

The Financial Impact of Manual Inventory Record Errors

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Abstract

All classes of inventory are an equally important asset and are accounted for as money on every business's balance sheet. The senior leaders of manufacturing businesses are obligated to protect the possession of inventory and to develop strategies to ensure items are converted to revenue. Inaccurate inventory amounts, waste from utilizing incorrect components in production, and the wrong pricing on all classes of inventory were the most frequent inventory errors accounted for by utilizing manual operating practices. The gaps in the security of the controls and the lack of traceability on the inventory movement have plagued the financial growth of small and large businesses. The presence of excessive manual inventory errors negatively impacts the effectiveness of inventory controls, inventory management, sales and profitability, and executive decision-making.

Keywords: inventory errors, inventory controls, inventory management, financial

1. Introduction

The use of a manual inventory management system creates inefficiencies in small private companies resulting in excess waste and labor, which harmed their financial well-being. According to Karim et al. (2018), "For a manufacturing company, inventory control and management is crucial to ensure smooth production and sustainable sales performance, as well as preventing stockout that will result in a customer switching to competitors" (p. 436). Zadeh et al. (2016) stated inventory tracking errors and fraud generate unnecessary losses in supplies, labor, customers, and ultimately revenue for businesses. Manual inventory tracking practices are more susceptible to frequent inaccuracies and hinder the visibility of actual inventory in stock (Barratt et al., 2018). To assist in minimizing the negative financial impact of poor inventory management, manufacturing companies must find an automated inventory system that aligns with their operational procedures (Shteren & Avraham, 2017).

The automotive liquids manufacturing industry produced human inefficiencies resulting in an increase in inventory record errors and poor financial outcomes on the financial statements. The absence of an effective inventory management strategy prevented the production and accounting teams' ability to execute inventory controls to protect the organization's productiveness and financial well-being.

The purpose of this paper is to investigate the inventory errors from the use of a manual inventory management system and the financial impact on a company in the manufacturing industry. I explain how automotive liquid manufacturers handle inventory record errors and their operational procedures, while using a manual inventory tracking system instead of technological inventory software. Chuang and Oliva (2016) stated inventory is a critical asset, so properly managing and reporting the manual movement of inventory is a major component for production and financial success. With an increase of inventory discrepancies and a lack of strategic retention methods, a barcode inventory management system can aid in alleviating excessive human errors and costs (Manthou & Vlachopoulou, 2001).

2. Conceptual Framework

A manual inventory management system is related to excessive inventory errors. The chance for human errors is increased with the use of a manual inventory tracking system in a manufacturing business. Inventory errors consist of misplacement, waste, and fraud, which can be costly (Shteren & Avraham, 2017). An automated inventory system is connected to fewer inventory tracking errors. Incorporating inventory barcode technology reduces the inventory variance between the warehouse floor and the computerized inventory system (Rekik, 2011).

Another costly error involves inventory valuation, which represents the dollar value of inventories on hand at the end of the month. The raw materials are available to be converted to finished products and generate revenue for the business. Teplická and Seňová (2020) explained selecting the improper inventory valuation method is related to misstated financial records. Inventory is located on the balance sheet and incorrect amounts of actual inventory on hand can be overstated or understated each month end (Briginshaw, 2010). Extra costs associated with labor and the purchase of extra materials increase the expenses on the income statement, which decreases the revenues.

Otley (2016) stated the contingency theory explains the internal and external components that guide operational decisions implemented by senior management. Additionally, the contingency theory helped explain the use of a manual inventory system and the procedures in place to control the inventory movement and minimize financial loss in a manufacturing setting. Upper management is responsible for evaluating the internal and external factors that can govern the organization's ability to outline objectives and function efficiently (Gamme&Lodgaard, 2019). Therefore, leaders must be equipped with production and operations knowledge to foster good decision-making skills concerning inventory management practices and controls.

This study confirmed managing a system of manual guidelines can be a tedious and time-consuming task for entering and tracking inventory data. Excessive inventory record errors leads to incorrect inventory amounts and an unnecessary increase in expenses, which hinders the opportunities to convert inventories to cash (Rekik, 2011). Additionally, this study showed continuous process improvement of the key variables in a manufacturing environment are required to keep discrepancies and costs low, while protecting the organization's financial well-being.

3. Literature review

Inventory is a vital component of an organization's supply chain and the central resource of profitability. The degree of supply chain quality is defined by the caliber of human labor and how closely the business manages the inventory costs. The literature review confirmed customers rely on the vow of a business to distribute finished products on time that achieve quality standards. For manufacturing businesses using manual inventory methods in a fast-paced industry, the literature review also explained there were opportunities to introduce new innovative processes to enhance inventory controls without compromising profitability.

The manufacturing industry has a vital role in creating job growth and stimulating the economy. Depending on the reaction of the market, the appropriate volume of inventory cannot be quickly verified with a manual tracking system, which can deliver unpredictable outcomes on the inventory movement and forecasted sales (Bhimani et al., 2018). Despite the dependency of manufactured goods, many manufacturing companies are confronted with losing a competitive advantage and the risk of mismanaging inventory. From an operational perspective, businesses should focus on monitoring the costs to efficiently maximize their income (Akhtar & Liu, 2018). To keep the expenses under budget, the proper controls and inventory systems are necessary to curtail a loss in revenue.

Manual inventory practices do not conquer the need for internal parameters to control costly inventory mistakes. Atieh et al. (2016) added with handmade inventory trackers and manual Excel data entries, tracking inventory movements such as, shipments and returns can become difficult to manage as inventory levels grow. Some companies fail to realize manual inventory processes lack the benefits of real-time output and prohibits users from making changes at the same time.

With a modest amount of cash flow, small and privately owned businesses often opt to secure inventories through a manual control system. From maintaining a continuous paper trail to formulating basic records, Kroes and Manikas (2018) expressed businesses are more sensitive to unforeseen loss and theft of inventory items. The prolongation of unforeseen inventory losses are costly for any business trying to access the root cause and rebuild from making poor inventory decisions (Yan et al., 2019). The goal is to obtain a functional inventory control system to secure the inventory flow and find cost savings to increase profitability.

Several businesses have the means for technological investments, but still prefer to preserve capital and find sustainability in a manual inventory system (Yan et al., 2019). Companies rely on maintaining a manual tracking system because management feels introducing automated inventory software requires too many changes to current guidelines (Atieh et al., 2016). In addition, executives have the mindset of not uprooting good practices that already work favorably for the company.

With any business process, human error is an unavoidable occurrence, but the key is finding solutions to control the amount of human errors (Yamazaki, 2017). There are numerous mistakes that can disrupt the inventory counts, which can weigh heavily on production and the customers' demand. When using a manual inventory control process, improper cycle counts, scrap, and theft can make it hard to maintain correct inventory totals. Snell and Dean (1992) added neglecting to have an efficient inventory control system in place leaves employees irritated and overwhelmed, which contributes to excessive oversights and disgruntled customers.

3.1 Lack of training

Training is required for proper execution of the business's vision for the inventory management plan. In a manual manufacturing environment, patience and analytical skills are a necessity to properly keep eyes on the inventory placement. Research by White and Censlive (2013) found adding the human experience without a full understanding of inventory practices leaves room for uncertainties and major mistakes.

When errors go undetected for a significant period of time, it can be difficult to manually trace back the inventory control mistakes to an individual or a specific group (Snell & Dean, 1992). Additionally, time wasted to retrain workers on a manual inventory system could be redirected to resources to generate more profit.

Based on research by Chuang and Oliva (2015), competent full-time employees are needed to combat frequent inventory errors rather than part-time laborers. Furthermore, the authors link frustrations with understanding job practices to increases in inventory record discrepancies and eventually burdens labor availability. Inefficiencies in training lead to high rates of employee attrition and understaffing (Böhn & Deutscher, 2020). Low staffing numbers along with incompetent workers results in higher inventory errors, which deflates the functionality of operational procedures, productivity, and sales.

3.2 Inventory maintenance

In 2013, the Committee of Sponsoring Organizations of the Treadway Commission (COSO) published revised procedures for the implementation of internal controls to certify the value of company performance and prevent unethical acts (Udeh, 2019). To guarantee the financial information presented to the public is free from erroneous mistakes and relevant to the transactions of the company there must be efficient internal controls. The absence of successful internal controls can cause a decline in the trustworthiness of information submitted to examine operating and investing opportunities and threats (Hansen, 2020). In agreement, Phornlaphatrachakorn (2019) explained valuable internal regulations are necessary to ensure all financial documents are administered with truthfulness and openness to stakeholders of the company.

To assist in eliminating excessive errors in data entries, inventory checks are critical to catching discrepancies and making corrections. Manual inventory tracking involves frequent cycle counts to keep stock numbers accurate without risking a decrease in demand and having perishable items (Yamakazi, 2017). Due to the uncertainty of the market, monthly, quarterly, or semi-annually, inventory audit schedules are set to analyze and control the inventory amounts for completeness and future orders. Businesses must strictly maintain the schedule and ensure the employees comprehend the inventory audit process as inventory is the lifeblood of the revenue stream for an organization. Thus, this is a crucial element in the auditor's evaluation of the going concern opinion. Fortunately, portions of inventory auditing can be automated to support the audit opinion through continuous auditing applications (Kuhn, 2012).

Maintaining the capability to track the movement of items in the supply chain is vital when tightening the differences in the inventory amounts (Lee et al., 2015). Tracing inventory movements is essential to pinpoint any problems and knowing where the inventory is located throughout the process is a necessity for production management (Chuang & Olivia, 2016). The overall goal is to guarantee the concluded amounts of the inventory items are balanced to support the supply and demand of the industry. Staying competitive involves utilizing the connections in the supply chain to observe the inventory changes and executing the appropriate internal controls when necessary.

With a manual inventory system, the risk of picking inventory from paper documents can lead to selecting the incorrect inventory for orders if not labeled and stored properly. Therefore, the operational leaders must assign skilled employees to accomplish regular cycle counts on random selections of all raw materials, work-in-process goods, and finished products without impeding productivity. Kok and Shang (2007) performed an assessment and concluded high-priced goods, inventories with an unwarranted discrepancy rate, and slow-moving materials tracked using papers should be cycle counted on a more frequent basis.

3.3 Communication

Constant communication is one of the major components to ensure the manual movements of inventory are known by the effected departments. A culture of open and effective communication must be established by senior leaders for all employees (Groddeck, 2011). When the communication is bad, the inventory numbers are harder to trace in the supply chain and possibly leads to misplaced items. Missing inventory or a lack of materials for production slows down the inventory turnover time (Zadeh et al., 2016) and adding the element of ineffective internal communication builds a system of long-term failure. Businesses align their financial goals with their ability to quickly convert raw materials into finished goods for sales.

Clear communication and the exclusion of unjustified obstacles must be a top concern and not a diversion to making sustainable decisions by any level of management (Groddeck, 2011). When the communication is bad, the inventory numbers are harder to trace in the supply chain and possibly leads to misplaced items. Missing inventory or a lack of materials for production slows down the inventory turnover time (Zadeh et al., 2016) and adding the element of ineffective internal communication builds a system of long-term failure. Businesses align their financial goals with their ability to quickly convert raw materials into finished goods for sales.

The communication starts with having reliable suppliers to provide inventory in a reasonable time for production of orders (Purvis et al., 2016). The suppliers' lead time enables the operations department to establish production schedules based on customer orders and communicate an expected delivery time (Srivastava et al., 2017). A major misstep for a manufacturing business is prolonging a customer's delivery because of delayed goods from the supplier. Too many late deliveries can hinder a customer's ability to generate profit and force them to order from another supplier. A company can possess the highest quality product in the industry, but untimely shipments will negatively influence the customers' expectations (Ponte et al., 2018).

3.4 Financial impact

The two most prominent financial documents that reflect the movement and value of inventories are the balance sheet and income statement. The balance sheet consists of detailing the assets, liabilities, and stockholder's equity, which the results end with total assets being equal to the sum of total liabilities and stockholder's equity (Akhtar & Liu, 2018). The income or profit and loss statement compiles the total manufactured sales and subtracts out various direct and indirect expenses. For instance, labor connected to the production of goods and the costs associated with the production of the finished products.

Stakeholders depend on the financial statements to be precise for personal and investment use, so businesses must exercise due diligence when presenting the final documents. The groundwork of an effective inventory management plan is a required goal for manufacturers because inventory has a significant connection to the income statement. The income statement aids management in analyzing and preparing strategies for operational performance, sales, and the correlated costs (Ciurariu, 2014). On the income statement, the revenues are linked to the cost of goods sold (COGS) based on the amount of inventory sold for the accounting period (Fan & Liu, 2017). To capture the movement of inventory amounts, the income statement includes cost of goods sold for a specific time period. The selling of finished goods and the revenue spent to manufacture the products for customers are displayed on the income statement (Ciurariu, 2014). Therefore, the beginning inventory numbers, and the ending balance of inventory must be recorded correctly to prevent false readings on the income statement. In addition, the final result informs senior leaders on the performance of the business through netting a loss or profit gains.

The balance sheet is prepared to reflect the business's financial well-being by showing the items owned and the amount owed to debtors over a certain period of time. Cash flow is a major indicator of liquidity for a business. Inventory is listed as an asset on the balance sheet and calculated each accounting period using either FIFO, LIFO, or WAC (Teplická&Seňová, 2020). The total value of raw materials, work-in-process, and the unsold finished goods inventories are grouped as current assets. Leaving too much inventory on the balance sheet can lead to misconceptions on the amount of working capital.

3.5 Automated inventory systems

As technology and automation continues to develop, more businesses are finding lean manufacturing practices complements future inventory management activities (Erdil et al., 2018). Shokri (2019) expressed manufacturing businesses no longer exclusively depend on humans to identify inventory errors in the supply chain. Businesses are investing in machines to not only reduce human inventory record errors and material scrap, but to increase the production process.

A company's investment in an inventory management system is large and is an ongoing cost for a substantial length of time as technology evolves. The correct inventory system selection is critical to a company's short and long- term profitability. Dolgov and Kaltenbach (2017) explained a key advantage of incorporating a real-time inventory system is the ability to capture a view of inventory consumption and examine current supply levels.

Automation is a resource to follow all inventory movement through the organization to provide an immediate location to the employees. An inventory software system captures purchases, inventory movement, and sales, which are all key pieces in real-time inventory management (Mbuvi et al., 2016). Inventories with assigned barcodes are scanned to link with the software program and users can instantly retrieve the product information. The technology supports inventory tracking throughout various frequencies with barcode scans and permits immediate alerts when discrepancies occur with inventory. In addition, automation enables the management team to use real-time data to enhance inventory practices and controls.

Automatic reporting is obtainable for inventory movement such as projecting the demand, evaluating recent sales performance, and assessing exactly how much a particular item is generating based on standard production costs and selling price (Momeni& Azizi, 2018). Reporting is important when a manufacturing business has to decide how to handle price fluctuations in the market. Moheb-Alizadeh and Handfield (2018) presented an illustration of how price fluctuations are connected to seasonal products and ways management can prepare for wavering production costs ahead of time to decrease financial woes. Furthermore, historical reporting empowers the leadership team to order the inventory in advance based on previous costs and sales patterns.

4. Research Methodology

Due to the time restrictions of this research study, the researcher refrained from seeking automotive manufacturing companies with manual inventory practices outside of North Carolina. Within the selected organization, the 18 eligible individuals required at least one-year of experience working directly with inventory movement and accounting. The organizational employees were in sales, production, distribution, and accounting to convey the source of the data and the measures taken to retrieve the information.

4.1 Sampling

The sample size of 18 people was sufficient to ensure coverage for all areas of inventory management and interpreted the financial health of the business. The manual tracking procedures were reviewed to verify the inventory moves throughout the business and the subjects were interviewed about the experiences with the current practices to learn the most common inventory mistakes and generate solutions for future use. Table 1 displays the results of the demographic survey questionnaire for each eligible participant.

Table 1

Demographic Survey Questionnaire Results of the Participants

Participant Code	Job Title	Job Tenure	Age Range	Gender
P01	Supervisor	11-20 years	36-45	Male
P02	Production Specialist	1-5 years	18-25	Male
P03	Sales	1-5 years	36-45	Female
P04	Accounting Specialist	6-10 years	26-35	Male
P05	General Manager	1-5 years	36-45	Male
P06	Warehouse Lead	11-20 years	36-45	Male
P07	Production Specialist	6-10 years	36-45	Male
P08	Production Specialist	1-5 years	18-25	Male
P09	Production Line Lead	1-5 years	26-35	Male
P10	Production Specialist	1-5 years	26-35	Male
P11	Controller	6-10 years	Over 45	Male
P12	Sales/Procurement	1-5 years	36-45	Male
P13	Forklift Operator	6-10 years	36-45	Male
P14	Receiving Specialist	6-10 years	26-35	Female
P15	Distribution Specialist	1-5 years	Over 45	Male
P16	Forklift Operator	1-5 years	26-35	Male
P17	Production Specialist	1-5 years	18-25	Male
P18	Production Specialist	6-10 years	26-35	Male

4.2 Data analysis

A plan for consistent evaluation of the compiled data aided in bringing forth overlooked concepts. Taking the time to revisit the interviews, documents, and observation notes limited the possibility of discrepancies and developed recognition of themes. Relevant data was extracted to ensure credible information was grouped by level of importance to understand the inventory errors and the weaknesses in inventory control.

4.3 Data collection

The main source of data was from the interviews with all 18 participants, which consisted of open-ended, semi-structured questions. The seven interview questions were structured to capture the participants' experiences with the phenomenon of inventory errors and aligned with the four research questions. All interviews were face-to-face and conducted in a private setting to guarantee the conversations remained confidential. All documentation associated with each participant was verified by the assigned code (Yin, 2014). After the interview was completed, as a form of member checking, the interviewee was allowed to read the handwritten or typed transcript and provide feedback for accuracy.

The second largest source of data derived from the onsite observations. Observations were conducted on the production floor and the shipping and receiving area. Before each observation, the researcher inquired about the proper procedure for the departmental tasks and made notations to refer back to when watching the actions of employees in real-time.

There were current and historical electronic inventory records, emails confirming customer orders, inventory

purchases from vendors, bill of ladings, packing slips, and financial documents. The researcher analyzed the documentation relevant to the purpose of the study and made detailed notes for future references.

The interviewees' review of the transcripts, saturation, and triangulation illuminated a valid amount of findings to produce an organized report about the human experiences with manual inventory errors. Triangulation was achieved through interviews with participants from various work departments, documentation, and observation field notes, which revealed common themes despite differences in job functions. Saturation of the data was identified by the comparable themes derived from examinations of numerous interview transcripts. During the process of member checking, there were no requests for changes and all transcripts were granted approval by the participant.

5. Results

The key themes for inventory errors were derived from the experiences communicated by the participants' interviews, personal observation by the researcher, and limited documentation. The first theme supported the three most common inventory mistakes experienced by the majority of the study's interviewees that ignited the conversation for improved inventory controls. The second theme related to an immediate need of an inventory management plan to accompany the revised inventory control processes. The third theme acknowledged how the inventory errors overshadow the monthly budgeted expenses and causes adverse effects on the balance sheet and income statement. Lastly, the fourth theme identified reasons senior leaders are hesitant to decide and strategize changes within the organization to mitigate inventory errors and recover revenue loss. The four themes were interpreted individually to incorporate the study participants' viewpoints and the information collected during fieldwork. Additionally, the themes were connected to the conceptual framework, research questions, literature, and anticipated themes for this study. The contributions from the interviews and observations provided a deeper understanding of the inventory problems, the financial impact, and the reasons senior leadership chose to function under manual operations rather than an automated system.

The findings of the study revealed the most common inventory errors were incorrect inventory counts, incorrect BOMs, and inaccurate pricing of raw materials and finished goods. Previous literature found inventory errors occurred with barcode scanners and automated systems because humans support the operation of the equipment (Cannella et.al., 2017; Dolgov & Kaltentbach, 2017; Mbuvi et al., 2016). Regardless of the inventory system, a strategized plan is necessary for management to properly maintain the stream of inventory in an organized manner to prevent excessive errors (Dolgov & Kaltentbach, 2017; Karim et al., 2018; Sharma et al., 2020).

Researchers advised updated technology allows for real-time information to extracted from the system to enhance sales and budget forecasts to predict the financial outlook internally (Alfares& Attia, 2017; Mbuvi et al., 2016; Nugroho & Zhu, 2019). Syncing inventory systems with external vendors can automatically enable inventory reorder points and share pricing information (Kourentzes et al., 2020; Kroes & Manikas, 2018; Nugroho & Zhu, 2019; Sharma et al., 2020). Real-time data increases the proficiency of inventory management and workers are allowed to focus time on resolving other issues within the company (Kroes & Manikas, 2018; Mbuvi et al., 2016).

The level of consideration in the management of inventory is reflected directly through sales and indirect expenses (Akhtar & Liu, 2018; Chuang & Oliva, 2015; Kroes & Manikas, 2018; Lee et al., 2015). Inventory turnover measures how quickly a company has the capability to sell products to the customer for profits (Lee et al., 2015; Nugroho & Zhu, 2019; Phornlaphatrachakorn, 2019; Sharma et al., 2020; Yan et al., 2019). The inability to track waste can cause unexpected inventory shortages that can stop production and prohibit sales to the clients (Erkayman, 2019; Karim et al., 2018). Therefore, companies that neglect accounting for waste and labor can deteriorate financially fast if inventory processes are not continuously monitored by management (Erkayman, 2019; Phornlaphatrachakorn, 2019).

Based on the perceptions of the interviewees, the recommendations provided to senior leaders were not received well or considered because of fear. Nugroho and Zhu (2019) shared leaders have to be prepared to enforce change and ensure the employees are in alignment with the new processes. In contrast, Ivanov et al. (2021) stated the efforts of incorporating new practices should be focused on the investment returns and organizational goals rather than the employees' involvement. A series of activities being incorporated without a solid strategy can often present a false representation to decision makers that business is going well.

7. Conclusion

The problem explored in this study was the financial impact inventory errors had on a manufacturing company with manual inventory operations. The findings from this study reinforced manual manufacturing practices suffer financially from various forms of inventory errors. For strategy application to happen, upper management must recognize the problems and be willing to explore solutions for change. When businesses desire to change inventory practices, senior leaders can analyze different cost options against the budget and construct a strategic timeline.

For businesses with manual practices, an automated inventory system can streamline the management techniques and valuation activities to combat numerous inventory issues. Based on the resources available to the business, managers can incorporate different strategies to organize various areas of the production floor. Companies can also develop an inventory team to focus on inventory management throughout the supply chain. An inventory team can function as an extra layer of protection on the company's most valuable asset.

The most prevalent concerns were the rise in costs found on the profit and loss statements, understated/overstated values reflected in the asset section of the balance sheet, and overall negative impact to the final income on all financial statements. Inventory must be safeguarded once received to manufacture a quality finished good for the customer. Customers depend on the proper development of materials to consume goods to satisfy daily needs. Without the necessary protection measures, the inventory items risk being unaccounted for or missing in the tracking system, which jeopardizes the potential of net sales.

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