beyond profitability, the review also considered factors like ingredient cost volatility and logistical challenges. Recipes that relied heavily on ingredients with unpredictable pricing or complex supply chains were deprioritized to mitigate risks associated with rising costs or supply disruptions. By concentrating on simpler, more predictable recipes, Lamplighter sought to create a more stable production environment and gain greater control over its direct costs.

In addition to eliminating underperforming recipes, the brewery began refining its purchasing strategy. Bulk purchasing agreements and long-term contracts with suppliers were explored for high-demand ingredients, locking in prices and reducing exposure to inflationary pressures. Wherever possible, substitutions were made for cost-effective alternatives that maintained the quality and flavor profiles of popular beers, balancing cost savings with customer satisfaction.

This intervention addressed two leverage points revealed through causal loop analysis: reducing ingredient costs to lower COGS and aligning the brewery's offerings with consumer demand by focusing on a tighter selection of high-performing beers.

## Round One of Interventions: Results

The first round of interventions sought to exploit leverage points targeted at several challenges. These included reducing labor costs, redesigning an out-of-date management structure, increasing revenue streams through private events and wholesale account growth, and optimizing non-labor COGS.

### Cost Reductions

One of the primary objectives of the initial interventions was to reduce Lamplighter's labor costs, which had become unsustainable in the post-pandemic landscape. The elimination of inefficient management roles and restructuring of their responsibilities resulted in significant savings. Total salaries and wages for 2023 were $2,028,997, and interventions initiated in Q3 reduced these costs to $1,896,997 by the end of 2024—a 6.5% reduction, saving over $132,000 year-over-year.

Non-labor COGS as a percentage of income fell from 49% in 2022 to 43.9% in 2024. Combined with labor COGS returning to 12% in 2024 (after rising to 13% in 2023), these changes lowered the total COGS percentage from 61% in 2022 to 55.87% by the end of 2024, underscoring the impact of recipe streamlining and ingredient cost controls in addition to a tighter, more focused staffing structure. (Figure 35)

| | **2022** | **2023** | **2024** |
|---|---|---|---|
| **COGS % of Income** | 61.22% | 57.28% | 55.87% |
| **Non-Labor COGS as % of Income** | 49.27% | 44.16% | 43.89% |
| **Labor COGS as % of Income** | 11.95% | 13.12% | 11.99% |

*Figure 35 Lamplighter COGS breakdown, 2022-2024.*

### Revenue Growth

Interventions targeting private events and wholesale sales expanded Lamplighter's revenue streams. Revenue from private events increased significantly as a result of prioritizing corporate rentals and on-site events, from $72,825 in 2022 to $127,311 in 2023 (a 75% increase) and to $171,946 in 2024 (a 35% increase).

The addition of a dedicated salesperson to expand Lamplighter's account base directly contributed to a year-over-year increase in wholesale sales to liquor stores. Sales from October 2022 to October 2023 were $1,935,357. With the addition of an active salesperson in October 2023, sales rose to $2,330,434, an increase of 20%.

## 5.2 Second Round of Interventions: Q1 and Q2, 2024

With the first round of interventions implemented and beginning to yield results, Lamplighter's leadership turned its attention to the next stage. While the initial changes focused on restructuring the organization and optimizing labor and production costs, the second round was deployed in parallel to these efforts as they began taking effect. This phase concentrated on refining production and pricing strategies, targeting two critical areas: aligning wholesale pricing with rising costs and transitioning to a flagship-centric brewing model.

### Adjusting Wholesale Pricing

After much discussion, it was determined that Lamplighter could not afford to wait any longer in delaying a wholesale beer price increase. Wholesale beer prices had not kept pace with inflation or rising costs, resulting in diminished margins despite steady sales.

The causal loop analysis suggested that increasing wholesale prices would decrease demand from retail customers. However, the decision to adjust pricing was grounded in the hope that the broader craft beer industry was already experiencing demand shifts due to economic conditions. It was anticipated that these systemic pressures had already influenced Lamplighter's performance, and matching competitor pricing would stabilize margins without significantly eroding demand further.

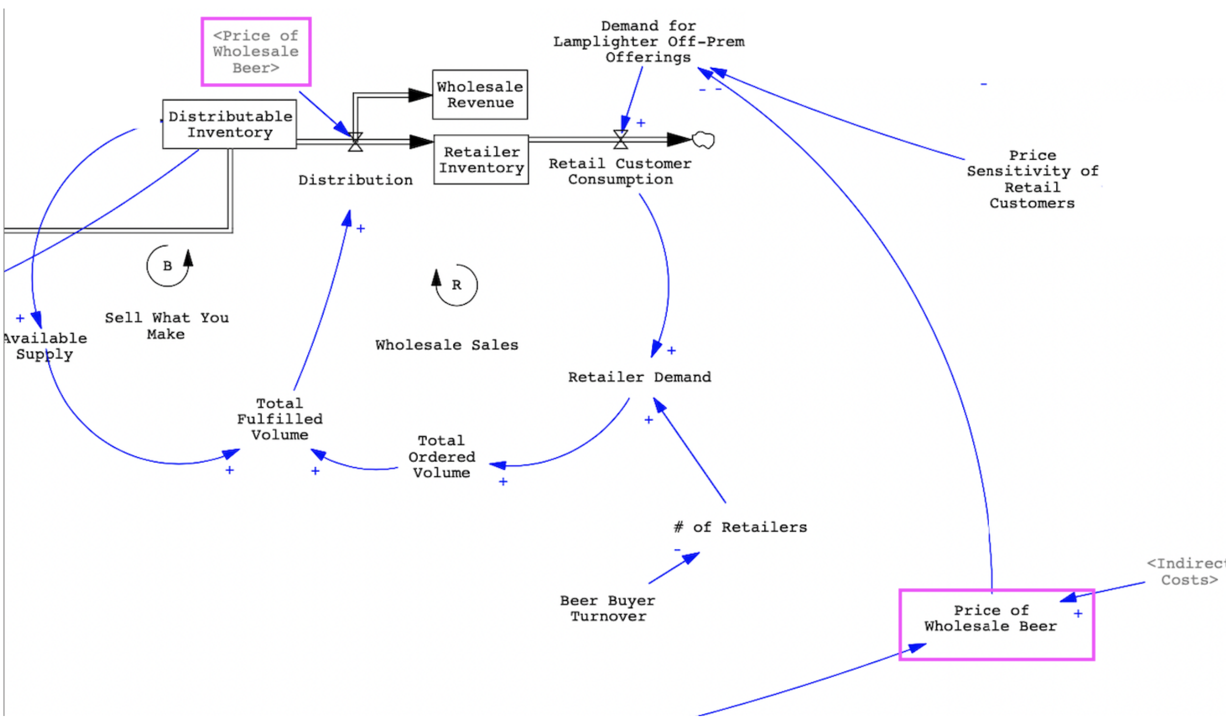


*Figure 36 Wholesale Sales Causal Loop Diagram highlighting "Price of Wholesale Beer"*

### Transitioning to a Flagship-Centric Brewing Model

The next intervention focused on optimizing Lamplighter's product strategy by transitioning to a flagship-centric brewing model. Analysis revealed that inconsistencies in product availability—particularly for popular beers like *Birds of a Feather* and *Rabbit Rabbit*—had diminished consumer's Enjoyment of Offerings, which in turn impacted both customer satisfaction and demand.

By prioritizing flagship beers and increasing production of seasonally popular products, the brewery aimed to limit this impact. Consistent availability of well-loved beers was expected to positively influence the Demand for Lamplighter Off-Prem Offerings. Simultaneously, reducing one-off batches streamlined production, aligning resources more effectively and decreasing variability in ingredient costs and supply chain complexity. Primarily, this was accomplished by reducing the number of lager beers the brewery produced. Lagers require three times as long to produce and sell for a lower price point, tying up space and reducing overall margins.

This intervention also built on earlier efforts to eliminate underperforming SKUs, further concentrating resources on products with strong, predictable performance. Together, these adjustments sought to stabilize demand and optimize production efficiency.

## Second Round of Interventions: Results

The second round of interventions included two pivotal strategies designed to address Lamplighter's profitability challenges: a deliberate increase in wholesale prices and the transition to a flagship-centric production model.

In 2023, Lamplighter's average revenue per unit of wholesale beer remained flat at $50.58, consistent with 2022. This stagnant pricing reflected the brewery's hesitation to increase prices in a market sensitive to economic pressures. However, the decision to adjust wholesale pricing in 2024 led to an immediate and measurable improvement: revenue per unit rose to $51.67—a 2.2% increase.

Notably, the price increase did not negatively impact unit sales. Wholesale unit sales grew from 42,258 in 2023 to 46,769 in 2024, representing a 10.7% increase, suggesting that the price adjustment did not significantly deter demand. Instead, it appears that other strategies—such as onboarding new wholesale accounts—effectively counteracted any potential resistance from price-sensitive buyers. Ultimately, wholesale revenue increased by 13.1%, rising from $2,137,498.71 in 2023 to $2,416,762.91 in 2024.

Simultaneously, the shift to a flagship-centric production model contributed significantly to Lamplighter's financial and operational performance. By focusing production on best-selling SKUs while eliminating underperforming one-off beers, Lamplighter achieved greater efficiency in both inventory management and increased theoretical maximum production capacity by 15% without acquiring any additional equipment.

The flagship-centric model also reduced the frequency of stockouts for popular products, ensuring that high-demand beers were consistently available to customers. Stock availability data for Rabbit Rabbit DIPA, for example, showed a marked improvement in 2024 compared to prior years, with fewer gaps in inventory and shorter restocking times, ultimately increasing month over month sales. (Figure 37)

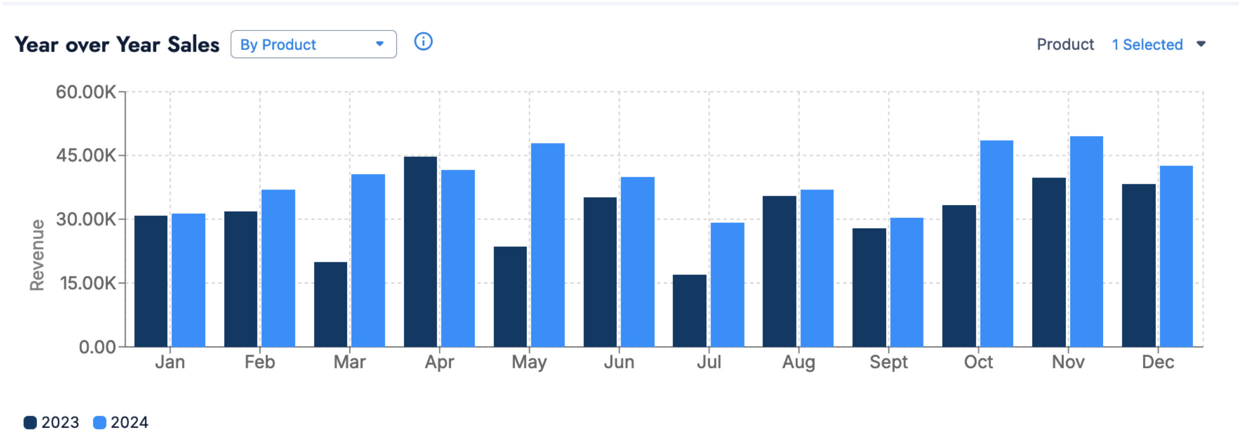


*Figure 37 "Rabbit Rabbit DIPA", 2023 and 2024 Sales Comparison.*

Together, the pricing adjustment and the flagship-centric production model drove measurable improvements in Lamplighter's gross margins. Non-labor COGS as a percentage of revenue decreased from 49% in 2022 to 43.9% by the end of 2024. Labor-related COGS, after a slight increase to 13% in 2023 due to initial restructuring efforts, returned to 12% in 2024. These changes contributed to a broader reduction in overall COGS, which declined from 61% of income in 2022 to 55.87% by the end of 2024.

## 5.3 Third Round of Interventions: Q4 2024

### Distribution Methods: Background

In the craft beer industry, wholesale distribution is typically dominated by the distributor model. Breweries outsource their sales and distribution to third party retailers to a distributor. Distributors employ sales representatives to visit retail accounts on a weekly basis, managing inventory, upselling products, and maintaining relationships. This high-touch approach is economically viable for distributors because they represent a large portfolio of breweries, vineyards, and distilleries, and expect to sell many different products at every stop. The model ensures consistent, weekly engagement with retail buyers, making the purchasing process simple and driving repeat sales.

Lamplighter, as a self-distributing brewery, operated outside this traditional framework. By managing its own sales and deliveries, Lamplighter retained higher margins per unit sold, avoiding the substantial cut taken by distributors. This approach allowed the brewery to maintain competitive pricing and direct control over its brand. However, self-distribution came with limitations, particularly in the inability to hire the number of sales representatives needed to cover all the accounts within the self-distribution territory.

With approximately 300 third party retail partners across the greater Boston area, replicating the distributor model would have required Lamplighter to hire 8-10 full-time sales representatives. This investment was financially prohibitive, due to the comparatively small commission per account that a hypothetical Lamplighter sales representative could expect to make per stop. The average order volume of Lamplighter products by a liquor store is 3 cases at $72 per case, with a typical commission of $2 - $3 per case, making total average commission per successful sale per sales rep in a traditional model $9, requiring a high base salary to make up for the paltry commission figures.  Given these constraints, Lamplighter leaned on an email-based ordering system that completely removed in-person sales representative visits from the model.

In the pre-pandemic environment, this was fine – the email-based system was a practical solution that aligned well with market conditions. Demand for Lamplighter's products consistently outstripped supply, and retailers proactively placed orders to secure stock. The system was efficient, scalable, and suited to a high-demand context where Lamplighter had significant leverage in its relationships with retail accounts. The brewery simply did not work with liquor stores who required more personal engagement.

## Limitations of the First Intervention

Lamplighter's first round of interventions introduced a critical adjustment to its wholesale operations: the hiring of a dedicated sales representative. This decision was aimed at reversing the stagnation in wholesale revenue caused by the attrition of retail accounts by onboarding new liquor stores and reconnecting with lapsed partners. Unlike a true sales representative as utilized by distributors, this role was strictly about onboarding - once an account was in the email chain, there were no in-person follow ups.

Initial results appeared good. Within the first year, wholesale accounts grew from around 300 to closer to 400, driven by the representative's ability to personally engage with prospective accounts and onboard them into the system. This expansion directly translated to an increase in wholesale sales revenue, underscoring the value of in-person engagement in a competitive market.

Yet the early gains of this approach soon revealed its shortcomings. While the sales rep effectively onboarded new accounts, many of those accounts failed to reorder after their initial purchase. Retailers accustomed to regular visits from representatives expected ongoing in-person engagement—a service that even Lamplighter's new model was not designed to provide. The email-based ordering system did not meet these expectations and was a different path to ordering than they utilized to stock their other products. Acquiring Lamplighter's product was a higher friction endeavor than they were used to, and without consistent follow-up, new accounts became disengaged, resulting in high attrition rates.

This attrition created a frustrating cycle. The sales representative succeeded in adding accounts, but without sufficient relationship-building to retain them, the brewery struggled to translate these additions into sustained growth. The email-based system continued to work well for long-standing accounts that were familiar with Lamplighter's products and processes, but it failed to establish the trust and loyalty with newer accounts.

The impact of these limitations on wholesale sales was significant. While overall revenue improved, it fell short of the potential suggested by the initial growth in the number of accounts, and projections suggested that sales would soon return nearly to pre-intervention levels as the amount of new viable liquor stores that remained to be onboarded neared zero. The approach was a leaky bucket - while the sales rep model addressed account acquisition, it did not provide the tools necessary for retention. Recognizing this disconnect, Lamplighter's leadership began exploring innovative solutions to bridge the divide between adding new accounts and maintaining them.

## Reiterating

The causal loop diagram once again served as a powerful analytical tool, mapping the dynamics of Lamplighter's wholesale operations and illuminating critical feedback loops. This time, it was used to attempt to deepen the analysis around the driving forces of demand and retailer orders.

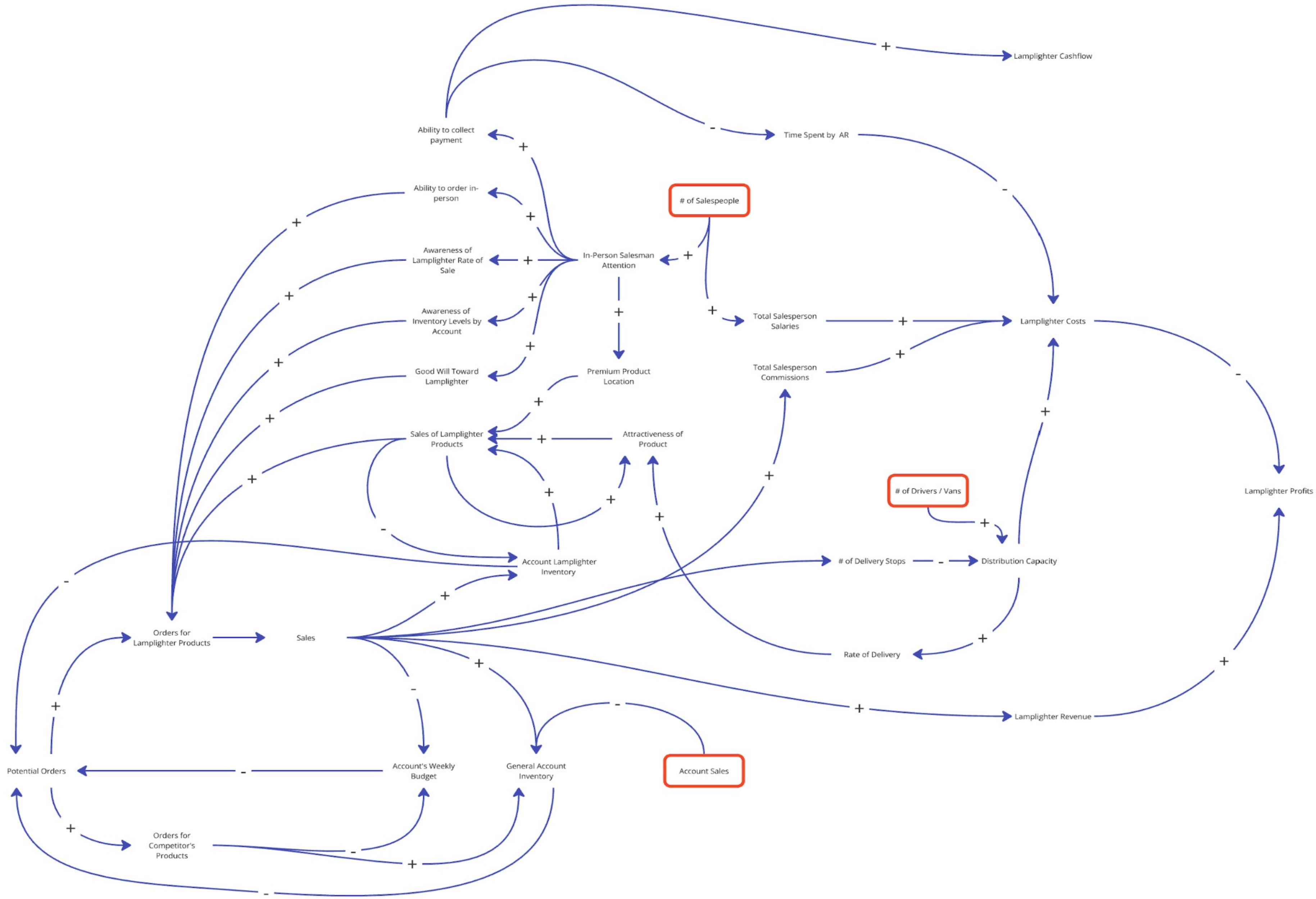


*Figure 38 Level 2 decomposition of the causal loop diagram created by the company during the implementation process, to address the question, "What drives orders for Lamplighter Products?"*

Key Insights and Leverage Points

Figure 38 illustrates the relationships and interactions that drive sales at wholesale accounts. It highlights how Potential Orders evolve into Orders, which then become Sales, connecting to delivery routes and ultimately impacting revenue and costs.

During the diagramming process, a crucial variable, In-Person Salesperson Attention, was examined in more depth. A salesperson physically present at an account allows customers to place orders in person—a capability absent in the model implemented in the first round of intervention, which still relied solely on digital ordering.

Additionally, a salesperson could increase awareness of Lamplighter's Rate of Sale at the account. High-performing products often sell out completely, leaving empty slots in the display refrigerator that competitors' products fill. This scenario reduces the retailer's Awareness of Lamplighter's Performance—"out of sight, out of mind." A salesperson on-site can highlight the "sold-out" status of Lamplighter SKUs to the purchaser, increasing their Awareness of Inventory Levels.

Moreover, salespeople can foster Goodwill Toward Lamplighter by demonstrating personal attention and reinforcing that the account matters to the company, something generic emails cannot achieve. Sales representatives can also "merchandise" products by moving them from less favorable placements, such as warm shelves or out-of-the-way spots, to Premium Product Locations, which boosts their Rate of Sale.

These combined factors lead to an increase in Orders for Lamplighter Products and ultimately higher Sales—an effect the online ordering system could not replicate. Higher sales also enhance the product's appeal in a reinforcing loop.

Additionally, salespeople can collect payments in person, aligning with industry norms where distributor representatives visit accounts weekly. This reduces the Time Spent by Accounts Receivable (AR) on chasing delinquent payments and improves Cash Flow.

However, increasing the number of Salespeople also raises costs. Higher Salesperson Salaries and increased Total Salesperson Commissions increase Lamplighter's expenses.

As Sales grow, so does the number of Delivery Stops. A higher number of stops reduces Distribution Capacity, requiring additional drivers to maintain the Rate of Delivery, a factor that influences the Attractiveness of the Product and also contributes to increased costs. Delays in delivery diminish the product's appeal to retailers.

In summary, increasing the number of salespeople would undoubtedly boost sales, but it would also mean significant additional costs. Traditional models suggest that the added salary expenses would outweigh the potential revenue benefits for Lamplighter, due to the higher salary that would need to be paid to offset smaller commission figures. To make in person sales work, a new approach would be needed.

## Alternative Architectures

With a deeper understanding of the factors driving sales to wholesale accounts, Lamplighter's leadership team began to rethink the sales system once again.

The concept of *Alternative Architectures*—a cornerstone of system architecting—played a central role in this process. This technique was used to answer the fundamental question; *How are we currently doing things, and how could they be done differently?* By brainstorming multiple approaches, adjusting different variables, and examining the outcomes, the team sought to design innovative configurations to optimize the sales system and align it with the brewery's evolving goals. Ultimately, five different architectures were considered for their strengths and weaknesses and potential utility to address the aforementioned leaky bucket.

The first option, "Digital Self-Distribution" was a continuation of the current model, relying on digital-only sales, and hoping to increase revenue through better methods of digital or communication outreach from afar. Retail accounts would continue to place orders online through a digital platform, and the brewery would fulfill and deliver orders using its own logistics team. This model maintained the advantage of complete control over pricing and logistics, while avoiding the costs and complexity of involving a distributor as a middleman. However, it relied heavily on the strength of the brewery's digital marketing efforts to drive orders and required significant internal resources to handle the logistics. Without proactive outreach from external sales reps, increasing sales volumes would likely continue to grow slowly if at all, and monitoring all accounts for sales falling off would remain a distinct challenge.

Also on the table was the classic "Distributor Distro" model, which would involve partnering with a distributor to handle wholesale accounts and deliveries. This approach offered immediate access to a broader network of retail accounts and significantly reduced the brewery's logistical and sales burden. It also allowed Lamplighter to tap into the expertise of a distributor, particularly in retail relationship management. However, the drawbacks were considerable: the brewery would lose control over its pricing and brand positioning, and distributor fees would cut margins in half, requiring a large increase in production capacity and volume to maintain current levels of profit, even with reduced labor costs from a smaller distribution team. Additionally, as a smaller player in the distributor's portfolio, Lamplighter might struggle to capture sufficient attention from sales reps to stand out in the market.

A third architecture dubbed "Just Send It" aimed to simplify operations by incentivizing retail accounts to commit to a set amount of product each week without requiring active sales efforts. By offering discounts in return for a signing up for what was essentially a subscription model, Lamplighter could secure predictable sales volumes, making production and delivery planning much easier. This model also reduced the labor required for account management and could foster loyalty among participating accounts. However, the reliance on discounts cut into margins, and there was a risk of overloading accounts with products they couldn't sell, potentially damaging relationships and creating logistical hassles and lost revenue due to refunds of expired, unsold products. The trust needed to secure these commitments would also require upfront effort and would likely only be agreed to by a small subset of current accounts.

A different approach was the "Collaborative Collective" model, where Lamplighter would share the costs of hiring multiple sales representatives with other local breweries while maintaining control over its own distribution. This approach would allow the brewery to leverage shared resources to expand its sales reach and fund additional sales representatives without relying on a traditional distributor. By strengthening ties with other breweries, Lamplighter could position itself as part of a local craft ecosystem, and spread the costs of a sales team across multiple companies. However, the model depended on strong alignment and trust among the participating breweries, their willingness to pay for their share of salesperson expenses, and the added difficulties of managing relationships with participating breweries. Further, the number of self-distributing breweries in the area was small, limiting the number of potential partners.

The final architecture was the "Ice-cream Truck" model, which combined delivery and sales into a single function. In this architecture, delivery drivers would also act as sales representatives, with vans pre-stocked with inventory visiting retail accounts to make sales to accounts who had not yet ordered. This model offered the benefits of the classic salesperson while eliminating the added costs of a delivery driver and the logistics and additional steps of taking, sending, stocking and routing orders inherent in the classic distributor structure. However, this architecture would require hiring and training driver-salespeople with a unique skill set, increasing labor costs, and would require increased internal logistics to manage.

1 Poor | 2 OK | 3 Decent | 4 Good | 5 Great

| | Digital Self Distribution | Distributor Distro | Just Send It | Collaborative Collective | Icecream Truck |
|---|---|---|---|---|---|
| Margin / Unit | 5 | 1 | 4 | 5 | 5 |
| Logistical Complexity | 3 | 5 | 4 | 2 | 2 |
| Staffing Required | 3 | 4 | 3 | 2 | 2 |
| Sales Growth Potential | 1 | 3 | 3 | 4 | 5 |
| Ease of Implementation | 5 | 5 | 3 | 2 | 2 |
| Risk Level | 2 | 1 | 1 | 2 | 3 |
| Upfront Investment | 5 | 5 | 4 | 3 | 2 |
| Scalability | 1 | 3 | 2 | 3 | 5 |
| Total | 25 | 27 | 24 | 23 | 26 |

*Figure 39 Unweighted Alternative Architecture Comparison Table.*

The architectures were ranked from 1 to 5 on their anticipated impact on eight key categories. The initial analysis suggested that the reduction in logistical complexity and the ease of implementation of the Distributor Distro model would make it the most appealing (Figure 39.) However, when the variables were weighted by their perceived importance, the Ice-cream Truck architecture was a clear winner. (Figure 40)

Margin per unit and sales growth potential were the most heavily weighted for their direct impact on revenue, along with staffing required, for its large impact on cost. Ease of implementation and logistical complexity were the least heavily weighted - Lamplighter had never been afraid of putting in the work to make a necessary change happen.

1 Poor | 2 OK | 3 Decent | 4 Good | 5 Great

| | Importance Weighting | Digital Self Distribution | Distributor Distro | Just Send It | Collaborative Collective | Icecream Truck |
|---|---|---|---|---|---|---|
| Margin / Unit | 1 | 5 | 1 | 4 | 5 | 5 |
| Logistical Complexity | 0.25 | 0.75 | 1.25 | 1 | 0.5 | 0.5 |
| Staffing Required | 1 | 3 | 4 | 3 | 2 | 2 |
| Sales Growth Potential | 1 | 1 | 3 | 3 | 4 | 5 |
| Ease of Implementation | 0.25 | 1.25 | 1.25 | 0.75 | 0.5 | 0.5 |
| Risk Level | 0.75 | 1.5 | 0.75 | 0.75 | 1.5 | 2.25 |
| Upfront Investment | 0.5 | 2.5 | 2.5 | 2 | 1.5 | 1 |
| Scalability | 0.75 | 0.75 | 2.25 | 1.5 | 2.25 | 3.75 |
| Total | | 15.75 | 16 | 16 | 17.25 | 20 |



*Figure 40 Weighted Alternative Architecture comparison table.*

The primary advantage of the Distributor Distro model was the ease and the low staffing requirements. This was offset by the Ice-cream Truck's stronger Sales Growth Potential and Margin / Unit. The Collaborative Collective model was the next best choice, but was limited by its scalability, lower sales growth potential and perceived likelihood of failure / level of risk. Ultimately, Lamplighter decided to implement the Ice-cream truck in a hybrid architecture with the current, Digital Self Distribution structure. This hybrid approach would attempt to directly influence the lack of in person interaction that was leading to account attrition, while combining traditional roles and responsibilities to mitigate expenses.

## How It Would Work: The Ice-cream Truck Model in Action

The Hybrid Ice-cream Truck Model as implemented was built on two key components: maintaining the email-based system for long-standing accounts and introducing proactive driver-sales routes for accounts requiring higher-touch engagement.

### Email First

The email-based ordering system would remain the backbone of Lamplighter's wholesale strategy, providing a reliable, scalable solution for established retail accounts. These accounts, already familiar with Lamplighter's products and processes, would continue to place orders via email, a system that required minimal in-person interaction. For those it was working for, the current system was ideal. One delivery van would remain a dedicated delivery driver for orders placed online, fulfilling all pre-placed orders in their traditional capacity. This component preserved the scalability, margins and cost-effective approach that had defined Lamplighter's success in the pre-pandemic market for those accounts for whom the current system was functioning well.

### Proactive Driver-Sales

For the accounts who were not currently ordering consistently, proactive driver-sales routes would be created that would attempt to hit every one of these accounts in person at least once every two weeks. Ice-cream Trucks would be preloaded with inventory and dispatched on set routes to engage retailers in person. Ice-cream Truck Drivers would provide personalized service, building relationships, showcasing new products, discussing inventory needs, and taking orders on-site, combining the traditional salesperson, account manager and delivery driver roles into one highly effective package. This would act to directly amplifying the variable In-Person Salesman Attention, the key driver of Sales in the causal loop diagram (Figure 38). Retailers who previously disengaged due to a lack of follow-up would be re-engaged, reducing attrition and making purchasing Lamplighter's products significantly easier for those who found the digital ordering system onerous and convoluted.

### Immediate Fulfillment

An emergent benefit of the Ice-cream Truck model would be the ability to immediately fulfill an order at an account from the mobile pre-stocked inventory on the Truck. Retailers would benefit from instant access to products, eliminating the typical lag time between order placement and delivery. This immediacy encouraged impulse purchases, as retailers could visually assess available products and adjust their orders on the spot. The logistical complexity of taking, routing, and dispatching orders would be eliminated, providing a competitive advantage over every other method on the market.

Ultimately, the Ice-cream Truck architecture would provide increased benefit, efficiency and utility by reducing the retailer's friction in the system, eliminating steps in the inventory, ordering, and delivery processes, and putting a sales rep in front of accounts to point out high sales, unstocked shelves, and promote newly released products. With the concept fleshed out, the company turned toward figuring out the feasibility and method of implementing the changes that would be required to pivot to a new wholesale architecture.

Implementing and Reallocating Resources

Implementing the Ice-cream Truck model required first determining the level of resources required for the two halves of the methodology - determining which accounts remained email and delivery driver based, and which accounts would become Ice-cream truck accounts. As a starting point, it was assumed that the goal would be to visit every Ice-cream Truck account once every two weeks. This was less than the classic distributor model's weekly visitation rate but was deemed a reasonable and attainable starting point.

Sales history of all accounts over the past year was reviewed for their average number of orders per quarter. In a thirteen-week period, 80 accounts ordered more than 7 times, and 320 ordered 6 or less. 7 times a quarter was more than every other week, so these accounts were determined to already be ordering at a rate that it would be difficult for the Ice-cream truck method to positively impact, and so they were assigned as "Email / Delivery Van" accounts. For these, nothing would change. (Figure 41)

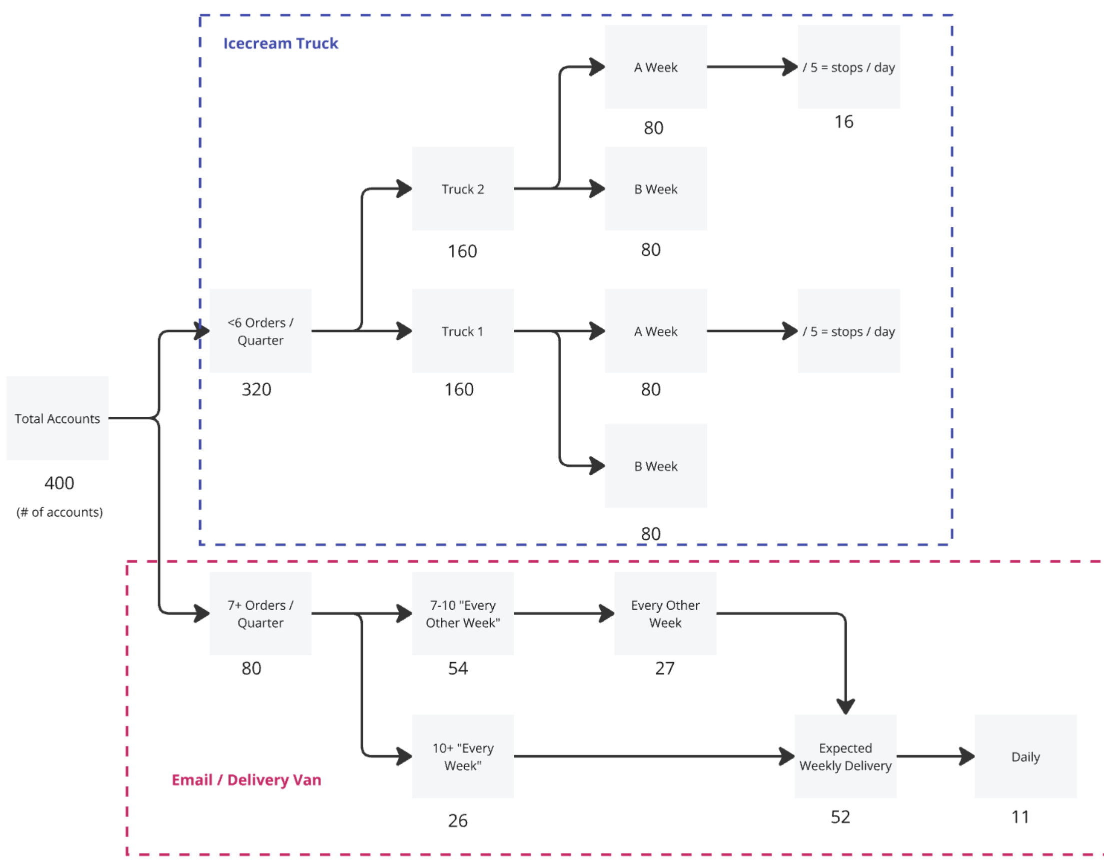


*Figure 41 Account Breakdown into Email / Delivery Van and Ice Cream Truck Accounts.*

These accounts were further categorized into two more groups based on their current order frequency: *Every Week* and *Every Other Week*. Using this breakdown, the total number of delivery stops for the van each week was estimated to be 52, or approximately 11 stops per day. For the remaining 320 accounts, the key question was determining how many Ice-cream trucks would be needed to service these accounts once every two weeks.

Figure 41 provides a detailed breakdown and suggests that two Ice-cream trucks, operating 4.5 shifts per week, could manage 16 stops per day. This workload appeared manageable, as delivery vans in Lamplighter's self-distribution system had historically handled up to 20 stops per day. Based on this analysis, the assigned workload for both delivery groups— delivery vans and Ice-cream trucks—was deemed feasible, sustainable and within the company's capacity.

Additional Equipment and Expenses

Lamplighter only had two delivery vans, so an additional delivery van would need to be acquired, along with a parking space, and the associated expenses related to running another vehicle in the company fleet.

Salary Changes and Savings

One of Lamplighter's three current delivery drivers could be promoted to Ice-cream Truck Driver, and the current Sales Representative could be pivoted from their current role, equipped with a fully loaded van and a list of current accounts to service to become an Ice-cream Truck Driver. By combining sales and delivery roles, and pivoting personnel (and their salaries) that were already on the books into different roles, the brewery would be able to put highly effective sales representatives on the road without dramatically increasing personnel costs, achieving significant cost efficiencies and hopefully increasing sales.

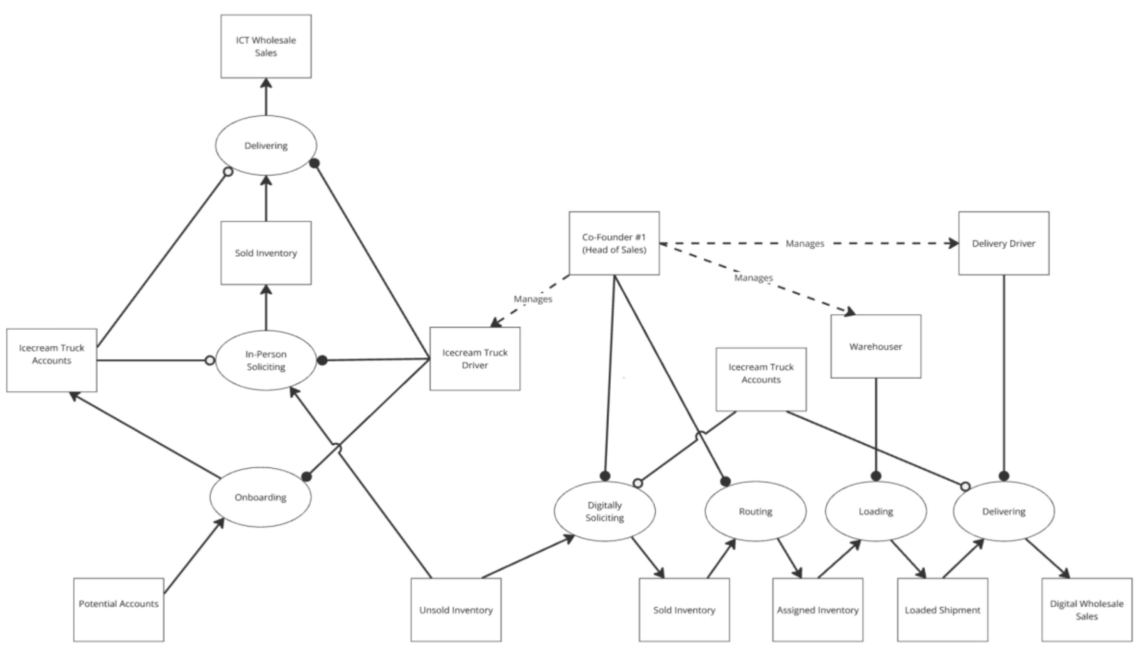


*Figure 42 New Model Sales Department OPM diagram, outlining "Digital Delivery" and "Ice-cream Truck" paths from Unsold Inventory to Wholesale Sales*

Ultimately, the Ice-cream Truck model emerged as a direct response to the systemic issues identified through Lamplighter's causal loop analysis. By targeting key variables that influenced account retention, scalability, and infrastructure utilization, the model offered a balanced solution to the brewery's wholesale challenges.

## Distributor Wholesale Sales

Over the course of 2023 and 2024, Lamplighter Brewing's strategic focus centered on optimizing its wholesale retail operations, with a particular focus on liquor and grocery stores. These channels offered higher margins and were logistically easier to manage than bars and restaurants. Liquor stores and grocery retailers provided more shelf space and lower competition per slot compared to the limited number of draft lines available at bars and restaurants, making them an attractive and scalable focus area.

However, the increased emphasis on retail accounts inadvertently deprioritized on-premise wholesale sales to bars and restaurants. By the end of 2024, this segment had experienced a significant decline in volume and attention. While concerning, this decline revealed a previously overlooked opportunity: the potential to partner with a distributor for on-premise wholesale sales in the greater Boston area.

### Why a Distributor Now?

Historically, Lamplighter avoided working with distributors for on-premise sales due to the steep margin cuts associated with such partnerships. Selling directly allowed Lamplighter to retain a larger share of the profits. For a distributor partnership to make sense financially, keg sales would need to more than triple their current volume to offset the margin lost by outsourcing sales and distribution responsibilities. Before the pandemic, this threshold was unlikely to be met due to constrained production capacity and high competition for draft lines in bars and restaurants.

By 2024, this dynamic had shifted. Lower keg sales volume, combined with better-optimized production capacity under the flagship-centric model, meant that Lamplighter had more flexibility to explore alternative distribution strategies. The shift to a distributor-based model for on-premise sales now presented a viable option, provided the distributor could deliver sufficient sales volume to offset the lower margins.

The transition to a distributor for on-premise sales aligned with several strategic priorities for Lamplighter. Distributors have established relationships with bars and restaurants, along with the infrastructure and salesforce to aggressively expand Lamplighter's presence in these venues. By transferring responsibility for this channel to a distributor, Lamplighter could benefit from increased sales volume without expending its own resources on direct outreach. Further, shifting on-premise sales to a distributor would allow Lamplighter to dedicate its internal resources entirely to the high-margin retail accounts served through the Ice-cream Truck model and digital ordering system.

Other changes also made this a more viable option. Under the production changes that led to the flagship model, Lamplighter's production had become more predictable, with fewer single-batch and one-off beers tying up production resources. This freed up capacity to meet the potential increase in demand that hsould result from a distributor's expanded on-premise sales.

Finally, with declining on-premise volume, the lower margin per keg from distributor sales was offset by the potential for higher total revenue. The distributor's ability to secure placements across a wide network of bars and restaurants offered a path to recapture lost on-premise market share.

### Forging an Agreement

Lamplighter forged a partnership with a regional distributor specializing in on-premise accounts in the greater Boston area, marking a significant shift in its approach to this channel. The distributor committed to tripling Lamplighter's on-premise keg sales within the first year, a target designed to ensure financial viability for both parties.

This collaboration enabled Lamplighter to eliminate the operational burden of managing on-premise sales internally, a move that freed up resources and allowed the brewery to concentrate on its optimized retail channels. By focusing on the Ice-cream Truck model and digital delivery sales for retail accounts, Lamplighter could maximize higher-margin sales while relying on the distributor to handle the complexities of on-premise distribution.

Additionally, the partnership provided a pathway for Lamplighter to increase its presence in bars and restaurants, a critical venue for brand exposure and consumer engagement. This strategic reallocation of effort ensured that Lamplighter could expand its footprint in the on-premise market without stretching its internal resources thin, increasing the brewery's footprint in the greater Boston area, and hopefully having positive ripple effects on both Taproom and wholesale retail sales.

## Intervention Round Three Results

Both the Ice-cream Truck and Distributor Keg initiatives were implemented in October 2024, and at the time of the writing of this thesis, it is early for comprehensive results and definitive success / failure determinations. Preliminary results, however, are promising.

An expected monthly average sales was calculated for each of the accounts assigned to the Ice-cream Truck Drivers. For Truck #1 and #2 these values were 370 and 445 respectively - representing the expected number of cases that would be sold per month to the accounts assigned to each driver in the old system, before the implementation of the Ice-cream trucks.

Each truck outperformed the average expected value for both October and November (Figure 43), with Truck 1 outperforming by 27% in October and 30% in November, and Truck 2 outperforming by 30% and 34%.

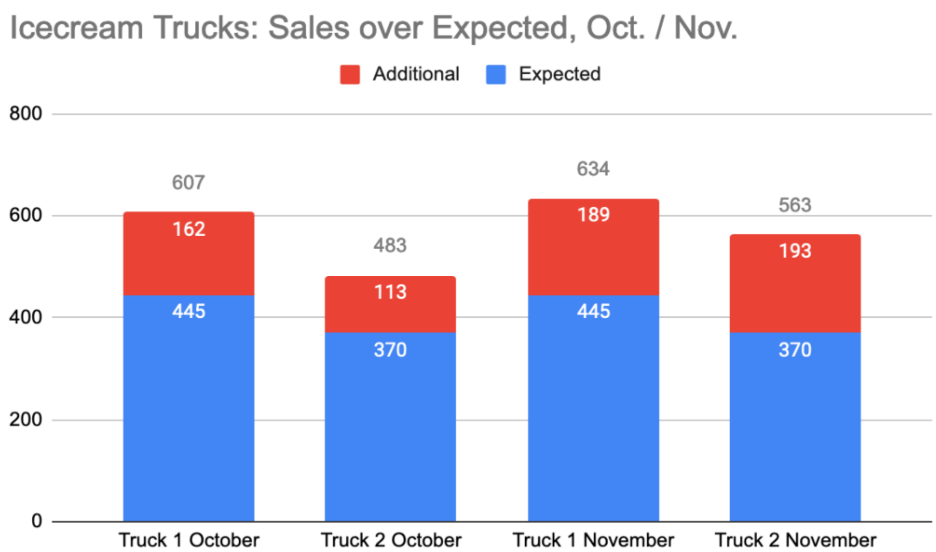


*Figure 43 Ice-cream Truck Performance over Expected Baseline Case Sales, Q4 2024*

October and November are traditionally strong sales months, and given the nature of a yearly average outperformance in strong months is to be expected. However, while overall wholesale retail sales outperformed in total for October and November 2024 compared to 2023, they did so by less than 3%, suggesting that non-Ice-cream truck sales were poorer than expected. More data would be needed to make a definitive statement, but the Ice-cream Trucks may have outperformed in an unexpectedly poor sales environment.

Switching to the distributor for wholesale keg sales dramatically broke the trend of poor 2024 sales compared to 2023, but given the reduction in margin from this approach, the profit from wholesale kegs in Q4 was nearly identical to the average quarterly profit in 2023. This was still a considerable increase over the previous quarters of 2024. (Figure 44)

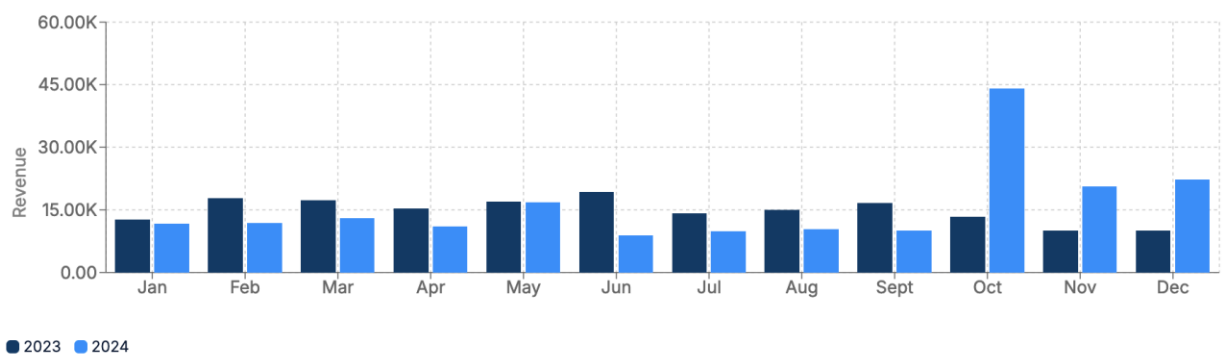


*Figure 44 Lamplighter Wholesale keg sales comparison, 2023 and 2024.*

# Chapter 7. Discussion

## 7.1 Introduction

The results section outlines many of the successes that Lamplighter had in making changes to the business in order to improve profitability during a difficult period of time - but I'm afraid of leaving the reader with a misleading impression. 2023 and 2024 were a war for our business' survival every step of the way. Since the start of the pandemic, breweries of all sizes have been closing left and right, and Lamplighter was in no way isolated from these brutal realities. By the end of this 2024 year, we are staring down an additional $450,000 decline in taproom revenue compared to 2023, which was already around 50% of pre-pandemic levels. And yet, we ended the year with more than $100,000 in net income, profitable for the first time in years.

How? Our application of the principles and techniques of systems thinking. Plain and simple, it saved us - but this wasn't a magic bullet or a one-time brainstorm. It was the constant, unrelenting effort to map out our problems, find leverage points, and iterate on solutions.

Every day of the past two years felt like we were teetering on the edge, and the only thing that kept us from tipping over was a laser focus on manipulating and adjusting the parts of the business we could influence. That's why most of our interventions targeted the wholesale sales component - It's where we saw actionable levers, where changes might make a difference. And while our interventions didn't solve all our problems, it stabilized us enough to keep going.

## 7.2 The Role of Systems Thinking

"A system isn't just any collection of old things." Donella Matthews says, in Thinking in Systems – "A system is an interconnected set of elements that is coherently organized in a way that achieves something… the behavior…. is latent within the structure"[xxiv]

Understanding what the elements were, how they were organized, what that structure meant for their behavior and that of the system as a whole – and then to build an actionable framework that provided a framework we could use to make reasonable predictions about future behavior. That is what the system's thinking approach allowed us to do. The level of detailed understanding this provided allowed us to grasp the nuances of how and why a shifting world was impacting us directly, and we were able to use that understanding to pivot, ideate, adapt, and adjust.

Systems thinking allowed us to unleash creativity in ways we never would have imagined. By understanding what we were working with—our actual constraints, capacities, and dynamics—we were free to think outside the box in ways grounded in reality. Creativity for creativity's sake can lead to wild ideas with no practical application. But creativity based on a clear understanding of our system was where our real breakthroughs happened. Systems thinking gave us the foundation to ask, "What if?" and to explore solutions that were not just innovative, but achievable.

In practice, our application of systems thinking was less than academically rigorous. Our graphics weren't perfectly made, our OPMs a mess. But our mindset, our approach and our understanding of the underlying principles and way of thinking was key to our success.

This practical, "back-of-the-napkin" approach allowed us to stay agile. The ability to iterate quickly, update our mental models as we learned and grew in our understanding gave us the clarity we needed to act.  Many of the figures included in this thesis reflect exactly that. They aren't polished or "to convention," - they are real. They were made during moments when we had to decide, pivot, and move. They were ugly and effective.

This adaptive, practical use wasn't just valuable—it was essential. It's the reason we ended the year profitable and still standing, while so many others didn't. For those of us using systems thinking in scrappy environments, it's not about the tools being perfect; it's about them being useful. Ultimately, however, our application of systems thinking was exactly what it was designed to do - address complex, dynamic problems by examining them holistically and understanding the latent behavior built into the structure of the system. (Meadows)

## 7.3 Confronting the Human Component

Our early examinations made clear was that the way the company was structured was holding us back. Mapping the company's form and function was what led us to this realization. Our corporate structure was visually top heavy. Combined with ballooning salary costs, the conclusions were unavoidable. What was the purpose of the layers of management between the company's leaders and its individual contributors, if collectively there were only a handful in need of management? Why did two taprooms need three managers below the CEO? The company was built for a different era – one of boundless growth and opportunity.

Designing and mapping the responsibilities and roles of each position allowed us to redistribute and reinvent in a way that would not have been possible otherwise. The core focus and reason for being for each role was considered, adjusted, and then, when necessary, changed.

Unfortunately, this meant that longtime co-workers and friends who had helped us get through the pandemic were suddenly part of the problem. It wasn't their fault, but we couldn't afford to keep roles that weren't helping us survive. We were forced into an era of consolidation, and eliminated positions and let go of people who had been with us through so much. This was an acutely painful moment, where being in the situation we were in felt the most like a failure of leadership. It was also unavoidable – and these changes were made to give the company a chance to keep going.

New, expanded roles were born with clear objectives, priorities and goals. We reduced our overall staffing level but increased our average salary. Events were prioritized to bring more sales on site, a more talented design and branding teammate was brought on and given significant creative freedom. Assistant GMs were promoted, and ultimately, the company culture, direction, happiness and effectiveness improved dramatically.

## 7.4 Wholesale Sales

Our next focus was wholesale sales. Taproom revenue had collapsed, and while there was no quick and obvious fix for that, wholesale sales were an area where we saw that we could make an impact. Overall, our sales to third party retailers had held up comparatively well. They had stagnated, however, and causal loop diagramming helped us identify a critical gap and an opportunity: we had no true sales function designed to bring in new business. For years, demand was high enough that accounts came to us, and we didn't need to actively seek out new partnerships. Further, we had been production constrained, and wouldn't have been able to handle new partners, anyway. But when the market shifted and demand dropped, it became clear that our old approach was no longer ideal.

We hired a dedicated salesperson to pitch our products and bring in new accounts, adapting a traditional model to function with our constraints. This gave us a way to reach out directly to potential customers and integrate them into our way of doing business. Eventually, however, we realized that just adding new accounts wasn't the full solution. We had understood part of the puzzle but not the whole picture.

This is where the importance of iteration in the process was the clearest. Our first attempt at change in this department identified the number of retailers as a manipulatable variable. Great - we put in a function to add more retailers. Sales improved and then stopped improving. What was going on? The first piece of data that gave us insight into this new problem was that the amount of revenue from our new accounts was a fraction of our old accounts. Why might that be? What was the difference between an old account and a new account? Further examination revealed that many of them ordered once, when our salesperson was at the account to onboard it - and then never again.

The problem was that the way we did business didn't align with the way they did business. These new accounts weren't ignoring us out of disinterest or poorly performing products; they simply weren't set up to engage with us. They didn't email, they didn't text. Distributors came to them in person, checked stock, took orders, and handled everything face-to-face. When we asked them to "just respond to emails," it wasn't how they worked—and so they didn't work with us. Our interface with them was poorly managed.

Our first attempt hadn't been wrong, but it wasn't complete. We had to get creative to come up with a solution that worked both our customers and for us.

## 7.5 Innovating with the Ice-cream Truck Model

Once we identified the disconnect between how we operated and how retailers did business, we knew we needed a different approach. The traditional options on the table weren't financially feasible. We had to get creative, so we turned to the concept of alternative architectures to design something that was optimized for our unique scenario.

The alternative architectures tool gave us a structured way to brainstorm and evaluate potential solutions but was only possible with a sophisticated understanding of the elements, interconnections and emergent properties[xxv] of our business, how we might alter them, and what the resulting concept would look like. We knew the breakdown was at the ordering interface but needed to come up with a less resource intensive way of solving that issue than traditional methods.

The resultant idea was simple. Merge delivery and sales into a single role. Leverage our comparatively small variety of SKUs as a strength instead of a weakness. Load a truck up, and send it out the door, fulfill orders at the point of sale, combine two salaries into one. Not only did we not need a distributor to act as middleman, but we didn't need Lamplighter's order-taker, route-creator, driver-dispatcher, and driver to all be different people, either. Ultimately, we created a competitive advantage, with the fastest speed from ordering to stocking in the industry emerging from the new structure of this department.

Implementation required careful planning, but we knew what all the components were already because of our previous work, and so we were able to move swiftly from concept creation to implementation. The impact was immediate. Accounts that had gone quiet started ordering again, the convenience of having someone show up and take care of everything in one visit making the process smooth and simple, and the relationships we rebuilt translated directly into increased sales.

What made the Ice-cream Truck model possible wasn't just the idea itself but the process that led us to it, and our ability to make an informed guess as to the emergent properties of the hypothetical system. We were able to map out the dynamics of our wholesale system, both for us and for our customers, and pinpoint the key levers where there was a disconnect between the two. By understanding how these points of friction created the behavior of the larger system, we were able to find a novel approach, uniquely suited to the needs and realities of us and our customers.

## 7.6 Rebuilding On-Premise Wholesale with a Distributor

While we focused heavily on retail accounts on-premise wholesale sales—kegs to bars and restaurants—were being neglected. This was simply a resource issue. Our small team was only able to do so many things at once.

Our digital delivery model really did not work very well for on-premise sales. Bars and restaurants required the kind of high-touch service and regular engagement that distributors specialize in, and we couldn't provide that with our existing resources and approaches.

Distributors take a significant cut of margins, and historically, we had avoided working with them for that reason. It was ultimately a similar problem to that which we had worked out for our retail customers - the ordering interface was poorly managed. We didn't have the resources to put a sales representative in front of every bar manager, and they didn't do any of their other business through digital channels.

Kegs to bars are unlike cans to liquor stores, however. With the Ice-cream Truck, we could load dozens of unsold cases into the vans and drive them around. Kegs, though, were bulkier and heavier, and bar managers held very limited hours for conversations with sales reps. Dinner service was a no go. Liquor stores didn't have that same limitation.

We needed the resources a distributor could throw at this problem, but the margin cut we'd take and the amount of volume we'd need to produce to move our entire wholesale to a distributor was prohibitive.

However, a hybrid model dividing on and off-premise responsibilities within the same territory between us and a distributor could solve this problem for us, and our on-premise sales had dwindled to the level where it was worth a shot. This was also an unusual approach, and one that was only possible because of our understanding of our own strengths and weaknesses that we had built.

We approached the transition carefully, negotiating terms to limit our potential downsides. This included clear sales targets and commitments to grow our keg sales significantly in the first year, with the ability to revoke distribution rights if they were unsuccessful.

The results have so far been promising. Within months, our keg sales rebounded significantly. While the margins were lower than direct sales, the volume increase offset much of the loss, and our brand's visibility in the on-premise market is improving dramatically.

Without the causal loop breakdown of what drove sales at retailers, an understanding of the differences between on and off premises accounts, and a holistic view of our own capabilities and driving factors, this unique solution would never have been possible.

## 7.7 Aligning Production with a Flagship Model

The success of our wholesale strategies—both on and off-premise—was only possible because we fundamentally changed how we approached our manufacturing process. Our rotating release model, while great for craft beer enthusiasts in the industry's pre-pandemic heyday, wasn't aligned with what retailers and distributors needed in 2022 and beyond.

We were leaving money on the table with stockouts of our most popular products. Beers like Birds of a Feather and Rabbit Rabbit consistently sold out, leaving retailers frustrated and customers unable to find what they wanted. Simultaneously, we were dedicating significant time and resources to brewing beers like lagers or those with high adjunct costs that took longer to produce, were less recognized by our customers, and returned significantly lower margins.

The flagship model was the solution. By identifying our top-performing beers and making them the core of our production, we reduced variability and focused on the products that retailers and customers wanted most. Fewer one-offs meant fewer stockouts of our most popular products, stronger relationships with retailers, and a more reliable experience for customers.

The change also made financial sense. Flagship beers offered better margins, required less time in production, and eliminated the inefficiencies of constantly rotating SKUs. This gave us the bandwidth to support wholesale sales and freed up resources to tackle other areas of the business.

This was a risky change, however. We were well known for our large variety and ever-changing SKUs. The flagship approach was outdated, an approach from the earliest days of the craft beer boom. Why did we think going back in time would improve things for us?

We were able to make this change with confidence because of our ability to put the financial data from one of our consistent SKUs, Birds of a Feather, in comparison to a less consistent SKU, Rabbit Rabbit, and our models made it clear that to some level we were making sales despite our level of variety, instead of because of it. We looked at what the driving factors were when our customers were making decisions, how the market had changed away from novelty for the sake of novelty, and we realized we were leaving sales of our most popular products on the table in return for the added difficulty of producing, promoting, and attempting to sell new products all time.

The results of making this change was also quickly apparent. Retailers appreciated the new consistency, Ice-cream Truck drivers could focus on building and holding consistent placements, distributors could confidently promote our core lineup. We saw stronger, more predictable sales across the board, freed up production capacity, and reduced operational complexity. Systems thinking allowed us to connect the dots: by simplifying and focusing our production, we stabilized wholesale sales and created a foundation for sustainable growth.

## 7.8 Lessons Learned

### Iterate, Iterate, Iterate

One of the most important lessons we learned throughout this process was that nothing worked perfectly on the first try. Whether it was our initial wholesale strategies, production models, or account management processes, every part of our business required adjustment and refinement.

Iteration became essential because the challenges we faced were dynamic. Causal loop diagrams revealed the underlying dynamics that were holding us back, such as how inefficiencies in communication with retailers created reinforcing loops of disengagement. Mapping out these systems showed us where adjustments were needed and where our assumptions didn't hold up under scrutiny.

This iterative approach forced us to question long-held practices. Why had we relied so heavily on rotating releases? How did we bring on new accounts, and identify lapsed ones? Systems thinking allowed us to step back, challenge our assumptions, and experiment with alternatives. Each round of thinking brought us closer to processes that actually worked for our team, our retailers, and our customers.

## Data and Feedback are King

One of the biggest shifts we had to make was identifying and tracking the right data to guide our decisions. Before systems thinking, we had pieces of information—sales figures, production costs, account details—but they weren't necessarily updating us about the key characteristics and performance that we cared about.  We had data, lots of it, but it wasn't necessarily useful data.

Systems thinking forced us to take a hard look at what we were tracking and how we were using it. We realized that a lot of the problems we were facing—whether it was account attrition, stockouts, or inefficient production—were made worse because we weren't gathering or using the right information. For example, we didn't have clear data on reorder rates for wholesale accounts, so we didn't even know how many of our accounts were dropping off. We didn't know how much we were leaving on the table every time we ran out of one of our primary products, so we didn't prioritize making sure that didn't happen.

When we mapped out our system, it raised questions that we needed to find the answers for. Our understanding let us set new, specific and targeted goals, and informed us which data we should be tracking to see if we were succeeding or failing.

Treating data and feedback as part of an ongoing process was a game-changer. Instead of thinking of setbacks as failures, we started seeing them as chances to learn. When something didn't work—whether it was a new account management strategy or a production tweak—it wasn't a dead end. It was information we could use to try again and do better. We were making decisions based on what was really happening in the business. That shift helped us turn problems into opportunities, and it made everything we did—wholesale, production, sales, personnel management—more effective.

Looking back on the challenges of 2023 and 2024, one thing stands out: survival wasn't about finding a single big solution—it was about being willing to adapt constantly. Every part of our business was open to and required rethinking, from how we handled wholesale sales to how we structured production and managed our team.

## Focus on Controllable Leverage Points

*"…Grant me the serenity to accept the things I cannot change, the courage to change the things I can, and the wisdom to know the difference" (Alcoholics Anonymous "Serenity Prayer")*

The big red numbers in our P+L were coming from our taprooms. The obvious thing to do would have been to focus on trying to turn those around – they had been so profitable before, surely, they would be the easiest place to find more revenue in the future!

Not so. Our analysis showed us where the problem was coming from (Decreased demand stemming from changing attitudes toward alcohol, high rates of inflation, diminishing interest in craft beer and crowded party spaces, aging demographic, etc.) – but also showed that there were not many leverage points that were under our control. We couldn't drag people into our business.

We could, however, fix the things we weren't doing well in the wholesale channels. We could pivot to private events. We could cut costs.

Without identifying they "why" things weren't working, we wouldn't have been able to target our interventions intelligently. We would have been throwing anything and everything at the wall that we could think of to get customers into the taproom spaces. We potentially may have spent tens of thousands of dollars in refreshing the space – and it might have all been for nothing.

### Creativity Comes from Clarity

Our most creative ideas didn't spring forth fully formed. They came about after first building layers of understanding about our system, context, constraints and capabilities - understanding clearly what needed to be accomplished and where pressure could be applied. Systems thinking gave us the clarity to see where the real problems were, and that clarity made it easier to get creative and design solutions that fit our specific needs, to think outside the box, and to innovate. Without first establishing that clarity, we would have had no parameters within which we could let our creativity flourish.

## 7.9 Looking Ahead

As we close out 2024, there's no denying that uncertainty still looms. The craft beer industry isn't out of the woods, and 2025 will no doubt bring new challenges. Taproom sales are still struggling, costs continue to rise, and the market remains as competitive as ever. But we're in a much stronger position than we were a year ago—and that's no accident.

The work we've done to stabilize and rebuild has left us more prepared than ever. Systems thinking gave us a way to navigate the chaos, not just by solving immediate problems but by creating systems that can adapt. It showed us the importance of developing a holistic understanding of the business, and how to use that to restructure, rethink, find leverage points, test solutions, and iterate when things didn't go as planned. More than just a set of tools, it's become a mindset that shapes how we approach every challenge and opportunity.

The tools we used were just the basics. We did not employ incredibly advanced techniques that require sophisticated degrees - we used the basics of Systems Thinking as a lens to gain a comprehensive understanding of the situation we were in. These tools can be taught and used by any small business navigating complexity, and they should. Systems thinking doesn't require perfect tools or exhaustive models. It can be used as a flexible, practical approach that helps businesses focus on what matters most, adapt to change, and find solutions that work in their specific context.

If there's one thing we've learned, it's that complexity doesn't have to be overwhelming. With the right mindset and tools, small businesses can not only survive but thrive—just as we have, against the odds.

# Notes

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iii Edward Crawley, Bruce Cameron, and Daniel Selva. 2016. System Architecture: Strategy and Product Development for Complex Systems. (Cambridge, MA: MIT Press, 2016), 8.

iv Crawley, Cameron, and Selva, System Architecture, 8-10

v *Ibid.*

vi Meadows, Donella H. Thinking in Systems: A Primer. Edited by Diana Wright. White River Junction, VT: (Chelsea Green Publishing, 2008), 145.

vii Crawley, Cameron, and Selva, System Architecture, 8.

viii Meadows, Thinking in Systems, 11.

ix *ibid.*

x Crawley, Cameron, and Selva, System Architecture, 8.

xi Crawley, Cameron, and Selva, System Architecture, 13.

xii Crawley, Cameron, and Selva, System Architecture, 17.

xiii *ibid.*

xiv Crawley, Cameron, and Selva, System Architecture, 26.

xv Crawley, Cameron, and Selva, System Architecture, 45.

xvi Crawley, Cameron, and Selva, System Architecture, 28-29.

xvii Crawley, Cameron, and Selva, System Architecture, 11.

xviii Crawley, Cameron, and Selva, System Architecture, 31.

xix *ibid.*

xx Meadows, Thinking in Systems, 17.

xxi *ibid.*

xxii Walter L. Perry and Louis R. Moore, Evaluating Alternative Systems Architectures (Santa Monica, CA: RAND Corporation, 1998), accessed January 15, 2025, https://www.rand.org/pubs/papers/P8024.html.

xxiii U.S. Inflation Calculator. "Current Inflation Rates." Accessed January 15, 2025. https://www.usinflationcalculator.com/inflation/current-inflation-rates/.

xxiv Meadows, Thinking in Systems, 11

xxv Meadows, Thinking in Systems, 12-14.

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