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Designing a Scalable Order Fulfillment and Inventory Management Framework for an E-Commerce-Driven Craft Beverage Enterprise

Case: The Black Bourton

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This study was completed not just for compliance to the requirements of my studies but also for a thorough review of the business that I started years ago. It was a good opportunity for me to revisit the business processes and dissect all the challenges and inefficiencies that led to its discontinuance. While working on this study, I gained valuable knowledge on how the business should have been effectively run. I was able to enumerate all the problems and how it should have been properly addressed. It has also brought me awareness that adaptability to changes and continuous learning of the current trends should also be taken into consideration when diving into business as it will be a relevant factor for its success.

I would like to take the opportunity to show my gratitude to everyone who has supported and guided me in this study. To the entrepreneurs who have shared information through interview, by sharing their insights and own experiences in their business laid the primary ideas I needed in putting this study all together and going to the right direction leading to the completion of this study.

I would also like to thank my teacher, Zinaida Grabovskaia for being so patient in giving suggestions on how I can make this research better. My appreciation also to Misa Bakajic for the professional advice and support. Their knowledge helped me make this research better in both the academic and practical parts. I want to thank my classmates in the Business Informatics program for working together and having interesting conversations that helped me learn more about digital transformation.

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Stephen Racal
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Abstract

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The objective of this thesis is to develop an order fulfillment and inventory management framework for The Black Bourton, a small craft beverage company in the Philippines transitioning from traditional sales to e-commerce. The study's goal is to find ways to fix the problems that come up when orders and inventory are handled by hand, as the company gets ready to go digital. The company wants to improve operational efficiency, cut costs, and keep growing over the long term while still keeping its artisanal brand identity.

An applied action research method is used in the study to create an order fulfillment and inventory management framework that fits the needs of the company's growth. Qualitative data essential to this study were gathered through workshops, founder's reflection of the current state of the business and conducting interviews with businesses who have similar challenges. The theoretical framework discusses the topics of the operations in order fulfillment and inventory management, a concept is based on SCOR, Lean and Agile frameworks in operations management.

The outcome of the study is a proposal for the framework for a systematic business operation with 3 major parts: 1. An effective and standardized order fulfillment process, 2. A centralized inventory tracking method and 3. Effective task/role delegation strategy so that the founder can focus on other important matters of the business. The proposal is expected that once in place, it will lead to a more organized, dependable and scalable fulfillment and inventory management processes. Through taking the advantage of digital tools, supplemented by a structured assignment of roles, the company can avoid delays and unnecessary spending. Once business is stronger, additional improvements can be easily integrated such as exploring third-party logistics services which will definitely boost growth of the business.

Keywords	Order fulfillment, inventory management, e-commerce, solo entrepreneur

Table of Contents

List of Tables

(I do not have glossary.)

1. Introduction

The power of digitalization has become so important not only in education, communication and IT sector but it has now reached even the smallest business sector. Years ago, we use social media to be informed but now social media is utilized by entrepreneurs for scalability and sustainability. Online marketing has now become a requirement for a shopper, most shoppers no longer ask for store's physical address but prefer online shop links. The demand for shopping convenience, fast delivery and good customer review are the factors taken into consideration by customers nowadays.

For small scale businesses, e-commerce can be both an advantage and disadvantage. It would be a challenge if the owner is not technology adept and open to adapt to digital changes. It will however be an advantage if the benefit of digital technology is maximized. E-commerce when learned and applied properly is a great tool for gaining brand visibility and market reach. This will lead to more demands, more sales, more inventory stocking and more profit. It will also take care of customer service, order taking, delivery and even brand reputation. The more the people are engaged, the more they will patronize a certain product. E-commerce makes the life a business owner simpler if utilized wisely and correctly.

The case company of this study has faced struggles in order fulfillment and inventory management of its products. To stay in business and stay up with the global changes in business, a company must consider how it has shifted from doing things by hand to using technology. Considering the widespread impact of digital technology and the growth of e-commerce, this thesis investigates how the company can improve its fulfillment and inventory management.

1.1. Business Context

The Black Bourton is a small coffee liqueur company from the Philippines that is used as a case study in this thesis. The business was started in 2021 and makes handmade coffee liqueurs from a warehouse in the owner's home. It then sends the products to local coffee shops on consignment.

Craft beverages are currently trending nowadays especially with the younger generation who are always on look-out for new taste and originality. With majority of the customers being Gen Zs and Xs, who mostly always wants things to be easy from ordering to delivery of the goods. Any changes in the business are critical especially to small businesses because not only that they are taking into consideration their financial capacity to be able to adapt to these changes but also maintaining the product quality, and customer's positive feedback plays a major part in the business trajectory. Changes / Business Make-over is a challenging process notwithstanding the good reviews, good quality of the product and founder's entrepreneurial vision. Without any strategic and clear business structure or process even, the business will face hardship in scaling up.

1.2. Objective, Business Challenge, and Outcome

The company being a small one is operating using manual business management. While this method is effective at first and it has built loyal customers, the increasing demands have begun to impede efficiency and makes it difficult for the founder to work on other areas such as marketing or scaling. Switching form manual to digital operations is a complicated process but is necessary because this is expected make the market grow and create satisfied customers.

With so many drinks offered in the market, the company's products stand out due to its uniqueness as being one of the few beverage stores in Philippines to offer a café-liqueur drink. The concept was unique and the packaging was well presented which is why more customers are sending orders thereby on the part of the owner a growing backlog is piling-up resulting to delays which eventually turns-off some of the customers waiting delivery of their orders. Not all customers are amenable with the idea of pre-order, some wanted to get the product instantly. With these challenges at hand, the business is bound to address the issue if it desires future success.

Although manual order and inventory management will make do on a smaller scale, for future prospects it will not be that effective. Errors, delays and dissatisfaction will slowly emerge and more and more problems will arise. Which is why, digitalization is the best remedy to address it.

To support the business growth plan, it will start developing a dedicated website that will streamline the ordering process and daily operation workflow. A strong system will also be put in place in order to prevent old problems in order fulfillment and inventory management from recurring. These problems mentioned if not properly addressed may hamper the business long-term growth and success, especially since more and more business are now adopting digitalization strategies.

Thereby, this study aims to come up with an effective order fulfillment and inventory management processes that will support sustainability, efficiency and effective cost management.

The outcome of this study is expected to result to streamline the business operations, reduce delays or inefficiencies, and provide a successful scalability through e-commerce. This study will also serve as guide to other small-scale businesses who are also experiencing similar challenges and are planning to shift from traditional process to e-commerce.

1.3. Thesis Outline

The study's goals are to find and study the operating gaps that come from manual systems and find ways to make order fulfillment and inventory management more efficient so that the small e-commerce business can save money, make customers happier, and grow over the long term.

A mix of qualitative methods, such as interviews, internal process reviews, and comparisons with other startups in the same field, were used to write the thesis. It also looks at relevant literature and best practices in the business to help come up with a workable solution.

There are seven parts to this thesis. The topic, case company, and business problem are all introduced in Section 1. In Section 2, the study strategy and methods are talked about. In Section 3, the results of the present state analysis are summed up. The present state analysis found areas of pain in the current order processing and inventory processes. In Section 4, we'll look at the research and best practices for small e-commerce businesses that want to use scalable systems, run lean businesses, and handle their inventory.

In Section 5, there is a basic idea for the company's new architecture for managing orders and stock. Input, validation, and suggested changes are summed up in Section 6. Section 7 wraps up the thesis by summarizing the results, making suggestions, and stating what will be done next.

2. Method and Material

This section describes the research approach, design, and the methods used for collecting and analyzing data in this thesis. It explains how qualitative insights were gathered to support the development of a practical and scalable solution for the order fulfillment and inventory management challenges.

2.1. Research Approach

Selection of a research approach is based on purpose and methodology. While basic research aims to generate new theoretical knowledge, often without necessarily aiming for immediate application, while applied research is directed at addressing, real-world problems within a specific context (Kananen, 2013). When it comes to analysis methods, content analysis is used in qualitative research to figure out what things mean, how people act, and what they experience. Conversely, quantitative approach focuses on collecting and analyzing numerical data in identifying patterns, relationships and trends. This technique produces measurable, objective and statistically reliable findings. This method is recommended when testing hypotheses, comparing, identifying the case and effect relationships, making predictions and generalizing findings to a larger population. On the other hand, mixed-method approach uses both qualitative and quantitative methods to gather a complete understanding of the study (Creswell & Creswell, 2018). Choosing what research approach to use will generally depend on the source of data. This method is a recommended technique for this study in measuring order fulfillment and delivery frequency, pattern and trends.

With above stated research approach, we dig deeper from identifying the reasons why stated problem arises to using the information gathered to solve the problem. This is what applied research is all about. In the basic research we focus on the how the problem happened while applied research utilizes the information obtained to create an effective strategy not only in addressing the problem but also in enhancing or finding the best ways to improve the current state of the subject matter. Applied research focuses in solving real-world problems where it aims to provide practical recommendations or solutions to real-life everyday situations. (Saunders, Lewis, & Thornhill, 2019).

Applied research uses several strategies to address these real-world challenges, among these, the applied action research is the best fit for this research study.

(described by Kananen 2013). Coghlan and Brannick (2014) say that classical action research is mostly about getting people in an organization to work together to solve problems. Action research that is used in the real world, on the other hand, is more about finding solutions and learning things that are useful in that setting. Case studies, on the different side, focus on carefully recording and analyzing a single event, but they don't always involve change. Applied action research combines research and development: it collects and analyzes data using rigorous methodologies, but the ultimate goal is to enhance and implement in a real-world environment. According to Kananen (2013), applied action research is most suited for improving a process or condition through systematic development. This makes it especially ideal for small enterprises with limited time and resources.

In this study, the Applied action research strategy was selected as it best aligns with the practical objective of improving the order fulfillment and inventory management through the development of an e-commerce platform of a small craft beverage startup in the Philippines. The goal is not only to identify the current situation of the business but also to enhance, improve or upgrade the current processes. The study includes qualitative and quantitative data gathering and analysis, review of best practices internally and from other businesses, designing an effective and efficient tailored solution that is both grounded by research and practically beneficial for the growth and success of the business.

2.2. Research Design

Figure 1 illustrates the research design of this study. It adopts a straightforward approach. The study is based on a real-world company need and incorporates stakeholder interviews, internal document analysis, and expert opinion. Each phase leads to the next, and the goal guides the entire research process. Figure 1 is a picture that shows an overview of the research design.

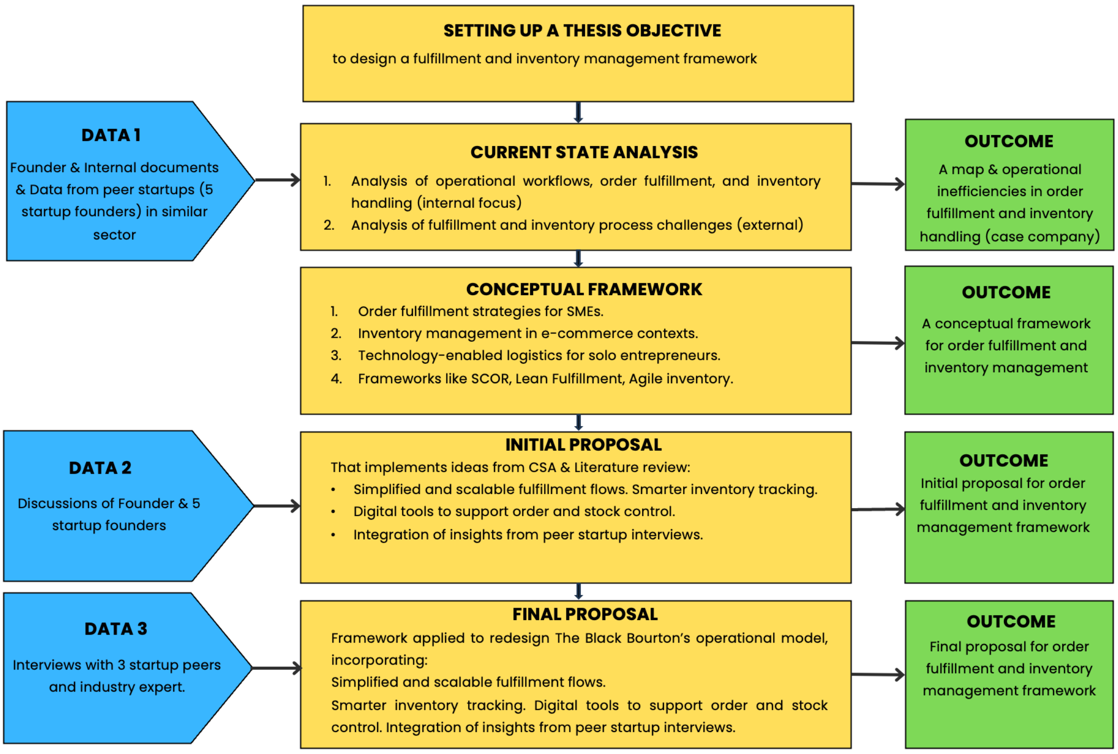

Figure 1. Research design of this study.

Figure 1 depicts the stages of the study, the types of data gathered, and the results at each stage. It starts with the thesis main point. The second step, "present state analysis," involves collecting qualitative data from a variety of sources. On the inside, the creator considers how things are run today and in the past. Interview was conducted with five business owners of similar scale size and of different product offerings such as handmade crafts and food products that shares similar challenges with the subject business. Internal documents both paper trail and google sheet order form records were reviewed to retrack the order process and fulfillment. In addition, consignment records and event order list were reviewed to supplement evidence.

Discussed in this study are some major topics including order fulfillment management, inventory management strategies and employment of digital technologies such as SCOR, Lean Fulfillment and Agile Inventory. In addition, the theory-based solution proposal that will address the order fulfillment and inventory management for small scale businesses.

Theoretical theories together with CSA outcomes were both used to enhance company's current order fulfillment and inventory management processes. Initial proposed suggestions include gathered best practices from peers, manageable workflows and efficient inventory tracking. This version is tested in its early stages and compared to similar business strategies.

The framework is checked and improved during the Final Proposal. The model is improved with the help of follow-up interviews, internal testing, and comments from academics or people working in the field. The end framework is a tried-and-true answer that the case company could use in real life.

2.3. Data Collection and Analysis

This study came from multiple sources of qualitative data collected in three distinct stages. Each data collection round focused on different stages of development, from identifying operational challenges to testing and validating a proposed solution.

Table 1. Details of Data collections 1-3 used in this study.

	Participants / role	**Data type**	**Topic, description**	**Date, length**	**Documented as**
	Data 1, for the Current state analysis (Section 3)				
1	Founder (CEO of The Black Bourton)	• Self-reflection • Workflow Analysis	Analysis of order fulfillment and inventory processes.	July 2025	Field notes
2	Industry experts from small startups using manual inventory and order fulfillment. (5 Founders)	Semi-structured interviews Face-to-face Interview	Insights on fulfillment Inventory challenges and current practices	July 2025	Field notes and recording
	Data 2, for Proposal building (Section 5)				
3	Industry Advisors/	Feedback session/ Discussions	Proposal building Review of conceptual framework and operational feasibility		Field notes
4	Small startups using manual inventory and order fulfillment. (5 Founders)	Semi-structured interviews Face-to-face Interview	Insights on fulfillment Inventory challenges and current practices	July 2025	Field notes and recording

	Data 3, from Validation (Section 6)				
5	Simulation with Mock Orders	Internal test cases	Simulation of new fulfillment model with real product examples		
6	3 Startup Founders/Business Mentors	Group interview/ Final presentation. Validation interviews, Focus feedback.	Validation, evaluation of the Proposal.		Field notes and recording

As shown in Table 1, the initial data gathering phase (Data 1) was used to evaluate current operations. This included an examination of internal documentation and operations data, observations, and workflow analysis, as well as interviews with five founders of small companies that use manual inventory and order fulfillment processes or are in similar adjacent industries (for example, food and handmade products). These face-to-face interviews with industry professionals took place in July 2025. They focus on order processing processes and inventory challenges encountered in the example company's resource-constrained environment. Notes were collected during all sessions, and interviews were taped with consent.

During the second phase (Data 2), data were collected to help shape the initial proposal. Brainstorming workshops with industry consultants were used to develop the order fulfillment and inventory management architecture. This also include a face-to-face interview with the five small startups founders who were all using manual order fulfillment and inventory management. This was done to get insights on the fulfillment and inventory challenges faced by their businesses with their current practices.

In the third phase (Data 3), internal test cases were performed with simulation of a mock orders to mimic the actual scenarios. These simulations will provide a bird's eye view on the capacity and limitation of the proposed solution once in place. This will also aid in identifying the improvement needed to come up with an effective operational method. Also in this phase, a group interview or final presentation was done with 3 start-up founders, a business mentor to gather feedback, validation and evaluation of the proposal. The discussion aided in determining the proposals applicability and suitability with clarity in the anticipated effect to the business. This phase was documented using field notes and audio recordings.

In this study, interview was used as the primary method of gathering data. It was a face to face, casual interview with prepared questions for the interviewees, that allows an open but informational discussion with the current state of their business and the challenges it currently face as a result of using manual process so that it can be addressed properly and theoretically through a study. The data gathered, including the notes during the interview and feedback session transcripts, and personal comments, underwent thematic analysis to identify recurring patterns and significant themes.

The study also used simulation of a mock order scenario in addition to interview gathered data which was used as the basis of the proposed solution or process improvement. The mock order simulation provides a better picture of operational cycle, uncovering all the weak points that needs to be focused on and improved.

Table 2. Internal documents reviewed in the Current State Analysis, Data 1.

	Name of the document	**Number of pages/other content**	**Description**
A	Internal Inventory Tracker (2022–2023)	4 Excel sheets	Historical stock records, order quantities, and restocking patterns.
B	Fulfillment Workflow Notes (Dec 2023)	3 pages	Description of packing, batching, and dispatch routines from prior operations.
C	Supplier & Order Logs (2023)	7 pages	Raw material order records and delivery timelines from key suppliers.
D	Email Correspondence with Logistics Partners	10 email threads	Communication related to delivery delays, order tracking, and logistics support.
E	Google Forms Tool Trial Summary	1 form, 12 responses	Trial form capturing manual inventory entries and mock tracking exercises.
F	Sales & Fulfillment Recap Sheet	2 pages	Snapshot of fulfillment bottlenecks and dispatch timing during peak sales.

Shown in Table 2 are the list of internal documents used in the current state analysis. These are internal inventory tracker, fulfillment workflow notes, supplier & order logs, email correspondence with logistics partners, google forms tool trial summary and sales

& fulfillment recap sheet. These documents were used in the current state analysis as part of Data 1. The goal is to capture a clear view of how the company was previously managed particularly in its order fulfillment, inventory management and logistics phase. These internal documents and interview data helped in identifying the loopholes in the process that will supplement in the formation of the proposed enhancement for the operational workflow.

In addition to interview data, the study also made use of internal simulations with mock product orders to test the proposed process enhancement. This practical testing complemented the interview data by disclosing usability insights and helped identify areas for improvement. The findings from the analysis of the current state (Data 1) are presented in Section 3 below.

3. Current State Analysis of Fulfillment and Inventory Management Practices

This section discusses the results from the current state analysis of the company's fulfillment and inventory management processes. The goal was to find operational inefficiencies, bottlenecks, and ways to make things better in a planned way so that they could be used to help create a scalable framework that would work for an e-commerce-driven craft beverage business.

3.1. Overview of the Current State Analysis

The goal of the Current State Analysis was to build understanding of the company's existing fulfillment and inventory management practices in the context of a small, e-commerce-driven craft beverage brand. The goal was to identify current strengths and weaknesses, surface recurring challenges, and determine key focus areas to improve the design of a future scalable system. The CSA followed 3 systematic steps to ensure a structured approach in its formation.

The first step is a review of the business' operational procedure including a self-reflection of the founder in identifying his previous setbacks encountered during the time the business operational. Furthermore, it also includes a reflection of all the cycles to have a better insight on the apparent drawback and challenges that needed to be focused on.

Second, thru interview of five business owners with relevant operational techniques that is unique from each other, two of which are involve in alcohol distribution (small-scale beverage retailer and bar/restaurateur) while the other 3 from other sectors (coffee shop, sustainability-focused goods producer, handmade craft retailer). Each one of them shared viewpoint on their operational end to end process flow that is significant in determining the areas or pain points that needed to be treated. The identification of these validated challenges is essential in the conception of a better proposed solution to address and rectify the flops experienced by these business owners.

The third step is known as thematic analysis which is done along with current practices vis-à-vis the information obtained from selected 5 founders of similar sized business echoing a similar concern related to process workflow. Information gathered are sorted out and categorized to determine priorities that requires more focus and in order to be able to come up with an appropriate remedy on the issues raised.

These three steps, form the basis of determining the key areas for improvement in the process workflow. It is a solid base for future enhancements as it is grounded by both personal business experience and collective learning experience that is relevant to this study.

3.2. Status of the Current Order Fulfillment and Inventory Management Process

To describe, it is manual, traditional, old-fashioned, archaic and antique process. Why? Because the business couldn't cope up, it can't perform well due to non-digitalization. With everything done manually, the business is not expected to create sustainable growth. Everything from order taking, inventory tracking, packaging, labeling and distribution is managed and monitored manually. There are no digital tools in place for inventory monitoring, and order fulfillment. This process is fit for small volumes but for growing capacities this method will choke the whole business and will not be able to step forward.

3.2.1. Order Fulfillment and Inventory Workflow

Presently, the company's operational workflow is propelled by a plain and manual-driven process. Raw materials, primarily neutral grain spirit, cold brew coffee, and proprietary ingredients are sourced in small quantities and stored at the founder's warehouse. Once production resumes, batching and bottling will likely take place in-house or with a contract manufacturer, followed by manual bottling and labeling. Finished goods will be stored temporarily before distribution to B2C and B2B customers.

The company plans to start with D2C deliveries via its own website and partner with local cafés, bars, and retail stores to support B2B sales. Fulfillment will initially be self-managed with parcel drop-offs and local delivery. A 3PL partnership is under consideration to handle future growth, particularly for order picking, packing, and long-distance delivery. Figure 2 below illustrates the current process flow from sourcing to fulfillment.

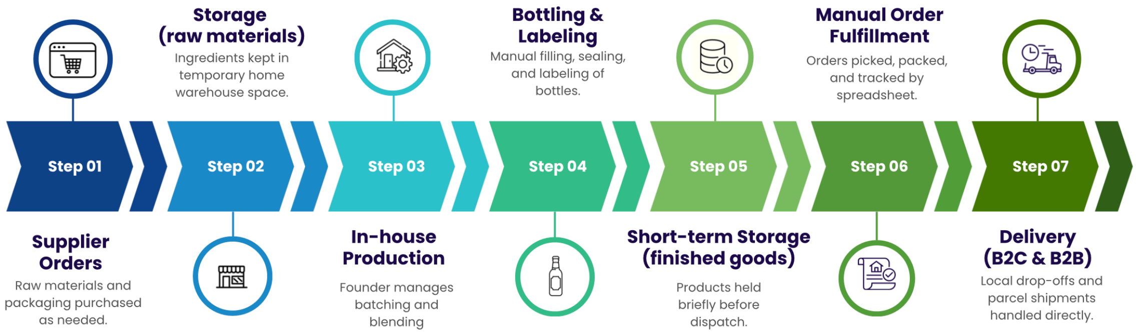

Figure 2. Current order fulfilment and inventory process at the company.

As seen in Figure 2, the company's supply chain operation is simple and follows a clear order from getting ingredients to delivering them. (a) Supplier Orders are placed when they are needed. Raw materials and packaging are purchased on demand instead of predictive forecasting which makes the business vulnerable to possible supply delays. (b) The founder runs temporary warehouse space for storage (raw materials) and stock is tracked using spreadsheets or instead of digital tools. (c) In-house production is done in small, flexible runs based on how much time is available and how much demand there is right away. This keeps the process adaptable but causes the output to be unstable. (d) Bottling and labeling are done totally by hand which strengthens the brand's craft positioning but also raises the danger of slower throughput and labeling mistakes if demand rises. (e) Short-term storage (for finished goods) is limited since products are only kept until orders are ready to ship, and inventory levels are managed by hand, which makes it hard to see. (f) Manual Order Fulfillment means that the founder must pick, pack, and process each order by hand. This system may still be valuable for small scale business but is dependent on the availability of the person in charged. Delivery on the other hand is carried out thru drop-off for direct consumer sales and local deliveries to partner cafes. This method may still work out for smaller orders but will create a backlog for bigger and wider distribution.

3.2.2. Roles and Responsibilities

The founder is the all-around manpower who handles the process end to end or the whole business cycle. He is responsible in the brewing of the signature coffee, packaging and labeling the bottles, and preparing the items that are ready for distribution. Although he finds assistance from some family member, but it is not constant and the founder has to bear the duties alone most of the time. He is present from the creation, customer interaction, product delivery, financial aspects and overall monitoring of the business the founder is the lone driver the business operations. As the volume of demand increases, the responsibility needs to be delegated and redistributed if the main goal is to achieve sustainable growth.

3.2.3. Tools and Interfaces

The current tools are simple and manual system. The inventory is managed using a basic tool such as manual counting and recording in a simple excel sheet that lists down the quantities of raw materials, packaging supplies like bottles, stickers and boxes and the quantities of finished goods on hand. The order processing is received and confirmed thru either mobile, email and private messages.

As the business increases, the need for improvement is highly necessary in order to harmonize the business operation workflow. The need for digitalization is increasingly essential to address and prevent inventory inaccuracies, packing and dispatching delays, and accurate financial analysis. As discussed with the interviewees, an emphasis on shifting to ecommerce is a solution to reduce operational setbacks.

At present, the company also interfaces with several external stakeholders: (a) *Suppliers:* For raw ingredients, bottles, and packaging; (b) *Local partners:* Cafés and bars interested in co-promotional sales, and (c) *Logistics services:* Consideration of future 3PL partnerships for storage and shipping.

3.3. Analysis of the Existing Order Fulfillment and Inventory Management Process

This part centers in the analysis of the business' order fulfillment and inventory management process. The information gathered are sorted and organized according to priority as tackled during the interview with 5 other business owners and founder's self-reflection. The goal is to identify in a structured manner the key areas for improvement supported by evidence from data sources.

3.3.1. Inconsistent Inventory Tracking Across Channels

One of the usual difficulties encountered is the complexity in carrying out inventory management. The business is currently using basic manual tools, including spreadsheets and personal notes, to monitor inventory levels. This approach is dependent on the sales channel used, whether it is for online direct-to-consumer (D2C) pre-orders trials, Retail or Café consignment and Event or Pop-ups. To have a better understanding, Table 3 below illustrates the Sales Channel used, Current Tracking Method and Main Limitation.

Table 3. Overview of Sales Channel Tracking Methods and Associated Limitations.

Sales Channel	**Current Tracking Method**	**Main Limitation**
Online D2C (pre-orders, trials)	Excel Spreadsheet	No real-time updates; error-prone
Retail / Café Consignment	WhatsApp messages & verbal updates	No digital trail; hard to reconcile sales
Events / Pop-ups	Paper checklists & receipts	Delayed data entry; high chance of loss

As shown in Table 3, the lack of real-time, integrated tracking tools led to unreliable

Table 3 shows the limitations of the current sales channel tracking methods that is currently applied by the business. The lack of reliable digital monitoring tools results to error, reconciliation dilemma, delays and high chance of loss. As raised by one retailer, he disclosed that he doesn't know how many numbers of bottles he still has on hand. Unless he performs a physical inventory, he wouldn't know what is already out of stock.

> I actually have no idea as to how many bottles are still on-hand unless I do an actual inventory or checking. Sometimes I thought we still have enough stocks only to find out later on that it has already ran out." (Interviewee 1)

Reconciling of inventories after consignment and pop-up events is a guesswork due to the lack of standard reporting from partners.

3.3.2. Lack of Defined Roles and Communication Protocols

Another challenge identified during the formation of current state analysis was the lack of defined roles and communication protocols in the business' order fulfillment and inventory management activities. There is a lone employee who is the founder himself who is doing all the work from beginning to end. As a start-up this was manageable at the beginning but as the business grows not to mention that everything is manually done, the business process starts to slowly breakdown.

Due to manpower limitation, lack of defined role and clear communication with partners in consignment transactions and retailers, the business efficiency reduced particularly in coordinating timely replenishments or capturing accurate inventory levels after product movement. According to one of the interviewees (Interviewee 5), the owner of a handmade craft supply shop, who is familiar with consignment transactions, he stated:

> “There should be a clear agreement or standardized method of reporting from both sides, every change must be recorded and informed immediately to the consignor to avoid stock-outs and missed payments because this is a common scenario especially with new and small producers who is managing everything by himself.” (Interviewee 5)

To avoid lapses such as delays in restocking, inconsistent updates from business partners and missed payments, a well-structured definition of roles and responsibilities must be agreed upon and practiced.

Furthermore, during the founder’s self-reflection, in order to address the expansion plans, manpower must be given priority because continuing solo is not sustainable and feasible in the long run.

3.3.3. Fragmented Order Fulfillment Workflows Across Sales Channels

Another discovery is that there is an operational disconnect of the fulfillment process, which differs significantly depending on the channel, Different sales channels such as online orders, consignment and/or events have its own unique process and that none of which are standardized or documented.

For example, in event orders, packaging is usually manually stocked the night before to make sure that the product is fresh and of high quality. The delivery of the product the next day is done by the founder personally. Often, coordination is done via common social media messaging. For online orders, it is managed thru email and google forms, however there is no integration between sales and inventory levels.

These channel diversity process results to, work duplication and high risk or operational mishap. This was also mentioned by Interviewee 2, a restaurant manager who is experienced in coordination of small-batch alcoholic ordering.

> "If every type of order has a different method or way of handling and lacks proper documentation, it would be challenging to train or delegate a task. You will just end up forgetting what you have agreed one and waste time doing the same work differently every time. It may be done but not in an efficient manner. (Interviewee 2)"

The founder also reflected another problem he has faced which includes difficulty in tracking product movement and order status from all sales channels. Most of the time, it requires manual retracing of the communications from email to text messages inquiry and multiple apps. A standardized workflow for a growing operation and for handling off tasks to third-party is extremely challenging.

3.4. Summary of the Current State Analysis Results

This segment summarizes the current state analysis results with regards to order fulfillment and inventory management processes. The summary includes the careful comparison of the strengths and weaknesses of the current practices in the business operational workflow of both the founder and the inputs of interviewees. The analysis is essential in determining how the current fulfillment and inventory workflow is designed, coordinated, and executed across different sales channels.

3.4.1. Current Order Fulfillment and Inventory Process: Strengths and Weaknesses

Table 4. Strengths and weaknesses of the current order fulfillment and inventory management practices of the business.

Strengths	**Weaknesses**
Lean and adaptable order fulfillment setup (low overhead, flexible order handling)	Lack of standardized processes across fulfillment channels (D2C, consignment, events)
Founder's deep involvement ensures agility and quality control	No centralized inventory system or real-time tracking across channels

Entrepreneurial use of basic tools (spreadsheets, messaging apps) to manage logistics	Manual stock updates prone to error, inconsistent reporting from partners
Strong partner relationships built through direct, personal engagement	Undefined roles and unclear partner communication protocols
Ability to scale temporarily via ad-hoc solutions (e.g., pop-up sales, events)	Heavy dependency on founder (creates single point of failure)

As summarized in the Table 4, the strengths include lean and adaptable order fulfillment setup with low overhead and flexible order handling. founder's deep involvement ensures agility and quality control, entrepreneurial use of basic tools such as spreadsheets, messaging apps, strong partner relationships built through direct, personal engagement and ability to scale temporarily via ad-hoc solutions such as pop-up sales and events.

On the other side, the weaknesses are enumerated as follow; lack of standardized processes across fulfillment channels such as D2C, consignment and events, Lack of centralized inventory system or real-time tracking across channels, Manual stock updates that are prone to error and inconsistent reporting from partners, undefined roles and unclear partner communication protocols and heavy dependency on founder that creates single point of failure.

The business sold 20 to 30 bottles a week through consignment and event sales. During special campaigns, sales increased up to more than 100 bottles. The proposed e-commerce debut intends to get 5 to 10 direct online orders a week at start, with the goal of receiving more than 50 orders a week within a year. As the firm grows, it needs fulfillment solutions that are light and can grow with it.

3.4.2. Selected Focus Areas

From the analysis above, three key weaknesses have been selected as the primary focus areas for this study. These issues were consistently raised across stakeholder interviews and present the most significant barriers to scalability, efficiency, and reliability in the company's fulfillment and inventory operations. The current state analysis discovered several issues that are making it impossible for the company to grow from a small, founder-led enterprise into a huge e-commerce operation. Three faults were identified as the primary impediments and were then selected as the focal points for this investigation.

The fundamental problem is that different ways of selling don't have the same ways of fulfilling orders. Right now, orders via consignment partners, sales at events, and direct-to-consumer sales are all handled in separate ways that aren't documented. People have to do the same thing repeatedly when things aren't constant, the lead times alter, and the possibilities of making mistakes go up. The organization can't receive help with logistics from outside sources or assign duties well since its methods aren't clear and consistent. This hampers the business' growth.

The second weakness is lack of a reliable system for managing inventory. Inventory is tracked using old-style method which is by using excel sheets, handwritten notes and conversation histories with partners. Due to this traditional or conventional manner of recording it is hard to keep track of the inventory movement. It is also challenging to have an estimate of sales from consignment sales and for keeping a steady supply because lack of real-time information about the inventory. Therefore, a single system would improve the business operations and can lead the business for growth in the future.

The third weakness is the excessive dependence on the founder to run the business operations. Overtime, flexibility becomes hard to achieve as the volume of demands increases. The founder is the overseer of order fulfillment, inventory management, production, and customer inquiries. This poses a risk on the business when the founder's availability is unattainable. The heavy dependence set hurdles on establishing collaboration agreements, delegation of roles and establishment of formal collaboration agreements and application of a systematized governance, all of which are essential for success and growth of the business.

The business needs to fix the three main problems such as lack of efficient order fulfillment, lack of knowledge about inventory management and heavy dependence on the founder. This thesis sets its limits and creates the framework for the rest of the paper. They assist make the ideas and best ways to do things in Section 4 clearer and write the proposal in Section 5.

4. Best Practices for Scaling Order Fulfillment and Inventory Management Operations

This section discusses modern approaches and ways for small e-commerce enterprises to grow their inventory and fulfillment. The section discusses four parts: (4.1) order fulfillment strategies; (4.2) e-commerce inventory management; (4.3) technology-based logistics for solo entrepreneurs and (4.4) reference frameworks (SCOR, Lean, Agile). Each part highlights key practices, explains main concepts and looks at how they apply to e-commerce. This gives the basis for the proposal building in Section 5.

4.1. Order Fulfillment Strategies for SMEs

Order fulfillment is the whole process of getting a customer order, processing it, and sending it to the final customer. Bowersox et al. (2013, 51) say that order fulfillment is the combination of managing customer demand with supply chain operations to make sure that deliveries are on time and correct. Chopra and Meindl (2016, 95) say that it is the set of actions that help businesses meet customer demand by adopting good inventory management, warehousing, and distribution methods. Christopher (2016, 103) further says that fulfillment should be seen as more than just a logistical task; it should also be seen as a key part of giving customers value. Order fulfillment includes physical procedure of moving items and is also a systematic ability of affecting customer satisfaction.

Order fulfillment and strategy are crucial especially for small and medium-sized firms since they have a direct impact on scalability and competitions (Mentzer et all 2007, 45). In choosing a fulfillment model, the business must be very careful especially since the business has no same level of infrastructure as large companies. A balance between cost and quality of service must be taken into consideration. There are usually four types of fulfillments, in-house fulfillment, third-party logistics (3PL), hybrid fulfillment and distributor fulfillment.

Businesses who do their own fulfillment or self-fulfillment is responsible in the storage, packaging, labeling and shipping. Though this method is tedious and quite costly as it requires substantial space, technology and manpower, but it gives more control over the brand that will give customers a positive feeling (Rushton et al. 2022, 342). However, when SMEs hire third party logistics (3PL) providers, they can use specialized infrastructure and knowledge that makes them more scalable and able to reach more places (Sinkovics & Roath 2004, 52). The disadvantage of 3PL is that businesses may have less direct control over the delivery and customers feedback when they use 3PLs. Businesses who care much about their brand may have a problem regarding this.

In hybrid fulfillment method, there are tasks done in-house and outside groups. This approach is normally cited in scholarly literature as an effective method in addressing issues of variable demand and growth. Businesses such as food and beverage, pharmaceuticals, and fast-moving consumer goods, where wholesalers and retailers serve as intermediaries between manufacturers and consumers, Distributor-based fulfillment has traditionally been the predominant business model, influencing (Kotler & Keller 2015, 412). This strategy is all about breaking into new markets and allowing the products to scale, although it makes it harder to directly improve customer service and connections.

This decision made between these models is always changing. It depends on the size of the company, the needs of the industry, and what the market wants. According to researchers, company's operations are affected by the economy, the technology it has, and the services it needs. (Esper et al. 2003, 56). The transition to e-commerce has expedited the necessity for SMEs to assess fulfillment not merely as a cost factor but also as a distinguishing element in the customer experience (Hübner et al. 2016, 270). So, the literature shows that order fulfillment is a deliberate design choice that links operational competencies with market positioning.

4.2. Inventory Management in the E-Commerce Context

Extensive research has been done on inventory management in the books of logistics and operations, since it is such an important part of managing the supply chain and operations. According to Wild (2017, 4), inventory management is the process of keeping the right amount of stock on hand to meet demand while minimizing the costs of having and moving it. Chopra and Meindl (2016, 65) say that inventory management is the set of rules and instructions that control inventory levels, figure out the best levels of upkeep, decide when to restock, and set quantities. Ballou (2004,321) discussed this in detail and described it as a set of activities that is used in determining what items to hold as inventory, how much to keep as inventory, when to replenish the inventory and how to maintain high quality and cost savings. In other words, it exists to buffer uncertainties and at the same time maintain a desired customer service level without overspending in logistics cost. The objective of inventory management is not only to build an organized procedure but also to create a strategy that will affect the long-term effectiveness, cost efficiency and good service quality.

There are also some factors that creates inventory management in e-commerce different. As consumers demand grows, demand for faster delivery, and predicting what the customers will want is hard to achieve thus hampering sales growth (Hübner, Holzapfel & Kuhn, 2016). In traditional retail, large amounts of inventory are stocked regularly in a warehouse to meet the demands of customers whereas in e-commerce, it requires a more flexible control system that can handle changing demands, short product life and orders coming from variety of locations (Müller, 2019). Order management systems (OMS) and warehouse management systems (WMS) must go hand-in-hand as they are both essential for a centralized view of all warehouses and marketplace stock, the real-time inventory movement, and communication between these systemin (Christopher, 2016). These innovations will aid businesses making sure that all of the platforms are stocked accurately, sufficiently and evenly.

Creating a safety stock is necessary factor of managing the inventory as it protects the business from changing demands and long supply waiting period. Silver, Pyke, and Thomas (2016) demonstrate that statistical models including service-level objectives and fluctuating demand can effectively determine safety stock levels. But smaller organizations typically don't have access to the high-quality data sources that complicated models demand (Axsäter, 2015). Because of this, small and medium-sized firms (SMEs) commonly utilize simple principles to figure out buffer amounts. These amounts are then reviewed and altered as needed to match the needs of the business.

When running an online store, businesses need to follow the rules for managing inventory. Using a single product identifier like Global Trade Item Numbers (GTINs) and GS1-128 barcodes makes it easier to keep track of items and lessens the likelihood of making mistakes in both internal operations and collaborations with third-party logistics providers (GS1, 2018). SMEs need these standards the most since they allow them join big supply chain networks and make it easier to keep track of items and make sure, they fulfill legal and retail standards (Kotzab et al., 2019). Product bundling, kitting, and SKU simplification are also frequent ways to speed up inventory turnover and make it easier to manage product assortments in e-commerce environments (Müller, 2019).

The study shows that it is not easy to manage the inventory in e-commerce because the company needs its operation to be efficient and the service needs to be reliable all the time in cases where things are not clear enough. Companies that are using a good inventory management practices like centralized visibility, reserve stocks and is following the global standards are doing better in many different areas. So, this shows that inventory management plays a very big role in businesses like e-commerce who wants to make their business grow and gain their customer's trust.

4.3. Technology-enabled Logistics for Solo Entrepreneurs

Digital tools, applications and platforms are no longer a mere support but are considered now as a central driver that aid s in planning, execution and monitoring of logistics activities that is expected to result to an efficient, responsive and competitive edge in supply chains. (Sanders & Ganeshan, 2021; Wamba et al., 2020). Christopher (2016, 233) also shares a similar view regarding technology-enabled logistics being considered as a strategic enabler and not as a mere auxiliary component. This technology is truly relevant and useful for small, scaled businesses and sole proprietors who are always faced with inventory constraints, but competition is requiring them a high level of flexibility.

For small e-commerce businesses, technology provides access to capabilities that previously required large infrastructure investments. Cloud-based warehouse management systems (WMS) and order management systems (OMS) allow centralized visibility of inventory, automation of replenishment triggers, and streamlined order processing without the need for costly IT infrastructure (Chopra & Meindl, 2023). Shipping automation platforms and application programming interfaces (APIs) are effective tools in making large-investment level functions accessible to micro and small-scaled businesses. These also enables direct integration with suppliers, retailers and third-party logistics (3PL) providers, reducing manual processes and enhancing speed and accuracy (Increff, 2022; Flexe, 2023).

Another emerging trend is the rise of on-demand logistics and warehousing solutions, Another rising trend is the on-demand logistics and warehousing solutions. Not necessarily new concepts as they have existed before but focused on traditional forms such as public warehouses and contract logistics but now it is a rising, modern trend because of digital platforms, real-time visibility and flexible logistics requirements.

(Sanders, 2020; Wamba et al., 2020). Businesses entering multiple markets and managing different seasons demand cycles, these services provide scalability that would otherwise be unattainable. A supplemental support is setting up GS1-compliant standards, these are systems, codes and processes that follow the global standards created by GS1, an international non-profit organization that develops data-sharing standards for supply chains. These standards are created for identifying, marking, and tracking products, shipments and locations across the supply chain. (GS1, 2022)

Putting it all in one place, the literature shows that technology-enabled logistics are more than just cost-savings tools but also a way for a successful and efficient operations. For small-scaled businesses and sole proprietors, this is a good opportunity to meet the demands of competition that were once available only to large investment entities. This gives small business entrepreneurs an edge to scale operations without spending so much in resources. Shifting to technology driven service models allows small firms to address customer expectations for fast delivery, accuracy and reliability. Despite employing the use of digital platforms and on-demand logistics to expand operational opportunities, a structured approach in evaluating, benchmarking and reviewing these systems should be put in place. Thus, the importance of process frameworks such as SCOR, Lean and Agile are necessary in regularly monitoring the progress of these technologies in scaling order fulfillment and inventory management.

4.4. SCOR, Lean Order Fulfillment and Agile Inventory Management

Supply chain management is a guide or structure that help companies improve efficiency, reduce cost, enhance product quality, increase customer satisfaction, standardize processes and benchmark performance. These activities in SCM are necessary in moving transferring product from supplier to manufacturer to warehouse and ultimately to customer in the most effective way. The most widely used SCM framework is Supply Chain Operations Reference (SCOR) Model, Its scope includes only core processes (Plan, Source, Make, Deliver, Return & Enable) which is used by businesses needing a structured optimization and benchmarking to analyze, measure and improve the supply chain performance. The Lean Order Fulfillment Approach also aids in improving efficiency, cost reduction and streamlining processes but with more focus on eliminating waste and doing more with less cost. It answers the questions, what steps are needed to add value? And What steps are needed to be removed? (Womack and Jones, 1996). Agile Inventory Management is an approach used to improve responsiveness. It focuses on flexibility and speed and is best for businesses with uncertain or fast-changing demands. The goal of Agile is to achieve higher

responsiveness and to answer the question How quickly can we respond to changes? Examples of Agile in supply chains are fast restocking of items, flexible suppliers, swift switching of production lines and quick delivery adjustments. (Naylor, Naim, & Berry, 1999).

The SCOR model provides framework to map, measure and improve key processes in the whole supply chain, set up at the top and activity descriptions at the bottom. The purpose is to enhance the planning, sourcing, manufacturing, delivering and returning of items. It also allows a view of how well the inventory and order fulfillment processes operate at different expansion stages. This approach promotes accountability and efficiency by implementing metrics and benchmarks and continuously improving processes through employing best practices. (Bolstorff & Rosenbaum, 2012).

Lean frameworks use the seven main wastes to make things better: too much production, waiting, unneeded transportation, overprocessing, excess inventory, motion, and defects. Value stream mapping, 5S organization, visual management, and error-proofing techniques (poka-yoke) are all common lean ideas utilized in fulfillment settings. These tools are meant to make flow more efficient, less random, and higher quality without spending significant amount of money up front. This is why lean methods work well in tiny businesses with less resources (Shah & Ward, 2007).

Agile frameworks stresses on being flexible, responsive and being able to quickly adapt to changes and disruptions by using modular process design such as task deferral options and quick information sharing. In practice, by postponing final production customization until a certain demand is confirmed is done in achieving agility. Information technology plays a very important role as it allows entrepreneurs to focus on events as they occur and come up with a quick decision across the networks. (Christopher, 2000).

The Leagile method, which is a combination of Lean + Agile is bot flexible and efficient at the same time. As Lean removes waste and reduce costs in stable parts of the process, Agile stays flexible and responds quickly where demand is uncertain. It works by applying Lean, upstream (production, inventory management) where demand can be predicted and Agile, downstream (Closer to the customer) were demand changes quickly. The decoupling point is the most complex part of supply chain. It is the point in supply chain where push or forecast-based production shifts to pull or demand-based production. It is where forecasting ends and demand begins. (Naylor et al., 1999). This technique is effective for businesses with predictable demands but is changing fast due to sales, seasonal changes and or promotions. These frameworks provide small-scaled businesses new techniques to improve and grow their inventory and order fulfillment operations. SCOR’s performance metrics and taxonomy enhance it by offering processes a common or universal “language” that formalizes beyond their natural state. However, the literature warns that complete SCOR implementation may be resource-intensive for SMEs; consequently, it is recommended to use a targeted approach to SCOR's KPI set and high-level process mapping (Huan, Sheoran, & Wang, 2004).

Lean methods offer quick and cheap fixes. For example, making packing stations work better, cutting down on picking activities, and using visual controls can all lead to big increases in production at a cheap cost. These solutions address the "hidden costs" of being disorganized, which many founder-led firms encounter. They make daily operations more efficient and create the framework for future growth. However, experts believe that lean alone may reduce flexibility if balancing mechanisms are not in place (Shah & Ward, 2007).

Agile procedures are essential in contexts with considerable changes in customer demand, such as new product launches, influencer-driven marketing spikes, or seasonal demand cycles. According to the literature, being agile reduces the likelihood of stock-outs and the costs of having too much stock by allowing for quick responses rather than relying on forecasts (Christopher & Towill, 2001). To make agility work, you must make deliberate structural decisions, such as modular product design or IT-enabled visibility. This might consume many resources in small businesses.

Leagile plans are a good compromise for tiny web enterprises. Founder-led businesses can achieve a balance between being cost-effective and responsive to the market by applying lean efficiency principles in their upstream procurement and production processes and making last-mile fulfillment and product change more flexible. Finding the decoupling moment is the most critical thing for managers to do. This could happen during packaging, labeling, or shipping. This will maintain operations upstream stability and efficiency, at the same time maintaining operations downstream flexibility as demand varies. (Naylor et al. 1999)

Therefore, literature agrees on a layered approach, the SCOR as the framework by mapping all processes, define metrics and identify areas for improvement, Lean for removing of waste in predictable parts of the supply chain, saving on cost and improving efficiency and Agile in adding flexibility in areas with unpredictable or variable demands allowing swift responses to customer needs. The integration of this strategic idea creates a highly efficient, measurable and responsive supply chain.

4.5. Conceptual Framework of This Thesis

This section defines the conceptual framework of this study which discusses the four key elements identified in Section 4.

Figure 3. Conceptual framework for scalable order fulfillment and inventory management system for SMEs.

Table 5. Key Tools, Practices, and References on Scaling Order Fulfillment and Inventory Management in E-Commerce SMEs.

Main Theme	Selected Tools & Sub-Elements	Key References
1. Order Fulfillment Strategies for SMEs	• Internal (in-house) fulfillment, 3PL, hybrid models, distributor-based fulfillment; workflow standardization; carrier portfolio management; service-level metrics (OTIF, perfect order)	Chopra & Meindl (2023); Christopher (2016); CSCMP (2022); Hübner et al. (2016)
2. Inventory Management in E-Commerce	• Centralized visibility (OMS/WMS); safety stock methods (rule-based vs. stochastic); multi-channel synchronization; kitting/bundling; global standards (GS1 identifiers, GS1-128 barcodes, RFID)	Silver et al. (2016); Cachon & Terwiesch (2019); Raman et al. (2018); GS1 (2022); APICS/ASCM (2021)
3. Technology-Enabled Logistics for Solo Entrepreneurs	• Cloud-based WMS/OMS, shipping automation tools, API/iPaaS integrations, on-demand warehousing platforms	Sanders (2020); Wamba et al. (2020); Increff (2022); Flexe (2023); Christopher (2016)
4. Frameworks: SCOR, Lean, Agile	• SCOR model (Plan–Source–Make–Deliver–Return–Enable); Lean principles (value stream, flow, perfection); Agile concepts (responsiveness, decoupling point); Leagile hybrid strategies	APICS/ASCM (2022); Supply Chain Council (2012); Lean Enterprise Institute (2021); Christopher & Towill (2001); Aitken et al. (2005)

This conceptual framework integrates four components, order fulfillment strategies for SMEs, inventory management in E-Commerce, technology-enabled logistics and supply chain management frameworks. These components highlight both operational practices and strategic approaches required for scaling.

Order fulfillment strategies include internal (in-house) fulfillment, 3PL, hybrid models, distributor-based fulfillment; workflow standardization; carrier portfolio management; service-level metrics (OTIF, perfect order). An excellent order fulfillment strategy forms the foundation of a good customer experience. Therefore, SMEs must apply the best strategy depending on their resources and market position. In achieving service-level metrics like on-time and in-full (OTIF) delivery requires balance in operational control, scalability and cost efficiency. (Chopra & Meindl, 2023; CSCMP, 2022; Hübner et al., 2016).

Second, inventory management, includes centralized visibility (OMS T/WMS), safety stock methods (rule-based vs. stochastic); multi-channel synchronization; kitting/bundling; global standards (GS1 identifiers, GS1-128 barcodes, RFID). Small scale businesses must have an effective tool to manage inventory stock without compromising service quality and inventory cost. This will ensure reliability and transparency across sales channels. (Silver et al., 2016; Cachon & Terwiesch, 2019; GS1, 2022).

Third, technology-enabled logistics provide opportunities to small firms and solo entrepreneurs in gaining access to advanced capabilities without spending a large sum for heavy infrastructure investments. Integration of these tools enables multi-channel order fulfillment while maintaining flexibility on the other hand in order to address changes in demands, on-demand warehousing and logistics marketplaces must be employed together while following digital standards to ensure accuracy. These tools results to a more transparent, accessible and reliable logistics method allowing small businesses to be at par with other competitors who are experiencing fast changing e-commerce conditions. (Sanders, 2020; Wamba et al., 2020; Flexe, 2023).

Supply chain management frameworks like SCOR, Lean and Agile provide ways to make processes better. The SCOR model gives categories for processes and performance measures that can be used to compare how well the supply chain is doing. Agile focuses on being flexible and quick to respond, while Lean focuses on getting rid of waste and better flow. By finding a point where push-driven lean processes and pull-driven agile practices no longer depend on each other, hybrid "Leagile" methods are both efficient and flexible. Small and medium-sized businesses can use these models to make fulfillment systems that work well and can handle changing market conditions (APICS/ASCM, 2022; Christopher & Towill, 2001; Aitken et al., 2005).

All four of these things work together provide an overview of how inventory operations and real-life fulfillment can be set up and run. The logic depicted above will guide creating a proposal for an inventory and fulfillment management for the SME company of this study.

5. Building Proposal for Improving Order Fulfillment and Inventory Management for the Case Company

This section merges the results of the current state analysis and the conceptual framework towards the building of the Proposal based on internal co-creation and discussions (Data 2).

5.1. Overview of the Proposal Building Stage

This section talks about how the Proposal for this study was developed. The goal was to provide a framework that can grow with the firm and make it easier to manage inventories and fulfill orders. This framework aims to rectify the three deficiencies of the CSA: (1) the absence of standardized order fulfillment methods, (2) the lack of a centralized inventory visibility, and (3) the excessive reliance on the founder's significance. Section 3's flaws helped us pick the proper topics for Section 4. In this part, we read the literature to uncover the best ways for small firms to use technology to keep track of inventories, build up delegation frameworks, and make workflows more consistent.

So, the proposal is developed from three inputs: the problems that came up in the CSA (based on Data 1); elements of best practice and literature selected for CF, and that inputs for the solution development (Data 2). These three steps were used for putting together the proposal. Initially, stakeholders received the CSA findings to revise. Second, ideas from literature and best practice were used as starting points to gather inputs for the solution building. Third, stakeholders made suggestions that contributed to the draft proposal.

As for contributors, it was important to involve experts with the experience in the company’s or similar processes. People who work for the company, such as the founder, mentors, and industry consultants, can talk about the first ideas and make changes to them so that they work in real life during the co-creation workshops. Their ideas are explained in more detail in Section 5.2.

5.2. Inputs to the Proposal Building (findings from Data 2)

The proposal was based on three sources of input: the CSA (Data 1), the CF (Section 4), and stakeholder recommendations (Data 2). The CSA highlighted weaknesses in fulfillment and inventory practices, while the CF offered structured insights from best practice and theory. Data 2 adds practical viewpoint from stakeholders that are aligned with real world limitations and opportunities.

Data collection 2 focused on getting the stakeholder suggestions regarding how to resolve the issues identified in the CSA. Stakeholders are given the opportunity to react to CSA findings and the theoretical frameworks used to allow transparency and openness to suggestions that are realistic and relevant. Stakeholders' insights are important in forming a concrete proposal that will bridge the gap between theory and practice.

Table 6. Key Stakeholder Suggestions (Data 2) Aligned with CSA Findings (Data 1) and the Conceptual Framework.

Focus Area (CSA)	**Inputs from literature (CF)**	**Suggestions from Stakeholders (Data 2)**	**Description**
Fragmented channel workflows cause errors and rework	Standardized fulfillment design, lean checklists, service-level metrics (OTIF/perfect order), simple visual work instructions	*"Adopt one SOP with channel variants instead of separate, ad hoc methods." "Use checklists at 'ready-to-pack' and 'ready-to-dispatch'."*	Consolidate D2C, consignment, and event fulfillment into one master workflow with only necessary channel-specific variations; include reverse logistics; publish 1 to 2-page visual guides at packing station.
No centralized, real-time inventory visibility	Cloud OMS/WMS for SMEs, SKU/lot/location tracking, FEFO for dated goods, cycle counting; pragmatic safety stock rules	*"Start with a low-cost cloud base (Airtable/Zoho). Keep a weekly-exported spreadsheet backup." "Introduce lot/expiry labels early."*	Configure a single source of truth for inventory; enable lot/batch and location moves (Main, Consignment-X, Event-Y, In-Transit); apply FEFO; set A/B/C cycle-count cadence; prepare simple dashboards for stock-outs and expiries.
Founder as single control point limits throughput and resilience	Role clarity (RACI), partner protocols & SLAs, outsource readiness (3PL triggers), cadence-based communications	"*Formalize partner reporting (consignment sell-through, event reconciliation)." "Shift customer updates from founder to a designated role." "Define a volume-based trigger for 3PL."*	Publish a one-page RACI; create partner playbook (report templates, cadence, escalation); assign customer communication to Sales/Account; define 3PL trigger (e.g., ≥50 D2C orders/week sustained) and minimal integration pack.

As seen from Table 6, stakeholder input added to available knowledge: a single master SOP to remove channel variability, a lightweight but disciplined inventory ledger that provides real-time visibility, and a governance approach that reduces founder dependency while preserving craft control. These inputs shaped the initial proposal presented below.

5.3. Initial Proposal

The initial proposal for the case company has three parts that work together: (1) a standard workflow for fulfillment; (2) centralized inventory tracking; and (3) job clarification with the ability to outsource. The four parts of the conceptual framework are order fulfillment strategies, inventory management, technology-enabled logistics, and control frameworks. These parts directly address the three problems that were found in the CSA. Each part has been turned into useful outputs that the company can use right away. These include drafts of SOPs, ledger rules, and job definitions.

5.3.1. Element 1 of the Initial Proposal - Standardized Order Fulfillment Workflow

This section focuses on standardizing procedures such that they are quick and easy to implement while maintaining high quality and efficiency. This section of the proposal develops a different order-to-delivery system for the case company, with minor, stated changes each channel.

The organization will employ a single Standard Operating Procedure (SOP) for all order channels, including direct-to-consumer, contracts, and events, with only minor variations required for each channel. Simulations (mock orders) were utilized to create and test this SOP.

A graphic process flow (Figure 4) defines the phases from order intake to delivery and returns processing.

Figure 4. Standardized Fulfillment Workflow Process Map.

When it comes to channel differences, each type has its own different needs. For example: a. In the direct-to-consumer (D2C) channel, carrier label templates are needed, along with a customer notice template to keep buyers up to date on what's going on and the need for an adult signature for alcohol deliveries. b) When it comes to consignment, tools like a restocking sheet and a partner accounting log are used to make sure that everything is correct and that everyone is responsible. For events, it is required to have both an event kit transfers form and return form that is sorted by state of the items. Additionally, performance standards must be strictly followed. These includes obtaining proof within 24 hours, maintaining error rate at below 2% and achieving an at least 95% OTIF (on-time in-full) rate.

Table 7. Proposal Element 1: Standardized Order Fulfillment Workflow.

Elements	Description
1. The process's scope and the point at which it separates	The master fulfillment process includes order taking, order confirmation, inventory allocation, packing, labeling, dispatching, obtaining proof of delivery and returns/damages. Final labeling/packing, decoupling point, separation of upstream production (forecast/push) from downstream fulfillment (order-driven/pull) stabilizes production while pushing enabling responsive delivery. A visual process map is included in Figure 4.
2. Standardized procedures (articulated as operational text for the Standard Operating Procedure).	Orders are received through the website, partner channels, or event forms and are automatically acknowledged with a confirmed ship-by date. Once confirmed, inventory is allocated at the SKU and lot level according to FEFO principles for dated goods, with any shortages triggering a back-order workflow and customer or partner notification. System creates a pick-up list that serves as a guide in picking process by location, SKU, and lot, after which items are packed in a tote bag with corresponding label. At the Ready-to-Pack room, a supervisor conducts a review of SKU, lot, quantity, container integrity, and other necessary accessories before closing. Packing also includes placing tamper seals, labeling cartons, recording the gross weight and dimension. A final scan is done at the “Ready-to-Dispatch” gate which confirms label-to-order accuracy, a photo of sealed box is saved, and the package is handed to the carrier or driver together with dispatch log. Next, a delivery confirmation is recorded through proof of delivery (POD) signed logs. Should there be damages or returns, it shall be logged against the original order and lot, routed for reinstatement, rework or disposal within 48 hours.
3. Minimal channel versions	There are three main channels that the company operates, each follows a specific variation of the master Standard Operating Procedure (SOP). Direct-to-Consumer (D2C) orders are placed through the website and shipping labels are automatically generated by the system. Adult signature is required for alcoholic beverages deliveries. Automatic notifications are received by the customers regarding their order confirmation, shipment progress and other issues such as delays. For the consignment channel delivery, such as cafes, bars and retail partners, stocking is planned in advance. Each delivery is recorded thru a bin card or digital transfer note. Partners are required to submit a sales performance report every after 14 days and payments must be processed after 30 days. For events and pop-ups, it is recorded thru an event kit transfer. It works by recording all sales and product samples followed by a return transaction that is categorized as either saleable or spoiled. In Figure 4, it shows the overall order fulfillment process via the three channels. D2c, Consignment and Events follow a cohesive flow from order entry, dispatch documentation and post-delivery reconciliation.
4. Regulations and service standards	There are 2 quality checks that all orders must go through before leaving the manufacturing facility or warehouse. These are Ready-to-Pack and Ready-to-Dispatch quality checks to verify the accurateness and completeness of the products. No cargo is allowed to leave without clearance from these 2 quality checks gate

	because this will ensure that the product went through a strict order fulfillment quality verification. The acceptable rate for on-time, in-full (OTIF) delivery must be at least 95% all over channels while Pick and Pack line accuracy must be at least 99%. Any exceptions or returns must be remedied within 48 hours of receipt. Customers are informed within 24 hours regarding the order confirmation, shipping status and other information such delays. Regulatory compliance shall be strictly adhered and will remain to be an important component of operations. This includes strict adherence to age-restricted deliveries standards, proper product labelling including ABV, batch numbers and expiry dates, record-keeping of the completed tracks. Standard operating manual and transaction records are safekept to ensure audit compliance. A routine check of the metrics and processes is done to discover issues and problems that needs for corrective steps quickly in order to guarantee a dependable fulfillment process from start to finish.
5. Documentation and artifacts	Fulfillment documentation is securely kept and is maintained under a strict version control that is within the shared operations manual to maintain uniformity and data integrity. No other templates except the authorized and approved ones are allowed for use in the packing and dispatching stations. Order packet or the consolidated order summary, pick list, allocation details are documentation that encompasses the entire workflow. The Ready-to-Pack checklist must be reviewed and signed by the designated supervisor prior to dispatch. Dispatch log or Handover records will confirm carrier collection and timing of shipment whereas Proof-of-Delivery register shows the delivery confirmations and delivery updates. If there are returns or damages, corresponding report must be cross-referenced with the original order to ensure complete traceability. Lastly, the channel reference sheets provide a short summary of procedures applicable to Direct-to-Consumer (D2C), consignment, and event-based orders. Each document bears a unique document ID to uphold document accuracy, traceability and audit compliant.

The structured workflow is aimed to provide ease in business operations. It is expected to reduce the variables, make the process faster and set conditions to make delegation of duties safe to delegate tasks.

5.3.2. Element 2 of the Initial Proposal - Centralized Inventory Tracking

This component fixes the biggest weakness in the CSA, which is the absence of a clear and open way to track inventory in all areas of operation. It immediately applies the Lean principles of visibility and flow, as well as the SCOR model's plan, source, make, deliver, return (scm.ncsu.edu) cycle, to ensure that all stock movements, whether associated with production, consignment, or events, are captured inside a single real-time source of truth.

Currently, the business uses manual inventory tracking method such spreadsheets, log list of returns and other issues and chat logs review. The proposed inventory management improvement is the shifting from this manual approach to a standardized cloud-based ledger that contains data such as batch numbers, lot codes and storage locations for easy analyzing and monitoring. With this new approach the business will gain a full view of the inventory movement that aids in decision-making and improved coordination with sales, manufacturing and delivery department.

The SCM method is designed based on SCOR framework that sweeps all the process workflow, define metrics and identify areas for improvement, Lean for eliminating waste in predictable parts of the supply chain that'll save cost and improve efficiency and Agile to drive flexibility and provide fast responses to customer needs. This design creates an efficient, measurable and responsive supply chain.

Documenting areas for improvement is necessary to identify the problems, organize them and make a clear plan of solution. The idea is to keep the business run better. Tools such as a single cloud-hosted inventory ledger which is an online central list that tracks everything in the inventory is helpful in avoiding duplications, provides real-time updates where the team can see instantly, minimizes errors as there is no need to reconcile multiple spreadsheets and can be accessed anywhere as long as there is connectivity. For this the business may use any of the free or cheap CRM apps such as Notion, Trello or Asana or go for Zoho or Airtable if you prefer for a custom system to manage improvements like formal projects with time track and for complex projects as well.

Likewise, in inventory data movement Zoho can be used in keeping track of the inventory record. Determine how much was sold and how much was added in the inventory and the current balance. In addition, an option on what methods is applicable for the business is available. Methods can either be periodic method, where inventory is counted at certain intervals like daily, weekly and monthly or perpetual, where inventory is always updated automatically.

To align with SCOR delivery and return regulations, the concept of First-Expired First-Out (FEFO) is applied. The real-time dashboard will help in determining inventory concerns such as shortages, expirations and errors, allowing early identification and rectification of errors.

On the other hand, in terms of Lean principle where it aims for reducing waste, efficiency improvement, process standardization and improving workflow with reduced error, use of digital tools will achieve all the stated principles because digital tools remove the unnecessary steps, it helps remove waste, creates consistent processes, creates easy to understand visuals, helps track issues. Ultimately improves efficiency without any unnecessary complexities.

Building agility may be achieved by short review of cycles, such as A-class SKUs are reviewed weekly, B-class on monthly basis and C-class on quarterly basis. Findings from these reviews shall be documented right away to identify any gaps or errors for future improvements. This method will help the operation become stable and flexible. This is earlier covered in Section 4.

Integration of these methods will serve as strong foundation for the development of order fulfillment and inventory system. This will provide a clear and easy to understand visual of the movements of stocks, making sure that entries done are error free, accurate and truthful. It also helps in notifying the appropriate team on when to replenish or restock. This method enables traceability from creation stage, delivery up to returns if any.

Performance parameters are also enumerated to measure stock accuracy, out-of-stock rate, backorder rate, loss or damage rate and lot traceability time. Not only the movement of inventory is monitored using the chosen methods but the performance as well upholding SCM method's commitment for dependability and responsiveness.

Table 8. Proposal Element 2: Centralized Inventory Tracking.

Components	**Description**
1. Data model and IDs	a structured SKU code is delegated to each product that are for sale and these production batches receives a unique lot IDs with manufacture and best before dates. Inventory locations are regulated as main, consignment X, event Y, and in-transit. All transactions like receive, produce, move, issue, return, and adjust are recorded with timestamp, SKU, user, lot, locations and quantity. Status codes like available, on-hold, damage/return, expired are clear and follows the rules.
2. Fundamental processes	The ledger keeps track of incoming payments, results from production, internal transfers, dispatches, and returns. For goods that have expired, all stock usage follows FEFO. To make reconciliation quick, event operations are summed up in three transactions: kit issuing, sales summary, and returns. Adjustments need to be approved by a boss to keep control and allow for auditing.

3. Counting and reconciling	A-class SKUs are counted once a week, B-class SKUs once a month, and C-class SKUs every three months. Small differences are fixed the same day, and the cause codes are written down so that trends can be seen. Every two weeks, consignment partners send in sell-through reports that are compared to the ledger to make sure they are correct and to start actions like restocking or making changes.
4. Safety stock and planning, tailored for small and medium-sized enterprises	Simple rule-based backups are used instead of complicated statistical models. For example, safety stock = (average two-week demand + one event allocation). Every month, buffer amounts are checked and changed based on the number of days without stock and the number of coverage days. Restocking can be done with simple demand signs like 7- and 28-day moving averages, which don't require complex analytics.
5. System Instrumentation and Data Integrity	The system uses an affordable cloud tracker (Airtable or Zoho) and has clear access roles for people who can change (operations) and see (partners). Every week, exports make a copy of the worksheet that can't be read and store it on a shared drive. Putting SKU and lot information on barcoded or QR-coded stickers speeds up counts and cuts down on mistakes made by hand.
6. Transparency and Key Performance Indicators.	Alerts for things like low stock, expiration dates drawing close, and problems with reconciliation are shown on a real-time dashboard. Core KPIs: 98% accuracy in inventory, less than 3% of items out of stock, less than 5% of items on backorder, less than 8% of days of cover per SKU, less than 1% of loss or damage, and less than 15 minutes of tracking time. These numbers assist in determining when to refill and when to review for growth.

The proposed centralized inventory tracking method is illustrated in the table. These components transform unstructured process to a systematic, dependable and efficient system. The combination of SCOR’s standardization, Lean’s purification, and Agile’s Flexibility, put together, can produce resiliency in the business. With the aid of digital support, e-commerce business will run smoothly and cost-effectively.

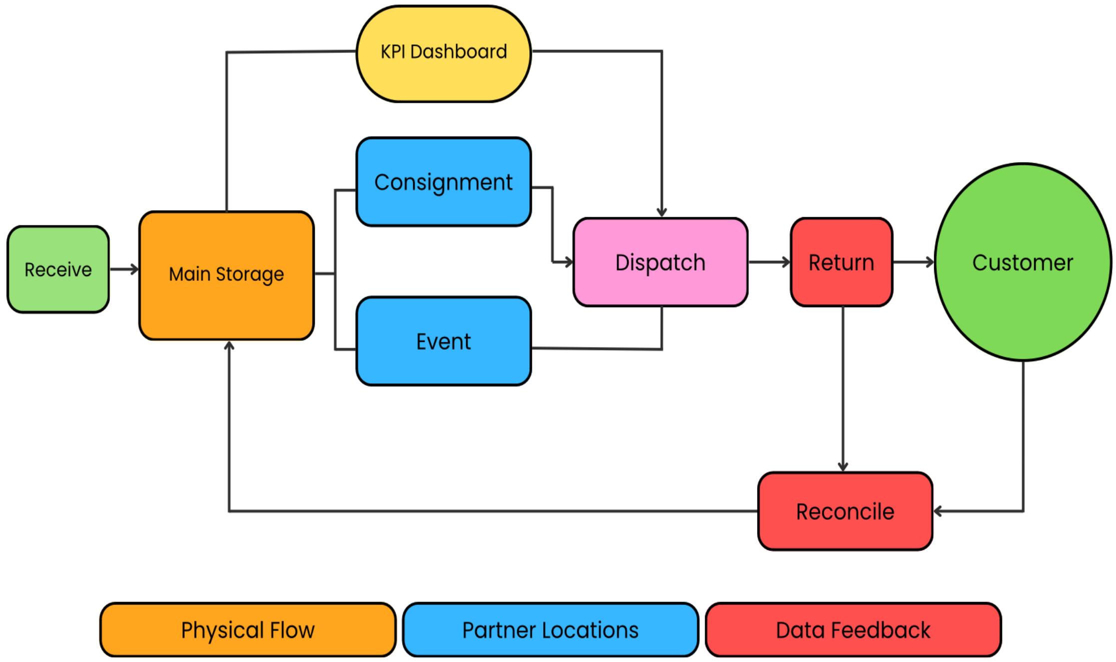

Figure 5. Centralized Inventory Tracking Process Flow.

The illustration shows the flow of inventory within the proposed centralized inventory management system. It starts with receiving of materials and keeping it to the main storage, followed by distribution to consignment, event locations and delivery to direct customers. Returns and unsold items are re-entered in the system in the reconciliation stage, where records are reviewed and performance indicators are updated. The physical flow, partner locations and data feedback are included in the diagram to determine the inventory movement within the business.

5.3.3. Element 3 of the Initial Proposal - Role Clarification and Delegation

This phase is the complete enumeration of job description. The specific responsibilities, authorities and limitations are identified in this stage. The clear delegation of duties are also deliberated in this phase. The limitation before was the excessive dependency on the founder's availability. With a clear standard on role clarification and delegation, founder dependency will be reduced. Once these standards are finalized, the information will be disseminated across the production, fulfillment, sales, partners, admin and finance team. These methods are based on tips from stakeholders and experts to hand off communication early on and to support that with templates and rhythms to keep the tone from changing and steps from being missed.

Sales or accounting send templates right away to customers for confirmation of shipment, shipment status, delivery updates and consignment reminders. This allows the team to focus on production quality and securing vendor approvals. The RACI is looked at every three months to make sure that roles are still clear as workloads change.

Partner rhythms and game plan. A short partner playbook lays out event kit time (T-7 plan, T-1 confirm, T+1 reconcile), biweekly sell-through reports, monthly settlements, and a way to handle reports that are late or missing. Customers who buy directly from a business get automatic confirmations and shipment alerts in standard English.

Ready to outsource. A 3PL pilot is started when work gets too heavy (for example, 50 or more direct-to-consumer sales per week, pick-and-pack tasks that take more than two hours per day, or two weeks in a row with less than 95% OTIF). Onboarding is quick thanks to a ready-to-share integration pack that includes an SKU master, pack specs, labeling/returns rules, and a CSV/API feed. The 3PL service is reviewed weekly using OTIF, damages, and claims.

Onboarding & continuity. Every role (internal or partner) receives a short, repeatable onboarding: current SOP excerpts, the handful of inventory transactions they'll touch, and the communication templates they'll send. Shadowing moves to supervised runs, then to independent work. A single repository (SOPs, templates, ledger backups, contact/escalation lists) avoids version sprawl.

Using instruments and being open. The same low-cost cloud tracker and labels used for inventory (edit rights for Ops; view rights for partners; weekly read-only export) support governance here too; barcoded/QR labels with SKU/lot/expiry reduce mistakes and speed checks. A small dashboard surfaces what matters: low stock, expiring lots, and open variances plus the governance KPIs below.

Table 9. Proposal Element 3: Role Clarification and Delegation.

Component	How it looks like in practice
1. Operating model and RACI in practice	The founder oversees planning production, releasing lots, getting approvals from vendors, and signing off on the final quality. The fulfillment lead or assistant oversees overseeing the pick, pack, and ship processes, as well as keeping track of tasks and recording proof of delivery. The sales or account team oversees bringing new partners on board, checking in on consignments every two weeks, planning events, and communicating with customers. The admin and finance team takes care of invoicing and settlements. When a third-party logistics provider (3PL) is involved, they manage line-haul, last-mile delivery, and returns in compliance with packaging and labeling requirements. The RACI framework for these responsibilities is reviewed quarterly and summarized on a single page.
2. Partners' cadences and rules	This is a short playbook with an event kit plan (T-7) confirm (T-1) and reconcile (T+1) every two weeks as well as an action ladder for reports that are late or missing. Standard forms can be utilized to send D2C confirmations and shipment alerts automatically.
3. Outsource-readiness and triggers.	Start the 3PL pilot if any of these conditions are met more than 50 direct-to-consumer sales per week for four weeks; pick-and-pack takes more than two hours per day; and OTIF is less than 95 % for two weeks in a row. Let 3PL have an interface pack with an SKU master, pack specs, returns rules, and a CSV or API feed. Every week, look over the OTIF, losses, and claims; use two sources or go back if service drops.
4. Onboarding and continuity	The onboarding process for any role follows three clear steps: (1) Go over the relevant parts of the Standard Operating Procedures (SOPs); (2) Practice the specific inventory transactions they'll oversee; and (3) Learn how to send messages using the message forms they'll be given. New employees start by watching more experienced team members at work, then move on to working with supervision, and finally are left to work alone. Standard Operating Procedures (SOPs), templates, copies of ledgers, and contact or escalation information are all kept in one central location that is easy to get to.
5. The instruments and the consistency	The low-cost cloud tracker allows operators to edit and partners to view data. It includes a weekly read-only export for backup and continuity. Each item is labeled with a barcode or QR code containing the SKU, lot number, and expiry date to minimize scanning errors and speed up inventory counts.
6. Transparency and Key Performance Indicators.	Service performance will be measured through the following standards: Service reliability must reach OTIF 95 percent and Pick/Pack line accuracy over 99.0% every week, as these goals are already written in the SOP and are expected of employees. To make sure the "ready-to-reconcile" gate is working, exception closes for returns or damage must be done within 48 hours every week. 98% accuracy in inventory quality, a stock-out rate of less than 3%, a backorder rate of less than 5%, and identification times of less than 15 minutes are among the standards that must be met each month. Partner control requires a consignment report on-time

	rate of at least 90% for every two-week cycle. This makes sure that the playbook schedule is followed. Governance hygiene must meet at least 95% cycle-count adherence to the ABC schedule every month, making sure that the counting schedule is met. Finally, talk to your customers According to the SOP communication rules, approximately 95 percent of order reports must be sent within 24 hours of each week.

The present lightweight stack (cloud tracker + weekly export), the partner script rhythms, and the SOP gates that have already been set can be used to measure all the above KPIs. OTIF 95 %, 48 hours of exception closing, and 99.9 % inventory accuracy are some of the numbers that are being worked toward. They are similar to current promises and include two useful governance checks: partner report timeliness and cycle-count adherence. This way, early signs of delegation success can be seen in daily operations.

Role Clarification and Delegation

Key Activities/ Processes	Founder	Production Lead	Fulfillment Staff	Sales / Account	Finance
Order Confirmation & Customer Communication	I	I	I	R/A	I
Order Packing & Dispatch	A	R	R	C	I
Inventory Tracking & Reconciliation	A	R	R	C	I
Exception Handling (Damages, Returns)	C	R	R	I	I
Stock Level Monitoring & Replenishment Planning	A	R	C	I	I
Consignment Partner Coordination	C	I	C	R/A	I
Customer Invoicing & Payment Confirmation	I	I	I	C	R/A
KPI Reporting (OTIF, Accuracy, Exception Closure)	A	R	R	C	I
SOP & Process Documentation Maintenance	A	R	C	C	I
3PL Coordination (When Applicable)	A	C	C	R	I

LEGEND: R = Responsible A = Accountable C = Consulted I = Informed

Figure 6. RACI Matrix for Role Clarification and Delegation.

The table illustrates the distribution of responsibilities of each key operational activity. This clear role clarification and delegation is done to avoid heavy reliance on the founder’s availability so he can focus more in growing the business financial standing.

5.4. Summary of the Initial Proposal

The initial proposed solution identifies three elements in different focus area that addresses the weaknesses and expected outcome.

Table 10. Initial Proposal Summary: Key Challenges and Objectives.

Focus Area	Proposed Solution (Initial Proposal Element)	Addressed Weakness / Expected Outcome
Fragmented fulfillment workflows	Standardized Fulfillment Workflow (Element 1)	Unified SOP across channels; reduced variability; improved accuracy and OTIF performance
Inconsistent inventory visibility	Centralized Inventory Tracking (Element 2)	Single cloud-based ledger; real-time visibility; full traceability and reduced stock-outs
Founder dependency and role ambiguity	Role Clarification and Delegation (Element 3)	Defined RACI structure; formalized partner protocols; readiness for 3PL engagement

The proposed solution provides a balanced and actionable system with the integration of SCOR, Lean and Agile. It serves as a practical bridge between the company's current manual setup and its envisioned e-commerce-enabled operations, providing a solid foundation for the validation and improvement activities described in Section 6.

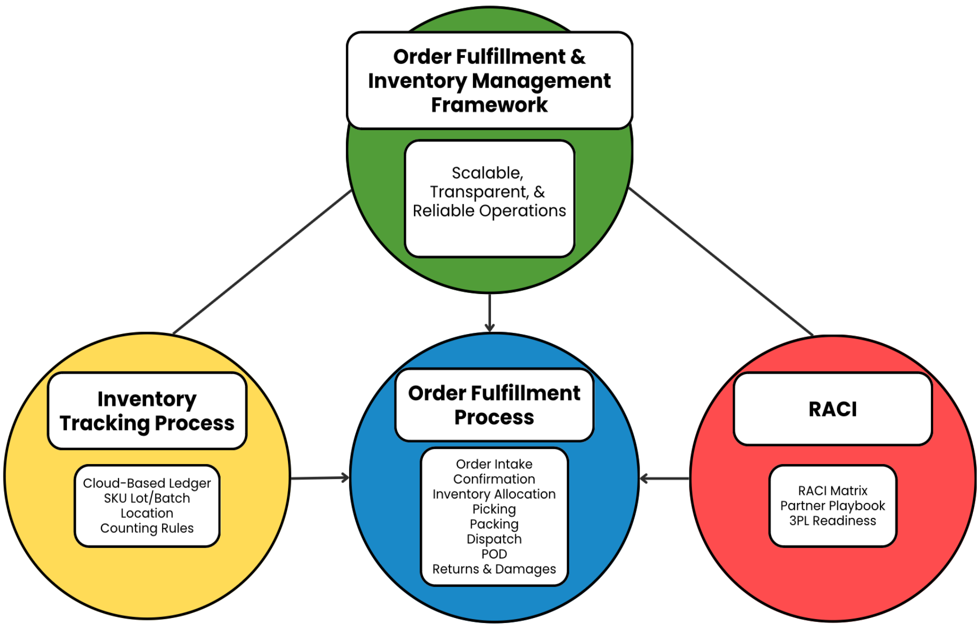

Figure 7. Initial Proposal Elements.

The three parts of the proposal contain, first, the standardized fulfillment workflow Second, the centralized system for keeping track of goods as a single ledger. Third, making jobs clear and giving them to other people is done by dividing tasks using a RACI grid, setting rules for partners, and getting the business ready for when it needs to outsource logistics as business grows.

The next step is validation of the Initial proposal in Section 6, discussing the results of how the framework was tried, changed, and finished based on what experts and stakeholders said.

6. Validation of the Proposal

This section reports the results of the validation stage and the developments made to the initial proposal. The final proposal and a practitioner level action plan is presented as a closing part of this section.

6.1. Overview of the Validation Stage

This phase is the part where the initial concept suggested in Section 5 is examined. This phase aims to evaluate whether the proposed solution is functional and compatible with the business' existing processes, which includes reliance on standardized fulfillment techniques, centralized inventory management and clearly defined job descriptions. For the validation process, it will be done through practical pilot tests, evaluation of experts and meeting of the minds with stakeholders. Strategies will be meticulously reviewed by both internal and external teams. The challenges faced during this assessment shall be analyzed to correct before relaunch. Optimal practices presented in Section 4 including SOPs, governance, SCOR, Lean, Agile, OMS/WMS with SKU, location management and outsourcing shall also be assessed and reviewed.

To assess the effectiveness of the strategy, a pilot test on the restricted quantity of existing direct-to-consumer and consignment transactions shall be done to check adherence to the cloud-based ledger and standard operating procedure (SOP). Approval criteria for evaluating findings are established to ensure that all processes are running well and all potential problems are addressed before the relaunch date.

A seminar with the founder, sale partners, contributors and stakeholders shall be conducted to discuss the test outcomes. The items for discussion shall include order packets, reconciliation sheets, and images of standard operating procedures (SOP) to gather different suggestions and insights in adopting the business strategy proposed to the business to further be informed of the adaption challenges and user experience.

Insights from an expert in operations management and two supply chain specialists will help in evaluating the opportunity for strategic growth, assessment of risk and evaluation of effectivity of SCOR, Lean and Agile in the adaptation in the business. The evaluation presented that the framework was sufficient to facilitate business growth and that the strategies are grounded in best practices.

By integrating all three methods simultaneously, the goal was to get diversified insights on validation. The pilot test showed that the proposal is feasible, the workshop came up with problems in adoption and role-specific issues, but the overall expert review confirmed that the proposal was creative and smart. The sources worked together to achieve a full validation process that is compliant with the requirements of Gate 6. The process included are practical testing, evaluation by experts and stakeholder's feedback.

6.2. Developments to the Proposal (based on Data Collection 3)

Validation provided concrete enhancements to each element of the proposal. Table 11 summarizes the experts' inputs and the action plan for adaptation to the initial proposal.

Table 11. Expert and Stakeholder Feedback and Revisions to the Initial Proposal.

Element 1 of the Initial proposal	**Parts commented in Validation**	**Description of the comment/ feedback by experts (in detail)**	**Development to the Initial proposal**
a) Standardized Fulfillment Workflow	Scope of SOP	The expert suggested that the SOP was incomplete because it did not include reverse logistics, pointing out that consignment returns occur frequently and must be systematically managed. The stakeholder suggested that without clear rules for handling damaged bottles, staff would create their own informal practices, leading to inconsistency.	A reverse-logistics stream was added to the SOP, covering receipt, inspection, reconciliation to lot/location, and reintegration/disposal. A new "ready-to-reconcile" gate was introduced to ensure all exceptions are closed within 48 hours.
b) Centralized Inventory Tracking	System resilience and accuracy	The expert suggested that relying exclusively on a cloud tool created operational risk in the event of downtime and recommended a weekly backup to maintain continuity. The fulfillment lead suggested that cycle counting was insufficiently frequent for high-demand items, noting that fast movers often produced record variances. The stakeholder suggested that event inventory was poorly tracked and required simple rules to avoid blind spots.	Introduced a weekly read-only spreadsheet backup for continuity. Tightened cycle count cadence (A-items weekly, B monthly, C quarterly). Simplified event-kit handling into three transactions (issue–sales–return) for fast reconciliation.

c) Role Clarification & Delegation	Founder dependency and communication practices	The expert suggested that founder overload was already a bottleneck and that customer-facing communication should be reassigned immediately. Another expert suggested that without standardized templates, delegated communication risked inconsistency in tone and accuracy. The stakeholder suggested that if roles and responsibilities were not explicitly defined, accountability would erode as the business scaled.	Immediate delegation of customer communications to the sales/account function. Developed standardized message templates (confirmations, delay notices, partner reminders). Updated the RACI matrix to redistribute responsibilities across production, fulfillment, sales, and finance.

As seen in Table 11, the experts and stakeholders provided extensive feedback emphasizing the need to broaden SOP scope, increase system resilience, and eliminate founder dependency more quickly. Their ideas resulted in particular advancements, such as integrating reverse logistics, incorporating redundancy and control mechanisms into inventory management, and expediting role delegation through explicit template, as shown in Table 12 below.

Table 12. Expert suggestions (findings of Data 3) for the Initial proposal.

Element	***Initial Proposal (Section 5)***	***Change from Validation (Data 3)***	***Final Proposal (Section 6)***
a) Standardized Order Fulfillment Workflow	One master SOP with minimal channel variants (D2C, consignment, events); two lean gates ("ready-to-pack", "ready-to-dispatch"); service-level metrics (OTIF, accuracy, exception closure).	Added: reverse-logistics stream for consignment/event returns and damages; new gate: "ready-to-reconcile" (close exceptions ≤48h). (Experts and stakeholders insisted that returns are part of real life and must be codified.)	One master SOP *including* reverse logistics; three gates: pack, dispatch, reconcile; explicit steps for receipt- inspection-lot/location reconciliation-reintegration/rework/disposal; exceptions must be resolved within 48hours; metrics unchanged but now cover returns quality and closure time.
b) Centralized Inventory Tracking	Lightweight cloud ledger (SKU/lot/location, FEFO); event kits handled as stock moves; cycle counting based on ABC; partner reconciliation protocols.	Added: weekly read-only backup for continuity; tightened cycle count cadence for A-items (weekly); simplified event kit rule (3 transactions: issue>sales/samples>return). (Experts emphasized resilience; pilot showed fast-mover variance and event blind spots.)	Cloud ledger remains the single source of truth, plus weekly offline backup; A-items counted weekly, B monthly, C quarterly; event handling standardized into the 3-step rule; visible dashboard flags low stock, expiries, open variances.

c) Role Clarification &Delegation	RACI defined across production, fulfillment, sales/partners, finance; partner playbook; 3PL trigger at sustained ≥50 D2C orders/week.	Accelerated: immediate delegation of customer communications to sales/account; introduced standardized message templates (confirmations, delays, reminders). (Experts warned about founder bottleneck and inconsistent tone without templates.)	RACI updated to move customer-facing comms now; standardized templates in use; partner cadences reinforced; 3PL trigger retained (less than 50 orders/week) with ready integration pack (SKU master, pack specs, returns rules, CSV/API).

The suggested refinements transformed in the initial proposal are feasible, realistic and scalable.

6.2.1. Element 1 of the Initial Proposal: Standardized Order Fulfillment Workflow

To enhance the initial proposal, a reverse logistics stream was incorporated in the SOP and included receiving the returned goods, quality checking lot and location reconciliation and taking appropriate actions such as reintegration, rework or disposal. A new gate labeled “ready-to-reconcile” was installed to make sure that returns and damages are addressed within 48 hours. These enhancements make the SOP step into the level of full integration that makes order fulfillment process complete, reliable and scalable.

6.2.2. Element 2 of the Initial Proposal: Centralized Inventory Tracking

Based on the expert’s review he mentioned using only a cloud-based inventory tool is a big operational risk if the system is down or had connectivity problems. The organization might not be able to access critical data. The fulfillment lead said that cycle counts are not happening often enough for high demand items, and that there are often problems with fast moving items. The stakeholder said that inventory related to events was especially prone to mistakes because kits are regularly returned with missing or unrecorded items, which made it difficult to keep track. To fix these issues, the Initial Proposal was to incorporate a weekly read-only spreadsheet/a periodic backup mechanism to ensure continuity when system is down. The cycle count policy is revised, establishing that A-items will be counted weekly, B-items monthly, and C-items quarterly. The event inventory management procedure was simplified into a concise three-step protocol: issue the kit, document sales and samples, and return surplus stock for reconciliation. These enhancements result to system resilience, intensify stock accuracy, and prevent event- related inventory problems, requiring both pragmatic and resilient solutions.

6.2.3. Element 3 of the Initial Proposal: Role Clarification and Delegation

The expert said that the founder should refrain from unnecessary engagement in daily communication to avoid delays and that tasks delegation should done right away instead of waiting for more orders to come in. Another expert suggested that there should be an established communication templates, to have a uniformity in communication tone, messaging and delivery quality. The stakeholder suggested that if roles were not clearly defined, there would be gaps in accountability as the company grew, which would make operations less efficient and more confusing.

In response, the initial proposal was revised by ordering the immediate delegation of customer-facing communications to the sales/finance team. A standardized templates was created to support order customer communication, confirmations, shipping notices, delay notifications, and consignment reminders to make sure that communication is consistent and professional. The RACI matrix was also updated to clearly redistribute responsibilities across production, fulfillment, sales, and finance, to address the accountability gaps and reduce excessive dependency on the founder. These improvements make the governance model more practical, scalable, and sustainable.

6.3. Final Proposal

This section discusses the Final Proposal which incorporates all the suggestions of experts and stakeholders. The table below shows the final suggestions taken from experts in the industry and stakeholders showing clearly the changes caused by the validation. It also shows the importance of each change, that problems it causes and how the business can address these problems.

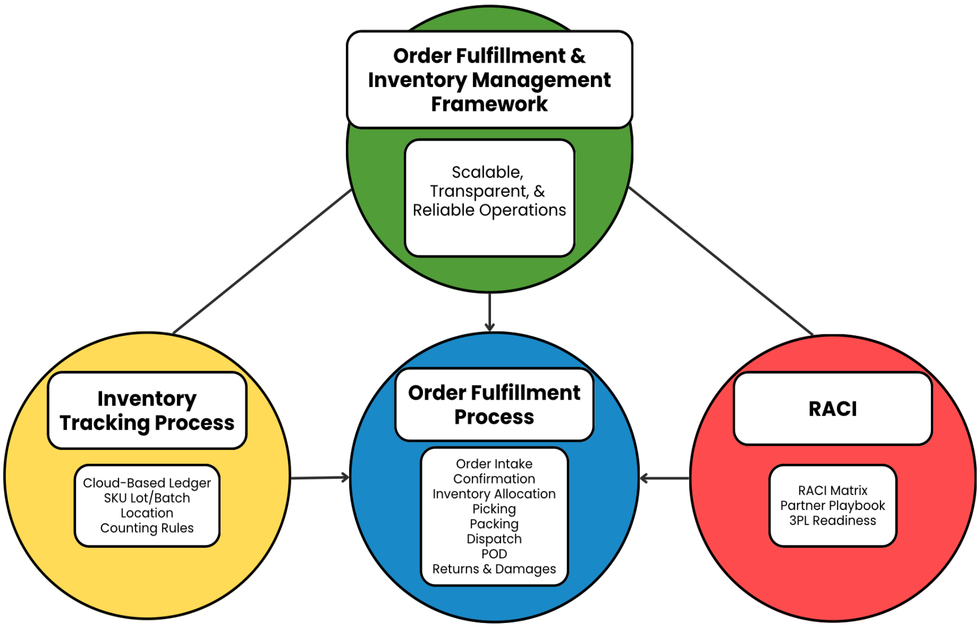

Figure 8. Initial Proposal Elements.

The validated proposal consolidates operational mechanism while allowing strategic flexibility. The addition of reverse logistics, resilience measures, and delegated governance brings the business' operations closer to best-practice models used by established businesses.

6.4. Recommendations

The primary recommendation is to apply the validate proposals within 12 months to increase the business order fulfillment and inventory management strategy without spending much on resources. This action plan provides a balance between systematic operations and strategic growth.

6.4.1. Key Recommendations for Management

The top management priority is to adopt the new standard operating procedure (SOP) without delay to attain process reliability that is essential in incorporating reverse logistics and a clearly defined exception closure process. In addition, it is important to adoption of these proposals are moving towards achievement of data resiliency and more revenues to the business. It is also important that inventory ledger will be backed up on a weekly basis and cycle counts be firmer because teams viewing the inventory are relying on its reliability and accuracy. The founder should delegated duties so he can focus more on other strategic leadership matters and quality management. Standardized templates must also be disseminated to the marketing or sales team for uniformity of responses to customers and business partners. Management can assess when the volume of work warrants outsourcing by monitoring key performance indicators (KPIs) related to operations, such as on-time delivery in full, pick accuracy, exception closure, and stock reliability. It is recommended that preparations for third-party logistics (3PL) integration be initiated after direct-to-consumer orders reach a consistent level of fifty per week.

6.4.2. Strategic Action Plan (12 Months)

The action plan is organized in a manner that spans three different time frames. Deploying the new standard operating procedure (SOP), delegating customer conversations, and activating the cloud-based inventory ledger with weekly backups are all necessary steps to take in order to stabilize operations in the short term, which covers the first three months. In the medium term, between months three and six, it is necessary to establish reliability by increasing cycle counts, enforcing partner cadences, and establishing weekly KPI reviews in order to offer visibility and discipline. During the long term, which spans months six through twelve, governance ought to be institutionalized by means of quarterly evaluations of standard operating procedures and RACI. Lightweight automation, such as barcode or QR pilots for high-demand commodities, can be tested at this point. Additionally, a 3PL integration pack can be produced to guarantee that the organization is prepared to scale when thresholds are achieved.

Table 13. Strategic Implementation Roadmap.

Timeline	**Focus Area**	**Key Activities**
Short term (0–3 months)	Stabilization	Deploy the revised SOP across all channels. Train staff on reverse-logistics procedures. Delegate customer communications. Activate weekly read-only backup and initiate regular cycle counts.
Medium term (3–6 months)	Reliability and Control	Reinforce partner cadences. Conduct weekly KPI reviews covering OTIF, accuracy, exception closure, and

		variance. Strengthen documentation discipline for event stock.
Long term (6–12 months)	Institutionalization and Scale Readiness	Conduct quarterly SOP and RACI reviews. Pilot lightweight automation (e.g. barcode or QR for A-items). Prepare 3PL integration pack including SKU master, pack specifications, returns rules, and API template.

As seen in Table 13, the Strategic Implementation Roadmap provides a step-by-step plan for improving operations over the course of a year. From 0 to 3 months, the short-term phase is all about stability It involves putting in place standard operating procedures (SOP), staff training, backups and cycle counts measure. The 3rd to 6th month phase will be stressed on checking the dependability and partner coordination by focusing on KPIs and being firmer with documentation. In the 6-12 months or long-term phase targets making system permanent and ready for operation. This includes review of processes, automation run tests and setting-up with third-party logistics partners.

6.4.3. KPIs & Implementation

Running the validated plan does not necessarily require substantial financial investment. It only needs strong managerial support, time, training, and low-cost digital tools to start it working. The company should prioritize operational discipline, transparency, and oversight ahead than spending too many resources on technology or outsourced solutions. KPI reviews should be done every week and SOP/RACI revisions every three months, in this way everyone is held accountable and the process does not get out of hand. This way, governance is built on daily operations and is not dependent on individual effort. The business will build a strong operational backbone that can handle future growth by enforcing data integrity and organized delegation.

This structured, step-by-step method helps the business avoid the wasted costs of adopting ERP prematurely or signing up for 3PL services that are not necessary. Growth is built into the way this method works. This strategy requires a high level of discipline and provides opportunity for growth that is low-cost. Although it does not need significant sum of capital spending, it still requires consistent attention from management in terms of monitoring performance, and supervising delegation of tasks. It is expected that the company will improve its operational processes and lessen its excessive dependence on the founder, maintaining its flexibility to make sure that the plan is carried out as proposed. When the organization is prepared to scale, it is the responsibility of management to ensure that data integrity is sustained and provide the "green light" for third-party logistics (3PL) partnership.

Phase	Finalize SOP & reverse logistics	Institutionalize data resilience	Strengthen inventory accuracy	Delegate & standardize communication	Reinforce governance (RACI & KPI)	Optimize partner cadence	Pilot automation & tools	Prepare 3PL integration	Monitor & evaluate
What	Plot the tasks needed for this stage of the project Finalize master SOP integrating reverse logistics and exception closure.	Implement weekly offline backup for inventory ledger.	Tighten cycle-count cadence (A weekly, B monthly, C quarterly).	Delegate customer-facing communication to sales/account function.	Update RACI matrix and launch weekly KPI dashboards.	Align partner order schedules and service levels.	Test lightweight automation (QR/barcode for A-items).	Develop 3PL integration pack (SKU master, pack specs, returns rules, CSV/API).	Monitor process KPIs, compliance, and readiness for scale.
Why	Ensure end-to-end visibility across forward and reverse flows; minimize ad-hoc handling.	Safeguard continuity against downtime and maintain data reliability.	Improve accuracy of fast-moving SKUs and reduce inventory variance.	Reduce founder dependency and standardize communication tone.	Maintain accountability and transparency as business scales.	Strengthen collaboration and reduce delay variance.	Enhance efficiency in data capture and traceability.	Prepare scalable infrastructure for outsourcing.	Sustain improvement and align with evolving business conditions.
How	Conduct workshops with fulfillment and event teams; validate reverse-logistics SOP with pilot returns.	Establish automatic export of read-only backups; store securely in shared drive.	Train fulfillment staff on ABC counting cadence; implement exception checklist.	Create and deploy standardized message templates (confirmations, delays, reminders).	Conduct RACI review meetings; activate KPI dashboard (OTIF, pick accuracy, exception closure).	Conduct joint planning sessions with partners; agree on monthly cadence.	Configure barcode/QR test for A-items; gather performance data.	Develop integration templates with IT/3PL provider; simulate CSV/API transfer.	Install feedback loop; collect monthly reports; review KPIs quarterly.
Who	Operations Manager, Fulfillment Lead, Quality Control	Inventory Controller, IT Support	Fulfillment Lead, Warehouse Team	Sales/Account Manager, Communications Lead	Management Team, Supervisor/s	Operations Manager, Partner Representatives	Fulfillment Lead, IT Support	Operations Manager, 3PL Contact, Data Analyst	Management Team, Quality and KPI Coordinator
When	Months 1–2	Months 1–3	Months 3–4	Months 3–4	Months 4–6	Months 6–7	Months 7–9	Months 9–11	Months 11–12

Figure 9. Action Plan.

The action plan summarizes phases for progression that are categorized into 3 sets, Stabilization, Governance and Alignment and Automation and Scalability. Under Stabilization, emphasizes the finalization of SOP & reverse logistics, Institutionalizing of data resilience and Strengthening inventory accuracy. Under Governance and Alignment are Delegation and standardization of communication, Reinforcing governance (RACI & KPI) and Optimizing partner cadence. Finally, under Automation and scalability includes Pilot automation tools, Preparation of 3PL Integration and Monitoring and Evaluation. Management can guarantee correct implementation of each step before proceeding to the next phase because the plan is both flexible and structured. The approach provides a satisfactory balance between the plan and necessary adjustments if needed. This systematic strategy aligns with Uttu's execution technique that ensures operational maturity, growth and adaptability to logistical changes.

With the validation of proposed improvements in Section 6, the study naturally progresses toward its concluding insights.

7. Conclusion

This final section, summarizes the main findings, answers the research question, explains the significance of the study, provides recommendations, and suggests areas for further study.

7.1. Executive Summary

The objective of this study was to design a structured workflow particularly for order fulfillment, inventory management and delivery of a small craft beverage business that is shifting from manual to online operations. The biggest challenge for the business was fixing the operational mishaps caused by lack of standardized process of order fulfillment, lack of centralized inventory system, heavy dependency on founder to get the operations working. This study is significant because more small-scale businesses are gearing towards digitalization or e-commerce. To stay relevant in the industry the business should be open to enhancement and should focus on operational efficiency and transparency.

For the purpose of this study, applied action research methodology was used, and qualitative data was gathered thru founder's self-reflection, peer interviews, documents review and analysis, and mock sales simulation. The method began with a CSA and ultimately through the formation of proposal and validation. It is clear that there is a strong connection between each step, which means that the findings from one stage will definitely influence the next stage. This method generated results that were not only based on theoretical principle but also is based on actual operational experience of the business.

The review of current state analysis stressed three key problems, fragmented order fulfillment process across channels, lack of centralized and real-time inventory management system and heavy dependence on founder to perform the operational duties. These discoveries served as the basis for the review of literature that revealed the best practices from SCOR, Lean and Agile frameworks. The theoretical foundation was obtained from academic and professional sources which was used in building a solution that is balanced both structure-wise and in terms of flexibility.

The framework that was created a result of this methodology are the following: (1) standardized workflows for order fulfillment; (2) centralized and real-time inventory management tracking; and (3) clear definition of responsibilities and rules on delegation of duties. These enhancements constitute an action plan that is transparent, efficient and scalable. Pertaining to standardized workflow, a uniform order-to-deliver process applicable through all channels is established. This process has quality gates (ready-to-pack and ready-to-dispatch) and service level metrics such as 95% OTIF (on-time in-full). As for inventory management, there will be a single cloud ledger that records everything according to SKU, lot and location function in order to centralize the recording of the inventory and track it real-time. In terms of delivery tracking, third party logistics that are within the governance component, specific responsibilities and partner norms and triggers for future outsourcing to third-party logistics. The application of these methods will lead to establishment of operational regulation without sacrificing flexibility. Small businesses have limited resources which is why all aspects should be well-balanced.

Through validation sessions with business owners, mentors, and academic supervisors, the framework was put through its paces and polished before being implemented. Its clarity, scalability, and practical usefulness were all validated by the feedback received. Standardized procedures were found to reduce the amount of time required for order preparation, increase stock accuracy, and simplify reporting, according to the results of some preliminary pilot testing conducted using dummy orders. The fact that these results are still preliminary does not change the fact that they provide optimistic evidence that the framework has the potential to improve efficiency and readiness for e-commerce practices.

In general, the contribution of the study is that it offers the company a model of operation that is both organized and adaptable, and it can be gradually implemented as the company expands. This study provides a written guide that can be used by other micro-enterprises who are faced with similar challenges and who are planning on shifting from manual to digital operation. If the plan is carried as intended, it will not only increase the efficiency of the business' daily operations but will also enhance the long-term strategic goal allowing the business to achieve sustainable growth.

7.2. Next Steps

To achieve the desired outcome and benefit from this study, it should be implemented in a clear and organized manner. A strict emphasis on changing the past process and applying the proposal gradually in each segment, being consistent in following the suggested enhancements and developing the internal skills as defined in the definition of responsibilities and delegation of roles so that the business will thrive.

Consistency is the key ingredient in achieving a positive result out of the proposed framework. The primary SOP (Standard Operating Procedure) that governs all order channels, such as direct to consumer, consignment and events, must be made official. To ensure consistency, there should also be a clear visual guide and brief checklist displayed in the packing and shipping facilities. “Ready-to-Pack” and “Ready-to-Dispatch” quality labels must also be added simultaneously. In addition, a brief and informal training sessions will also help in applying these practices in regular work.

Secondly, a lightweight cloud-based platform like Zoho Inventory or Airtable should be used to create a centralized inventory management system. The first step is to create a single, well-organized ledger for tracking SKU, lot, and address. As abilities increase, data contact with the company's online store will be introduced. Stock levels may be monitored in real time thanks to weekly reconciliation and simple dashboard tracking. This will help to prevent shortages and overstocking.

Third, the company should define employment roles and responsibilities clearly. A fast RACI (Responsible-Accountable-Consulted-Informed) matrix will help you determine who oversees each critical job. Purchasing, shipping, inventory management, and customer communication. As the volume of orders increases, some tasks, such as logistics coordination, might be delegated to assistants or third-party partners. Shift of responsibility will reduce excessive dependence on the founder thereby increasing the business’ resilience.

In fourth, business should be open to the idea of employing the aid of a third-party logistics (3PL) partner to achieve growth. This is also necessary when there are more than 50 online orders per week or the frequency of regular shipping exceeds the normal rate. A readily available data formats and conversation templates must be set-up in advance to make future adjustments easier.

Lastly, the goal should always be for continuous improvement. A regular review on the progress and performance indicators such as analysis of OTIF rate, inventory validation and back-order frequency assessment. On a regular manner, small adjustments should be made to the framework in response to customer and partner feedback. These short, well-planned assessments will ensure that the response evolves as the company expands.

To summarize, the next steps are to standardize, digitize, delegate, and continuously improve. Each of these processes reinforces the previous one to achieve long-term efficiency and scale.

7.3. Thesis Evaluation

To meet the needs of a small craft beverage firm that has limited resources, the objective of this thesis was to design a framework for inventory management and fulfillment that is customizable. In the first place, this objective was accomplished by the research project by building a framework that was not only evidence-based but also practical. On the other hand, there are still some areas that will require further improvement in the years to come.

Given the circumstances, the applied action research method proved to be an excellent approach because it supported the group in identifying the issues that were occurring and in implementing constructive solutions. To guarantee that the results were founded on both theory and practice, the procedures of analyzing the current circumstance, formulating a plan, and putting it to the test were carried out in a sequential manner. The findings, on the other hand, cannot be generalized to a wide variety of situations because the research was conducted in a casual setting and only a small number of people took part in it. If quantitative data had been included, such as measurements of order cycle times or fulfillment costs, it would have been possible to demonstrate that performance had greatly improved.

The fact that the pilot validation was primarily based on simulations rather than long-term practical use is another problem. This study has the potential to be expanded in the future by monitoring performance data from the real world after the system has been fully established. To add insult to injury, the research only looked at methods and tools that are successful for small businesses. To use the framework for larger companies, extra information technology integration would undoubtedly be required, which was not a part of this study endeavor.

When I thought back on the process of studying, I realized how challenging it is to find a middle ground between the rigorous requirements of the academic world and the requirements of the business world. A more systematic approach to data collection could have been helpful for certain procedures, particularly validation, to conduct a more in-depth investigation. Nevertheless, the fact that the research technique, theoretical background, and practical results are all coherent gives us reason to anticipate that the study will influence the world.

This brings us to the final point: the framework needs to be regarded as a work in progress rather than a finished product. The findings are provided with the idea that both their limits and the fact that they can always be improved upon are taken into consideration. The true value of the framework will become apparent over the course of time, as the business continues to enhance its processes and adjust to the always changing environment.

7.4. Closing Words

Through this thesis journey, I have learned much about myself and about the subject of my thesis. Creating the company's operational framework was a chance to connect theory and practice, to go beyond simple models and see how structured thought can really help small businesses make decisions. I wasn't expecting much of the business I once started and eventually closed that there would still be a chance of rebirthing it since I actually have locked down the idea in a storage somewhere and have no intention of finding the key to establish it back. This study however kind of gave me a little desire that maybe in the right time in the future I can pull it out again and restart it with the improvements and better practices that came out of this research.

This research opened my eyes that doing business should not be a straight-line journey but should be a journey of climbing the stairs. A business should be adaptable to change and should always aim for better processes, new innovation and larger goals. If we keep the same process from the time we started until the present time, we will be left behind and may not be able to catch up. A business owner should always be aware of its surroundings, competitors and risks. Competitors will always compete and business owners must know how to fire back or react wisely and profitably. Especially in food business where almost every day new flavors, new recipes and new deals are offered in the market, business owners should have a smart foresight and action plan if risk is at its doorstep.

But before tackling the competitor risk, a business owner must first learn how to put its own brand in order. Making sure that the basic business tools and processes are working well and within a satisfactory range of customer acceptance. A review of each business operational phase should be routinely performed making sure that everything is working well as planned from the manpower, technology and products, all should be operating well.

Ultimately, this study teaches that changes should not be dramatic or done one-time, big-time, rather it can be adapted, switched, upgraded, gradually but logically. Like liquor that tastes better with time, business success is not achieved overnight rather it is attained through consistency, constant innovation and originality. one step, one idea, and one change at a time.

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APPENDIX:

The texts in this thesis were completed based on the author's original concepts and interpretations. The analysis and conclusions were derived from the outcome of the interviews, data gathered and previous studies relevant to this topic. The author has used AI tools such as Keenious, ChatGPT 7 Pro and Canva, for the grammar checking, paraphrasing and language refinement in writing this thesis. The AI tools were also used in clarifying complex concepts, searching for relevant material, and creating visuals and diagrams. The use of AI tools was done responsibly ensuring that the core ideas and conclusions were formed independently by the author.