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Enhancing Quality and Efficiency in Operations

A Qualitative Study of the Inbound Process of a Second-Hand Online Retailer

Master's thesis in Quality and Operations Management

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Abstract

Following the increased customer demand for flexibility and accessibility e-commerce has become a substantial segment of the global retail industry. This study investigates a company that operates as an online retailer, specialising in second-hand items. Due to the rising demand for both flexibility and sustainability, The Company has experienced significant growth in recent years, with a primary focus on expanding existing processes to increase capacity and operational efficiency. To further improve efficiency, The Company needs to conduct a thorough analysis of the processes to identify potential bottlenecks and inefficiencies. The Company has also recently observed an increase in quality-related issues within its processes, resulting in a notable number of defects and recurring rework. Therefore, this study aims to provide The Company with recommendations on how to enhance the quality and efficiency of their inbound process.

Through observations, interviews, and process mapping, several limiting factors were identified and categorised into four themes: *Production Design, Performance Metric, Training,* and *Motivation & Engagement*. To comprehensively address the limiting factors, six final recommendations are presented. An implementation strategy as well as the significance and potential impact of implementing the recommendations are further discussed, along with the applicability of the research findings to other companies and contexts. By implementing these final recommendations, The Company can enhance both the quality and efficiency of its inbound process, creating opportunities for sustained growth.

Keywords: Employee Training, Motivation, Performance Metric, Process Efficiency, Process Mapping, Process Quality

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Sincerely,
Lisa Hörnberg and Emma Zöögling, May 2024

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1 Introduction

This chapter introduces the increasing demand for sustainability and the growing consumer expectations regarding flexibility and accessibility. The chapter also introduces The Company, an online retailer for second-hand items and provides a brief presentation of The Company's business model and company background. Furthermore, the chapter consists of a problem description, a clearly defined aim, and relevant delimitations to provide clarity on the research scope.

1.1 Background

In recent years, there has been a noticeable shift in consumer behaviour characterised by heightened awareness and selectivity in consumption habits (Rita & Ramos, 2022). This shift places significant pressure on businesses to adapt to evolving consumer demands. Today, a large number of customers are committed to sustainability and seek to minimise the environmental impact of their consumption (Rita & Ramos, 2022). As a response, many businesses have adopted a circular approach to their operations and flow of goods (Kirchherr et al., 2017). By embracing a circular economy, businesses aim to minimise waste by retaining materials within the economy for as long as possible, thereby extending the lifecycle of products (European Parliament, 2023). Simultaneously, businesses need to address the increasing consumer expectations regarding flexibility and accessibility (Zhang et al., 2022). E-commerce has emerged as a response to the demand for flexibility and accessibility and has significantly evolved over the past decade, becoming a substantial aspect of the global retail industry (van Gelder, 2023). Due to the change in consumer behaviour, e-commerce platforms are confronted with the task of addressing increased environmental awareness while also providing a more flexible customer experience. Balancing these requirements while maintaining operational efficiency is a challenge that businesses are facing today (Lei et al., 2016).

This report focuses on a company operating as an e-commerce platform specialising in second-hand retail. The Company puts a lot of emphasis on sustainability and seeks to extend the lifecycle of used items of good condition, guiding their customers "From careless consumption.

To better use". The Company's business model is based on collecting used items from individual consumers and reselling them to new users, enabling a more circular economy.

The Company's operations can be divided into two distinct operational segments: one dedicated to collecting and handling consumer items, and the other focusing on selling these items through the online platform. The latter segment closely mirrors the traditional supply chain of e-commerce retailers. However, the initial segment of the operations is more complex and can be described as a reverse supply chain because of the unpredictable inflow of items, where the customers serve as the primary suppliers. According to Lindsey (2016), reverse supply chains significantly differ from their traditional counterpart. Unlike the traditional supply chain, which adheres closely to seasons and trends, the reverse supply chain is characterised by greater variability. The erratic behaviour of the reverse supply chain results in operational challenges as standardising processes for unpredictable, high-variety goods is a complex task.

The Company collects used items by sending out large plastic bags which the customer fills with items they wish to either sell or recycle, ensuring that nothing goes to waste. The items in the bags can range from clothing items, and interiors to unique and unconventional items. When the items arrive at The Company's facility, they are handled through multiple process stages before they finally are published on the online platform and are available for purchase by the next customer.

1.2 Problem Description

During recent years The Company has encountered challenges similar to those faced by traditional e-commerce retailers in terms of operational efficiency. Since their establishment in 2014, they have witnessed significant growth, driven by the large number of customers seeking to sell their items through the platform. Throughout the period of growth, The Company's emphasis has been on expanding existing processes to increase capacity and operational efficiency. These efforts were intended to cope with the increasing demand and to streamline processes. To further promote long-term growth and sustainable efficiency improvements, The Company must analyse the individual processes more thoroughly to identify possible bottlenecks and inefficiencies. The term *efficiency* refers to the ability to achieve specific goals with limited waste, effort, time, and resources (Rodriguez & Walters, 2017).

Furthermore, The Company's emphasis on increasing capacity and streamlining processes has resulted in a neglect of process quality. Recently, recurring quality issues have been identified throughout the process, which The Company believes collectively diminish customer satisfaction and reduce process efficiency. The Company has also observed that employees are not consistently thorough in their work, leading to a significant amount of rework to correct mistakes in subsequent process stages. Addressing these quality issues is essential for The Company to ensure a high level of quality and to further improve operational efficiency. *Quality* is defined as items that satisfy the stated needs and are free from deficiencies (Bauer et al., 2002).

The Company's inflow can consist of various household items, although the majority of items processed fall within different categories of clothing. The unpredictable nature of each item necessitates thorough analysis and handling across multiple process stages before it can be listed and sold through the platform. These *process stages* include the reception of customer bags, item evaluation and creation of detailed descriptions, photographing and packaging, which together are referred to as the *inbound process*. The high variety of items requires several decision points that necessitate a high degree of manual employee involvement. The diverse item characteristics also make it challenging to implement fully standardised work routines, emphasising the critical role of employee performance and engagement.

1.3 Aim

Based on the problem description, the following aim for the study has been developed:

The aim of this study is to provide The Company with recommendations on how to enhance the quality and efficiency of their inbound process.

To provide recommendations, factors limiting the inbound process in terms of quality and efficiency will be identified and analysed.

1.4 Delimitations

The scope of this study is limited to The Company's inbound process within the Poland facility where the majority of items are handled, excluding other facilities and external processes. This limitation ensures a focused and detailed examination of The Company's internal operations at

the specific location. Lastly, although the study's findings will be of relevance to other companies dealing with similar challenges, the focus will be on The Company and their inbound process.

2 Theoretical Framework

This chapter presents relevant literature and research aiming to create an understanding of concepts and terms needed to understand and evaluate The Company's current situation and explore future recommendations. First, various perspectives on operational performance are presented, detailing how it can be evaluated, the factors that influence it, and strategies for improvement according to the literature. Additionally, literature about processes and how they can be visualised and analysed is presented and explained to provide a theoretical framework for evaluating The Company's inbound process. Finally, due to the identified issue with employee performance, the last section focuses on factors influencing employee performance and different improvement strategies. It covers areas such as motivation, employee training, and the nature of work tasks, highlighting their impact on employee performance.

2.1 Operational Performance

The term performance is extensively used across all management fields. According to Lebas and Euske (2007), performance encompasses all processes that make managers take appropriate actions today, fostering a future organisation that is both effective and efficient. The authors describe it as doing something today that will lead to an outcome of measured value tomorrow.

The following subsections will describe the evaluation of operational performance and explore literature describing the key factors of quality and efficiency. Additionally, the concept of waste will be defined and described due to its significant and direct impact on operational performance.

2.1.1 Performance Objectives

Slack and Lewis (2019) describe five performance objectives which can be used to analyse an organisation's performance at an operational level: *quality, speed, dependability, flexibility*, and *cost.*

The *quality* objective entails meeting or exceeding customer expectations by considering both the level of product or service specification and how well the operation adheres to it, this objective is described further in Section 2.1.2. *Speed* refers to the amount of time it takes to

complete an operations process, with a focus on fast delivery and short lead times. According to Slack (2017), speed in production processes not only saves costs but can also be valuable to the customer as both productivity and customer satisfaction might increase. Slack and Lewis (2019) further describe that *Dependability* focuses on keeping delivery promises, honouring the delivery time given to the customer and avoiding delays, cancellations, or disruptions. *Flexibility* has two definitions; the first focuses on the degree of adaptability the processes have in handling input variations. The second definition focuses on how fast the operations can change between its possible states. Lastly, *cost* is defined broadly as any financial input to the operation that enables it to produce its products and services. This objective is according to Slack and Lewis (2019) the most important objective to consider.

According to Slack and Lewis (2019), The five performance objectives are interconnected, and organisations must strike a balance between them to achieve overall operational effectiveness. Depending on the nature of the business and its strategic goals, different priorities may be placed on these objectives at different times.

2.1.2 Quality in Operations

According to Bauer et al. (2002), performing with a high degree of quality in an organisation's operations has several benefits for the organisation, the employees, customers, and suppliers. Employees are affected by the quality of the processes as it makes their job easier when error-free processes are performed (Bauer et al., 2002). Additionally, meeting customer demands can also boost employee motivation and safety by fostering a sense of accomplishment and job security. Employees are crucial when it comes to implementing quality efforts within an organisation (Bauer et al., 2002). When all employees are involved and participate in the organisation's efforts, the chances of achieving qualitative operations are substantially higher. Creating an environment and climate where employees feel supported, motivated, and can develop helps organisations to excel (Bauer et al., 2002). A culture that embraces quality engages employees in improvement efforts and incorporates quality thinking into their daily tasks (Sörqvist & Bergendahl, 2021).

Quality also benefits the organisation as resources are utilised effectively when high-quality processes are performed (Bauer et al., 2002). This saves time and cost by reducing rework, warranty claims and scrap. When an organisation fails to achieve quality, it can have negative

impacts, especially in terms of receiving customer complaints. Subsequently, if an organisation instead delivers high-quality products or services that meet or exceed the customer's requirements considering for example product specifications, delivery times, pricing, and performance they will achieve high customer satisfaction (Bauer et al., 2002).

2.1.3 Efficiency in Operations

According to Lebas and Euske (2007), performance is often connected with effectiveness and efficiency. Efficiency is also an important aspect of Lean Manufacturing as it aims to increase productivity in a process by reducing waste (Gremyr et al., 2020). There are two different types of efficiency: resource efficiency and flow efficiency, where the latter is the primary focus of Lean Manufacturing. According to Sörqvist and Bergendahl (2021), resource efficiency is defined as how efficiently available resources such as humans, tools, and equipment are utilised. When resources are maximised, this type of efficiency is typically very effective (Gremyr et al., 2020). Flow efficiency on the other hand is defined as how a single unit such as people, physical goods or information contributes to the created value, in comparison to the total lead time of the process (Sörqvist and Bergendahl, 2021).

Improving the speed and quality of processes is usually related to improving flow efficiency (Gremyr et al., 2020). However, achieving complete flow efficiency can be challenging, and as a result, most processes today are designed to achieve resource efficiency. It is also important to note that due to the constant presence of variations, it is not possible to achieve maximum resource and flow efficiency, and there is always a trade-off between the two dimensions of efficiency (Sörqvist and Bergendahl, 2021). Gremyr et al. (2020) further explain that organisations need to balance these two efficiency types to be able to optimise their operations.

2.1.4 Eight Types of Wastes

Waste represents the opposite of resource efficiency, directly impacting operational performance. According to Sörqvist & Bergendahl (2021), anything that does not add value to the customer or is critical to the business operations is considered non-value-creating. Non-value-creating activities can be divided into two distinct groups: necessary non-value-creating activities and waste. Sörqvist and Bergendahl (2021) further describe how waste can be eliminated from a process without altering the value proposition. Below the eight types of waste are presented:

1. The first type of waste is *overproduction*, which describes the situation when producing more products than necessary or producing them before the products are demanded which both impacts time and resources (Santos et al., 2015).
2. Secondly, *over-processing* represents another form of waste, entailing the execution of tasks that do not add value to the final product by adding functions or appearances that the customer is not willing to pay for (Sörqvist & Bergendahl, 2021). This results in unnecessary costs and time spent without adding any value.
3. Waste in terms of *inventory* is a common problem that refers to inventory in terms of raw materials, work-in-progress and finished goods (Santos et al., 2015). Inventory directly binds up capital but can also hide underlying issues or other wastes in the production flow rather than address them, making it a problematic waste (Sörqvist & Bergendahl, 2021).
4. The fourth type of waste is *waiting*, which directly impacts the efficiency of a process. Waiting can be defined as a situation where goods or products are not moving, and time is not efficiently utilised, directly affecting the lead time (Sörqvist & Bergendahl, 2021).
5. *Transportation* is another type of waste which involves moving materials or products from one unit or place to another. This waste directly impacts productivity without adding any value, which makes it important to address and eventually minimise or eliminate (Sörqvist & Bergendahl, 2021).
6. Similarly to the fifth waste, *unnecessary motion* is a type of waste that involves excessive movement by humans or equipment which does not create value for the customer (Sörqvist & Bergendahl, 2021).
7. The seventh waste is waste in terms of *defects*, such as when produced products create scrap, need rework or repairs that disrupt the production. This is a common waste which affects the efficiency of the process flow (Sörqvist & Bergendahl, 2021).
8. Lastly, a type of waste which has been added to the list in recent years is the waste of *unutilised people* (Sörqvist & Bergendahl, 2021). This occurs when employees' skills, knowledge, creativity, and potential are not utilised to the fullest or do not contribute directly to the process. Additionally, it is also considered a waste when employees are not fully motivated to perform or lack work tasks. Liker (2004) describes the eighth waste as "Losing time, ideas, skills, improvements, and learning opportunities by not engaging or listening to your employees".

2.2 Understanding and Analysing Processes

Production units are usually faced with three major challenges: increasing production costs, quality issues, or longer lead times (Holweg et al., 2018). According to Santos et al. (2015), the problems can originate from various aspects of the production process, including employees, materials, tools, methods, or products. In order to enhance business processes, it is crucial to identify the central issue of the process and analyse the underlying reasons behind it (Bauer et al., 2002). This knowledge can then be used to improve processes to minimise variation, eliminate non-value-creating activities, and increase customer satisfaction. The key issues hindering a smooth flow of production units are usually inconsistency in quality and productivity (Santos et al., 2015). However, all factors affecting the processes need to be evaluated, including materials, machines, methods, and people to identify all root causes (Bauer et al., 2002).

Processes are what constitute an operation, where a process can be defined as a series of steps or activities that transform inputs into outputs, where the output is the ultimate purpose of the process (Bauer et al., 2002). According to Holweg et al. (2018), a process is composed of inputs, conversion, and outputs, as illustrated in Figure 1.

Figure 1, The components of a process converting input to output.

The inputs can be anything from production resources, materials, components, labour, energy, or capital (Holweg et al., 2018). These inputs undergo several process steps and as the inputs move through each step they are transformed into work-in-process, which is referred to as the conversion. The output is the result of the conversion and occurs when the input has been transformed and is completed or becomes useful to the customer, even though this is not necessarily the end customer. However, a process can also result in undesired outcomes, such as emissions, rework, defects, and scrap (Holweg et al., 2018).

A prerequisite for a functioning process is a continuous and effective flow of material, also referred to as a material handling system. Material handling involves ensuring the correct materials are delivered to the right place, at the right time, and in the right quantity and encompasses all material movements within a manufacturing setting (Stephens & Meyers, 2013). Srinivasan et al. (1994) describe how all steps in a process have designated pick-up and deposit points from which materials are consequently delivered to and picked up from. According to Mohsen and Hassan (2010), manufacturing operations lacking a well-designed material handling system may face delays, increased production times, an increased risk of product damage or defects, and unnecessary motion, all potentially inflating operating costs. Conversely, a well-designed material handling system can boost productivity, enhance product quality, and reduce operating expenses (Mohsen & Hassan, 2010).

2.2.1 Flowchart – a Processes Mapping Tool

To comprehend and improve processes a widely used technique is process mapping (Holweg et al., 2018). A process map provides an overview of a process, including its different stages and main stakeholders. The method involves creating flowcharts and outlining the sequence of stages, steps, decision points, and flow of information throughout the process (Hirano, 2011). According to Holweg et al. (2018), process mapping is an effective tool for process improvement, and it is the first step to take in an improvement effort. Process mapping can help identify inefficiencies, bottlenecks, and opportunities for improvement (Hirano, 2011).

Holweg et al. (2018) describe flowcharts as an effective tool when mapping out a process. Flowcharts are usually used to define the current state of a process and map each step included between the start and end of the process (Bauer et al., 2002). Flowcharts help in visualising each detail of the process, making it easier to understand the reality of what is happening (Hirano, 2011). Hirano (2011) further describes how the steps within a process can differentiate between value-creating and non-value-creating activities, helping to identify areas where value is created and where non-value-creating activities are occurring. Processes that convert resources into something valuable for customers are known as value-creating activities. As described in Section 2.1.4, non-value-creating activities are instead activities which do not transform the material but still consume resources and time, also referred to as waste. By identifying these activities, areas of improvement become apparent within the processes (Hirano, 2011).

When creating a flowchart there are standard symbols which can be used to map out the process, see Figure 2. These symbols help to differentiate value-adding and non-value-adding activities (Hirano, 2011). According to Hirano (2011), while mapping the process it is important to define the boundaries of the map by identifying the start and endpoints. Then, the activities should be arranged from left to right or top to bottom in the sequence of the process steps.

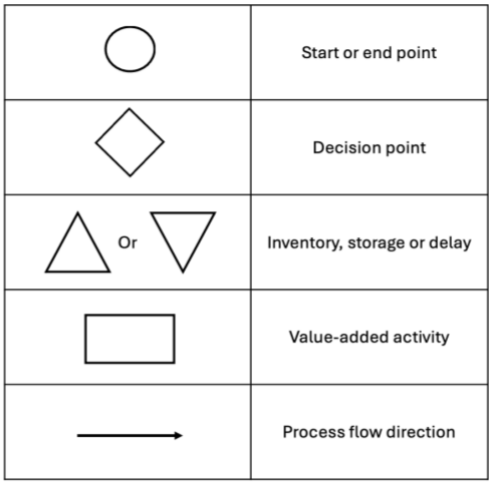

Figure 2, Standardised Flowchart Symbols

2.3 Strategies to Enhance Employee Performance

According to Rodriguez and Walters (2017), it is crucial to establish clear goals and standards to measure progress in order to improve employee performance. The most common factors to measure regarding an employee's performance are productivity, efficiency, effectiveness, quality, and attendance (Rodriguez & Walters, 2017). Organisations should further measure employee performance in a standard way to ensure clarity and efficiency, thus leading to increased performance. The authors further explain that an employee's performance can be affected by several factors such as their skills, workload, lack of standard routine, unclear performance standards, and pressure from co-workers. To enhance an employee's performance, it is therefore also important to create a good work environment that fosters motivation, trust, teamwork, and establish clear performance measurements (Rodriguez & Walters, 2017).

The following sections will focus on different perspectives of motivation and strategies to increase motivation among employees. The sections will also present literature focusing on

employee training and different work approaches such as job rotations and cross-training and explore how they impact employee performance.

2.3.1 Different Perspectives of Motivation

Lussa et al. (2023) describe how motivation at work forms the cornerstone for organisational growth, indicating the existence of discipline. The authors state how motivation encourages employees to approach their responsibilities with diligence, carefulness, and an active and enthusiastic mindset. Organisations that manage to motivate their employees will most likely gain both operational and economic advantages as well as develop a long-term competitive advantage (Jacobsen & Thorsvik, 2014).

According to Deci et al. (2017), autonomous motivation is a type of motivation where people engage in activities or work by their own will or interest instead of feeling forced or controlled by external factors. This type of motivation is crucial for organisations and employees since autonomous motivation leads to better performance, learning, and adaptation (Deci et al., 2017). Employees can experience autonomous motivation when they feel a sense of purpose and ownership in their job, and when they receive clear feedback and support. Motivation can also be controlled through both outcome-driven rewards and power relations. However, this can instead result in both a lack of engagement and efforts by employees, short-term successes and limited performance (Deci et al., 2017).

Motivation can also be divided into internal and external motivation. Internal motivation is a type of autonomous motivation where employees or people find interest and enjoyment in the assignment or job and can perform it without the need for any external reward (Deci et al., 2017). This type of motivation can result in higher work quality and overall wellness. Deci et al. (2017) further explain that external motivation is driven by performing an activity to receive a reward or to achieve a specific outcome by external factors. These external factors can include incitements like money, promotions, praise, or recognition.

Fowler (2014) presents three psychological needs that together describe and determine a person's motivational level. The three needs are *relatedness*, *competence* and *autonomy* and their summarised degree of satisfaction can describe an employee's overall motivation. *Relatedness* focuses on the need to care about and to be cared about by others and to feel a

sense of greater purpose (Fowler, 2014). The need for *competence* focuses on the need to feel effective at meeting everyday challenges and opportunities, demonstrating skill over time. Lastly, the need for *autonomy* highlights the human need to have choices and be the source of its own actions. According to Deci et al. (2017), workplaces that support the fulfilment of the three basic psychological needs have a higher level of employee well-being, performance, and autonomous motivation.

2.3.2 Strategies to Increase Motivation

When presenting strategies for increased motivation Jacobsen and Thorsvik (2014) talk about motivational incitement and state that the two most important incitements an organisation can offer are salary and career systems. These incitements are both of a materialistic character, however, motivational incitements can also be of a symbolic character such as recognition and appreciation from a manager. The authors also highlight that most rewards have both a materialistic and symbolic character, for example, a promotion often comes with an increased salary as well as increased status and recognition.

Jacobsen and Thorsvik (2014) also highlight the importance of the three psychological needs; *relatedness, competence,* and *autonomy* and relate these to a model originally developed by Hackman and Oldman in 1976. This model presents five strategies an organisation can consider for increased overall employee motivation.

First, the authors highlight the importance of combining work tasks to increase the employee's experienced daily variation and to create a more holistic and purposeful perception among the workers. A common approach to this is to implement rotations where employees get to work at different process stages and with different tasks (Ortega, 2001), this approach is further explained in Section 2.3.2. Jacobsen and Thorsvik (2014) also mention how an organisation should aim to create work tasks which stimulate a sense of personal ownership for the employees involved in the tasks. This can be done by for example allowing employees to follow a project through from start to finish. Thirdly, the authors mention the importance of communicating the big picture and illustrating how each employee's efforts contribute directly towards achieving those objectives. Additionally, they present the strategy of allowing a higher degree of autonomy and personal responsibility to increase the perceived level of autonomy. Lastly, the authors mention how an organisation also should focus on strengthening or adding

feedback channels to better follow up on employee performance and development (Jacobsen & Thorsvik, 2014).

Jacobsen and Thorsvik (2014) conclude that organisations that prioritise and put great emphasis on their employees and their individual development with efforts such as implementation of different incitements, and adapting work tasks to increase *relatedness*, *competence* and *autonomy*, will utilise their human resources more effectively. This relates to the eighth waste: *Unutilised people,* described in Section 2.1.4 and how prioritising employee motivation will consequently result in less waste.

2.3.1 Employee Training and its Correlation to Employee Performance

Employee training and development is essential at all levels of an organisation as it helps individuals achieve different objectives and ensure a high quality of work (Rodriguez & Walters, 2017). Rodriguez and Walters (2017) describe how employees may become less motivated to continue working if they encounter difficulty in executing tasks effectively or if the outcomes do not meet their expectations. Over time, these individuals might choose to leave the organisation because of low productivity or dissatisfaction with their performance. Therefore, employee training acts as a tool that not only improves job performance by developing competencies but also helps employees feel more satisfied and confident in their abilities (Rodriguez & Walters, 2017). Rodriguez and Walters (2017) further highlight how employee training and development stands out as a key motivator employed to assist both individuals and organisations in achieving their short-term and long-term goals and objectives.

Research suggests that new employees at companies with clear and well-designed training programs feel more welcomed and valued, which ultimately leads to lower turnover rates (Davila & Pina-Ramirez, 2018). Eventually, reduced turnover results in significant cost savings due to an increased level of productivity and minimal expenses being spent on recruiting and training new employees.

2.3.2 Job Rotation and Cross-trainings Impact on Employee Performance

Job rotation refers to the practice of moving employees from one work task to another, allowing them to perform different types of jobs at different times (Jorgensen et al., 2005). The primary objective behind implementing job rotations is to increase learning and knowledge and gain

new skills and competencies, while simultaneously decreasing boredom (Bhadury & Radovilsky, 2006). Furthermore, research has shown that job rotation has a positive impact on employee motivation, making it an effective tool for enhancing workforce engagement and productivity (Kaymaz, 2010).

According to Casad (2012), can job rotations be divided into two types: cross-functional and intra-functional. Cross-functional job rotation occurs when an employee moves from one function to another, such as from manufacturing to logistics. Intra-functional job rotation occurs when an employee moves from one task to another within the same function. Job rotations can therefore be a useful tool for creating an efficient recourse allocation for lower hierarchy-level jobs working intra-functionally (Eriksson & Ortega, 2006). For example, by rotating employees between different tasks to meet production requirements.

Job rotations should not be confused with cross-training, which is another method used to adapt employees to new skills and tasks. Casad (2012) describes that cross-training focuses on employees learning new skills by temporarily entering new tasks and job duties, and then returning to their ordinary work tasks. Cross-training is therefore an effective way for organisations to create flexibility in their processes by reallocating employees temporarily to balance flow during high demand. The main difference between job rotation and cross-training is that cross-trained personnel are only temporarily re-allocated, while employees who are job-rotating stay at their new task (Casad, 2012).

3 Methodology

The following chapter describes the research strategy, presents the different data collection methods which were utilised throughout the study and describes how the gathered data later were analysed. Furthermore, the quality of the research in terms of credibility, transferability, dependability, and confirmability is discussed and motivated and relevant ethical considerations are addressed.

3.1 Research Strategy

The research strategy for this study was designed to employ a comprehensive approach which integrates various methods to explore and understand the operational processes under investigation thoroughly. This strategy was tailored to align with the study's aim, emphasising the collection of data from diverse sources to enhance the quality of the findings.

When it comes to research, two primary methodologies are typically employed: quantitative and qualitative research strategies. Quantitative research is mainly concerned with numerical data and statistical analysis, with the goal of measuring and quantifying phenomena (Bell et al., 2019). Data in quantitative research is typically gathered through structured methods such as surveys, questionnaires, and experiments. Qualitative research, on the other hand, is a method that focuses on understanding words and meanings rather than numerical data (Bell et al., 2019). Qualitative research aims to provide in-depth descriptions and explanations of visual or textual data and answer questions about experience, meaning and perspective, most often from the standpoint of the participant (Hammarberg et al., 2016). This approach often uses semi-structured or unstructured techniques for data collection, such as interviews, focus groups, and observations.

In this study, the primary research approach was qualitative inductive research, driven by the research's objectives. Within the qualitative research framework, Bell et al. (2019) describe inductive research as a method where theory emerges or develops from the collected data. This method utilises data sources such as interviews, observations, and documents to comprehend and explain phenomena (Bell et al., 2019). Additionally, as qualitative inductive research primarily employs non-numerical data sources, it is worth mentioning that some numerical data will be retrieved to facilitate a better understanding of the processes.

3.2 Data Collection

In this section, the primary data collection methods are described and motivated. The methods aim to complement one another, collectively describing the operations in a way that aligns with reality.

3.2.1 Literature Review

To gain a deeper understanding of related concepts and theories, the literature review is a vital component of the project. Relevant literature includes academic articles, reports, and books, primarily sourced from Chalmers Library, Google Scholar, and Scopus. The literature review helped to create an understanding of existing research on relevant topics. Based on the literature a theoretical framework was created to connect and relate the study's findings to existing concepts and theories. Additionally, the theoretical framework provided the study with relevant and effective tools and methodologies which later was used while analysing findings and data.

Bell et al. (2019) present two primary approaches when conducting literature reviews: systematic and narrative. The choice between these approaches depends on the nature of the research. A systematic review is most suitable for quantitative studies involving measurable data and analysis, while the narrative approach is more efficient for qualitative research. Given the predominantly qualitative nature of this study, a narrative analysis approach was more appropriate and effective. Bell et al. (2019) describe the qualitative approach as iterative, allowing the researcher to continuously adjust the direction and focus of the research together with the increased understanding of the literature. In this study, the narrative approach facilitated a deeper understanding of the subject due to its iterative and flexible nature.

3.2.2 Interviews

To gain a comprehensive understanding of the individual steps within the inbound process as well as identify factors limiting quality and efficiency, eight interviews were conducted. During the interviews, it was relevant to consider perspectives from employees at different hierarchical levels to identify challenges of distinctive character. Therefore, interviews were conducted with operators and team leaders working directly within specific process stages, as well as shift managers with an overview of the inbound process and managers working with improving and developing the current processes. Interviewing employees directly involved in process stages

was equally important as engaging with team leaders and employees with a more holistic and strategic position. Together the different interviews helped to gain a better understanding of the current process and identify possible factors limiting the quality and efficiency of the inbound process. The interviews were conducted online through the communication platform Google Meet. Conducting online interviews is a flexible, time-efficient way to interview without incurring travel expenses but still maintaining face-to-face interaction (Bell et al., 2019). Additionally, all interviews were recorded and transcribed to ensure the collection of all relevant information. Table 1 illustrates the various job positions of the interviewees and the respective departments where they are stationed or responsible.

Table 1, Interviewees described by their job position at The Company and the respective department they are stationed at or responsible for.

Interviewee	Job position	Department
1	Operator	Assortment
2	Operator	Photo
3	Operator	Re-pack
4	Team Leader	Assortment
5	Team Leader	Photo & Re-pack
6	Shift Manager	Inbound Process
7	Production Manager	Poland facility
8	Head of Operations	Poland facility

Since the primary objective of the interviews was to become aware of the perspectives and challenges faced by the employees, interviews with a qualitative character were most applicable. Bell et al. (2019) highlight how a qualitative method allows the interview to follow the direction set by the interviewees, encouraging insight into what they find relevant and

important. In this study, semi-structured interviews were conducted, as this offers the flexibility to ask follow-up questions in addition to the initial predetermined interview questions (Bell et al., 2019). Bairagi and Munot (2019) further point out how this interview approach due to its flexible character makes it possible to acquire data or insights that were not thought of beforehand.

To further ensure the quality of the findings it is also important to consider the sampling strategy when conducting interviews (Bell et al., 2019). To identify appropriate interviewees who would contribute the most to the research objectives a purposive sampling strategy was applied. The purposive sampling strategy is according to Bell et al. (2019) one of the most common sampling strategies in qualitative research. It is a non-random sampling strategy where the participants of the research are chosen to help achieve the goal or purpose of the study. Purposive sampling is typically used when the research aims to gain specific knowledge or understanding about a particular subject, rather than drawing statistical inferences (Bell et al., 2019).

3.2.3 Observations

In addition to interviews, observations were performed to understand each step of the process as well as to get a holistic view of the entire process. According to Bell et al. (2019), observations are a good complementary method together with interviews to get a comprehensive understanding of a situation. Similarly to the interviews, the observations were semi-structured in order to capture essential variables at each step of the process. Incorporating unstructured elements allows for the identification of unexpected issues, behaviours, and factors that the structured approach may not cover (Bell et al., 2019). Additionally, observations are a reliable method to gain an accurate understanding of the process flow and are usually performed by following and observing the process steps multiple times, starting from upstream and going downstream (Bauer et al., 2002).

The observations conducted during this study aimed to create a thorough understanding of each step involved in the inbound process. This involved identifying all decision points and following the material and information flow. The process was observed multiple times to better understand its operations, as recommended by Bauer et al. (2002). The observations performed were of different character where the processes and employees were both observed from a

distance without interaction and more closely where the researchers engaged and performed the same tasks as the employees. According to Kuada (2012), these two rather different approaches can be described by the observation types called *nonparticipant* and *participant*. A *nonparticipant* observer simply observes the studied environment or people without taking part in any of the daily activities. This type of observation approach can according to the author create an unnatural situation where the observed people will be aware that they are observed and therefore alter their behaviour. *Participant* observation studies on the other hand can be described as when the observers become active participants in the situation which is studied (Kuada, 2012). While using this approach the observers perform the same tasks as the employees and engage with them more actively. Kuada (2012) highlights how this approach gives the researchers a profound knowledge of the setting of the studied situation, making it possible to describe the context in which the participants operate.

In this study, it was important to perform both observation approaches to get a holistic as well as in-depth knowledge of the processes to identify challenges, bottlenecks, and recurring issues. The data gathered during the observations were later used while mapping the current state of the inbound process, which is described in Section 3.3.1

3.2.4 Secondary Data

Secondary data was used as a valuable resource to complement the primary data obtained in the interviews and observations. Secondary data refers to data that has been previously collected by other researchers, organisations, or companies (Bell et al., 2019). Specifically, the secondary data in this research primarily originated from The Company's internal databases consisting of already measured data points. This was possible due to the high level of digital information flows which consistently generates accurate process data. Some examples of process data considered in this study are lead times for each step of the process, the number of items processed, and details regarding the allocation of human resources. This data played an important role in enhancing the understanding of the processes, providing an overview, and helping to identify process stages associated with lower quality and efficiency. Utilising the existing internal data from The Company lessened the need for additional data collection, streamlining the research process while leveraging valuable insights from within the organisation. This data was mainly used during the current state mapping, to better understand the flow of the processes, which will be described in Section 3.3.1.

3.3 Data Analysis

The following section outlines the methods used to analyse the acquired data and the process of evaluating the current state to be able to provide recommendations. First, the initial process of understanding the current state is described. Then the thematic analysis method used to identify and explore limiting factors is presented. Finally, the chapter describes how the final recommendations are generated and provided.

3.3.1 Understanding the Current State through Process Mapping

To begin the data analysis, the current inbound process was mapped and outlined in a flowchart, using the data collected through observations, secondary data, and interviews.

To fully understand each stage of the process the three-step method recommended by Holweg et al. (2018) was followed. The first step was to walk around where the process was performed to see it for yourself. This was done to get a full view of the process and not just how it should work in theory. The second recommendation was to focus on capturing the main aspects of the process rather than every detail of it or all special non-majority flows. The third recommendation was to use the standard process mapping methodology with symbols that are according to standard in this setting. Where additional explanations were needed it was added appropriately for the specific map, including comments instead of changing the standard symbols (Holweg et al., 2018).

Flowcharts were used as a tool to visualise and document the current state of the entire inbound process and helped to identify inefficiencies, bottlenecks, and opportunities for improvement. The current process was outlined in detailed flowcharts, using the method described in Section 2.2.1. The flowchart's primary purpose, beyond just visualising each step of the individual processes, was to identify value-creating and non-value-creating activities within the inbound process.

3.3.2 Identifying Limiting Factors and Categorising them through Thematic Analysis

The second stage of the data analysis encompassed the identification of factors that are limiting the quality and efficiency of the process. This part of the analysis mainly included data

collected through interviews and observations, which were analysed with a thematic approach. Thematic analysis is a commonly used method for analysing qualitative data (Bell et al., 2019). It involves identifying patterns in the data and categorising them into themes and sub-themes related to the aim of the research. To identify themes, Bell et al. (2019) recommend looking for repetitions in the collected data as well as local expressions, topic transitions, and similarities between interviewees. The identified limiting factors together with the created process maps helped to identify improvement areas and themes limiting the overall quality and efficiency of the process. The thematic analysis was conducted using the method described below by Braun and Clarke (2006).

Braun and Clarke (2006) explain that there are several steps involved in conducting a thematic analysis. The analysis is explained as an iterative process of going back and forth through the different steps of analysis. (1) The first step is when the researcher starts familiarising themselves with the collected data, such as transcribing, reading and taking notes. (2) The second phase is to create initial codes for the collected data. (3) The next step is to group or categorise the codes into broader themes, where a thematic map can be used to organise the themes and subthemes. (4) The fourth step is to refine the themes generated in the previous step. At this stage, it may become evident that certain data is missing, and some themes are too narrow or too broad. (5) The fifth step starts when the researchers are satisfied with the thematic map and give the themes clear definitions and names. (6) Lastly, the sixth step is producing and including the themes in the report (Braun & Clarke, 2006).

3.3.3 Generating Final Recommendations

Finally, to fulfil the aim of the study and provide recommendations to improve The Company's inbound process in regards of quality and efficiency, a comprehensive analysis of the research findings in relation to the theoretical framework was conducted. Connecting the findings from the thematic analysis with relevant concepts and theories provided more perspectives and facilitated learning from already conducted research.

Furthermore, to tackle the identified limitations and provide recommendations, the suggestions mentioned during the interviews were compiled. These suggestions, combined with relevant theory as well as internally generated ideas, together contributed to the recommendations to improve quality and efficiency in the inbound process.

However, identifying limiting factors and providing recommendations do not directly guarantee the changes' impact on performance in practice. Therefore, an evaluation was conducted to assess how the final recommendations, both individually and collectively, contribute to increased quality and efficiency within the inbound process.

3.4 Research Quality

When conducting this research, it was crucial to prioritise quality assessment. According to Bell et al. (2019), three primary criteria should be considered for maintaining research quality: reliability, validity, and replicability. However, it is also emphasised that these criteria are particularly relevant for quantitative and measurable studies. Given that this research predominantly adopts a qualitative approach, the criteria of *credibility, transferability, dependability*, and *confirmability* are more appropriate to consider (Bell et al., 2019).

Credibility focuses on the trustworthiness of the findings and research (Bell et al., 2019). To ensure that the analysis was based on credible literature each source was critically evaluated, eliminating sources that were not either first-hand sources or frequently peer-relieved material. This quality criteria is also important to consider when collecting data from interviews to ensure that participants are accurately understood and interpreted (Bell et al., 2019). Accuracy in information was in this study guaranteed by allowing the participants to verify the information obtained during the interviews. This method, as described by Bell et al. (2019), is referred to as respondent validation. Additionally, the appropriate number of interviews can be determined by whether the collected data has achieved saturation, defined as the point at which no new information or themes emerge from the data (Guest et al., 2006). In this study, the data was considered saturated after eight interviews, as the information provided in the interviews became repetitive over time. This justifies the sample size, as additional interviews were unlikely to uncover new insights.

The second criterion, *transferability*, focuses on whether the findings from research are generalisable and applicable to other contexts (Bell et al., 2019). Given that this research focuses on a company-specific context and internal operations, ensuring generalisability can be challenging. However, because of the many similarities to the challenges other e-commerce retailers experience when handling online returns, the findings can still offer valuable insights

into this challenge and potentially serve as a foundation for further research. This quality criterion is further discussed in Section 5.3.

The *dependability* criterion examines whether the findings remain consistent over time (Bell et al., 2019). Typically, high dependability is ensured through peer assessment. In this study, a supervisor consistently evaluated the research methods, which guaranteed a high level of dependability. Additionally, the final report was peer-reviewed by two other students during the thesis presentation.

Lastly, the quality criterion *confirmability* focuses on bias and investigates whether personal values have influenced the research in any way (Bell et al., 2019). To minimise the risk of allowing personal beliefs to impact the interpretation of results, all interviews were conducted in the presence of both researchers.

3.5 Ethical Considerations

To ensure the ethical integrity of the research there are four principles that should be considered; harm to participants, lack of informed consent, invasion of privacy, and deception (Bell et al., 2019). The authors further emphasise the importance of addressing ethical issues by informing participants about the study's approach, ensuring anonymity, and providing the option to refrain from answering questions. In this research, the ethical principles were considered by informing interviewees that the thesis will be publicised by Chalmers University of Technology. Additionally, all participants were offered the choice of remaining anonymous and not answering questions they considered to be sensitive.

4 Findings

This chapter presents the result of the research conducted, addressing the research aim. The chapter begins with a description of the current state of The Company's inbound process. Each process stage is described, and the entire process is visualised in a flowchart. Additionally, the identified limiting factors are presented and analysed in relation to their impact on the current state. Finally, recommendations addressing the limiting factors aiming to improve the quality and efficiency of The Company's inbound process are presented.

4.1 Understanding the Current State

First, it is important to understand the current state of the inbound process to be able to identify improvement areas. The inbound process encompasses the initial reception of customer bags filled with items up to the point where the items are packed and published on the online platform, ready for purchase. The inbound process consists of four individual stages: Inbound Bag, Assortment, Photo, and Re-pack. Each of these stages is described chronologically in the following sections.

The first stage, Inbound Bag, involves the initial reception of customer bags upon their arrival at the facility, where they are stored until it is their turn to be processed in the subsequent process stage. The following stages—Assortment, Photo, and Re-pack—are where the processing of the items begins. These three stages form a process line, as they are arranged sequentially in the facility, with Assortment being the first stage and Re-pack the final one. There are a total of 10 process lines in the facility today. The entire flowchart of all process stages together is visualised in Appendix A.

4.1.1 First Process Stage - Inbound Bag

The initial phase of the inbound process is called Inbound Bag, with the corresponding flowchart displayed in Figure 3. During this stage, items are received in large bags, each containing items from a single customer. The bags arrive at the facility in larger boxes, where each box contains multiple customers' bags. To begin this stage, a box is opened, and the first bag is handled. Each bag has an attached label containing a QR code which the operator scans to retrieve customer information. A new label is then printed and attached to the bag before it is placed into an empty box. This process is repeated for all bags within the box until the new

box is filled. Once all bags from a box have been handled, a label is put on the new box, indicating the current week and from what market the bags originate. The box is then put in storage until it proceeds to the following process stages.

Figure 3, Flowchart - Inbound Bag

4.1.2 Second Process Stage - Assortment

Assortment is the second stage of the inbound process, with the related flowchart shown in Figure 4. After the bags have been handled in the Inbound Bag stage and put in storage, they are transferred to the Assortment stage. The initial step in Assortment is to pick a bag from the box and bring it to a designated computer at the front of the Assortment area. At this computer, the operator locks the bag to their name by scanning the label and entering their work ID. Subsequently, the operator moves the bag to its workstation.

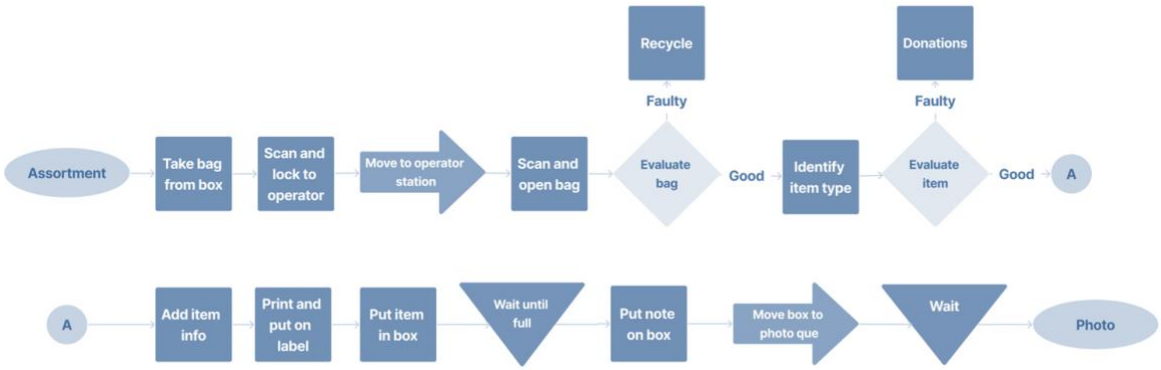

Figure 4, Flowchart – Assortment

At the operator's station, the operator begins by logging into the computer and scanning the bag once again. Afterwards, the bag is opened and evaluated. If the content is determined to be unsellable due to factors such as odour, leakage, or damage, the bag is placed into a specific recycling box. If the content is deemed acceptable, the handling of the first item starts.

Each item is described in the system on the computer where descriptions of item type, brand, and gender are registered. Following this, the item's condition and potential defects are

evaluated and documented within the system. The system then displays whether the item is suitable for sale or donation. If the item is assigned for donation, the operator places it in a designated bag at the station which is later placed in a donation box. If the item is deemed saleable, additional details such as colour, size, and patterns are registered in the system.

Once all necessary information is added, a QR code label is printed. The label can either be attached to a clothing tag, which is attached to the item or directly to the item if considered more suitable. Lastly, the system displays a number representing the category in which the item should be sorted. The operator then puts the item in its designated black box. There are nine specific categories of black boxes where items may be placed. The different categories are:

1. Tops for women
2. Tops for men
3. Tops for children (>104 cm)
4. Bottoms for women
5. Bottoms for men and children (>104 cm)
6. Static table, children's clothes (<104 cm)
7. Round table (shoes/hats/bags)
8. Manual table (other items)
9. Other larger items

When the operator has evaluated all items within the bag and it is empty, they proceed and collect a new bag and repeat the process. Once a black box is full, the operator moves it to the queue where it waits before it proceeds to the Photo stage. The queue is divided into different lanes based on the nine different categories. This system makes it easier for the operator within the Photo stage to find the appropriate black box. Additionally, a note indicating the day and shift the box was handled is placed on top of the box.

4.1.3 Third Process Stage - Photo

The Photo stage is the third step of the inbound process and consists of 15 distinct stations, see Figure 5 for the corresponding flowchart. Eight of these stations focus on photographing tops and three stations focus on bottoms. These stations handle clothes for women, men, and children (> 104 cm), with manikins available for each category at every station. One station is

dedicated to photographing items such as shoes, bags, and hats, using a round, flat rotating table, this station is referred to as “Round table”. Another station, referred to as "Static table" is designed for photographing small items laid flat, such as children's clothing (<104 cm). Finally, two stations handle manual photography, enabling photography of other items. These two tables require manual photography while the others have fixed cameras. Additionally, all 15 stations are equipped with a smartphone, a screen displaying the photos as well as a photo station with a camera.

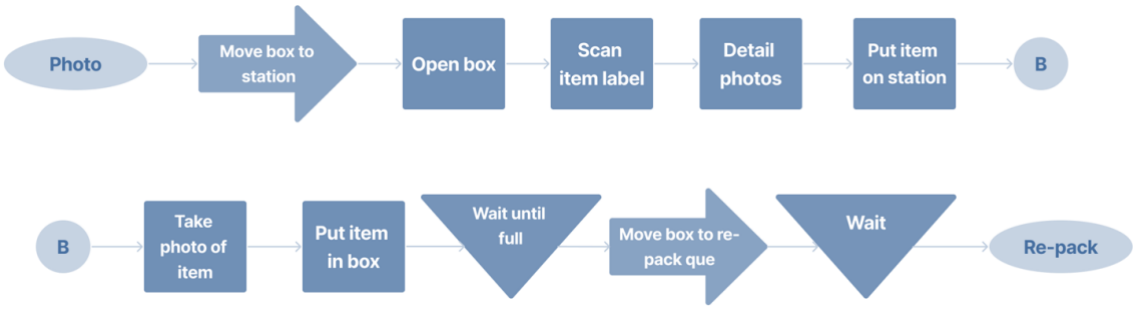

Figure 5, Flowchart – Photo

At the start of this stage, the operator brings three black boxes from the designated queue to their station, prioritising the boxes that have been in the queue the longest which is indicated by the note on top of the box. When the boxes are brought to the station, the operator selects one item from the box and scans its QR label. The next step involves using the smartphone to photograph the item’s brand and material description labels and potential defects documented during the Assortment stage. Subsequently, the item is placed on a manikin or table to photograph the whole item. Upon pressing the “take photo” button on the smartphone, the item is automatically photographed from the front and back, except on the static and manual tables where manual handling is necessary. When the item has been photographed it is placed in an empty black box, and the process is repeated for all items in the boxes. Once the black box is full of photographed items, it is moved to the next queue awaiting the last inbound stage, Re-pack.

4.1.4 Fourth Process Stage - Re-pack

The final stage in the inbound process is Re-pack, the flowchart for this stage is shown in Figure 6. At the start of this stage, three black boxes are retrieved from the queue between the Re-pack and the Photo stage and brought to the operator's station. The operator selects one item

from the box and scans its QR label. All information gathered from the Assortment stage and the photos taken are then displayed on the operator's computer. The item is then carefully evaluated to ensure that the correct information is provided and that the pictures are accurate and well-presented. If any photos are incorrect or additional photos are needed, the item is returned to the Photo stage for further processing. If any information needs to be added or corrected, the operator addresses this themselves.

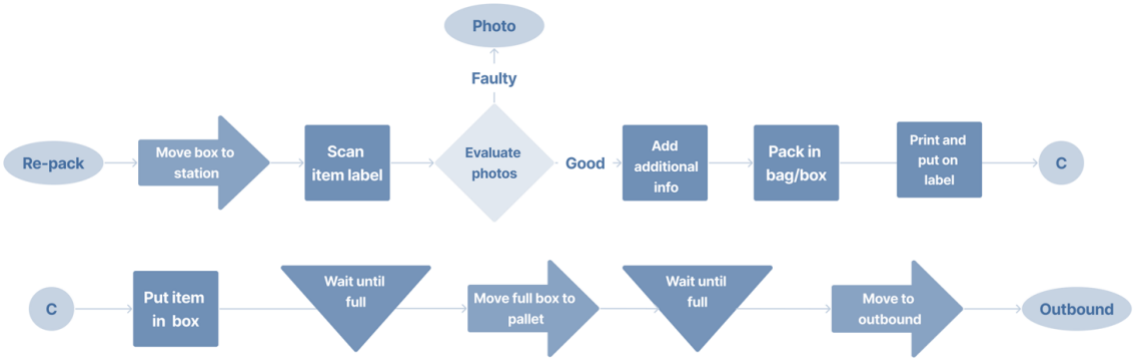

Figure 6, Flowchart - Re-pack

Subsequently, the item is folded and packed in appropriate packaging material. Packing information is updated in the system, and a new QR label is printed and attached to the packaging. The packed item is then placed in an empty black box, and the process is repeated until the black box is full. Finally, the box is moved to a pallet awaiting transfer to the outbound process.

4.2 Identification of Limiting Factors

Through a thematic analysis of interviews and observations, the four themes; *Production Design*, *Performance Metric*, *Training*, and *Motivation & Engagement* were identified as factors limiting the efficiency (E) and quality (Q) of the inbound process, see Table 2. Within each theme, subthemes with specific limiting factors were identified, these are also listed in Table 2. All four themes with their corresponding limiting factors are described and analysed in the following subsections.

Table 2, Identified factors limiting efficiency and quality in the inbound process categorised into four different themes. The E/Q presents if the factor is limiting quality or/and efficiency.

Identified factors limiting quality and efficiency

Production Design	
Unbalanced workflow	
• Lower efficiency in the Photo stage compared to other stages.	**E**
• Unbalanced distribution of items across process stages and process lines.	**E**
Production layout	
• Operators performing unnecessary motion.	**E**
• Unnecessary workstation in Assortment.	**E**
• Items sometimes end up in the wrong photo station where they cannot be photographed.	**E**
Training	
Lack of training	
• Inconsistent quality of trainers' knowledge.	**Q**
• Inadequate duration of new employee training.	**E, Q**
• Inadequate training in the Assortment stage.	**E, Q**
• Lack of knowledge regarding the performance metric.	**E, Q**
Trainings disrupting the daily workflow	
• Training of new employees disrupts daily production and limits efficiency.	**E**
• Difficult to find the time and space for training new employees.	**E, Q**
Performance Metric	
Employee pressure	
• Employees feel pressured and stressed to reach the daily speed performance score.	**Q**
• The stress and pressure result in quality issues, rework, and impacts sales.	**Q**
• Difficult to prioritise quality over speed when processing challenging items.	**E, Q**
The design of the performance metric	
• Inaccurate speed performance score input.	**E, Q**
• Hard to motivate employees to keep working when the daily speed performance score is reached.	**E, Q**
Understanding the performance metric	
• A complex performance metric system which few employees understand.	**E, Q**
• The performance metric is calculated differently between departments/process stages.	**Q**
• Delay in quality performance score makes employees prioritise speed.	**Q**
Motivation & Engagement	
Lack of motivation and engagement among employees	
• Operators lack thoroughness in handling items.	**Q**
• Lack of employee motivation.	**E, Q**
• Low level of employee engagement.	**E, Q**
• Employees often fail to grasp the bigger picture.	**E, Q**

4.2.1 Production Design

While analysing the first theme, *Production Design*, two primary subthemes were identified, both of which predominantly focus on the process stage of Photo. During the interviews, it was found that the Photo stage serves as the primary bottleneck in the inbound process due to its lower efficiency level.

Unbalanced workflow

The first subtheme identified was the presence of an unbalanced workflow, both across different production lines and between individual photo stations. One challenge The Company experiences in this regard is scheduling the daily workflow while also considering the somewhat lower efficiency level of the Photo stage. It became evident that the Assortment stage handles more items per hour than the Photo stage, which sometimes creates an overflow in the queue and results in an increased production time between the Assortment and Photo stage. A similar challenge was observed between the Photo and Re-pack stage, as Re-pack, much like Assortment, sometimes operates at a higher efficiency level. The Photo stage can therefore occasionally be considered a bottleneck, and the workflow must consciously be balanced by reallocating personnel or items between lines or stages.

However, when the efficiency is high in the Photo stage, it was further explained by an interviewee that all photo stations might not have enough items to process for the duration of the whole shift. The uneven distribution of workflow is partially a result of the diverse and unpredictable quantity of item categories, making planning challenging. Due to the unpredictable inflow of items, the team leader must attempt to anticipate whether all photo stations will have sufficient work throughout a shift. This often results in inefficient scheduling and time wasted on reallocating employees between lines to other photo stations, subsequently reducing productivity levels.

Production layout

The second subtheme identified concerns the actual production layout and the frequent occurrence of the waste categorised as unnecessary motion, presented by Sörqvist and Bergendahl (2021), which is further described in Section 2.1.4. This limiting factor was found

during the creation of the current state flowcharts and was further highlighted during interviews and observations.

The predominant issue revolved around unnecessary motion between various steps within the inbound process. These steps involved operators moving from their designated stations to handle and move items to the next stage in the process, which can be considered a wasteful activity, these are visualised in Appendix B. The most notable unnecessary motion mentioned during the interviews was the time wasted when employees from the Photo stage frequently moved from their designated station to retrieve or move items from or to other stages, significantly decreasing the efficiency of the Photo stage.

Additionally, another non-value-adding task which became evident through observations and while creating the flowchart was one of the intermediate Assortment steps, where bags were transferred to a separate workstation to digitally "lock" the bag to the operator, before reaching the operator's workstation. The main purpose of this step is to assign the bag to the operator handling it, to be able to track its progress. This step can also be described as unnecessary movement, similar to the inefficiency previously mentioned.

Lastly, another factor within this subtheme which also diminishes productivity is how items sometimes end up at the wrong photo station where they cannot be photographed, which disrupts the workflow and increases the total processing time.

4.2.2 Training

Training was another theme that emerged from the interviews and observations as it became apparent that training was a root cause impacting the quality and efficiency of the process in various ways. Two distinct subthemes emerged, the lack of training and disruptions of the workflow caused by training performed.

Lack of training

During the interviews and observations, it was discovered that the inbound process was being limited by a lack of training. Both employees and trainers lacked sufficient training, leading to a decline in the quality and efficiency of the inbound process. Interviews revealed inconsistencies in the training methods and quality between different trainers, resulting in varying levels of competence among new hires.

Another concern raised during the interviews was the insufficient length of training, typically lasting only two days. It was mentioned that during the two days of training for the Photo stage employees were expected to learn procedures for five significantly different stations. This timeframe was deemed insufficient for employees who were unable to master all stations and perform according to expectations after the training period. Additionally, one interviewee noted that while the training might be adequate for the Re-pack stage, which is considered the least challenging, it was insufficient for both the Assortment and the Photo stage. Multiple interviewees also expressed the need for additional training in the Assortment department. They expressed that many mistakes regarding materials were later identified in the Photo and Re-pack stations. Some common mistakes were mistaking the appearance of the material of an item as a defect and failing to register expensive materials of items, such as costly metals or cashmere sweaters. Another recurring issue was inadequate descriptions of defects, which made it difficult for employees at the Photo stage to identify and photograph the documented defects effectively.

Lastly, interviewees expressed a lack of understanding of the performance metric that measures the employee's performance in terms of quality and speed, which will be analysed further in Section 4.2.3. This suggests that there may not have been sufficient training provided on the performance metrics function. Several employees also mentioned how they missed internal development opportunities and having the chance to learn something new.

Trainings disrupting the daily workflow

Another subtheme which became evident when analysing the findings was how the training of new employees often disrupts the daily workflow. It was stated during the interview that the high number of new employees disrupted the daily work tasks performance in the production lines. Additionally, it was explained during interviews that finding the time and space to train new employees within the production lines was challenging. This is due to specific performance goals that need to be met during shifts, leaving limited opportunities for training.

4.2.3 Performance Metric

The performance metric emerged as a significant theme linked to factors limiting the inbound process in terms of quality and efficiency. The performance metric is determined based on both the speed and quality of an employee's work and is measured as a combined score. The speed

performance metric is measured by the number of items handled by one operator per hour, with various points assigned to different items processed. Meeting the speed target requires an employee to achieve a score of 100 points per hour. The quality performance metric, on the other hand, varies across different stages of the inbound process. Quality assessment is based on randomly selected items for quality control, where operators receive a score based on the evaluation. However, quality can also be assessed by an evaluation of the quality of photos and item descriptions online, with scores allocated accordingly. The quality and speed metrics together evaluate the employee's performance as a combined score.

Employee pressure

One of the identified factors limiting the performance metric was the pressure to achieve the hourly speed performance score. In interviews, both team leaders and operators highlighted the prevalence of stress and pressure among employees striving to meet hourly speed performance score. The pressure to attain the score sometimes results in quality issues, as operators choose to prioritise speed over quality. One team leader interviewee remarked, "When I'm checking the quality of my team, I noticed that when they are rushing and feel pressured, they are more likely to miss defects. That's because they want to reach the score for the day". When defects slip through during the initial stage of the Assortment process, they may resurface later in the process, requiring rework. If they are not identified during the process, customers might identify them, leading to claims and unsatisfied customers. This directly impacts both quality and efficiency due to the need for rework and handling of returns.

Issues can also arise later in the process if photos are not taken correctly due to time pressure. This could lead to the need for a reverse material flow and rework. If mistakes are not noticed and addressed during the Re-pack stage, the item will be published on the sales platform with faulty pictures which might make the item appear less attractive to customers, lowering the chance of it being sold. This impacts both the customers selling the item and The Company's performance. The reoccurring rework and errors within the process can be identified as another form of waste. This waste is described by Sörqvist and Bergendahl (2021) and referred to as defects. The numerous items requiring rework are evident in the flowcharts where it is visualised as a reverse material flow.

Additionally, employees expressed during interviews that achieving the hourly speed performance score can be stressful, especially when tasked with photographing challenging items, leading to added pressure. Even if employees emphasised the importance of maintaining a high quality, they also stated that it was not always possible to prioritise due to the pressure to achieve the speed performance score. One interviewee expressed frustration about their team leader, stating, “She reminds us about targets and honestly listening to this two times per day when you have difficult clothes. It's really demotivating for me”.

The design of the performance metric

The speed performance score input has been identified as one of the root causes impacting efficiency and quality in the processes. Items are assigned varying points intended to accurately reflect the processing time for the specific item at the different stages. However, these inputs may not always be truthful for all items. As highlighted in one of the interviews, some products that require significant processing time may receive lower scores compared to quickly processed items. Therefore, it is imperative to update these score inputs to ensure accuracy.

Incorrect or inaccurate productivity score inputs can result in operators being assigned multiple items with long handling times while not receiving points which correctly reflects the difficulty and time spent on the items. This may lead to stress as operators strive to achieve the hourly score. During one interview, an operator expressed their uncertainty about the scoring process, stating, “The process of meeting targets and how many points we get for a specific item is a little bit unclear to me. Because some items are very easy and some are more difficult, for example large size clothing. Larger sizes are harder to take good pictures of on the quite small mannequins, and nobody will want to buy it if it looks a bit baggy, right? This especially applies to fancy dresses. So, this takes time”.

Another issue related to the design of the performance score, which was expressed by the interviewees, was the possibility of reaching the daily score before the end of a shift. When operators reach their score before the end of the day, they may become unwilling to continue working, as they feel their target has already been met. This impacts operational efficiency, as more items could be processed if employees were motivated to keep working. Additionally, it

impacts the level of quality, as operators may prioritise speed over quality in their eagerness to achieve the score quickly.

Understanding the performance metric

Linked to the performance score input, a lack of understanding has been observed among employees regarding how the score is calculated and how to effectively prioritise speed and quality. Numerous interviewees highlighted that not all operators grasp the intricacies of the scoring system, which affects both efficiency and quality negatively.

Something that complicates the understanding of the performance score further is how the speed performance score is updated immediately after processing an item, while the quality score is updated later. The quality score experiences a delay since an item can undergo quality checks days after processing. With the combined scores reflecting both quality and speed, operators might prioritise speed to achieve a higher combined score, given its direct impact.

4.2.4 Motivation & Engagement

A key factor contributing to inefficiencies and quality issues in the inbound process is a *Lack of motivation and engagement among employees*. In addition to inadequate training and an undeveloped performance metric, many errors and rework within the process stem from a lack of motivation to perform tasks thoroughly. Given the manual nature of the inbound process, unmotivated operators may overlook essential steps and fail to be sufficiently thorough when handling items, thereby causing quality issues. Therefore, enhancing operators' motivation can potentially improve quality and overall process efficiency. An interviewee with a managerial position stated, "If you are just looking at making the processes more efficient, I think it's mostly about getting people to want to do a good job".

Another aspect impacting employee motivation is the low level of employee engagement which was identified as a type of waste categorised as unutilised people, further described in Section 2.1.4 (Sörqvist & Bergendahl, 2021). Several interviewees expressed how sharing suggestions or thoughts regarding processes, or their work currently is challenging. Presently, there are no established employee feedback channels between employees and managers, apart from reaching out to team leaders.

Furthermore, one interviewed operator emphasised how employees often fail to grasp the bigger picture, leading to a lack of motivation in performing work tasks thoroughly, which ultimately affects the entire process. The operator stated, “Each stage is an essential part of the whole process and I think more employees need to realise that their actions have consequences in the next stage”. Several interviewees mentioned how employees many times deliberately performed at a low level, not caring what happens later in the process. This is a clear sign of low level of motivation.

4.3 Recommendations for Enhanced Quality and Efficiency

The following six recommendations presented in Table 3 aim to address and resolve the identified factors that are limiting quality and efficiency. Each recommendation will in this section be presented and described briefly. The recommendations were generated by combining suggestions mentioned by interviewees together with internally generated ideas. The six recommendations will be discussed and evaluated further in the discussion chapter, Section 5.1.

R1: Remove the non-value-adding step in the Assortment stage.

The first two recommendations are related to the waste of unnecessary motion identified in the current processes. The first suggestion is to remove the step in Assortment referred to as "Scan and lock to operator". This step requires the operators in Assortment to first lock a bag to their work ID at a separate computer station in front of the Assortment area before bringing it to their workstation. This causes unnecessary motion and by removing this step, the operator's movement will decrease by instead bringing the bag straight to their station. Additionally, eliminating this step will mitigate the risk of queues forming at the computer desk, as all operators working at the Assortment stage within a single process line currently utilise the same desk. The evident risk of this step becoming a bottleneck due to sensitivity to disruptions or technical issues serves as another reason for its removal.

Table 3, Recommendations to improve quality and efficiency in the inbound process indicating what limiting factor the recommendation addresses.

Recommendations to improve quality and efficiency

Recommendations	Limiting factors addressed
R1: Remove the non-value-adding step in the Assortment stage.	**Production layout** • Unnecessary workstation in the Assortment stage
R2: Increase the number of support operators working with material handling	**Unbalanced workflow** • Lower efficiency in the Photo stage compared to other stages. • Unbalanced distribution of items across process stages and process lines. **Production layout** • Operators performing unnecessary motion. • Items sometimes end up in the wrong photo station where they cannot be photographed.
R3: Create more development opportunities and implement cross-training initiatives.	**Unbalanced workflow** • Lower efficiency in the Photo stage compared to other stages. • Unbalanced distribution of items across process stages and process lines. **Lack of motivation and engagement among employees** • Lack of employee motivation. • Low level of employee engagement. • Employees often fail to grasp the bigger picture.
R4: Evaluate the current training of new employees to determine the ideal duration, environment, and instructional routines.	**Lack of training** • Inconsistent quality of trainers' knowledge. • Inadequate duration of new employee training. • Inadequate training in the Assortment stage. • Lack of knowledge regarding the performance metric. **Trainings disrupting the daily workflow** • Training of new employees disrupts daily production and limits efficiency.

	• Difficult to find the time and space for training new employees. **Lack of motivation and engagement among employees** • Operators lack thoroughness in handling items. • Lack of employee motivation. • Low level of employee engagement.
R5: Develop the current performance metric and separate quality and speed into two separate variables.	**Employee pressure** • Employees feel pressured and stressed to reach the daily speed performance score. • The stress and pressure result in quality issues, rework, and impacts sales. • Difficult to prioritise quality over speed when processing challenging items. **The design of the performance metric** • Inaccurate speed performance score input. • Hard to motivate employees to keep working when the daily speed performance score is reached. **Understanding the performance metric** • A complex performance metric system which few employees understand. • The performance metric is calculated differently between departments/process stages. • Delay in quality performance score makes employees prioritise speed. **Lack of motivation and engagement among employees** • Operators lack thoroughness in handling items. • Lack of employee motivation.
R6: Implement strategies for employee engagement and enhance communication of broader operational goals and vision.	**Lack of motivation and engagement among employees** • Lack of employee motivation. • Low level of employee engagement. • Employees often fail to grasp the bigger picture.

R2: Increase the number of support operators working with material handling.

The second recommendation involves increasing the number of support operators and assigning specific support personnel to work with material handling. This recommendation aims to reduce unnecessary motion among operators by allowing them to remain at their designated workstations while items are brought to them for processing. Dedicated support operators would be responsible for moving bags to the operators' stations during Assortment and transferring the full boxes to the queue awaiting the Photo stage. At the Photo stage, boxes would be transferred from the Photo queue to a dedicated photo station, and after being photographed, the boxes would be moved to the queue awaiting Re-pack. During the Re-pack stage, boxes would be moved from the queue to the operators' workstations. Once packed, the full boxes with packed items would be transferred to pallets awaiting outbound transportation. This approach not only enhances efficiency by allowing operators to remain at their assigned stations to process items, but it also ensures the accurate transfer of items to the appropriate photo station.

Additionally, the material handlers shall also have the capability to transfer items between different production lines to ensure a balanced flow across all lines. This proactive measure resolves any potential bottlenecks resulting from imbalances of items that may arise, ensuring smooth operations across the various lines.

R3: Create more development opportunities and implement cross-training initiatives.

The third recommendation is to create more development opportunities for operators and to implement cross-training initiatives. Creating possibilities for internal development opportunities could significantly increase motivation among employees. Interviews revealed a strong desire among employees to influence their career paths and acquire new skills. Possible development opportunities include advancing to a team leader or trainer role or learning how to operate in a new process stage. To train employees in several process stages is what the recommendation refers to as cross-training. Cross-training would result in employees becoming familiar with different work tasks which would make it possible to relocate employees between process stages, either as a response to an unbalanced workflow or based on the employee’s own preference. Ultimately, these changes would create an opportunity to introduce job rotations, a proven method for increasing employee motivation.

R4: Evaluate the current training of new employees to determine the ideal duration, environment, and instructional routines.

The fourth recommendation is to evaluate the current training of new employees to determine the ideal duration, environment, and instructional routines. Through interviews and observations, it became evident that The Company invests significant time in training new employees. However, several interviewees indicated that the current training methods and routines are far from optimal. Employees reported feeling stressed during training and described how they after completing the training felt like they lacked essential knowledge due to insufficient training time. Interviewees stated that the training did not allow them to learn how to handle more challenging items, which, although less common, are crucial. Additionally, interviewees mentioned how operators within the Assortment stage lacked knowledge about materials and how to judge if the appearance of an item's material should be considered a defect. It is therefore recommended that The Company evaluate and adjust its training programs to better align with the needs of each process stage. Providing adequate training is crucial for enabling employees to gain confidence in their tasks, leading to improved efficiency and thoroughness.

One interviewee also highlighted the issue of training employees directly on the operating process lines. The interviewee described how the training both disrupts the daily workflow and how the educational environment is too stressful, which hinders effective learning and limits training outcomes.

Finally, it became evident that the training often lacked consistency, both in terms of the information shared and the trainers' levels of knowledge. Standardising the training content and ensuring a consistently high level of quality among trainers would increase the competence level among employees and thereby significantly reduce operator errors. In addition to establishing standardised training content, it would be beneficial to dedicate time to explain and teach how the performance metrics function and how operators can influence them.

R5: Develop the current performance metric and separate quality and speed into two separate variables.

The fifth recommendation focuses on refining the performance metric and prioritising the quality variable. The current method of evaluating and measuring performance is leading to

quality issues, stress among employees, and reduced motivation. The recommendation is therefore to evaluate and develop the performance metric to better align with operators' work and support the desired process output of efficiency and quality.

The performance metric has been identified as a critical factor impacting both quality and efficiency in the inbound process. The primary concern is that the current metric primarily emphasises speed over quality. The operator's speed performance is continuously updated to reflect their efficiency over the past hour, whereas the quality component is assessed later through physical or digital quality controls. The variation in evaluation timing and methodology complicates the overall performance metric, leading to reduced employee comprehension which subsequently lowers motivation. Therefore, there is a need to redesign the metric for better clarity, aiming to enhance employee motivation and performance in terms of quality.

The predominant focus on efficiency creates significant pressure on operators to process items quickly to meet hourly targets, resulting in recurring quality issues that require rework in later process stages. Measuring speed and quality individually will help eliminate the current trade-off, enabling a focus on quality and thoroughness while maintaining a productive pace.

Another identified issue is the inaccurate and unbalanced inputs into the current speed performance metric. One interviewee described how certain simple items that are easy and quick to handle generate more points than more complex and time-consuming items. This unbalanced distribution leads to an inaccurate representation of individual speed performance and causes significant stress among operators assigned to handle complex or faulty items. Therefore, The Company is recommended to re-evaluate the inputs to better reflect the complexity and time required for each item type.

R6: Implement strategies for employee engagement and enhance communication of broader operational goals and vision.

The final recommendation is to improve employee motivation by actively involving them in improvement initiatives and clearly communicating operational goals and visions. One way to foster motivation is to create more opportunities for employees to engage in continuous improvement initiatives or establish direct channels for idea submission. Currently, the process for suggesting improvements beyond directly approaching the team leaders is non-existent. To

remedy this, it's suggested to incorporate idea submission into daily or weekly meetings, allowing employees to propose improvement efforts or changes. Alternatively, these meetings could address specific problems, inviting employees to propose solutions for upcoming improvement efforts. During an interview, an operator suggested that creating a digital survey on The Company’s work portal where employees can submit improvement ideas on any topic could be an effective way to directly reach the people working on The Company's efforts. Including the employees in continuous improvements can both improve motivation but also reduce the waste of unutilised people in the process.

Furthermore, the proposal is also to improve communication regarding The Company's operational goals and vision, emphasising the importance of the employees' roles in both operations and the overall company structure. This will help in enhancing employees' comprehension of broader organisational objectives and increase motivation. The suggestion is to implement strategies to better communicate these goals to employees and assess the current methods to identify areas for improvement.

5 Discussion

The following chapter starts by discussing and evaluating the final recommendations of the study, integrating insights from relevant research and literature. Secondly, the theme of motivation and engagement is discussed and further elaborated in Section 5.2. Due to the significant limiting factors associated with this theme, which is addressed by many of the provided recommendations, it is allocated its own section to explore its interconnection with quality and efficiency. Lastly, the final section examines the potential applicability of the findings and recommendations to other companies and contexts, contributing to broader research beyond the scope of The Company.

5.1 Evaluation of the Final Recommendations

According to Santos et al. (2015), some of the most common challenges in production processes are usually quality issues or efficiency-related problems, both of which can disrupt the process flow. These challenges also represent the largest problems at The Company, as quality and efficiency are two operational performance objectives they currently are trying to balance. The various performance goals are interconnected, requiring The Company to strike a balance between maintaining an efficient process flow and ensuring a product free of defects or quality issues (Slack & Lewis, 2019). Both factors are of importance for The Company, internally for the processes as well as externally for customer satisfaction (Slack, 2017; Bauer et al., 2002).

The Company's recent focus on expanding existing processes to enhance capacity and operational efficiency has unintentionally demoted process quality, resulting in an increase in rework, returns and defects throughout the process. These emerging quality issues are particularly problematic for The Company due to their direct impact on sustainability and environmental impact. When customers receive items with quality issues, categorised as inaccurate photo representations or descriptions, the item will most likely be returned. The procedure of returning items is far from sustainable, involving both transportation and further processing. Since sustainability is one of The Company's core values and a prevalent demand among its customer segments, a larger environmental impact can evidently affect customer satisfaction and business performance. Additionally, the oversight of quality also has a social impact on the employees because of the perceived lower value of their work. Improving quality

within the inbound process is therefore an important step in increasing sustainability in terms of social and environmental impact.

The recommendations outlined in this study are intended to assist The Company in addressing factors that hinder both quality and efficiency in their processes. Santos et al. (2015) explained that factors constraining efficiency and quality can stem from employees, materials, tools, methods, or products. The limiting factors identified in The Company's inbound process encompassed several of these elements. Bauer et al. (2002) further described that pinpointing the root causes of factors restricting the process can subsequently be utilised to enhance the process by eliminating waste, enhancing customer satisfaction, or reducing product variation, which is what the recommendations aim to accomplish. These efforts are designed to cope with increasing demand and to streamline processes. Below, the recommendations are discussed and evaluated. The six recommendations are hereafter referred to as R1 to R6. See Table 4 for details.

Table 4, The recommendations listed with their indication, R1 to R6, which they are referred to.

Recommendations to improve quality and efficiency
R1: Remove the non-value-adding step in the Assortment stage.
R2: Increase the number of support operators working with material handling.
R3: Create more development opportunities and implement cross-training initiatives.
R4: Evaluate the current training of new employees to determine the ideal duration, environment, and instructional routines.
R5: Develop the current performance metric and separate quality and speed into two separate variables.
R6: Implement strategies for employee engagement and enhance communication of broader operational goals and vision.

5.1.1 Evaluation of Recommendation 1 & 2

Both R1 and R2 are linked to the concept of waste due to their potential to eliminate unnecessary motion within the process. According to Sörqvist & Bergendahl (2021), the type of waste called unnecessary motion occurs when employees move or execute tasks without generating any value for the end customer, which also can be referred to as a non-value-adding activity. This is particularly noticeable in the intermediate Assortment step since the step activity does not contribute to the item's value, as this step solely involves locking the bag to the operator. The Company introduced this step as a safety measure following numerous instances of operators forgetting to mark the bag as finished within the system after completing its contents. This oversight resulted in errors where the contents of a new bag were mistakenly sorted under the ID of the previous bag. This intermediate step ensured that only one bag was brought at a time to the operator's station which prevented the previous sorting mistakes.

Removing this step while implementing R2, where a material handler transports bags to the Assortment operator station, could mitigate sorting mistakes since the operator will only have one bag at a time in their station. Furthermore, removing the station could potentially enhance the flow efficiency within the process, allowing employees to contribute more to the created value compared to the total lead time of the process (Sörqvist & Bergendahl, 2021). It is further recommended to provide adequate training and investigate other safety measures to prevent the recurrence of the previous mistakes which the intermediate step prevented. However, there is still a potential risk of similar errors happening in the future if the station is removed, and new problems may arise that need to be assessed.

Implementing R2 could ensure that materials are moved in the correct quantity, at the right time, and to the appropriate location, providing an efficient material handling system, as explained by Stephens and Meyers (2013). Implementing a well-designed material handling system will enhance both productivity and quality as well as reduce costs (Mohsen & Hassan, 2010). As explained in Section 4.3, the material handling should occur between the different process stages, and the designated pick-up and deposit points should also be designed to minimise operator movement as much as possible (Srinivasan et al., 1994). This approach could mitigate the risk of mixing contents between bags and prevent boxes of processed and unprocessed items from being mixed. The additional support operators will solely focus on moving materials to the correct location, thereby enhancing quality within the process.

Additionally, increasing the amount of material handlers will streamline the process by allowing operators to concentrate on their tasks. This can significantly increase the efficiency of the Photo stage which is the stage that today spends the most time on unnecessary motion by moving material. This will also effectively mitigate the risks of defects and unnecessary motion and enhance efficiency and quality in the process (Mohsen & Hassan, 2010). However, while integrating additional material handlers can improve both quality and efficiency, it will also have other consequences, such as increased resource consumption due to a larger workforce on each shift. This, in turn, will directly impact costs, which is a crucial performance metric to consider (Slack & Lewis, 2019).

Lastly, it is suggested in the recommendations that the material handlers should be capable of transferring materials between different lines to address the issue of unbalanced material flow. However, interviews revealed a preference for moving personnel between lines rather than items to ensure that items from the same bag are processed evenly over time. Moving material with material handlers should be considered a backup solution. Instead, moving operators could serve as a solution for balancing the flow, as further elaborated in R3, *create more development opportunities and implement cross-training initiatives*. This recommendation will be explained further below, illustrating how it can contribute to a more balanced workflow.

5.1.2 Evaluation of Recommendation 3 & 4

The recommendations R3 and R4 are focused on employee development, both in terms of training, internal development, and cross-training. Rodriguez and Walters (2017) describe employee training and development as essential for an organisation as it helps individuals achieve different objectives and ensure a high quality of work.

R3 connects to how as of right now The Company are not utilising their employees' skills, knowledge, creativity, or potential to the fullest and employees lack motivation to perform their work tasks. The unutilised potential is what Sörqvist and Bergendahl (2021) describe as the eighth type of waste, as time and potential ideas are lost because of a lack of engagement with employees. Creating more internal development opportunities would both eliminate waste within the processes as well as satisfy the interest articulated by employees by increasing their level of competence. An increased level of competence, which is one of the three psychological

needs described by Deci et al. (2017), would not only increase the employee's internal motivation but also increase employee performance.

Furthermore, the recommendation to implement cross-training would allow The Company to increase effectiveness by broadening employee competence. Implementing cross-training would increase operational effectiveness as it creates flexibility within the processes by making it possible to relocate employee's temporality (Casad, 2012). As a long-term strategy, The Company should consider implementing job rotations because of its proven positive impact on employee motivation, making it an effective tool for enhancing workforce engagement and productivity (Kaymaz, 2010). An appropriate strategy would be to initially implement cross-training by offering training opportunities to the employees who are interested as well as evolve the existing training for new employees to include introductions to multiple process stages. By first implementing cross-training would widen the employee's knowledge base, creating prerequisites for later implementing job rotations, making the transition less resource and time-demanding.

Initiating cross-training brings various benefits, but the most apparent drawback is the efficiency impact when operators switch between stages. The transition period during cross-training results in reduced efficiency until employees regain their previous speed, which can vary depending on the complexity of the stage. Additionally, as operators need training in the new stage to be cross-trained, the efficiency is also affected during the period when they are learning the new process stage. However, this impact might be limited if R4 is implemented according to The Company's suggestion, which will be further described below.

R4 emphasises the need for The Company to evaluate and enhance its current employee training programs. However, this recommendation is something The Company already has started to explore. Throughout the project's duration, The Company has developed a more suitable training format both when it comes to educational environment and training duration. Their suggestion is to dedicate a new process line entirely to training so that the daily workflow is not affected, and the higher pace in the processing lines does not stress the new employees. According to their suggestion, the developed training program would be prolonged from the current two days to two weeks, during which the expected speed performance score will be at a lower level. The redesigned training program will decrease the high levels of stress reported

by multiple operators during interviews. The prolonged training will also result in a higher level of competence as the employees will have sufficient time to understand and learn all routines. Changing the training programs will increase employee motivation as operators will experience fewer challenges in executing their work tasks and become more confident in their abilities (Rodriguez & Walters, 2017).

However, it is essential to evaluate the newly implemented training program after a certain period of time to comprehend its impact. This evaluation should investigate if employees are satisfied with the program, determine if competence has improved over an extended timeframe, and assess if the new training environment is more effective. Additionally, it's crucial to investigate if any new limitations have emerged following the program's implementation and explore avenues for further development.

Developing the training programs and creating more development opportunities in terms of duration, environment and learning contents will furthermore contribute to a higher inbound process quality. The enhanced quality will be a result of enhanced employee competence and motivation which subsequently make operators more thorough in their work. A higher level of process quality in this context refers to the reduced amount operator errors which decrease the amount of time spent on rework (Bauer et al., 2002). Eliminating rework and time spent on non-value-creating activities, categorised as the seventh type of waste: *defects*, will also increase the overall process efficiency (Sörqvist & Bergendahl, 2021).

5.1.3 Evaluation of Recommendation 5

R5 solely focuses on the evaluation of employee performance. The Company's current performance metric has during the study been identified as a critical factor impacting both quality and efficiency in the inbound process. According to Rodriguez and Walters (2017), it is crucial to establish clear goals and standards to improve employee performance and measure their progress. The recommendation is therefore to redesign the performance metric to enhance clarity and better align with The Company's vision.

As highlighted by Rodriguez and Walters (2017), understanding the performance metric is crucial, as unclear performance standards can impact the employee's performance. Presently, employees struggle to grasp the performance scores due to their complexity, particularly when

speed and quality are measured as a combined score. Speed tends to be a priority due to its direct evaluation, while the assessment of quality is often delayed. Separating these two scores represents an initial attempt to enhance comprehension while also mitigating the trade-off, where a lower quality score can be compensated with a higher speed. It is equally important to provide a detailed explanation of how the score is evaluated for employees, to increase the understanding of the score. This, in turn, can potentially reduce the pressure on employees because of an increased understanding and a score which more accurately reflects their job performance.

Rodriguez and Walters (2017) highlight how a high workload and pressure are significant factors affecting employee performance, these factors were further identified during the interviews. A team leader at Assortment emphasised how the pressure to work fast often leads operators to overlook registering defects in items, resulting in recurring quality issues that require rework in later process stages. Additionally, an operator within the Photo stage indicated a high level of pressure. The operator described how they often are unable to take high-quality photos due to the pressure to work fast, which they find frustrating and demotivating as it contradicts the creative aspect of their work. For The Company, maintaining high-quality photos is essential for customer satisfaction. Both by satisfying buyers, which reduces return rates, and by satisfying sellers who can expect their items on the site to be sold at a higher price. According to Bauer et al. (2002), an increase in customer satisfaction fosters a sense of accomplishment among employees and enhances job security, thereby increasing motivation.

The Company can address the limiting factors connected to the performance metric in several ways. One option is to maintain the current performance score metric but review and modify the inputs to the speed performance metric as suggested during interviews. The change of the input can potentially result in a more user-friendly and effective metric compared to the current one. Alternatively, a more sustainable approach might involve developing a new metric that places a greater emphasis on quality. For example, instead of measuring speed individually for all operators, The Company could evaluate this metric on a team level, where process stages within each line collectively receive a daily or hourly score. This approach would better balance handling times based on item categories, reduce individual pressure, and foster a sense of teamwork. Simplifying the current speed performance metric to focus solely on measuring

items processed per hour rather than giving points for each item processed could provide a clearer reflection of the workload and contribute to a more straightforward evaluation metric. This approach might also increase productivity during the final hour of the day, as operators currently stop working before the shift has ended as they trying to reach the hourly score early. Introducing a team-based performance metric could potentially prevent this phenomenon since operators will not be measured individually. This approach aligns with Rodriguez and Walters (2017) who state that increased motivation, trust, teamwork, and clear performance measurement are all essential to enhancing employee performance.

Moving forward, it is crucial for The Company to conduct a thorough evaluation of how to proceed with performance evaluation, whether they wish to adjust the current speed score or introduce an entirely new metric. However, regardless of which option The Company chooses to implement, the suggestion of dividing quality and speed into two separate metrics remains. While separating these metrics could compromise process efficiency to some extent, as operators might prioritise quality over speed, it can also help alleviate some of the pressure associated with the speed performance metric.

5.1.4 Evaluation of Recommendation 6

The final recommendation, *implementing strategies for employee engagement and enhancing communication of broader operational goals and vision*, is primarily suggested to address the theme of motivation, which is a contributing factor that limits both quality and efficiency in the process. Addressing these factors is crucial for ensuring employee motivation, which in turn can lead to increased employee engagement.

One approach to improving motivation among employees, as suggested by Jacobsen and Thorsvik (2014), is to foster a sense of personal ownership. This recommendation seeks to achieve this by involving employees in continuous improvement initiatives and giving them a say in organisational matters. This approach directly contributes to fostering employee autonomy and enhancing internal autonomous motivation (Deci et al., 2017; Fowler, 2014).

The recommendation also has the potential to minimise the waste of unutilised people. This waste, as described by Sörqvist & Bergendahl (2021), occurs when employees' skills, creativity, and knowledge are not utilised to their fullest potential or not utilised at all. By

implementing strategies for employee engagement and improvement efforts, organisations can tap into the full potential of their workforce, thereby reducing waste and maximising efficiency and quality.

Furthermore, communicating broader operational goals and visions has a direct correlation to motivation, as explained by Jacobsen and Thorsvik (2014). When employees understand the overarching objectives of the organisation and how their roles contribute to these goals, they feel a greater sense of purpose and alignment with The Company's mission. For The Company, the vision is a sustainable solution for consumption. Enhancing communication of this operational vision could increase internal employee motivation, encouraging them to prioritise quality and work more thoroughly. This clarity and transparency in communication, foster a motivating work environment where employees are driven to perform their best to contribute to the organisation's success.

Lastly, it is important for The Company to thoroughly explore different opportunities for implementing employee engagement efforts into their daily operations. Connecting with employees and asking them about how they want to communicate suggestions, be involved in continuous improvement efforts, as well as how The Company could engage with the employees more in these efforts, could prove helpful. It is therefore suggested to thoroughly research and evaluate the most suitable strategies for implementing improvement efforts and communicating broader operational goals and visions before implementing this recommendation.

5.1.5 Implementation of Recommendations

To initiate the process of addressing the limiting factors for The Company, it is essential to consider in which order the recommendations should be implemented in the inbound process. Implementing operational changes and improvements is resource-intensive and time-consuming, making it important to create a structured implementation plan. To achieve successful and sustainable results, it is advisable not to implement all changes at once but to prioritise them based on urgency, continuously evaluating the outcomes. When prioritising the implementation of the final six recommendations, R4 and R5 are considered the most urgent as they directly target the most significant limiting factors identified in the current operations, impacting both the largest number of issues and the primary concerns. These recommendations

were also underscored as significant during interviews. Therefore, prioritising the development of training programs for new employees and evaluating and developing the performance metrics will significantly increase quality and efficiency within the inbound process.

Moving forward, The Company should initiate the implementation of R2 and R3 to tackle the issues of unbalanced workflow and inefficiency in the photo station, which are major current concerns. Increasing the number of support operators engaged in material handling presents a relatively straightforward solution to this challenge. However, the implementation of R3 is equally crucial in achieving a balanced workflow, necessitating prompt action to mitigate imbalances within the process line through cross-training initiatives.

Moreover, prioritising the implementation of R6 is vital for fostering long-term employee engagement and motivation. Even if this recommendation is not immediately critical, it holds considerable importance for sustained organisational growth and should therefore be the fifth priority.

Lastly, the implementation of R1, which involves removing the non-value-adding step in the Assortment stage, is of the lowest priority due to its proactive and long-term nature. Although this recommendation represents a minor adjustment, it is the least urgent compared to the other recommendations. However, addressing this recommendation and removing waste within the Assortment stage, will make the process more flexible, enhance efficiency and facilitate future improvements.

5.2 Employee Motivation and Engagement

Two significant limiting factors found in this study were the lack of motivation and employee engagement which was addressed in many of the final recommendations. This section discusses how implementing the recommendations can further enhance motivation and employee engagement and how this in turn can improve quality and efficiency.

The study identified several factors that limit the quality and efficiency of the process. A significant portion of these factors is related to quality issues such as recurring rework and defects. These quality issues also affect the process's efficiency by requiring a substantial amount of rework to resolve them. As stated by Gremyr et al. (2020), improving process quality usually results in enhanced flow efficiency.

Upon delving into the root causes of recurring rework and defects, it became evident that they were strongly associated with low levels of employee engagement and motivation. This connection stems primarily from the substantial manual work across various process stages, which intensifies pressure on employees' performance and engagement levels. Quality is highly correlated with motivation, meaning that improved engagement and motivation can lead to enhanced quality (Rodriguez & Walters, 2017; Deci et al., 2017). Similarly, employee motivation increases when organisations prioritise quality in their operations, which in turn increases employee performance (Bauer et al., 2002).

At the core of increasing motivation within an organisation lies the establishment of a culture that nurtures three fundamental psychological needs: *relatedness, competence,* and *autonomy* (Fowler, 2014). These are apparent and connected to many of the recommendations provided in the study.

Satisfying the need for *competence* involves enabling employees to excel in their roles by offering them opportunities to tackle challenges, showcase their skills, and demonstrate their competence (Fowler, 2014). R3 and R4, which emphasise improving training, development opportunities and cross-training, are important in supporting this need. These initiatives not only enhance employees' skill sets but also instil a sense of confidence and competence in their abilities. Additionally, recommendation R5, which focuses on improving the performance metrics, plays a crucial role in supporting competence. Performance metrics must be clear, achievable, and well-understood by employees. If the metrics are too difficult to reach or are unclear, they can demotivate employees rather than foster engagement. Therefore, ensuring that performance metrics are appropriately calibrated and communicated is vital for supporting employees' sense of competence and maintaining their motivation.

Addressing the need for *relatedness* entails creating an environment where employees feel valued and cared for, fostering a sense of connection and companionship among team members (Fowler, 2014). By instilling a shared sense of purpose and belonging, employees are more likely to feel motivated and engaged in their work. This is exemplified in recommendation R6, where employees are encouraged to actively participate in improvement efforts. By involving employees in decision-making processes and demonstrating how their contributions align with the broader organisational goals, a deeper sense of relatedness can be fostered among them.

When employees feel that their work is meaningful and contributes to a greater purpose, they are more likely to feel connected to their colleagues and committed to the success of the organisation.

Autonomy is realised when employees are granted the freedom to make decisions and exercise control over their actions and choices (Fowler, 2014). By providing autonomy, organisations foster an environment of creativity and ownership of tasks, which in turn leads to heightened motivation and satisfaction among employees. This principle is closely linked to recommendation R6, which advocates for involving employees in continuous improvement initiatives. By empowering employees to contribute their ideas and take ownership of improvement projects, organisations not only enhance autonomy but also foster a culture of innovation and collaboration. When employees feel trusted and empowered to make decisions about their work and contribute to organisational goals, they are more likely to be motivated, engaged, and invested in their roles (Deci et al., 2017).

Implementing the six final recommendations is likely to boost motivation and employee engagement, thereby enhancing both the quality and efficiency of the inbound process. However, implementing these recommendations does not guarantee that all employees will become motivated. Some employees who perceive their workplace as a short-term employer may not value long-term engagement efforts but instead prefer short-term external incentives such as competition and bonuses (Deci et al., 2017). These types of employees exist in all workplaces and will always pose a challenge. Nevertheless, implementing the six recommendations will likely increase the overall motivation as it supports the three psychological needs. As stated by Bauer et al. (2002), creating an environment that fosters support, motivation, and personal development enables organisations to excel.

5.3 The Generalisability of the Findings

Since this study focuses on a company-specific context it is important to discuss and evaluate its generalisability to other contexts. The inbound process of The Company is distinctive, leading to specific findings that may not directly apply to other contexts. However, certain identified factors and corresponding recommendations address broader issues that can be valuable for other companies and contexts.

As outlined in Section 3.4, the operational environment of The Company shares similarities with how other e-commerce retailers manage online returns and handle reverse supply chains. Furthermore, the final recommendations are of relevance for any company handling material with a high degree of manual involvement. In operating processes with manual involvement aspects such as motivation, employee training and employee engagement play a central role. The final recommendations which are presented in Table 3, can therefore provide valuable insights into how to enhance the quality and efficiency of any manual process. The first two recommendations, R1 and R2 highlight the importance of analysing internal processes thoroughly to identify waste and inefficiencies. This is an essential first step in any improvement project as it creates a comprehensive understanding of the individual processes. An effective way to do this is to map up and visualise the processes using flowcharts similar to those utilised in this study.

R3 and R4, instead, emphasise training and designing work tasks, which are also of great importance for a company with manual processes due to the increased responsibility placed on each employee. For an employee to perform both qualitative and effective they must first have learnt the process thoroughly to feel confident in their daily tasks. It is therefore essential to invest time and resources in qualitative training programs for new employees to enhance operational performance and ensure social sustainability. For companies with manual repetitive processes, it might also be beneficial to consider implementing cross-training or job rotations to enhance autonomy and motivation among employees.

R5 which focuses on the performance metric, is relevant for any company wanting to measure their employee’s performance or set productivity goals. To measure performance, it is important to consider the metrics' level of complexity, making sure it is easy for the employees to understand. If employees fail to grasp how the metrics work and how their work translates to these goals, the effect of the performance goals won’t be effective, and the metric can instead be perceived as demotivating and stressful.

Finally, R6 which emphasises employee engagement and enhancing communication of broader operational goals is essential for any company because of its direct correlation to business performance, both in terms of quality and efficiency. Without a sense of relatedness, which is one of the basic psychological needs presented in Section 2.3.2, employees will not be

motivated to contribute to the operational goals and perform at work. Furthermore, focusing on employee engagement and motivation will in the long run create a more sustainable and attractive workplace.

6 Conclusion

To shift the organisational focus from expansion and increasing capacity to developing more qualitative and effective processes, The Company must initiate operational changes. Through observations, interviews, and process mapping, several factors limiting quality and efficiency were identified throughout the study. These were summarised into four themes: *Production Design, Performance Metric, Training,* and *Motivation & Engagement,* where all themes had a substantial impact on the current operational performance. To address the limiting factors and enhance quality and efficiency, six recommendations were formulated together with an appropriate implementation strategy. By implementing and addressing the provided recommendations listed below, The Company will enhance the quality and efficiency of their inbound process.

R1: Remove the non-value-adding step in the Assortment stage.

R2: Increase the number of support operators working with material handling.

R3: Create more development opportunities and implement cross-training initiatives.

R4: Evaluate the current training of new employees to determine the ideal duration, environment, and instructional routines.

R5: Develop the current performance metric and separate quality and speed into two separate variables.

R6: Implement strategies for employee engagement and enhance communication of broader operational goals and vision.

The first and second recommendations primarily address the initial theme of *Production Design*, focusing on increasing efficiency throughout the inbound process. Removing the initial step of the Assortment stage can significantly enhance efficiency, mitigate potential bottlenecks, and streamline the process facilitating further improvements. The second recommendation emphasises the significance of improving operator efficiency and reducing the operators' movement by increasing the number of material handlers, which consequently will enhance the overall process efficiency, reduce rework, and balance the flow of items.

The third and fourth recommendations address the three themes: *Production Design, Training*, and *Motivation*, and thereby several limiting factors making them important to acknowledge.

Adapting and evolving the current training is an important step in enhancing both quality and efficiency due to its direct correlation to employee competence and motivation. Furthermore, implementing cross-training is an effective approach to managing the dynamic and unpredictable inflow of items, as it enhances responsiveness, creates opportunities for balancing the workflow and increases the overall process efficiency.

Moreover, the fifth recommendation focusing on the theme of *Performance Metric* is connected to numerous limiting factors and significantly affects both efficiency and quality. Currently, employees are struggling to understand the metric and feel stressed and pressured to perform, which leads to numerous errors, rework, and low motivation levels. By developing a more suitable metric, several of the limiting factors can be eliminated and greater emphasis can be put on the quality variable.

The last recommendation focuses on increasing motivation within the inbound process to foster greater employee engagement and improve the quality of their work. Implementing strategies to enhance engagement and involve employees in improvement initiatives will reduce the waste of unutilised people and improve motivation. Moreover, communicating broader operational goals and visions will have a long-term impact on quality by further motivating employees.

Finally, it is worth mentioning that some of the recommendations need further research before a final implementation. Regarding the development of the performance metric, The Company has two options: they can refine their existing speed performance metric by assessing the score of each item to ensure it accurately reflects reality, or they can explore alternative methods of measuring employee efficiency that better align with their operational goals. Secondly, strategies on how employee engagement can be enhanced and how such initiatives can be implemented within the processes need to be explored. The Company should further investigate cross-training, exploring how it can be implemented on a large scale, and consider opportunities for eventually implementing job rotation. Lastly, The Company must continuously evaluate their processes, performance metrics and training programs to ensure their quality and efficiency, and to identify possibilities for future improvements.

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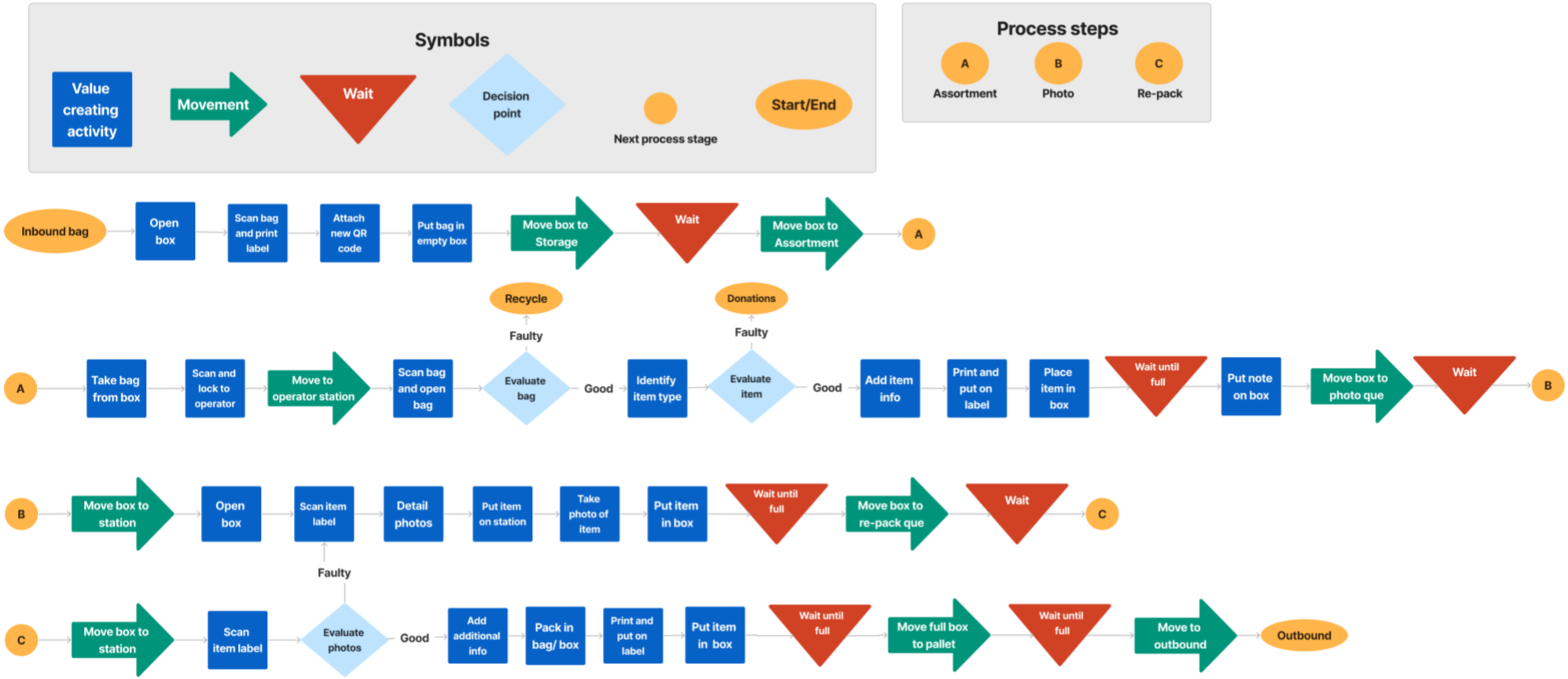
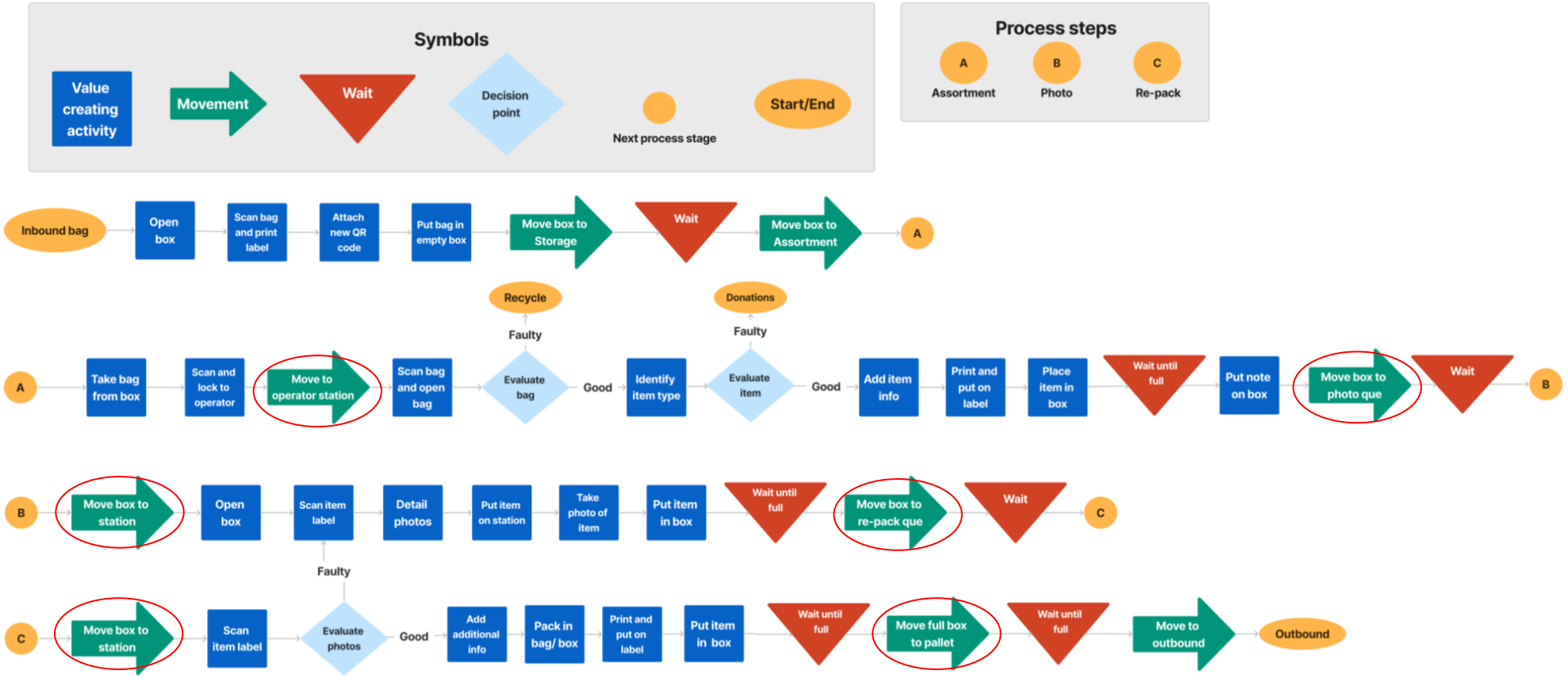
Appendix A – Flowchart of the Entire Inbound Process



Appendix B – Flowchart Visualising Unnecessary Motion



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