

THE FINANCIAL IMPACT OF MANUAL INVENTORY RECORD ERRORS

THE FINANCIAL IMPACT OF MANUAL INVENTORY RECORD ERRORS

by

Shamia Wynn

---

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

---

Liberty University, School of Business

September 2021

### **Abstract**

This qualitative case study investigated how the most common inventory errors in a manual manufacturing environment impacted the financial health of the business. 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. Knowledge of the phenomenon was gained through interviewing and observing participants in their natural setting to discover potential themes and solutions. 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 the participants. The participants felt the senior leadership's fear of change and automation costs would continue to stunt efficiency and delay the strategies to minimize inventory errors. Observations showed the gaps in the security of the controls and the lack of traceability on the inventory movement. Documentation from various departments reflected the inheritance of the manual inventory errors through increased expenses and financial loss. The findings led to themes revolved around inventory controls, inventory management, sales and profitability, and executive decision-making, which all coincide with inventory errors. In addition, this study provided a deeper look into manual inventory operations inefficiencies through previous scholarly literature, possibilities to overcome the inventory issues, and opportunities for further research.

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

THE FINANCIAL IMPACT OF MANUAL INVENTORY RECORD ERRORS

by

Shamia Wynn

Dissertation

Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

Liberty University, School of Business

September 2021

**Approvals**

_____	_____
Shamia Wynn, Doctoral Candidate	Date

_____	_____
Dr. John Kuhn, Dissertation Chair	Date

_____	_____
Dr. Yongil Luo, Committee Member	Date

_____	_____
Edward M. Moore Ph.D, Director of Doctoral Programs	Date

### **Dedication**

First, I am honored to dedicate this study to God, my Heavenly Father, who equipped me with tools to produce this work and guided me through to the end. God, I thank you for giving me purpose and for the stretching. To my husband Will, thank you for your understanding and not allowing me to give up. To my dearest mother, thank you for your endless love and staying up late with me to proofread my work. To my earthly father, Andrew Milton (Pops), thank you for being my biggest cheerleader in life! Pops, although you transitioned to Heaven before I started the program, thank you for being my guardian angel during this process! To my daughters, Samiah and Amiyah, you are my motivation and I pray I inspire you to raise the bar too! LJ, my godson, you are such a joy and I pray this cultivates your educational journey. To my second parents, Rita and Boba (Will), thank you for rearing me and Rita, thank you for being my family's personal chef. Aunt Leslie, thank you for being my snacking buddy and providing live entertainment. Aunt Joyce, Aunt Toot, Aunt Ann, Aunt Lennie, Uncle Thadford, Ms. Phyllis, Ms. Ann, and Ms. Canty, I thank you for imparting wisdom into my life and encouraging me to push through. Aunt Dianne, I thank you for keeping me informed on our TV shows and the prayers. To Papa Milton, my uncles Robert, Gary, and Erwin, and my aunts, Bobbette and Kim, thank you for covering me during my darkest hours and allowing me to experience a piece of my father through you. To my In-Loves, Will and Collette, thank you for the constant check-ins and affirming words. To the Tisdale, Parker, Milton, Hardy, Spells, and Wallace families, thank you for your prayers and support. To anyone I may have unintentionally missed and all my other beloved family members who have passed away, thank you and I dedicate this to you as well, because you helped mold me into the woman I am today.

### **Acknowledgments**

First, I would like to acknowledge God for never forsaking me and giving me the strength to endure. I am grateful to Liberty University for allowing God to set the atmosphere in the academic industry. I am grateful for the amazing staff and leadership that assisted me with persisting to the end. Dr. John Kuhn, Dr. Yongil Luo, and Dr. Nicole Lowes, I thank you for the correction, the insight, and the encouraging words throughout the doctoral program. I am thankful for my Girl Talk sisters, Candice, Star, and QuaNesha, for genuine sisterhood, prayer, and great conversations with a good meal. I appreciate my small group, Ashley, Britney, Charda, Donnitria, Jasmine, and Miracle, you ladies are the most amazing six women I know! You ladies always found a way to make sure I had a social life. To Britney and Dr. Sabreen, Lord, thank you for our weekly Bible studies, sharing songs and sermons with me, and fasting and praying with me. To Cameron Hodge, thank you for sharing your academic journey with me and bouncing strategies off of each other. Special thanks to the best boss ever, Mark, for encouraging my doctoral journey. Thank you to the new friends I have met at Liberty, and I pray our friendships last beyond this chapter in our lives.

**Table of Contents**

Abstract .....	ii
Approvals .....	iii
Dedication .....	iv
Acknowledgments .....	v
List of Tables .....	xi
List of Figures .....	xii
Section 1: Foundation of the Study .....	1
Background of the Problem .....	1
Problem Statement .....	2
Purpose Statement .....	3
Nature of the Study .....	3
Discussion of Method .....	4
Discussion of Design .....	4
Research Questions .....	6
Conceptual Framework .....	7
Manual Inventory System .....	7
Incorrect Inventory Values .....	7
Automated Inventory System .....	8
Discussion of Relationships Between Concepts .....	10
Constructs .....	10
Summary of the Conceptual Framework .....	12
Definition of Terms .....	12

Assumptions, Limitations, Delimitations .....	13
Assumptions.....	13
Limitations .....	14
Delimitations.....	15
Significance of the Study .....	16
Reduction of Gaps in the Literature.....	16
Implications for Biblical Integration.....	16
Relationship to Field of Study .....	18
Summary of the Significance of the Study. ....	19
A Review of the Professional and Academic Literature.....	19
Inventory Management .....	20
Contingency Theory.....	21
Manual Inventory Systems .....	22
Inventory Classification .....	24
ABC Analysis .....	25
Inventory Storage.....	26
Human Inventory Errors .....	30
Ineffective Communication .....	37
Inventory Valuation Methods .....	39
LIFO, FIFO, and WAC.....	40
Impact on Financial Statements .....	42
Alternatives to Inventory Management .....	46
Real-Time Inventory Systems.....	47

Barcode Inventory System.....	52
Just-in-Time Inventory.....	52
Economic Order Quantity.....	57
Conclusion .....	61
Summary of the Literature Review.....	62
Summary of Section 1 and Transition .....	62
Section 2: The Project.....	63
Purpose Statement.....	63
Role of the Researcher .....	64
Research Methodology .....	65
Discussion of Flexible Design .....	66
Discussion of Qualitative Method .....	66
Discussion of Method(s) for Triangulation.....	66
Summary of Research Methodology .....	67
Participants.....	67
Population and Sampling .....	68
Discussion of Population .....	68
Discussion of Sampling .....	69
Summary of Population and Sampling.....	70
Data Collection & Organization .....	71
Data Collection Plan .....	71
Instruments.....	72
Data Organization Plan.....	73



Summary of Data Collection & Organization .....	74
Data Analysis .....	74
Emergent Ideas.....	74
Coding Themes .....	75
Interpretations .....	75
Data Representation .....	76
Analysis for Triangulation .....	76
Summary of Data Analysis .....	76
Reliability and Validity.....	77
Reliability.....	77
Validity. ....	78
Bracketing.....	78
Summary of Reliability and Validity.....	79
Summary of Section 2 and Transition .....	79
Conclusion .....	80
Section 3: Application to Professional Practice and Implications for Change .....	81
Overview of the Study .....	81
Presentation of the Findings.....	81
Themes Discovered.....	86
Interpretation of the Themes .....	86
Representation and Visualization of the Data.....	94
Relationship of the Findings to the Research Questions .....	98
Relationship of the Findings to the Conceptual Framework .....	102

Relationship of the Findings to the Anticipated Themes.....	104
Relationship of the Findings to the Literature .....	107
Relationship of the Findings to the Problem.....	113
Summary of the findings.....	113
Application to Professional Practice.....	115
Improving General Business Practice.....	115
Potential Application Strategies.....	117
Summary of Application to Professional Practice .....	119
Recommendations for Further Study .....	120
Reflections .....	121
Personal & Professional Growth.....	121
Biblical Perspective .....	122
Summary of Reflections .....	125
Summary of Section 3.....	125
Summary and Study Conclusions .....	127
References.....	128
Appendix A: Pre-Interview Demographic Survey Questionnaire .....	142
Appendix B: Semi-Structured Interview Guide Questions.....	143

**List of Tables**

Table 1 .....422

Table 2 .....82

Table 3 .....95

Table 4 .....96

**List of Figures**

*Figure 1.* Conceptual framework.....9

*Figure 2.* Types of inventory errors experienced at Slick Automotive. ....94

### **Section 1: Foundation of the Study**

The balance sheet holds one of the largest assets a manufacturing company possesses, which is classified as inventory. Inventory determines the welfare of the company and the sustainability of financial wealth. To maintain the problems with inventory, good inventory management practices regulates the total inventory transactions going in and out of stock. Improper maintenance of inventory records can contribute to substantial loss of productivity, a lack of competitiveness in the market, and ongoing financial failures.

The problem for this study was manual inventory practices result in various inventory errors, which can negatively hinder a manufacturer's profitability. In this section, there is an illustration of this qualitative study's purpose, research questions, framework, and a scholarly literature review. Section two of this study explains the researcher's data collection and analysis processes to explore the inventory and financial issues through the experiences of the participants. This study discloses in Section three the findings from the fieldwork, the emerged themes, the relations to components from Sections one and two, and how the findings could be applied to businesses and future research endeavors.

#### **Background of the Problem**

The researcher investigated the reasons organizations with manual inventory practices experience numerous inventory discrepancies and poor financial performance. The previous professional studies focused on international manufacturers rather than domestic production manufacturers. Most of the current literature highlighted the inventory weaknesses of retail businesses with a barcode inventory system, while there is limited research available on the automotive liquid manufacturing industry. In addition, research lacked details on the negative impact to inventory value and revenue on the financial statements from continuous inventory

record discrepancies. The value added from this research included identifying the inventory management gaps and the best inventory controls to alleviate the financial pressures caused by using manual practices. This research provided an illustration of how excessive inventory errors of an automotive liquid manufacturer with a manual inventory system can harm their financial health. A qualitative case study was conducted to obtain centralized themes to offer insight to more effective inventory management procedures and future implementation of automated systems to minimize inventory discrepancies and costs.

### **Problem Statement**

The general problem addressed was 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 customer switch 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 hinders 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 specific problem this study addressed was the use of a manual inventory management system within the automotive liquids manufacturing industry in the southeastern United States 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.

### **Purpose Statement**

The purpose of this qualitative case study was to understand the inventory errors from the use of a manual inventory management system and the financial impact on a company in the manufacturing industry. The research highlighted the various inventory management weaknesses to formulate the best strategies to employ an effective automated inventory management system to minimize loss in a manufacturing environment. This study aimed to provide an in-depth examination of manual inventory management and control activities and its negative influence on the financial performance at Slick Automotive Manufacturing Company, located in North Carolina.

### **Nature of the Study**

This study was conducted with a flexible design using qualitative methods specifically, a single case study design. The case study design is a qualitative method necessary for researching single or numerous realistic events on a selected issue to understand the intricacy to evaluate the information (Morgan et al., 2017). Case studies support illuminating, examining, or describing research of people and businesses, which involves accumulating information through various approaches, such as observations, meetings, and documentation (Fletcher et al., 2018). Cheek et al. (2018) clarified important factors of a successful case study consists of knowledgeable participants with detailed explanations about the phenomenon and conducting in-depth analysis to divulge new themes.

### **Discussion of Method**

Although the quantitative method uses numerical measurements for all the incorporated variables through proper data instruments to prove the mathematical statistics are valid and reliable (Moore & Komesaroff, 2012), the researcher felt the quantitative method results are too narrow to provide deep insight and instead chose the qualitative method. Additionally, the researcher rejected the quantitative method because gaining access to software licenses to compile the computations can be costly to obtain and would be a personal expense. Disman et al. (2017) stated to clarify the cause and effect or the link between the variables, all the transmitted feedback from the surveys is converted into numerical values with the use of statistical computer software. Stone (2018) advised focusing on numerical values for research outcomes may deflect the attention of researchers with mathematical weaknesses. Once survey answers were provided, the qualitative method provided clarity on the information returned and allowed additional contact with the participants. Surveys were a collection of close-ended questions to limit the participants' answers. The researcher had continual contact with the study participants and was permitted to ask questions openly to seek a deeper level of understanding about operational processes and viewpoints, so the quantitative method was not appropriate for the purpose of this case study.

### **Discussion of Design**

Narrative research expresses the participants' emotions in written form based on actual stories in a specific situation (Bruce et al., 2016). The objective was to obtain a wide range of stories from the individuals to rewrite in chronological order, which deterred the researcher from using this design. Polkinghorne (2016) stated a challenge for the narrator is compiling enough data about the series of events to provide a simplistic understanding to the audience. Another



reason the researcher did not select the narrative design was linked to the participants being reluctant to disclose pertinent information that could expose others or make them feel uncomfortable to completely recall private encounters. Additionally, the narrative design was not an option because of the complex and lengthy process, so time constraints in the field can lead to minimal evidence to support the stories or shift the narrative based on their own experience without complete validation.

Based on the time constraints in the structure of the Doctorate in Business Administration (DBA) program, the ethnographic design was not ideal for time restricted research. Due to the complexity of the ethnographic design, the undertaking of assembling data entails working in the field of the study to build close relationships with the subjects and allotting time to perform intimate observations for several months or years (Morse, 2016). This study did not seek to grant the readers awareness on the principles, values, and traditions that create the culture of the participants in a shared environment, which selection of a certain sample group can become a tedious project and therefore, the researcher did not select the ethnographic design.

The phenomenological design illuminates the shared experiences of individuals who have lived through a similar situation (Groenewald, 2018). Phenomenology brings meaning to the phenomenon through realistic life events of the researcher too. The author did not wish to overshadow the expressions of the participants and went with another design. Kaivo-oja (2017) found researchers struggle to complete the bracketing process and issues appear in the ability to prohibit past experiences influencing the current findings throughout the research. The researcher did not want to introduce bias into the project through personal encounters, so the phenomenological design was not suitable for the study. The researcher focused on the subjects'

viewpoints to avoid overlooking the contextual issues in the research project. This was another reason the phenomenological design failed to attract the researcher.

### **Summary of the Nature of the Study.**

To capture their personal experiences with the current processes of tracking errors using a manual inventory system, the case study method was chosen by the researcher to interview and observe multiple employees. Furthermore, this design was appropriate to understand the rare use of a manual inventory system rather than an automated barcode inventory system in efforts to reduce inventory tracking errors. Observing and evaluating the elements of the participants' individual interactions with the manual operational procedures created an opportunity for a deeper exploration of the aspects that influenced the production environment and the financial statements. In addition, the case study design was perfect for continuous collection of information through emails, reports, and financial documents. The notes from virtual meetings supported research analysis and ways to find new data and patterns.

### **Research Questions**

The case study research questions were formatted to focus on obtaining a descriptive experience with the phenomenon and understand how automotive liquid manufacturers handle inventory record errors and their operational procedures, while using a manual inventory tracking system instead of a 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). The research questions for this study are:

RQ1. What inventory errors do organizations in the automotive liquids manufacturing industry experience with using a manual inventory management system?

RQ2. How does the experiences with a manual inventory management system influence the decisions related to reducing inventory record errors?

RQ3. How do inventory record errors impact productivity and the financial statements?

RQ4. Why is a manual inventory management system utilized instead of a barcode inventory system within the manufacturing industry?

### **Conceptual Framework**

The concepts, theories, employees, and constructs played different roles in the investigation of the use of manual inventory tracking discrepancies. When all research was collected and analyzed, the combination of each component highlighted the detailed description of the problem. The following terms are described to give the reader a better understanding of the context and application used in this case study.

#### **Manual Inventory System**

A manual inventory management system is related to excessive inventory errors. The chance for human errors are increased with the use of a manual inventory tracking system in a manufacturing business. Inventory errors consists of misplacement, waste, and fraud, which can be costly (Shteren & Avraham, 2017).

#### **Incorrect Inventory Values**

Inventory valuation is the dollar value used to represent the amount of inventories on hand at the end of the month. These goods 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.

### **Automated Inventory System**

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). Just-in-Time (JIT), a lean manufacturing technique, is used to eliminate scrap, reduce labor expenses, minimize inventory stock inconsistencies, and prevent storage costs for large quantities of unused inventory (Wang et al., 2018). Sahin and Dallery (2005) found implementing the use of technology with an inventory management technique supports better productivity, which enables manufacturing companies in generating more revenue.

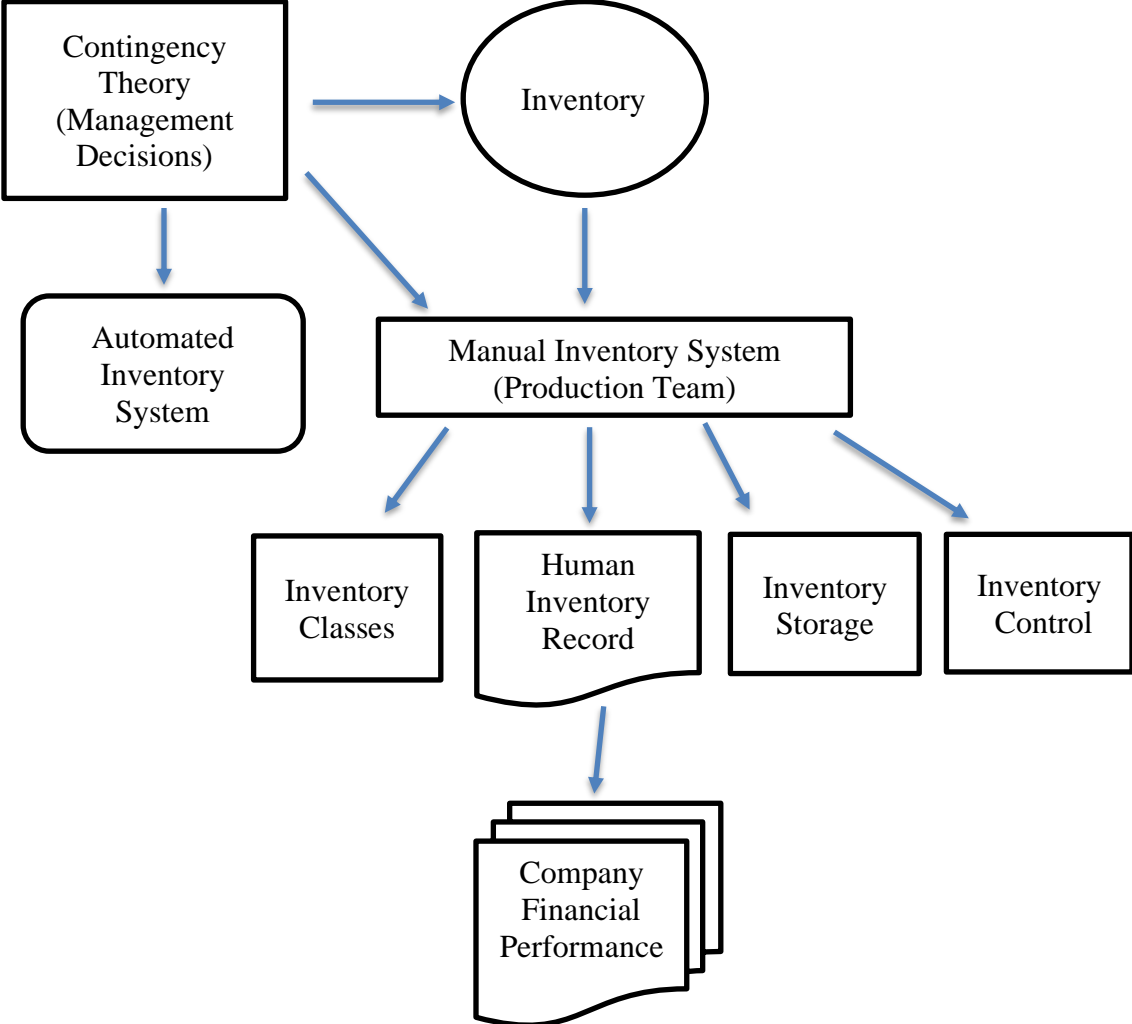


Figure 1. Conceptual framework.

### **Discussion of Relationships Between Concepts**

**Contingency Theory.** 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.

**Managers.** The management team is responsible for the use of a manual inventory system rather than a barcode inventory system. Therefore, they make the decisions pertaining to the operations of the manufacturing business surrounding their available resources to strategize solutions for inventory errors and achieve financial goals (Otley, 2016).

**Production Workers.** The production team is trained to work with the available resources and perform according to the standard operation procedures (Barratt et al., 2018). Through observation and interviews, an in-depth overview was displayed to understand the processes of using a manual inventory system and the common occurrences of human inventory record errors.

**Accountants.** The accounting team provides insight on the negative financial impact pertaining to the use of a manual inventory system and inventory discrepancies in a manufacturing environment (Myrelid & Olhager, 2015).

### **Constructs**

**Humans.** Emami-Mehrgani et al. (2016) stated creating finished goods requires a combination of specific skillsets and learning capacity from humans to ensure the final product is acceptable to the customers. An increase in inventory mistakes threatens a manufacturing business's ability to produce quality finished products to make continuous profit (Sahin &

Dallery, 2005). Numerous inventory errors by humans can inflate the expenses to replace inventory losses and perform rework on goods (Briginshaw, 2010).

**Inventory Classification.** Inventory is organized by class in the manufacturing environment and helps the operations team keep track of the inventory available for production (Yang et al., 2017). The structure of the goods manufactured, and the amounts of items required for production determined the extensiveness of the classifications. To control how inventory was managed and valued, raw materials, work-in-process, and finished goods require the major inventory classifications, along with uniquely assigned item numbers.

**Inventory Storage.** Manufacturing companies must have adequate space to store unused inventory for future use and control purposes. Storage areas and warehouses are assigned locations to make inventory to preserve their usage life and organized accessibility (Beemsterboer et al., 2016). The ability to find goods in a sensible timeframe is required to continue the efficiency of production and manually oversee the inventory on hand (Sharma et al., 2020). The inventory levels were increased and shipments to customers were decreased, which jeopardized the amount of storage space available and large amounts of inventory became defective, or supply orders were duplicated.

**Inventory Control.** Effective inventory controls encompasses having frequent inventory audits to catch inventory mistakes (Gallmann & Belvedere, 2011). Furthermore, Shteren and Avraham (2017) found with the use of an automated inventory system, all inventory is assigned individual item numbers to provide traceability.

**Company Financial Performance.** Inventory is a vital factor to innovation and financial survival of a manufacturing business (Lee et al, 2015). Excessive inventory record errors jeopardizes the amount of inventory on hand, which can diminish a company's opportunity to

maximize their net income (Myrelid & Olhager, 2015). Lieneck (2015) explained the decision to deploy the first-in, first-out (FIFO) process results in a higher margin of profitability because of lower costs associated with production. However, the last-in, last-out (LIFO) process uses higher direct costs for the manufacturing goods, which lowers the business's profit margin. Inventory expenses have a direct connection to sales on the financial statements and the reputation of a company is evaluated based on their success to sustain profitability.

### **Summary of the Conceptual Framework.**

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 qualitative 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.

### **Definition of Terms**

**Cost of Goods Sold.** Cost of goods sold (COGS) is the cost of producing finished products that were sold to customers in a given financial period (Fan & Lui, 2017).

**Finished Goods.** Finished goods are final manufactured products qualified to sale for profit (Gallmann & Belvedere, 2011).



**Forecast.** Forecast is a future outlook on the overall financial performance of a company (Liu et al., 2016).

**Raw Materials.** Raw materials are base components necessary to formulate a final product (Yang et al., 2017).

**Work-in-Process.** Work-in-process is an inventory item partially completed and used to assist in completing a finished good (Oláh et al., 2017).

### **Assumptions, Limitations, Delimitations**

#### **Assumptions**

In research, assumptions are justified statements throughout the study taken as truth by the audience. For this research study, there were various assumptions. One assumption was all employees were skilled and understood the processes of manually tracking the movement of inventory. In addition, the workers would lack skills because of tenure with the company or time in a particular job function to fully understand procedures and the impact of their mistakes. To avoid risk, participants were asked to share their tenure with the company, their job title, and their age range to determine eligibility for this study. Through the interviews and the observations, participants confirmed their knowledge about the inventory issues stemmed from operating in a manual inventory environment. Methodological triangulation is resourceful to extract consistent details from the selected participants through discussions and personal observations to ensure reputable information is provided to the readers (Heesen et al., 2019).

Another assumption was that when utilizing a manual inventory tracking system, all inventory record mistakes were caused by the employees. Although this study revealed internal human errors happened, there were external factors that contributed to inventory management issues. To maintain the security over all inventory items, companies must establish guidelines to

ensure all packages received from vendors or returned back from customers are accurate in count and qualified for resale (Kroes & Manikas, 2018).

The third assumption was implementing automated processes would resolve all inventory issues and revenues would automatically increase. Dolgov and Kaltenbach (2017) found incorporating automation does not have direct correlation or guarantee a higher rate of productivity from workers. Questions were asked about the most common inventory errors and suggestions to help minimize them to prohibit risk with this assumption. Based on the interest of migrating to automated practices expressed by participants, the information gathered was used as a guide to make suggestions on inventory methods that were a good fit for the culture and company goals.

### **Limitations**

The limitations in this case study were constraints, which were not controlled by the researcher. Due to COVID-19, observation time and completeness was limited, but the selected participants gave in-depth personal experiences about the existing inventory errors and financial impact. In addition, the pandemic heavily curtailed the labor force, so the business operated with a smaller workforce and two shifts. Case studies permit small sample groups, so the available time in the manufacturing facility was fixated on interviewing and watching those subjects in attendance.

The case study focused on the comprehensiveness of manufacturing in the automotive industry, the organizational procedures operated under active manual inventory procedures, and the demographic location was the southern part of the United States. However, the findings from this research was not from randomly selected manufacturing companies across the nation. Due to technological advancements in the global manufacturing industry, the uniqueness of this case

study research would be hard to replicate in most domestic regions. Therefore, the results were only applicable to the company in this study and did not serve as an overall conclusion for all companies in a manufacturing setting. Where present data was lacking to provide reliability and validity, historical information was included to supplement the research findings. An opportunity for future research was documented by the researcher to compare the findings to other companies in the global industry.

As the research project progresses, the researcher's bias could impact the participants' answers in the interviews (Creswell & Poth, 2018). Researchers could get off track and become an insider rather than an outsider. Perspectives about the study were easily formed because naturally humans are built to have opinions based on how things are presented and interpreted. An independent notebook was utilized to dump thoughts, objective feelings, interpretations of the data collected, the subjects involved in the case, and the conclusions found in the study to eliminate personal bias. Furthermore, the researcher allowed each participant to proofread their transcript and edit as needed to prevent misrepresenting their experiences and interpretations regarding each interview question.

### **Delimitations**

Delimitations are the standards implemented and maintained by the researcher to provide the study clear direction. The scope of this case study took place in a liquid manufacturing company located in North Carolina. There were 18 participants involved in maintaining the inventory items from the time received by the business. The researcher observed and identified the different practices of handling inventory errors by the production, distribution/receiving, accounting, and account management teams.

### **Significance of the Study**

This goal of the study was to identify the common inventory mistakes by the users of a manual inventory tracking system and the importance of safeguarding the asset from negatively impacting the sales of smaller businesses in the automotive manufacturing environment. In addition, this significance of this study spotlighted senior leaders' fear to make better decisions of how to strategize their plans to build an effective inventory system to assist in eliminating costly human errors or incorporate proper alternatives to improve manual inventory management performance. Kroes and Manikas (2018) concluded when designed properly, accurate inventory maintenance is key to converting materials into finished product for customers and generating positive financial growth for stakeholders.

### **Reduction of Gaps in the Literature**

This study added to a wealth of research that underlines the human errors experienced when combined with operational practices in the manufacturing industry. While there was an abundance of previous research on inventory system errors, there was a lack of studies on domestic companies tracking inventory manually. Therefore, the study investigated inventory inefficiencies and how the inventory errors created stress on the financial performance for manufacturing companies.

### **Implications for Biblical Integration**

A significant reason for implementing supply chain techniques in the organizational strategies was to certify there is sufficient inventory amounts in stock to sustain the customer demand. This encompassed improving every part of the supply chain to ensure inventories were controlled, expenses were kept low, and deliveries were completed as promised to guarantee ongoing revenue. In comparison, God granted Adam and Eve the independence to work in the

garden but warned them not to eat fruit from one particular tree (Genesis 3:3, KJV). However, they disobeyed God's instructions to stay away from the tree and permitted the serpent an opportunity to entice Eve to consume fruit from the forbidden tree. Due to unauthorized actions, a divergence from the initial plan inflicted substantial risk and interruptions in the original objective.

The same approach companies use to build strategies for plans to shield inventory is the same way God has created everyone with a purpose. God had relationship with us prior to our parents planning our conception in the womb (Jeremiah 1:5, KJV). In an instant, God blessed us with purpose and an identity just like inventory items are appointed to a category and location in the warehouse. We were armed with unique gifts to assist us in fulfilling our purpose and detailed instructions to steer us in the right direction. Our existence, purpose, and gifts were all deliberately coordinated by God, so we could complete His work on Earth.

Our responsibility is to acknowledge our talents and incorporate them to perform meaningful work. Jesus, a servant to mankind, came from Heaven with the mission to circulate the Gospel around the world and to deliver us from evil actions (Mark 10:45, KJV). Although Jesus realized his ability to work alone, he still recruited twelve random men and made them disciples. God made all talents congruent, so when they work together activities are flawless. In God's perspective, no status or work title is more important than the other. Schwartz and Rivera (2010) stated an efficient inventory control plan involves individuals from different departments to combine their specialized gifts to make certain the inventory systems are completed properly, and the correct controls are compatible for their business operations. Even though all workers involved in the practices have various talents and positions, they are all just as important and necessary for a productive flow of monetary gains.

As the technology advances in the manufacturing environment, so should the composition of the business's production practice and other parts of the inventory process to sustain a competitive advantage. Despite an organization's technological capabilities, senior leaders are responsible to obtain and manage the value of inventories in stock (Kumar & Evers, 2015). The contentment of the customer is the main goal in a manufacturing setting and the core of the strategies are built around satisfying them with quality goods to purchase on a continual basis (Brunaud et al., 2019). Our mission as Christians in the workplace is utilizing our talents to cultivate the work and create resolutions to assist the business in eliminating financial threats and promoting growth.

Making choices to function against the will of God means we place our wants over everything else. Often, we select swift decisions in fear of not securing the power over a situation and suffer major consequences. In the manufacturing industry, methods for managing inventory errors are presented based on an assortment of knowledgeable thoughts and guidelines to produce profits. Proverbs 11:14 (KJV) states "where no counsel is, the people fall: but in the multitude of counsellors there is safety". Therefore, the obligation is not designed for one individual or one sector to choose the daily operational activities without pursuing feedback from other managers (Calabrese & Costa, 2015). Lack of understanding on a problem could prohibit the opportunity to choose a sound decision and avoid a financial obstacle.

### **Relationship to Field of Study**

The presence of inventory is vital in the accounting field and determines how the asset is valued on the financial statements (Avinadav & Henig, 2015). These instruments provide an outline of the business's financial well-being in relation to the projected forecast and assist with future financial planning (Bhimani et al., 2018). Therefore, the inventory amounts must be

recorded and valued correctly regardless of the production systems in use and errors must be kept to a minimum. Moheb-Alizadeh and Handfield (2018) found improper valuation can cause misleading numbers for inventory for stakeholders, which can be understated or overstated and lead to inadequate financial decisions. Since inventory is a crucial element of the supply chain and the main resource for revenues, controls are important to ensure the inventory flows securely (Brunaud et al., 2019). Once the inventory is received, the financial achievement of a successful organization reflects the accomplishments of the inventory control strategy (Otley, 2016).

### **Summary of the Significance of the Study.**

When making decisions how to manually handle and safeguard the inventory, senior leaders must analyze the current production practices, financial documents, and any other important operational reports in comparison to the present strategy. A high margin of companies do not survive financially because they neglect to properly manage the flow of goods. Poor management of inventory reduces the level of work performance, which can take a substantial toll on the financial health of the company. Superior inventory management practices do not happen suddenly and involves a series of continuous process improvements to achieve satisfactory outcomes. The work of numerous facets is urged to make an organization function and deliver financial success in the industry. Ultimately, the career we select should allow us to showcase our gifts to foster respect in the fields, provide reliable services to all mankind, and give honor to God.

### **A Review of the Professional and Academic Literature**

The professional and scholarly literature stressed 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 authors revealed inventory problems for each business is different, but the combination of the proper management tools can provide favorable results when implemented correctly. This implied building strategic plans to guarantee inventory controls are significant to the structure of the operations to maximize productivity and eliminate wasteful mistakes. This study aimed to evaluate previous research about the common inventory mistakes in a manual tracking environment, the effect of inventory valuation on the revenues, and effective techniques to monitor the inventory levels from start to finish. Furthermore, the researcher investigated the findings from this literature review through interviews and observations in the field.

### **Inventory Management**

Inventory mistakes consistently made in a manufacturing setting jeopardizes the timely expectations of the customers and the financial expectations of the business. Senior leaders have a responsibility to use the resources available to implement inventory practices that will safeguard the asset upon conception. Businesses know humans are essential for the operational processes and are necessary for them to function for generation of revenues. Therefore, businesses prepare for a loss of inventories when focusing on production and planning for current and future spending.

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.

Inventories are recognized based on the business's preferred method of inventory system. A good inventory management strategy includes growth in sales, minimizing costs, loyalty, flawless execution, and protecting the interests of customers and stakeholders (Calabrese & Costa, 2015). The periodic inventory system entails the materials acquired by the company and applied to the purchases general ledger account, then the inventory is manually reconciled at the end of the month (Hansen, 2020). Under the perpetual inventory system, all materials acquired and returned to the vendor, sales and returned sales, and discounts on materials purchased are automatically recognized when the transaction occurs (Phornlaphatrachakorn, 2019). By immediately applying the numbers to the specified ledger accounts, the inventory balances remain correct unless there are ongoing losses.

### **Contingency Theory**

Senior management's ability to lead with sound decisions is a key ingredient needed to attract success and longevity for any business. The operational processes and strategies for inventory management are installed based on the decisions of organizational leaders (Rekik, 2011). McAdam et al. (2019) found the theory derives from the thought that success is dependent upon the conditions of operations and alleviating the problems with strategic alignment. Sunder and

Prashar (2020) added critical failure factors are needed to explore the techniques for continuous improvement and decision-making through the contingency approach. The challenges measures the efficacy of management's decisions and the ability to adjust to the outcomes.

Otley (2016) argued management control systems coupled with contingencies specific to the business should be included to handle organizational problems and develop strategic parameters for each part of the business. Once critical decisions are made the management team must have a plan established for employees to execute and an organizational style to maximize performance in the industry (Sunder & Prashar, 2020). Employee involvement is necessary for accomplishing the organizational objectives and ensuring the quality of the products delivered to the customers (McAdam et al., 2019). By nurturing internal relationships, senior management sets the tone for the business operations and employees are trusted to deploy the improvement plans. Creating meaningful relationships with employees helps management detect the threats to the organizational assets, so issues can be controlled before disrupting the financial well-being of the business.

### **Manual Inventory Systems**

Manufacturers depend on the supply of raw and work-in-process inventories to complete the finished products for profits (Oláh et al., 2017). Therefore, the operational department must ensure the correct parts are on hand and understand how to maintain the stock levels for future customer demand. Although little costs are involved, Manary et al. (2019) explained manually tracing inventory movement requires papers are kept in order and spreadsheets to be updated on a consistent basis. Furthermore, there has to be a skilled team of individuals capable of accurately tracking the inventory and proactively engaging in communication about the stock levels.

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 cashflow, 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.

To obtain consistency in accuracy with a manual inventory system, frequent daily meetings are mandatory to double check every manual adjustment. Oláh et al. (2017) found a common missed adjustment is the use of raw materials in production runs the risk of not being properly accounted for during the manufacturing phase. When the materials on the production

lines are not manually deducted from inventory, manufacturing businesses experience problems with cycle counts and delays in production (Shokri, 2019). The current inventory levels will show higher than expected on the paperwork, but over time physical inventory counts will become highly inaccurate. Tracking consumption of raw materials is a difficult operation with a manual inventory system managing multiple production lines.

Safety precautions assists companies with protecting the best interests of employees and how they handle the movement of inventory through the supply chain. Accidents associated with manual processes can slow down the flow of the supply chain, which can cause production delays and low efficiency (Huang et al., 2019). Managers should incorporate safety measures along with frequent checks to ensure all employees are using caution to manually track inventory moves. Neglecting to perform risk assessments and educate frontline employees on proper inventory management safety measures decreases workforce and profitability.

### **Inventory Classification**

In the manufacturing industry, there are three main classifications to assist with managing and controlling inventory. The three categories are raw materials, work-in-process, and finished goods. Raw materials are the fundamental parts necessary to build the finished products (Ali & Khan, 2019). Work-in-process are the incomplete goods that have not cycled through the entire production process. Finished goods is the final product ready to be sold to customers. Breaking inventory down into groups is the foundation for senior leaders to build a good strategy that fits the structure of the business.

When raw materials are received, the quantity of each item is added to the raw material inventory total. As raw materials are consumed and created into a finished product, the materials are deducted from the raw materials category and added to the finished goods total (Liu et al.,

2016). For the partially completed inventory, they are transferred from raw materials to the work-in-process group. As the final products are sold to customers, the total parts shipped should be subtracted from the finished goods inventory.

### **ABC Analysis**

The efforts of senior leadership should concentrate on regulating the inventory costs in the supply chain. In a manual inventory environment, inventory turnover is not easily detectable and opportunities to schedule customers' orders are overlooked when they are not projected, and inventory shortages arise. The practice of grouping goods by value of greatest to smallest is called ABC analysis (Mishra & Lsoni, 2012). This empowers the leadership team to analyze and maintain a close look at the high-priced items, which yields the most income.

Observations by Yang et al. (2017) indicated an increase of nearly 8% in revenues by deploying the ABC technique. In ABC analysis, a manufacturing business evaluates the inventory and then divides the inventory into classes centered around certain standards set by operations management. For instance, the categories can be implemented as follows: Category A covers inventories with the highest earning potential, category B covers inventories with the next highest price tag, and category C includes the inventory with the lowest value (Mishra & Lsoni, 2012). The categories enables production management to retrieve the inventory items based on consumption cost and the volume of sales. In addition, ABC analysis prioritizes the amount of financial influence placed on each category of inventory.

The inventory items with the greatest magnitude of importance is the main focus and closely managed through the supply chain (Ali & Khan, 2019). The high value items should be cycle counted frequently to guarantee no orders are skipped due to inventory shortages. According to the Pareto standards, the top 20 percent of inventories generate the majority of an

organization's sales, so the senior leadership team must maintain high visibility of the items until ready for shipment (Millstein et al., 2014). The distribution department should safeguard the finished products in the warehouse and strategically place orders for easy access.

The B category receives the next level of control since the inventory is deemed essential to the company. Fu (2016) advised executive managers evaluate the sales forecast frequently to see if there is any inventory to be reclassified into another category. Based on the level of sales, the inventory can migrate to category A or be downgraded to category C, which can involve the demand for more inventory or a requirement for less materials from the vendor (Millstein et al., 2014). Furthermore, management has time to brainstorm strategies for handling the advancement of the inventory items and the implementation of a cost-effective plan.

For category C, inventory items require the least amount of control and are seldomly ordered by the customers. Erdil et al. (2018) noted similar to the JIT process, the inventory items are normally manufactured based upon receiving the customer's order request. Category C items risk the chance of not being in stock or overstocked, which unnecessary amounts of inventory can increase material costs. Ultimately, senior managers should decide whether to maintain a limited stock of the inventory items with a periodic sales record or suspend production for the slow-moving items in category C (Fu et al., 2016).

### **Inventory Storage**

Overseeing inventory in storage locations can be a daunting task for a business without an automated enterprise resource planning (ERP) system. A good inventory management strategy includes a plan on how to monitor the warehouse inventory, financials, and the logistics of the company (Laosirihongthong et al., 2018). Stocking excessive amounts of inventories can drive up the rent expenses for additional warehouses or cause disorganization if space is limited.

Having large amounts of low demand inventory in storage for too long is a sign of lost revenues and a poor ratio for days on hand.

Every business should revamp the current strategies continuously to ensure the storage costs are not outweighing the effectiveness of warehouse inventory performance (Sharma et al., 2020). Overlooking the expenses to store inventory items can sabotage a company's ability to maximize sales growth. Alignment of the warehouse management strategy will guide better decisions with selecting the layout of inventory, labor and training, procurement guidelines, and the performance goals (Beemsterboer et al., 2016). Warehouse performance is usually structured by the percentage of goods leaving out as sales, the amount of shipments returned, and the costs associated with storing inventory. With periodic restructuring, the strategy can optimize the operational processes of inventory storage and companies can experience the best possible outcomes for sales.

When building an efficient warehouse management plan, one of the biggest misjudgments is treating all inventory items the same (Sharma et al., 2020). Businesses should know the demand associated with each unit and develop procedures to store each item differently. The stock keeping units (SKUs) must be prioritized by the how fast the item moves through the entire supply chain. Beemsterboer et al. (2016) expressed inventories should be categorized by the range of profit margin generated or the inventory item's turnover rate. Items should be positioned in the warehouse based on the shipping destination. Warehouse management strategies must optimize the stock levels and concentrate on decreasing excessive inventory totals, increase productivity, and boost liquidity.

Buffer or safety stock is favored by some manufacturers to guarantee customer orders are readily available for assembly and distribution. The purpose for excess inventory is to sustain

excellent customer service and mitigating shortages and obstacles in the production process (Graves & Schoenmeyr, 2016). Safety stock inventory is also beneficial to replace damaged goods or as another stream of business income to store a specific amount of inventory on the customer's behalf for future availability. The sales, marketing, and production management teams are responsible in projecting the goods or product codes that necessitate a reserve of inventory on hand for future demand (Kumar & Evers, 2015). However, the warehouse management team must govern the safety stock on hand to prevent low turnover ratios and obsolescence.

Overstocking items during times of uncertainty in the market can be detrimental for manufacturers with promotional and seasonal materials. Extreme amounts of unwarranted inventories in stock is intensified by a poor cycle count and inventory audit patterns. Inefficient policies on stockroom floorplans and inventory locations provoke issues with item rotation (Kumar & Evers, 2015). Distribution employees select shortcut options that entails picking items more visible out of confusion or lack of knowledge. Frequent occurrences of selecting the wrong materials for production or shipments leads to inventory loss and diminishes sales potential.

Regular updates on inventory benchmarks, audit schedules, and actions to organize warehouse space are imperative in combatting storage problems. A compatible ERP system alleviates the stress of misplaced inventory receipts, location transfers, high scrap levels, and product returns (Liu et al., 2016). With manual inventory practices, there are too many incidents to cause a disconnect with the warehouse management system and the information presented on the financial statements. Due to the lack of precise inventory records, irregularities in the budget and forecasting models can encourage senior leaders to submit to bad warehouse management decisions.



Poor quality control is another factor to create overages in the warehouses. When inventory is not checked for defects or incorrect labeling, product returns can start to consume storage space and require continuous rework of customer orders (Momeni & Azizi, 2018). Warehouse management must incorporate current procedures to include quality checks on all items entering and leaving the company's storage locations. All components necessary to complete finished goods should be in working condition to present quality shipments to customers in a timely manner.

Streamlining the processes between various departments and the distribution team is critical to preserve the effectiveness of the supply chain. Senior leaders should not allow assumptions between departments to delay inventory storage, production schedules, or shipping deliveries (Faber et al., 2017;2018). The strength of the supply chain is tested with how businesses survive unforeseen problems and still maintain momentum in efficiency. For instance, the interference of COVID-19 forced the manufacturing industry to adapt to unknown economic conditions, while trying to maintain productivity with limitations on inventory orders and staffing. Therefore, businesses without a contingency plan suffered because of poor execution of inventory management processes.

A warehouse inventory management strategy is not complete until there are knowledgeable workers to fulfill the duties. Senior leaders should not neglect to manage the roles of the employees and confirm the accuracy of the inventory movements. Despite incorporating technology, errors in handling the inventory will occur if employees are not capable of enforcing the protocol for storage (Graves & Schoenmeyr, 2016). Workers monitoring the inventory should understand the validity of finished goods and strive to ensure all inventory movement is cost efficient. When businesses integrate warehouse inventory plans with

incompetent people, the labor costs increase because of correcting careless inventory record errors.

### **Human Inventory Errors**

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.

The total number of inventory items available is vital to accepting customer orders and forecasting future orders. The production team has to account for every piece of inventory that enters and leaves the building (Tejesh & Neeraja, 2018). In addition, the inventories must have specific locations for storage based on the stage of production. Losing visibility of items in the warehouse can result in spoilage and delays in shipments. Another common result of misplacing inventory is ordering too much, which requires extra warehouse space and is an unnecessary cost driver.

Chuang and Oliva (2015) found improper labeling and not placing inventories in the correct locations are two major contributors to inventory record errors. Kok and Shang (2007) described how inventory mistakes can increase based on higher profitability, the complexity of the supply chain, and the number of different materials on hand. As the inventory levels increase, so will the amount of paperwork and the responsibility to maintain an organized floorplan.

Mishandling the location of inventory wastes valuable time in searching for product to fulfill orders.

Auditors expect to see an organized inventory tracking system and a well-maintained paper trail for all items in the warehouse (Faber et al., 2017;2018). The auditors anticipate the accounting documents to synchronize with the inventory tracking records. Reliable paperwork allows audits to flow smoothly from the production floor to the accounting department.

Neglecting to store inventory records in one main location brings confusion to investigators trying to trace information from the beginning to the end of the fiscal year.

**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.

The purchase of inventory software programs is expensive and is designed to help streamline processes and enhance overall business performance. Ali and Khan (2019) emphasized failing to have the right tools operated by educated employees can be detrimental to any size company. Businesses should invest ample time into securing employees' confidence with any new system that is implemented for inventory management. Unhealthy decisions can still surface from incompetent users operating the most expensive, intelligent inventory software.

Employees in the operations department must learn the product lines and become familiar with the physical location of the inventory items. There can be financial consequences when the incorrect materials are counted or not fully executed because of unqualified cycle counters. Good training practices of inventory quality control requires time management (Böhn & Deutscher, 2020) and strong mathematical skills from knowledgeable workers throughout the operational supply chain.

Employers must be confident in the workers they hire and place them in positions to best fit their strengths. Training employees to adapt to the culture of the company is the foundation for successful teamwork (Böhn & Deutscher, 2020). When employees feel confident in their work, they can connect the job function to the company's vision. In addition, employees should be cross trained to support other areas of the business, which enhances the morale and productivity levels.

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.

Numerous accounts of inventory record errors forces knowledgeable employees to be burdened with the responsibility to reconcile the inventory count differences and fall subject to burnout (Chuang & Oliva, 2016). Therefore, the training department should send out literature about the manual inventory system, so all employees can acquaint themselves with the purpose

of the process and the expected outcomes. Frequent meetings should be conducted on a departmental level to assist employees with understanding how the new processes will impact their job roles and develop ways to improve work performance.

**Improper Inventory Controls.** 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 (Zhao et al., 2016). Businesses must strictly maintain the schedule and ensure the employees comprehend the inventory audit process.

Maintaining the capability to track the movement of items in the supply chain is vital when tightening the differences in the inventory amounts (Tejesh & Neeraja, 2018). 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.

**Inventory Counts.** 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.

Vendors are essential for companies to have goods in stock to convert over to profit. Most inventory lost happens upon the point of inception because businesses fail to review order receipts and packing lists. Mitreva et al. (2018) added as a precaution, all raw materials received from vendors should be counted for accuracy and examined for damage before being added into stock. Since raw materials are a key part of the supply chain, defective parts and incomplete shipments from vendors can cause interruptions in production and compromise sales to customers. Continuous shortcomings with unpredictable suppliers can be damaging to a company's bottom-line numbers.

When items are added or removed from stock for production or to fulfill sales orders, mandating employee signatures on the inventory sheets provides traceability on the adjustments to stock levels. Thus, a good practice is to organize stocked inventory by product line labeling

and location to ensure accurate input and output of inventories. In addition, visibility is important for all materials, especially high traffic raw materials and finished goods (White & Censlive, 2013). Negative amounts of inventory in the records is an indication of a disconnect in the internal control procedures and extensive audits are necessary to rectify the negative balances.

Inventory audits should be administered often to guarantee the inventory records in the manual system match the physical amount in the warehouse. Current supply quantities are valuable to the financial health of the company and erroneous amounts can interrupt the production of the finished goods (Yamazaki, 2017). When inconsistencies of key inventory items exist, the inventory counters should inform management before modifying the inventory documents. Tracing the materials and finished goods is necessary to determine if items have been misplaced in other warehouse locations or was overlooked in an earlier transaction (Zhao et al., 2016). Materials must be backflushed and deducted from the inventory records after being used to manufacture a finished product. Unfortunately, neglecting to complete this task will cause inventory overstated numbers, which cannot be detected until a physical inventory count is completed.

Based on the size of the business, complete inventory counts should be included in the inventory management plan and scheduled accordingly at the discretion of management. During a full warehouse inventory count, all operational functions cease until the counts are finished and the new inventory totals are reconciled (Karim et al., 2018). Furthermore, inventory movements are not permitted, no goods can be received or shipped out of distribution to the customers, and no production. When the physical inventory counts are preplanned, all divisions of the

organization can collaborate to create an effective plan. Skilled employees should be notified and informed of the designated areas to audit before starting full inventory counts.

Some goods need to be counted as on hand inventory even though the materials are not in the warehouse. For example, goods ordered from an overseas supplier may be in route to the business, but not actually in the warehouse and are adjusted into the inventory numbers. Although the items are not received in the business's possession, the materials still belong to the company once shipped from the vendor (Atieh et al., 2016). Once the inventory updates are completed, the value of old and stagnant goods should be removed from the accounting books or salvaged for future endeavors. Some manufacturers send scrap items to outside recycling companies to recoup a portion of the inventory cost. All inactive or missing inventory discoveries should be immediately addressed, and a thorough investigation conducted before modifications are performed (Karim et al., 2018). A request for another inspection can be deployed to double check human mistakes, such as inaccurate computations, on the final number of inventories. When patterns of huge differences are found, then stricter internal controls should be communicated to mitigate future errors in the inventory tracking records.

**Separating Duties.** Segregation of duties is a control that permits more than one employee operating in a job function. To steal inventory and coverup the fraud, employees would have access to move inventory items and access to alter the inventory records (Kroes & Manikas, 2018). Therefore, multiple employees will be involved in the role of safeguarding inventory and manually recording the entries to prevent unethical acts. This allows employees to perform the task and another employee to confirm the job was completed accurately. Job rotations are encouraged to deter employees from committing theft because the next employee can discover the fraudulent actions.



By assigning specific roles to each employee, the efforts to find the root cause of inventory errors are traced back to the responsible individual. In a manual inventory tracking environment, accountability is an important factor, especially since an employee identification system is not feasible (Kok & Shang, 2007). When questions about inventory arise, the assigned employee can explain the task and give insightful information about any issues. Designating job functions gives employees a sense of importance and urges them to perform with integrity.

### **Ineffective 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.

**Internal Communication.** 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 internal actions of a manufacturing business can impact lead times in production. Every division must connect and work directly together to certify the specifics of a customer's order is transferred effortlessly across the supply chain (Ponte et al., 2018). For operational preparations, every section of the supply chain should have an estimated time frame for each stage of operations from beginning to end. For instance, the finance department investigates the status of slow-moving inventory resting in the warehouse, while the customer service members and sales account team desire to maintain inventory in stock and available to complete orders. If setbacks occur internally, all impacted departments should have accessibility to locate the deviation and instructions on mitigating the problem the first time (Purvis et al., 2016). Weak parts in the supply chain along with improper operational practices in any department will stagnate the production schedules.

Regardless of what inventory management methods are used, face-to-face meetings are necessary to prohibit mishandling inventory and jeopardizing revenue potential (Lee et al., 2015). For example, once the inventory items are pulled for production, the production employees must communicate the removal of stock and record the new amounts on hand. Communicating this part of the inventory cycle is critical for reordering the proper inventory, having the correct amounts in stock to complete future orders, and securing revenue for the business (Schwartz & Rivera, 2010).

**External Communication.** Inventory has numerous roles in the supply chain, so staying aware of the path is important in a different way for each link in the chain. 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). Eventually, some customers will exchange a decrease in quality for finished goods to be delivered as promised. Therefore, companies should order from dependable vendors and build positive communication paths to ensure the supply chain is suitable to meet the customers' specifications and demand.

When vendors miscommunicate arrival times of raw materials, manufacturers order excessively from other sources or accumulate large amounts in freight expenses to avoid insufficient inventory for production (Haçerlioğulları et al., 2016). Additionally, when damaged materials are received, companies are stressed with the task of returning items and finding replacements in a timely fashion. Ignoring the impact of long lead times jeopardizes attracting new customers and competitiveness in the industry.

### **Inventory Valuation Methods**

The value of materials still in the warehouse has to be reconciled at the end of every accounting period. Every piece of inventory must be counted and priced correctly, so the asset value is accurate on the balance sheet. Based on economic trends, Ciurariu (2014) added pricing for materials can fluctuate at any given time. A company must establish an inventory valuation method to determine the appropriate price for the unused materials (Laosirihongthong et al.,

2018). This ensures items are properly priced based on when they were received, which is an item of concern for auditors.

### **LIFO, FIFO, and WAC**

Businesses most commonly enforce valuation techniques to account for their assets using the first in, first out (FIFO), last in and first out (LIFO), or the weighted average cost (WAC) (Conley et al., 2019). The FIFO method removes the inventory first purchased from the stock to sell to the customers to avoid accumulating obsolete items. In contrast, the LIFO method removes the inventory last received in from the stock to sell to the customers and the oldest inventories remain on the shelf. WAC or average cost is utilized through a calculation of dividing the COGS for goods ready for sale by the amount of inventory currently on hand.

The management team must implement a valuation method to fit the needs of the business and present the desired financial outcomes. Conley et al. (2019) advised inventory valuation is a component of production expenses that are critical to improve because the costs change the selling price of finished goods. A top priority for all organizations is securing a solid customer portfolio to obtain healthy numbers on the balance sheet, so executing poor choices about inventory valuation can negatively impact revenue. Competitive manufacturers focus on the liquidity, how quickly inventory is converted into sales, and net worth, which is all outlined on the balance sheet. Therefore, Teplická and Seňová (2020) concluded FIFO encourages the use of higher inventory values to strengthen the available cash and asset value on the balance sheet.

When using the LIFO method, the assumption is the cost of inventory is higher and the newest inventory received is the first to be used in production. The LIFO method is within the rules of generally accepted accounting practices (GAAP) and the freedom to control changes on the financial statements is preferred by some businesses (Ciftci & Darrough, 2019). Although the

taxes may be lower with older assets in stock, the aging inventory is understated on the balance sheet as time passes along. With the International Financial Reporting Standards (IFRS) changing to concentrate more on the balance sheet projections, the LIFO method was omitted as a suitable inventory valuation technique. Additionally, when documenting manual records, maintaining older goods makes inventory management harder task. Companies risk having the older inventory to turn into perishable items and failing to appeal to investors with less revenues.

Average cost accounts for all saleable items in stock and takes the mean to determine COGS and the amount of inventory on hand at the end of the financial period (Conley et al., 2019). If difficulties arise in establishing costs for various inventory items, then senior leaders may employ the WAC method. When valuing inventory under the WAC method, the COGS and ending inventory values will range between the outcome of FIFO and LIFO.

The inventory demand can be determined by the shelf age and how fast or slow the inventory is moving through the supply chain. To maintain the guidelines of the matching principle, the decrease in the value of inventory must be applied in the same accounting period for proper recognition in the inventory records and financial statements (Ciftci & Darrough, 2019). The correct recording is completed by posting the write down of inventory and then a credit to the inventory account. In contrast, inventory values should not increase beyond the net realizable value.

Inconsistencies in the strategies of inventory controls can result in a significant rise in material costs, direct labor, and delivery expenses. Furthermore, it impedes the organizations' ability to quickly sell finished products and replenish the inventory stock. Hançerlioğulları et al. (2016) added the inventory turnover numbers consists of taking the mean of inventory on hand and dividing by the COGS. Enhancements in operational procedures are critical for

manufacturing businesses wanting to increase its profitability and requires strengthening the relationship between efficiency and production performance (Lee et al., 2015). The total manufacturing sales are largely driven by the costs incurred from securing inventories for production.

### **Impact on Financial Statements**

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. The table below illustrates the impact of improper inventory amounts and the monthly outcome on the financial statements.

Table 1

#### *Effect of Inaccurate Inventory Records on the Income Statement -First Period*

<b>Inaccurate Inventory Records for <u>Ending Inventory</u></b>	<b><u>COGS</u></b>	<b><u>Net Income</u></b>
<b>Understated</b>	<b>Overstated</b>	<b>Understated</b>
<b>Overstated</b>	<b>Understated</b>	<b>Overstated</b>

#### *Effect of Inaccurate Inventory Records on the Income Statement -Second Period*

<b>Inaccurate Inventory Records for <u>Beginning Inventory</u></b>	<b><u>COGS</u></b>	<b><u>Net Income</u></b>
--	--------------------	--------------------------

<b>Understated</b>	<b>Understated</b>	<b>Overstated</b>
<b>Overstated</b>	<b>Overstated</b>	<b>Understated</b>

*Effect of Inaccurate Inventory Records on the Balance Sheet*

<b><u>Inaccurate Inventory Records</u></b>	<b><u>Assets</u></b>	<b><u>Liabilities</u></b>	<b><u>Stockholder's Equity</u></b>
<b>Understated</b>	<b>Understated</b>	<b>No Impact</b>	<b>Understated</b>
<b>Overstated</b>	<b>Overstated</b>	<b>No Impact</b>	<b>Overstated</b>

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 flows 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. Therefore, businesses must be mindful not to

neglect the inventory management procedures in place and be proactive in making operational adjustments.

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).

Proper valuation of the inventory and costs of goods sold are imperative for businesses to accurately report the net income after subtracting expenses. Kroes and Manikas (2018) stated incorrect inventory tracking and valuation can impact the outcome of revenues. For example, if inventory is overvalued, then COGS will be mistakenly higher, which will lower the true amount of net income. In contrast, when inventory is undervalued, then COGS is decreased and falsely increases the true amount of net income. In fact, research by Moheb-Alizadeh and Handfield (2018) found as profits increase, an increase in inventory expenses will follow closely in proximity.

With doubt in the customer demand, inventory control is imperative to preventing extreme amounts of overages and shortages. In manufacturing environments, Hançerlioğulları et al. (2016) found the performance of finished goods inventory has the biggest impact on the ability to accumulate wealth. Inconsistencies in the amount of inventories causes miscalculations in the COGS, which triggers errors in the net income. Furthermore, if the inventory on hand



numbers are not rectified, then the COGS and net income in the following accounting period will be opposite of the previous period, but the distributions to those assigned general ledger accounts will be inaccurate for both accounting periods (Fan & Liu, 2017). When the ending balance of inventory is incorrect, then the beginning inventory balance in the next accounting period will also be incorrect. However, understating and overstating inventory on the balance sheet carries through to the assets and stockholder's equity, while the liabilities remains unchanged.

Defective raw materials and delivery shortages should be immediately returned to the vendor along with a return merchandise form and a notification sent to the accounts payable staff to stop payment on the original invoice (Moheb-Alizadeh & Handfield, 2018). Without the replacement of damaged goods or sufficient credit memos, paying for low quality materials will drive up unnecessary costs and diminish cash flow for the business. A collection of flawed materials loses monetary value when left without remedy. Additionally, overstocked materials jeopardizes warehouse space (Tejesh & Neeraja, 2018), which raises the rental expenses on the income statement. For manufacturers, net sales of finished products are expected to be more than total expenses in order to secure longevity in the industry and residual profit margins.

Stockouts occur when finished goods are not on hand to supply the customers' demand and lower manufactured sales for the business. Controls for verifying the inventory amounts on hand frequently enables management to replenish low stock levels in a timely manner. Up-to-date inventory count lists along with good storage procedures aligns the materials purchases with the customers' sale orders (Gallmann & Belvedere, 2011). Leaders must define the popular machine maintenance parts and selling goods that are vital to maintaining productivity and keep those items in stock and accessible at all times. To pursue continuation of optimal profitability, companies need sufficient product levels to satisfy the needs for production and prevent

customer retention. When manufacturers fall short on the market demand, the customers become frustrated with losing the opportunity to properly service consumers.

A functional part of inventory control is balancing the cost of inventory items to produce finished product and accessing the quantity of inventory in the warehouse. A well-executed plan will deter stockouts and alleviate cash flow being consumed by over ordering inventory (Gamme & Lodgaard, 2019). The absence of efficient inventory management makes forecasting stressful, especially in a manufacturing environment without automation. The sales should grow at the same rate of inventory and a surge in inventories with a flawed manual tracking system can create challenges for budgeting and forecasting.

Some smaller manufacturing companies develop computerized spreadsheets to accompany the manual inventory practices. Huang et al. (2019) found depending on the complexity of the coding and formulas, an unfamiliar user can accidentally manipulate the data and create errors in the inventory numbers. Another major downfall of a spreadsheet is the limitation of conducting simultaneous updates by multiple individuals (Manary et al., 2019). Since spreadsheets require continuous edits, sporadic updates can result in miscounts of materials throughout the supply chain.

### **Alternatives to Inventory Management**

With the implementation of technology, clerical mistakes are minimized because the use of papers and manual spreadsheets are no longer a necessity for operation. Automated inventory systems increase accuracy in tracking the movement of inventories, the costs, and the amount of inventory on hand (Liu et al., 2016). Senior leaders can generate reports for historical and real-time operational information. The reports can vary from product sales to identifying the age of unutilized inventory items (Avinadav & Henig, 2015). Incorporating technology in the

manufacturing arena allows multiple users in different departments to make changes simultaneously. The various changes can produce real-time results across the organization and save time for all stakeholders.

### **Real-Time 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. For example, machines can be designed to detect and remove damaged product before cycling through the entire production process. With employees detecting the errors in production, there is a possibility the item is already a finished good before performing an inspection. Combining automation with current inventory management practices supports the reduction of human mistakes to save on labor costs.

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. The automated system supports determining the reorder point for individual inventory items to avoid the danger of having stockouts. Additionally, when cycle counts are conducted properly, automated inventory software alleviates excessive ordering of items already on hand. Customer satisfaction

is contingent upon the business's ability to meet the demand, which involves maintaining the appropriate amounts of inventory in stock for all occurrences.

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.

Inventory management software programs coupled with support systems improves the output of data to minimize inventory errors and increase productivity. Although the software programs can be costly, some businesses prefer to improve the internal communication and leverage time management across various departments. Manthou and Vlachopoulou (2001) found with better communication, employees can pinpoint the location of inventories faster, so methods like perpetual inventory are implemented to increase accountability. The perpetual inventory method discloses the results for the receiving inventories, goods used and purchased, and inventory returns. For example, when materials are subtracted from on hand totals or wasted during production, the system instantly subtracts the total quantity from the current inventory amount. Eventually, physical inventory counts are not required regularly because the perpetual inventory system continually revises inventory totals based on the activity and allows management to focus on resolving other operational issues.

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. Specific individuals are given authorization to perform the necessary updates in a live system environment at any time. When the revisions are finalized, the statistics can be examined by various employees simultaneously and saved for a later date.

Operational details are required by various departments to investigate inventory discrepancies from different angles to pinpoint the impact on key performance indicators. The automated inventory system encourages users to customize the reports based on the statistics pertinent to specific work standards, or to provide as supporting documentation to strategize continuous improvement of inventory requirements (Mbuvi et al., 2016). Technological advancements allows reporting of business scorecards, inventory days on hand, and key performance indicators to be posted in a centralized platform for all employees to review and track the progress. Executive leaders contribute effective decision-making skills to obtaining the appropriate data for current and historical business projections. This is advantageous when discussions entail various departments of the organization to collectively examine specific details regarding the inventory controls and supply chain process (McAdam et al., 2019).

An automated inventory system provides structure for the production floor and warehouse division. The new and current stock is appointed an individual inventory number to establish an organized system for the goods (Cheng et al., 2018). This creates a seamless process when buying, cycle counting, and evaluating inventory levels. When the final products are manufactured and boxed, a specific inventory barcode tag is included to assist distribution employees in distinguishing the amount of goods. Furthermore, locations in the warehouses are allocated to aid in the manageability of items for manufacturing orders or deliveries. Locating inventories in a timely manner is essential to maintain the supply chain flow and physically evaluate inventory totals.

Integrating the supply chain procedures with technological enhancements saves a manufacturing business significant labor hours and money. The use of manual inventory practices welcomes opportunities for misplaced paperwork, miscalculated data, and unapproved adjustments without traceability. A series of careless activities promote pointless expenses, which involves wasted goods and unscheduled reorders to rectify manual mistakes (Avinadav & Henig, 2015). Manual processes involve various employees in numerous divisions to complete the paperwork implicated in the production and can be a very lengthy process. Nevertheless, the implementation of a complementary automated inventory system increases profitability for a business. Due to the use of technology, a business can scale back on the man hours by removing the manual procedures in operations. The replacement of manual procedures with inventory technology makes data application a cleaner task and eases the possibilities for inventory inaccuracies. With technological involvement, employees can exploit the additional time to concentrate on continuous process improvement and other approaches to cost savings.

Automated inventory software delivers a pathway of clearer transmission for all divisions inside and outside the company. Synchronization is important when sending inventory information throughout the supply chain (Cheng et al., 2018). Technology enables companies to link systems with outside vendors globally to retrieve the necessary goods to manufacture the finished items. By using the information from the international vendor's systems, shipments can be traced to estimate scheduled delivery times. Furthermore, order invoicing and payment requests are executed quicker with both databases exchanging data.

Additionally, organizations can integrate databases with suppliers and customers to initiate quick orders to suppliers and inventory forecast details. Production management and vendors have the capability to obtain notifications in instantaneously of goods below the minimum level, which alerts managers to order more materials (Avinadav et al., 2017). Inventory information is transferred to warehouses or communicated between various production locations within the organizational umbrella. A lack of effective communication causes interruptions in production yield, which can adversely influence the distribution and the organization's financial performance.

Depending on the intricacy of the parts being manufactured, the finished products may include distinctive components that are only sold by an overseas vendor. When determining the logistics of transit and supplier lead times receiving the product, businesses must use sales forecast and customer delivery requirements (Ponte et al., 2018). Materials from global vendors usually entail elevated shipping costs because of tariffs, especially when attempting to minimize the arrival time with air freight. Furthermore, international shipping routes includes restrictions and deviations, such as customs, must be fulfilled before the materials are released from the country. The extra measures for international orders can extend the wait time, which

encompasses significant delays in production. As a precaution, production managers should look for local vendors to increase dependability with inventory orders.

### **Barcode Inventory System**

Radio frequency identification (RFID) operates through wavelengths and labels to track inventory items (Cheng et al., 2018). The tag is equipped with the data to identify the goods and the information is routinely transferred to the main database with not much human involvement. Sahin and Dallery (2005) stated the best attribute is RFID offers a hands-off approach and does not require close contact from a scanner for the data to be retrieved from the tags. The flexibility of not being in close proximity of the inventory allows tracking to commence from a distance. Frequent updates and increased visibility makes RFID technology ideal for businesses looking to add more efficiency to their inventory management plan.

Senior leaders should complete the research to find the correct technology to enhance operational performance. RFID technology is adaptable to various styles of inventory management and the return on investment is witnessed through decreases in labor and inventory errors. Inventory work duties, such as validating shipping and receiving products and locating inventory faster, are empowered by RFID and need minimal supervision from employees (Dolgov & Kaltenbach, 2017). The costs of incorporating RFID is counterbalanced by the benefits of fewer manual job functions. Effectively leveraging savings in labor should be redirected to invest in future technological opportunities to support the continuous in the manufacturing industry.

### **Just-in-Time Inventory**

An operational plan executed by senior leaders to purchase and manufacture materials after receiving a customer order is known as the JIT method. The JIT method is a lean process



executed when businesses prefer to stock marginal amounts of base and work-in-process items (Erkayman, 2019). The productivity is started when an order is received in the automated system. Management receives an alert to review the amount of goods on hand and send purchase orders to the supplier.

The key metrics for management to examine is the cycle time, scrap rates, and the revenue per product line. If planned correctly, Bond et al. (2019) added this process relieves the requirement for numerous warehouses because safety stock is no longer a necessity and controls are placed on items with high inventory levels. Furthermore, the JIT technique decreases the number of materials scrapped due to overproduction and outdated inventory items. Generally, the business realizes the advantages of improved productivity, less inventory record mistakes, and inventory cost savings on the financial statements.

For businesses to apply the JIT method, a connection must be linked with the forecast to secure production demands. Forecasting is used to verify which items are necessary to manufacture the customers' orders and the estimated costs associated with the materials to establish adequate pricing for the finished product (Modof, 2015). A great connection with the vendors is critical, especially if unforeseen orders are obtained from a customer. The vendors must be dependable and maintain good record of fulfilling orders within specified timeframes (Erkayman, 2019). This requires the vendor's lead time on materials to accommodate the production process and the business's promised delivery date to customers.

Senior management has to recognize the importance of investing in the suitable equipment to comply with production requirements. JIT will not be advantageous if the machinery does not function appropriately and has repeated issues that result unpredictable downtimes (Bevilacqua et al., 2016). Production managers and quality employees must certify

the final product has met the customer's qualifications, because JIT does not allow room for excessive material waste. Additionally, proficient line workers are vital to prevent discrepancies and immediately settle any unanticipated errors that can stall the production process.

The JIT inventory system is a method that necessitates continual evaluations for improvement opportunities based on the formation of operational procedures and the supply chain needs. In a review by Bond et al. (2019), the raw material inventory costs were projected to be lower once the JIT technique has been added to the manufacturing process. The inventory costs are determined by the pricing from suppliers and the market conditions. Due to the need for a fast response on inventory orders, companies do not have adequate time to research the market trends and pursue the lowest prices without jeopardizing the quality of the goods. Consequently, surges in vendor pricing can negatively influence the amount of income the business receives per sale (Myrelid & Olhager, 2015). Therefore, vendor relationships are imperative for discussing price agreements and timely receipt of goods to obtain revenue.

The objective of supply chain supervision is to reorganize the processes to secure the demand, deliver excellent customer service, implement preemptive techniques, enhance system flexibility, and improve profitability (Purvis et al., 2016). Additionally, JIT and a functional supply chain regulates inventory levels without experiencing unexplainable waste of inventories and loss of revenues. When forecasting, there is no precise methodology, so vendor partnerships must be formed to aid in curbing the levels of unused materials (Schwartz & Rivera, 2010). While the nature of the economic condition is unpredictable, the elimination of cost drivers is important from the beginning of the production stage to the moment finished goods are converted into profit.

**Forecasting.** One valuable technique to control inventory in the supply chain is through forecasting sales and operational planning (Modof, 2015). Various members of senior management investigate options to carry sufficient quantities of inventory on hand and align them with current business practices. The goal is to streamline the volatility of the economy by exploring the threats to certain areas of the supply chain to produce a plan for inventory consumption without exclusively trusting the forecast numbers (DuHadway & Dreyfus, 2017). For JIT to execute orders seamlessly, the sales team predicts the projected number based on a forecast and thorough market evaluations, so the production department can retrieve the amount of inventory items required to fulfill possible customer orders in a suitable timeframe. Ultimately, demand driven decisions will be structured on the JIT approach to attain adequate inventory based on immediate need or either the operations management team will adhere to the pace of scheduled orders and complete the production in real-time leaving some buffer stock on hand.

DuHadway and Dreyfus (2017) explained the sales and operational planning activities connects the strategic objectives of the organization with the execution process and analyzes performance outcomes for continuous improvement. Operational forecasting and planning sessions are conducted to focus on the detailed locations of the goods in the supply chain, so when problems surface the sections can quickly find the root cause. By highlighting potential issues and allowing the impacted department to resolve the problem, the JIT method promotes opportunities for enhancements and a higher level of products sold (Erkayman, 2019). Therefore, every area must be eager to recognize the importance of a quality finished product before moving raw inventory items through the supply chain. Over time, fewer inventory

mistakes will occur, and profitability will improve by establishing healthy relationships with customers and minimizing material expenses.

**Supplier Partnerships.** Manufacturing businesses must know the product lines and expectations of the consumer in order to secure the appropriate suppliers. When implementing JIT, management should secure vendors with the best contractual pricing on quality materials and favorable delivery lead times (Ciftci & Darrough, 2019). A secure exchangeable line of communication must be maintained for suppliers and businesses to be effective and remain viable in the market (Srivastava et al., 2017). Harmonization between the companies and vendors is essential to maintain a relevant status in the industry and build a highly effective supply chain.

A supplier partnership is a long-term obligation that offers advantages to both participating parties. The partnership's success should generate a decline in the supply of stock, greater product quality, and an improvement in delivery times. Material managers and suppliers must build a level of trust that will permit them to communicate pricing options and market demand openly to coordinate supply orders and estimated deliveries (Shokri, 2019). The cooperation is critical for the inventories to flow through the manufacturing process with fewer supply chain mistakes and the inventory requests become easier to satisfy (Srivastava et al., 2017). Eventually, the teamwork ensures the production rates are stable, and the goods are produced in the phase as needed without overstocking the warehouse.

The partnerships should be based on standards formed and consented to by both the vendor and the business. In addition, JIT requires a clear path of the supply chain flow to be executed to ensure balance and comfort for all. Bevilacqua et al. (2016) stated clarity and frequent communication are critical to continue the production through the JIT system and both parties must commit to being successful together to accomplish their goals. The short-term

intentions of JIT supply management are largely to boost productivity and lower stock levels and cycle time, while the continuing objectives are to expand the market share and earnings for all participants of the supply chain (Alcaraz et al., 2016). Long relationships include a history of group effort to perform continuous improvement strategies, which mitigates extra storage of work-in-process inventory and unwarranted costs. For example, cutting unnecessary spending can enable companies to pass a portion of the savings to the customers to generate more demand for finished products. Failure to consider a vendor's insight on material needs threatens partnership agreements and the chance to build a winning environment for the vendor, customers, and the business.

With JIT, ordering in large quantities to reduce the concern of inventory shortages is no longer a risk to productivity. The JIT philosophy suggests a company should evaluate whether ordering reduced quantities more often will be cost efficient and offer shorter lead times on deliveries (Alcaraz et al., 2016). If there is a sudden change in the market demand, bulk ordering can consequently cause astronomical amounts of inventory and possibly an increase in warehouse costs. Manufacturers have to prioritize effective communication with the vendor to emphasize the materials required to ensure the expected deliveries are received as promised or transported faster than anticipated (Bond et al., 2019). For example, smaller orders relayed through a system of real-time sales request information provided to the supplier affords them sufficient time to arrange orders accurately and prepared to ship before the business submits the purchase order.

### **Economic Order Quantity**

The economic order quantity (EOQ) is an appropriate tool to verify if the appropriate quantity of items purchased can fulfill the requests of the customers. EOQ helps businesses

maintain the standard costs in the budget when processing orders and diminishes storage expenses for overstocked inventory. The formula to determine the approximate number of units for production is prepared by taking the annual demand, order costs, and warehouse expenses into consideration (Skouri, 2018). EOQ was established based on the idea that inventory items would be continuously ordered at the same quantities each time. Taleizadeh et al. (2016) found when the customer demand is volatile, manufacturers can alter the amounts in the formula to accommodate various amounts based on fluctuations in the production schedule. This method alleviates the probability of stockouts because the inventory quantities requested from vendors should be adequate to cover the demand.

Storage for goods can be an astronomical expense when businesses do not monitor the flow of inventory items. When early discount pricing models are not appropriately linked with the demand, the inventory cycles out of demand and potential earnings decrease (Avinadav et al., 2017). EOQ helps businesses build a model for continuous ordering of the top products. Research by Skouri (2018) found high demand inventories lose attractiveness the longer they remain unavailable to customers, especially if there are no alternate goods to purchase. Stock outs minimize financial performance because some customers will refuse to reorder when finished product is constantly unavailable.

Additionally, EOQ enables management to disregard future orders for stagnant inventory items and slow-moving product lines to eliminate dilemmas with storage capacity. Eventually, goods without movement are in danger of being reclassified as inactive and must be treated as perishable inventory (Taleizadeh et al., 2016). Avinadav et al. (2017) investigated decisions to regulate promotional pricing on low demand inventory can prevent the goods from aging and being unsaleable. Businesses have to be diligent about the life cycle of goods and proactively

negotiate lower price points with customers to avoid expiring goods. The correct EOQ model calculation can specify the amount of inventory to keep on hand, when to place another order, and the quantity to replenish the stock level.

### **Discovered Themes**

The literature review detailed the various mistakes related to poor inventory management and controls and negative impact to the financial health of manufacturing businesses. From this collaboration of professional literature and research, a few themes surfaced to expose relevant information. The first theme explained the lack of inventory controls causes inventory issues in a manual environment. The issues discussed were the infrequency of cycle counts, improper data entries, and low visibility on inventory items. Weak inventory controls can create a domino effect on a business's productivity, which contributes to missed sales forecasts and unexpected expenses (Kok & Shang, 2007; Mitreva et al., 2018).

The next theme involved the presence of incomplete inventory management practices and alternate techniques that can be applied to manual operations. Inaccurate pricing of inventory items, along with the incorrect inventory amounts, compromises the value of the inventory on financial documentation (Conley et al., 2019). Additionally, inventory must be labeled and correctly placed in the warehouse for easy access in production and distribution (Atieh et al., 2016; Sharma et al., 2020). Therefore, inventory warehouse management is a critical part of managing inventory in a manual setting. The use of the ABC system enables businesses to categorize inventory items based on their monetary value, so the high-priced items remain accurate and visible (Fu et al., 2016; Yang et al., 2017). The LIFO and FIFO methods allows businesses to utilize inventory items based on when they are received into stock (Teplická & Seňová, 2020).

Another theme is the inventory errors result in financial problems for the business. Balance sheets misstatements are caused from inaccurate inventory counts and monetary inventory values at month end (Akhtar & Liu, 2018). The inability to trace inventory increases labor and other inventory related expenses, which lowers the net income on the income statement (Moheb-Alizadeh & Handfield, 2018). The COGS and overall profit could be understated or overstated because of poor inventory management processes, which is misleading to stakeholders and potential investors (Ciurariu, 2014; Fan & Lui, 2017). Researchers suggested adding automation to proper inventory management procedures can help businesses curtail inventory errors and improve financial stability (Momeni & Azizi, 2018; Shokri, 2019).

The final theme expresses the leadership team's ability to make the best decisions and execute strategic plans for the business. The guidelines established for a business are implemented through senior leadership on how to govern daily inventory movement. Strategies aid decision-makers in preparing for uncertainties and recognizing internal and external threats to the operations of the business (Calabrese & Costa, 2015; Sunder & Prashar, 2020). Senior leaders set the tone for effective communication, the efficiency level, and the earning potential of the business. The plans implemented by senior leaders are navigated through the workers, so proper communication of the practices is a requirement (Groddeck, 2011; McAdam et al., 2019; Purvis et al., 2016). Another part of communication is providing training for sufficient outcomes to the protection of inventory. When strategies are not producing the desired result, management must proactively evaluate the current practices and decide on possible resolutions to remedy inventory issues (Otley, 2016).



## **Conclusion**

Manufacturing businesses have to protect the inventory items produced in order to generate residual cash flow and to fulfill the demand of customers. The earning potential of the business relies on the effectiveness of leaderships' decision-making and execution procedures. The research showed every manufacturer is not identical, so the ability for leaders to deploy the appropriate operational plans is imperative to ensure the strategy supplements the company's goals.

Additionally, every facet of the organization should be incorporated to have a smooth execution process and preserve the capacity of inventories from receiving to distribution. With manual inventory systems, the success of each procedure is weighed heavily on the efficiency and is directly related to the competency of every employee in the supply chain to keep expenses low and sales high. Human mistakes occur and are unavoidable, but previous research emphasized the internal controls should be sufficient to curtail the amount of financial damage when inventory is handled improperly.

Many authors continue to stress the use of automated systems coupled with lean manufacturing empowers the use of technology to mitigate frequent costly mistakes and increase traceability of inventory to secure increases in overall productivity. Furthermore, the technological management techniques controlled by effective decision-making should be structured to classify materials, store them systematically in the warehouse, and be visible for production and distribution. Commonly, the literary review revealed despite the type of inventory system implemented, missing opportunities to govern the inventory on hand manifest in the financial statements, which are indicators to stakeholders and investors concerning the business's ability to engage in new ventures and maintain profitable outcomes. Therefore,

inventory, as the most valuable asset, must be the main objective driving inventory management methods to safeguarded and controlled throughout the supply chain.

### **Summary of the Literature Review.**

Every manufacturing leadership team needs to execute a plan on how the inventory will move throughout the supply chain. A manual tracking system ushers in the frequent occasions for human errors in how the inventory is managed in the business, especially when the communication has gaps. The introduction of an automated inventory system allows synchronization of inventory operations throughout the organization. Regardless of the inventory management technique used in the business, providing adequate training for employees is key to maintaining the effectiveness of the inventory control practices. With the correct plan in place, various departments are empowered to instantly make updates, quickly trace inventory amounts on hand, and reduce discrepancies on the financial statements.

### **Summary of Section 1 and Transition**

Inventory is a major necessity for manufacturing companies to produce products that meet the demands of consumers and secure revenue. When inventory amounts are insufficient for production, there are disconnects in the methods utilized to control the materials. Through a manual tracking method, the inventory is managed by humans and documented on papers or spreadsheets. To assist in organizing inventory without a long paper trail, manufacturing business have opted to incorporate cost effective inventory software to eradicate excessive errors. A high level of competence and the ability to communicate the location of inventory is needed for employees to have visibility on all inventories. The absence of accurate inventory knowledge and pricing strategies lead businesses into economic stress, which manifest in the financial documents.

In the next section of this study, the researcher used the case study design under the qualitative method to investigate the use of manual inventory tracking procedures in a liquid automotive manufacturing environment. The interview questions were open-ended and conducted with members of production, the accounting department, the sales team, and senior leadership. The interviews and observations unveiled the inventory errors that impact the company's financial performance and the organizational decisions of the management team. A safe place was created for the interviewees to feel free to share pertinent information and documentation related to the operational processes. Through the information and documentation gathered from the participants, patterns were discussed and assisted in bringing forth new and truthful data connected to the purpose of the study.

### **Section 2: The Project**

The role of the researcher was to protect the integrity of the field by certifying the information collected was not enforced under false measures or personal objectives. The choice of research design and method was critical for a researcher to use the proper resources to bring forth possible solutions to problems, highlight new themes, and appropriately communicate invaluable knowledge to others. Without the presence of a neutral researcher, the final presentation of the project would be ineffective and would undermine the purpose of the research. Accountability of the researcher ensured respect for all participants' interviews, the security of the data collected through observations, and outlined the facts without personally interfering with the results.

#### **Purpose Statement**

The purpose of this qualitative case study was to understand the inventory errors from the use of a manual inventory management system and the financial impact on a company in the

manufacturing industry. The research highlighted the various inventory management weaknesses, ways to formulate the best strategies for an effective automated inventory management system, and practices to minimize loss in a manufacturing environment. This study aimed to provide an in-depth examination of manual inventory management and control activities and the negative influence on the financial performance at Slick Automotive Manufacturing Company, located in North Carolina.

### **Role of the Researcher**

The researcher had the task of pursuing and retracting quality data in an ethical manner, while minimizing the use of personal inferences through reputable research sources. The researcher governed the overall flow of selecting the participants, the setting, data collection methods, and presenting factual findings. Therefore, the researcher set the tone for the research from start to finish without compromising the goals of the research project and relied on the beliefs of the subjects and literature to increase the understanding of the phenomenon. The researcher was transparent about the purpose of the project, while safeguarding the identities and perceptions of individuals to ensure truthfulness. The researcher implemented an environment to promote comfortable, consented exchanges of vocal experiences and tangible artifacts. Additionally, the researcher respected the denials of all parties without pressure or negative consequences. Overall, the objective was to mitigate the potential risks of personal bias and protect the elements of the project to produce results beneficial to the field.

The researcher remained dedicated throughout the project without formulating and inserting personal conclusions, which was necessary to alleviate unethical actions in the final publication. The reason for the study was centered around representing the encounters of the participants into knowledgeable facts about the phenomenon. Bracketing is a complex technique

that was used before the interview process to assist in reducing the judgment of the researcher. To start the bracketing process, the researcher wrote down thoughts connected to the centralized purpose of the research study. The researcher continued to take the time necessary to thoroughly record random ideas pertaining to the concepts until no new ideas come to mind. The researcher noted all preconceived notions related to the topic, then the researcher proceeded to engage the subjects to further remove personal bias.

This research project started with a detailed purpose to enlighten the field and the minds of the audience. The researcher owned the creditability of the process and controlled the level of reliability. Therefore, the researcher avoided unethical practices when incorporating participants and conducting field research. Before pursuing in person research procedures, the researcher removed all personal viewpoints directly associated with the project. To distribute personal bias, the researcher used bracketing, which is an ethical practice to complete before starting the data collection process. The researcher strived to eliminate personal opinions from the outcome of the research and saved the notes from bracketing to validate the submission of the professional research.

### **Research Methodology**

The selection of the correct design for the study was critical to deter the collection of inaccurate information and wasting valuable research time. The researcher was able to manage the efforts of the project in advance with the flexible design. The qualitative method provided comprehensive insight about a convoluted situation through the beliefs of others. Open-ended interviews and observations were introduced to this study to vocalize the participants' experiences. Integrating triangulation in the research plan boosted the researcher's confidence as

personal beliefs about the project were removed and the validity was increased through diverse sources.

### **Discussion of Flexible Design**

A flexible design enabled the researcher to maneuver the path of the study without being confined to a set of rules. Flexibility created a deeper connection between the researcher and the project because there was an option to freely explore various resources. The researcher was empowered to omit procedures not rendering the desired outcomes and implement new strategies to extract more favorable data. This provided the researcher extra time to devote to pursuing knowledge about the existence of the phenomenon.

### **Discussion of Qualitative Method**

The research project was based on descriptions by the subjects instead of being fixated on numerical measures. The use of the case study approach allowed the viewpoints of the participants to guide the relevance of the topic. Using the qualitative method, the researcher constructed a semi-structured interview guide with seven questions. The researcher captured the thoughts through a series of single interviews and observations to pinpoint the “how” and “why” of the problem. Furthermore, the researcher gained access to the participants multiple times and was not bound to virtual contact limitations. The researcher utilized reliable records and scholarly materials to support data through the words and actions of others to present factual remedies.

### **Discussion of Method(s) for Triangulation**

Allowing the subjects to review the final results, along with incorporating triangulation, helped the researcher in capturing various facets of the problem and checking the data for shortcomings that would distort validity and credibility. The researcher had the flexibility of

customizing open-ended questions and had them reviewed by academic mentors to ensure pertinent information was collected through individual interviews and observations across various departments. The researcher did not structure the questions to coerce participants into providing answers suitable to the viewpoints of the researcher. Therefore, the researcher permitted the participants to examine the information retrieved to guarantee the data aligns with their beliefs to mitigate personal interpretations. In addition, the researcher implemented methodological triangulation to incorporate field notes and historical documents to support the experiences and actions of the subjects, which was introduced to undergird common similarities, new perspectives, and explore contradictory findings.

### **Summary of Research Methodology**

The researcher's creativity had the freedom to flow and granted a deeper understanding of presenting a valid research project, while minimizing the presence of personal bias. The research project was not based on theories and the constructs related to the research were not compatible with the numerical structure of the quantitative method. A flexible approach combined with semi-structured questions encouraged the researcher to have a plan to capture applicable data instead of blindly entering the research field. By using a case study, the researcher worked well to promote the use of interviewing and observing the participants, which was duplicated to achieve different versions of triangulation and transparency.

### **Participants**

For the population of the research site, the researcher considered employees in the sales, production, distribution, and accounting departments of the automotive manufacturing company to participate in the research project. From the sample of participants, there were two from the sales department, two from accounting, three from distribution, and the remaining

participants were from production. The employees involved in manufacturing product had the knowledge to address the problem of manual inventory tracking systems and supply chain movement. Furthermore, the personal experiences of the accounting employees with handling inventory errors and the misstatements on the financial statements added an additional level of relevance to the research.

### **Population and Sampling**

The researcher discussed the importance of seeking useful information by choosing suitable subjects. The researcher included all levels of organizational employees in sales, production, distribution, and accounting to provide answers to the research and interview questions. The 18 willing subjects functioned as a key component for the researcher to convey the source of the data and the measures taken to retrieve the information. The researcher explained the process of gathering and analyzing the data to exhaust all emerging themes or new theories.

### **Discussion of Population**

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. Gender did not eliminate any employee when determining the work proficiency or value of the participant. The researcher relied on the guidance of managers, supervisors, and production workers from various areas of the plant floor to understand the different roles in the manual inventory supply chain. The participating employees had the experience with handling inventory from the time of inception until the final product is placed in the warehouse. In addition, the researcher selected members of



distribution, sales, and the accounting team to capture the influence inventory errors depicts on sales and net income. The distribution members provided the layout of the placement for finished goods and how the product is removed from inventory when leaving the shipping dock. The sales employees discussed the process for executing customer orders and the completion rate for timely orders. For the accounting professionals, the researcher only considered those who work with directly with inventory, journal entries, and financial documents. The accountants gave insight on the importance of proper inventory valuation and the impact inventory mistakes have on the financial statements. Furthermore, accountants had access to historical documents to show trends on costly inventory management errors and financial audits.

### **Discussion of Sampling**

The researcher used the purposeful sample method to obtain participants for the study using a demographic survey questionnaire. The purposeful sample method afforded the researcher the opportunity to develop specific criteria to choose individuals connected to the issue, which is displayed in Appendix A. The researcher solicited participants capable of engaging the interview and observation process with comprehensive information to aid the investigation of the inventory error problems.

The sampling frame consisted of an employee list by department, job title, years of service, and contact information within the manufacturing organization. A senior leader assisted the researcher with recruitment by sending out an internal email. The survey questionnaires were collected in a box from the breakroom and returned to the researcher for approval. The researcher gained consent from willing participants for the study before starting the interview process. The researcher used the sampling frame list to identify key individuals empowered to release pertinent information and documentation for data collection. In addition, the list saved

the researcher time on preparation and managing the time of the participants throughout the study.

The sample was comprised of participants from various departments ranging from every level of the organizational hierarchy. The researcher only recruited participants with at least one year of service with the manufacturing company. 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. With approval, the researcher observed the policies for order placement, receiving, production, packaging, warehouse movement, and shipping out finished goods by visiting the site. Additionally, the researcher reviewed the manual tracking procedures to verify the inventory moves throughout the business and interviewed the subjects about the experiences with the current practices. This allowed the researcher to learn the most common inventory mistakes and generate solutions for future use.

A diverse sample of participants assisted the researcher in understanding when there is an in-depth realization about the phenomenon and achieving saturation. The researcher continuously conducted interviews and analyzed the answers of all participants until no new relevant themes or information surfaced about the manual inventory tracking processes. The researcher examined all the information gathered to ensure the purpose of the research study was complete with no new findings.

### **Summary of Population and Sampling**

The population of a study rested upon the interests the researcher deemed necessary to satisfy the purpose of the research. A researcher's ability to engage the entire population was impossible, so the researcher generalized the mass of subjects down to a marginal group of 18 accessible participants. The researcher's preferred technique of sampling allowed the targeted

subjects to assist with exploring the questions and illuminated the specific problem of this study. The researcher inherited the tedious task of examining the responses of the participants and the practices observed to complete saturation. Therefore, the researcher's confidence in the recruited participants was vital in seeking relevant data to ensure no new concepts surfaced throughout the fieldwork.

### **Data Collection & Organization**

A comprehensive data collection plan assisted the researcher in securing quality information using the best methods for further analysis on the research project. The types of collection methods, such as interviews and observations determined the amount of time spent to develop an in-depth understanding and themes pertaining to the issue. The researcher maintained efficient storage materials for all data files to allow accessibility for present and future use.

#### **Data Collection Plan**

The researcher aimed to collect descriptive information about the manual operations for an automotive liquids manufacturing company and the decisions to function in a manual environment. The researcher collected information about the manual operating procedures when transforming raw materials into finished product. The researcher revealed the most common manual inventory errors and how the errors occurred from manually tracing the inventory throughout production. Furthermore, the researcher investigated how the manual production and inventory errors negatively impact the financial health of the company.

The researcher started with observing the inventory supply chain from inception to the departure of the final product through notetaking and documentation. In conjunction with handwriting notes, the researcher monitored the recording of the inventory and the communication trail throughout the organization. Additionally, the researcher documented the

manual inventory audit guidelines and the process of correcting manual inventory errors. The researcher gained insight on the experiences of working under manual inventory processes and collected supporting documentation through one-on-one interviews consisting of open-ended questions with the diverse members of production, sales, the accounting department, and the distribution team. The observation and interviewing methods enabled the researcher to increase the understanding of the phenomenon and provided endless access to the participants to provide details about historical and current encounters in the manual inventory setting.

### **Instruments**

A demographic questionnaire, in Appendix A, was incorporated to capture an overall view of the potential participants and offered insight on their capacity with managing inventory. The demographics added value to selecting the best participants to ensure meaningful information was secured to understand the causes of manual inventory errors across multiple departments. The researcher went deeper by formulating a proper set of interview questions resourceful for the research project. Furthermore, the survey allowed the researcher to compare results across various demographic groups. The researcher focused on the important characteristics needed to avoid compiling too many questions, which may have injected doubts of confidentiality or privacy with the participants.

The researcher implemented the interview questions in Appendix B to gain knowledge of the current operational processes, which helped the researcher appropriately follow the experiences of the participants and extract the relevant information for the research study. All individual face-to-face interviews were administered in a private room to ensure security of the information and to provide the participants a comfortable environment. The internal control procedures provided an understanding of how manual inventory mistakes occur and the

frequency of them. This also allowed the participants to share the decision-making process for solutions used to correct the errors in various departments. Additionally, the researcher was able to analyze the influence inventory mistakes have on the valuation and the overall income on the monthly financial documents. The accounting participants were able to further explain the contact with other departments to remedy the financial errors and their roles to alleviate the common errors month after month. All participants had the opportunity to discuss any future plans for introducing an automated inventory system or other inventory management techniques to streamline the inventory supply chain and mitigate the costly mistakes.

Through observation, the researcher analyzed archived documents to review the effects of manual inventory errors on the financial records and examined the changes from month to month and over the past fiscal year. The financial damage was assessed to determine the root cause related to the use of the manual inventory practices that stunt financial growth. The researcher observed the cycle counting process, production runs, and inventory placement. The researcher reviewed the documented standard operating procedures and internal controls to see how long they have been active, and the last time senior leaders implemented changes. In addition, the researcher reviewed the historical inventory records to analyze the inventory cycle counts and noted any common occurrences with the process that may have contributed to the mistakes.

### **Data Organization Plan**

Before starting the interview process, the researcher assigned a pseudonym for each participant to retain confidentiality and maintain organization of the data. The researcher used Microsoft applications, notebooks, and flash drives to properly organize and safeguard the information acquired throughout the field research project. The researcher recorded, annotated, and saved the data, while categorizing the interview transcripts by pseudonym, observation

notations, supporting documents, and a list of duties in an orderly manner for future use.

Furthermore, colored subject notebooks and sections enabled the researcher to keep the data separated by departments, topics, and each individual participant to track and analyze themes.

Additionally, the researcher named the formats of electronic files from other databases, such as Microsoft Word and Excel, according to the task and the collection date of the research in the field.

### **Summary of Data Collection & Organization**

The appropriate data collection methods enabled the researcher to gather the necessary information about the phenomenon. The researcher relied on the experiences of individuals, live investigations, and related artifacts to explore the problem. Proper examination of the data files led the researcher to develop themes and formulate sound conclusions. The researcher responsibly preserved all resources and maintained an organized system for traceability to incorporate changes to data files.

### **Data Analysis**

A plan for consistent evaluation of the compiled data aided the researcher in bringing forth overlooked concepts. Taking the time to revisit the interviews, documents, and observation notes limited the possibility of discrepancies and strengthened the researcher's organizational style. The researcher extracted the relevant data to ensure credible information was grouped by level of importance to understand the phenomenon.

### **Emergent Ideas**

Constant reviews of the collected data empowered the researcher to capture key ideas. The researcher browsed through the series of information and inserted memorandums to assist with prioritizing the substance of the materials. By continuously analyzing all sources of

information gathered from the site, the researcher recalled the field events and revitalized evolving thoughts throughout this research study. While the research project was in progress, the researcher diligently recorded all ideas as they developed and established a regular routine of analysis. Adding memos complemented the researcher's efforts to streamline the data in an orderly manner and prepared a functional system for coding.

### **Coding Themes**

The researcher incorporated NVivo software to evaluate all the data and stored data to incorporate common similarities within each interview, observation, and additional paperwork. Additionally, the NVivo software helped with importing the documentation in an orderly fashion and transcribing the data collected to simplify the identification process of determining codes. From this overview, the researcher sought to extract notable references and cultivate themes from the data under suitable categories applicable to the study. The researcher started with broad topics and progressively condensed the topics into several workable groups. The researcher selected the most frequent ties between the different forms of data and determined the codes significant to validating the purpose of the research project.

### **Interpretations**

The researcher recorded a visual of the established codes to bring meaning to the text and give clarity on patterns existing throughout the analysis of the phenomenon. The researcher determined the level of importance by dismantling the codes into subgroups. This assisted the researcher in connecting personal revelations of the data to the research questions, literature review, and other relatable resources. The researcher obtained advice from the dissertation chair and committee members to assist in conveying the ideas into the text.

### **Data Representation**

For the visualization process, the researcher compiled all of the different sources of information for analytical review and utilized keywords to characterize the wide range of subjects. The researcher compared and contrasted the current information retrieved from the field study by creating graphs and charts. The visual aids allowed the researcher to manipulate the data collected to present an image of centralized themes directly related to components of the research. Furthermore, the researcher certified the final assumptions support the original information retrieved from the study and made updates as needed to guarantee completion.

### **Analysis for Triangulation**

The implementation of two research methods overshadowed the use of one research method and strengthened the certainty of wavering explanations of the findings. During triangulation, blending the qualitative and quantitative techniques allowed the researcher to uncover underlying information to gain comprehensive insight about the issue. The methodological triangulation process manifested through direct observation and interviews with the participants pertaining to the research questions. By incorporating descriptive statistics, the researcher made inquiries with the subjects to obtain results for the most common inventory errors experienced with a manual inventory tracking system in a numerical form. The experiences retrieved from the participants' interviews and observations underlined the various feelings and the statistical view supplemented the details about the problem.

### **Summary of Data Analysis**

The researcher compiled detailed notes in the field about the occurrences with the participants and the actions reviewed through observations. The researcher performed due diligence to ensure the coding procedures were not influenced with personal opinions. Through



the comparison of the participants' insights and the tangible documents collected, the researcher determined what information was invaluable to the study. The researcher scrutinized all the data to extract ideas about the problem and revealed several classifications of themes to provide structure in exploring workable solutions. The themes enabled the researcher to introduce charts and tables to heighten the knowledge of the audience.

### **Reliability and Validity**

The researcher implemented the best research practices to convey honest results to the industry and the readers. Other professionals in the field confirmed the study was reliable when the researcher's detailed outline was duplicated and manifested comparable outcomes. The researcher installed good practices to keep the data centered around the research questions. During research process of this study, the researcher guaranteed the final conclusions were from consented engagements with the subjects, visual encounters, and supplemental documentation.

#### **Reliability.**

The researcher recognized the existence of bias from the beginning of the data collection process by truthfully delineating all personal opinions and mitigated any potential risks as the research project matured. The researcher divulged all thoughts as separate notes to alleviate distractions that would detour readers away from the center of the study. The researcher released the interview questions, so the participants would have sufficient time to assess the situation and prep information ahead of time. Ultimately, the researcher permitted the participants to scrutinize the final transcripts and only applied the participants' viewpoints that were conducive to understanding the context of the issue with proper consent. In addition, documentation and visual inspections in live environments provided completeness to the study. The use of in-depth interviews, notes, and observations enabled the researcher to bring forth as many themes from

every subject for an analytical evaluation. The researcher exhausted all new concepts from the data collected and revisited all sources of data until all themes were classified.

**Validity.**

The researcher strived to display transparency of all findings and committed to maintaining files in an orderly manner to secure pertinent information. The proper selection of participants directly linked to the problem was a critical component to cultivate truth in the research findings. The researcher offered specifics regarding the research site events and collection practices, such as interview and observation platforms. The records reflected the researcher's personal encounters with decision-making throughout the research project and explanations to outline the actions taken to collect the data. The researcher employed suitable analytical research methods to produce reputable results and provided ease for future researchers to derive at similar conclusions from the final presentation. The researcher discovered concepts from interactions with the participants instead of inserting personal views and permitted the participants to validate the researcher's findings appropriately correlated to the actual events.

**Bracketing.**

Before starting the initial interviews using the guide in Appendix B, the researcher attempted to answer the questions to assist in eradicating any preconceived notions. Additionally, the researcher shared pre-interview information with participants to set the expectations and purpose of the research study to remove personal perspectives. The removal of the researcher's viewpoints about the study allowed the information collected connect to the problem and supply unbiased themes. These bracketing techniques transpired as needed, so the researcher could eliminate introducing personal revelations throughout the research project.

### **Summary of Reliability and Validity.**

By implementing tools to prove authenticity of the research, the researcher protected the integrity of the study. Bracketing influenced the researcher to release personal beliefs that may have overshadowed the true feelings of the subjects. The researcher displayed the connection of the findings with the themes and theories through eradicating personal philosophies. The semi-structured interview questions correlated with the conclusions of previous scholarly research and concentrated on the purpose of the study. The researcher retained the proper amount of individuals to sustain the quality of the research and gain further insight to improve the final results. During the course of the data collection process, the researcher monitored the stability of the results and determined the success level of duplicating similar outcomes in future research endeavors.

### **Summary of Section 2 and Transition**

One of the main roles of the researcher entailed eliminating personal perspectives from the conclusions of the research project. The researcher implemented bracketing techniques in alignment with the qualitative method to ensure the selected subjects' experiences were exclusively documented in the data. The 18 knowledgeable participants provided consented details about the phenomenon and increased the creditability of the findings. Through interview questions and observation time in the field, the researcher gathered data as permitted in the natural setting to achieve triangulation. The researcher retained documents and other artifacts to support the subjects' viewpoints. The data was collected and stored electronically to maintain control of the information, so developing themes were less tedious. Integrity was a vital part of the research study to give assurance to future researchers deploying the same processes to reach comparable conclusions. The researcher permitted participants to evaluate the answers recorded

to uphold the credibility of this study. The researcher strived for the scholarly work to display the voices of the subjects, align with the documentation, and provide substance to the phenomenon for the readers.

Section three of this research study discussed the themes recognized from the individual interviews, observing the work processes, and the documentation. The themes were applied to the problem statement, conceptual framework, and research questions to provide more clarity on the phenomenon. Additionally, this part of the study addressed how the findings can be suitable for other manufacturing businesses and enhance current operational practices. The researcher ended section three recounting areas of personal growth, future study recommendations, and a Christian business perspective.

### **Conclusion**

In conclusion, the governing of assets is the core of any company. The maintenance level of the inventory dictates the quality and demand of the product and the earning potential of the business. When sales are not equivalent to the inventory turnover, the companies have to explore the current procedures and uncover the root cause. Then, the companies have the responsibility to examine the findings and incorporate change as needed to rectify the issue for better outcomes.

In comparison to research, the researcher had the task of identifying the problem and investigating the root cause without personal perceived notions. The researcher decided on the appropriate research method and design before strategizing a plan for the project. The researcher secured the location and subjects necessary to accomplish retrieving data in the field. The researcher documented the procedures followed throughout the course of the study to confirm the information was trustworthy and consistent. With the consent of the subjects and no new

theme arrivals, the researcher converted the collected data into a final submission. The final submission provided the audience an opportunity to learn more about the phenomenon, formulate a personal perspective, or conduct additional research in the future.

### **Section 3: Application to Professional Practice and Implications for Change**

Section 3 concluded the fieldwork for this part of the research project. This segment started with a descriptive review of the study and presented the conclusions drawn from the interviews and observations. The researcher compared emergent themes that evolved from the participants' viewpoints to the framework, research questions, and problem statement of the study.

#### **Overview of the Study**

The objective of this qualitative study was to focus on the problem and discover answers to the four research questions. The selected subjects for this study had to be actively employed and engaged with the inventory for at least one-year with the manufacturing company. With the participants working directly with the inventory, the information collected was applied to provide a deeper understanding of the research problem and answer the research questions. The interview sessions were conducted individually with the 18 participants and contained seven main open-ended questions. The observations highlighted the information provided in the interviews and gave a visual perspective on the research problem and allowed another opportunity to further address the research questions.

#### **Presentation of the Findings**

Utilizing a qualitative approach, along with a single case study, this study explored the various inventory mistakes caused by using manual inventory practices. The research investigated how the manual inventory mistakes impacted the financial health of a company in

the automotive liquid manufacturing environment within the state of North Carolina. Subjects of this study represented various work areas of the company and had a role in the inventory supply chain. This diversity in participation enabled the researcher to gather the perspectives about the cause and the effect of manual inventory errors in different job functions that contributes to financial loss. The data for this field study consisted of (a) a pre-interview demographics survey questionnaire, (b) interviews, and (c) observations to direct the path of data collection fieldwork.

A member of senior management dispersed an email of interest on behalf of the researcher, which included the pre-interview demographics survey questionnaire. The researcher placed a box in the main breakroom where willing individuals submitted the completed pre-interview demographics survey questionnaires for review. The participants were selected using the demographics survey questionnaire to ensure they were at least 18 years of age, acquired more than one year of tenure, and their work experiences complemented the phenomenon.

A purposeful sample was utilized to select 18 eligible participants from the active employee pool of Slick Automotive, which is a pseudonym to protect the identity of the company (Yin, 2014). In addition, the researcher appointed unique identifiers (P01-P18) to protect the identity of the participants. All participants interacted with the inventory through their diverse positions either physically or indirectly on a daily basis and were at least 18 years of age. Participants worked in production, shipping and receiving, accounting, and the sales department. The tenure of the participants ranged from 2-19 years with the company. Originally, the researcher received consent from 23 willing participants, but two were eliminated because of tenure and three employees left the company prior to the start of the study. Table 2 displays the results of the demographic survey questionnaire for each eligible participant.

Table 2

*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

This research study was conducted onsite at Slick Automotive. A member of senior management granted access to a private area to ensure COVID-19 distance requirements were achieved, while face-to-face interviews were performed in private. The door remained closed during all face-to-face interviews, so the participant's information would not be compromised by others. The researcher typed up all the interviewees' answers on a Microsoft Word or converted the answers into Microsoft Word after the interview session.

This research information was gathered from actively employed individuals with inventory management connected to their job functions. In addition to the survey questionnaire, all participants were presented with a consent letter and provided a signature as confirmation to partake in the activities of the research study. The researcher reviewed all survey questionnaires and consent forms for qualification and completeness before the research study began.

Participants consisted of two members of leadership, nine production employees, three shipping and receiving employees, two sales employees, and two employees from the accounting department. The leadership members, General Manager and the Production Supervisor, led the control processes of inventory movement and production. The production team members executed the processes to convert raw material inventory into finished goods. The shipping and receiving workers governed the distribution of inventory as it enters and leaves out the company. The sales team members handled the vendor and customer relations to guarantee the proper inventory items are ordered and the customers' orders are scheduled. The accounting team members supervised the costs and sales of the inventory, which flows into the monthly financial statements.

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). The researcher avoided acknowledging the participants by their real name throughout the study.

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 interviewee was allowed to make corrections or add more detail to the transcript before providing a signature of approval. Then, the researcher transferred each handwritten transcript to a Word document and saved with password protection. This process allowed the researcher to thoroughly analyze each participants' verified responses and become acquainted with the data. In



addition, the researcher started the transcription process and identified key elements related to the study. All interviews were successfully saved to a flash drive and uploaded to NVivo for further analyzation of the data.

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. Deviations and similarities between the action and the standard operating procedures were notated for each step.

Lastly, the researcher was permitted to review documentation for each department to get a visual perspective of the supply chain processes. There were current and historical electronic inventory records, emails confirming customer orders, inventory purchases from vendors, bill of lading, 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 data collected from the interviews and observation field notes were reviewed and coded separately by department. Phrases and keywords were highlighted and then compiled for an overall overview of the participants' assessments. Synthesis and coding recognized several instances of agreement in views, with infrequent occurrences of different opinions emerging. The continued pattern of the repetitive interviewees' views and themes verified an acceptable sample size and completeness of data saturation (Creswell & Poth, 2018).. The categories were united with using thematic analysis to create meaningful themes significant to the purpose statement and research questions for the study. Thematic analysis is a research technique to guide researchers through conceptualizing qualitative data (Nowell et al., 2017). The process of

thematic analysis provided ease in maneuvering across multiple data sets to compare and contrast the perspectives given by the participants.

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.

### **Themes Discovered**

Following an extensive review of the findings, the researcher translated the data collected to focus on the connection with each research question and to relate the interpretations to the issues surrounding manual inventory errors. In this research study, themes were revealed through exploration of synonymous patterns and participant views across multiple departments within the company. The researcher gathered a compilation of four themes to identify the most common manual inventory errors and the connection to the financial health of the business.

### **Interpretation of the Themes**

*Theme One: Inventory Controls Structured for Manual Practices.* Inventory is the main source of revenue for any type of manufacturing company. Missed opportunities to convert purchased raw materials into a finished product can hinder the company's financial growth. Companies must be diligent to incorporate safeguards to protect the inventory as it moves throughout the supply chain. Unfortunately, when companies neglect to implement policies that

are suitable, the operational standards are difficult to uphold. In addition, the strategies must be sustainable to meet the needs of the business as evolution progresses. According to P07, the absence of inventory controls removes the element of accountability from the process, which results in the repetition of errors. P14 added inventory errors are prevalent because there is only one spreadsheet to record inventory transactions for the most valuable raw material inventory items. The majority of participants stressed the need for an organized plan to control the inventory and implementation of inventory classes. One participant said, “I believe a lot of our inventory control and management issues would be eliminated with the creation of inventory classes. Inventory classes allow distinction of the most popular inventory items” (Participant 05, personal communication, May 4, 2021). Another participant emphasized, “Although we had a process in place for inventory practices, I think we got off track as business continued to grow. We concentrated more on getting orders to the customers rather than keeping track of our inventory properly” (Participant 18, personal communication, May 5, 2021). In agreement, another interviewee stated, “We forgot about the processes and the inventory errors started popping up consistently, which is causing missed orders at least three to five times per week” (Participant 09, personal communication, May 4, 2021).

During a personal observation, the researcher found there was no sign off or second review of the inventory data recorded on the Excel spreadsheet. Multiple individuals have access to the main inventory record spreadsheet throughout the day with no process for traceability or accountability for mistakes. Customer orders are provided from the sales department to the production team on Fridays for the upcoming week. Adding to the list of inventory control issues, participants expressed the difficulty of locating the proper inventory to fulfill the orders on a weekly basis. For instance, one participant revealed there was no system in place for storing

inventory and space was very limited, with the comment, “There are no inventory locations and inventory is stacked to the ceiling. Warehouse space is tight, which makes it hard to keep the inventory visible” (Participant 16, personal communication, May 4, 2021). Another interviewee advised, “We have mistakenly overlooked raw material inventory and ordered more because the inventory is impossible to locate. This is one of the main reasons we need more inventory space” (Participant 02, personal communication, May 5, 2021). According to P05, another warehouse location is at the top of the list along with a plan to account for the inventory movement between both locations.

Cycle counts are an intricate piece to controlling the inventory in stock. Out of stock inventory leads to disruption in production and loss of sales, so frequent cycle counts are relevant to keeping accurate stock records. The researcher observed a cycle count and noted there were only 20 items on the list. Cycle counts are performed once a month through a random selection of raw material items. The accounting department provides the list to the production managers every month and the same count is performed by all the plants companywide. The inventory list was printed in real-time from a system referred to as Sage. One individual performed the cycle count and noted the variances for each item. A member of the production management team made the raw material inventory corrections in Sage and notified the sales team for any reorders. All of the participants from the accounting and production department voiced concerns with the infrequent cycle counts and the process of randomly selecting only 20 raw materials items to cycle count per month, as one interviewee explained, “We only cycle count raw materials and neglect counting our finished goods, while I am sure the finished good numbers are off too” (Participant 10, personal communication, May 12, 2021). Interviewee P11 added,

These monthly cycle counts of random items are not efficient. It impacts sales based on the forecast when inventory is not available to produce finished goods. We need a full inventory count at least twice per year to reduce errors and increase profits. Big inventory errors on a consistent basis makes you look bad or like you do not have control of the inventory. In my opinion, year-end inventory audits are the best and more thorough than the regular monthly audits.

Another participant stated, “I have pulled two other people to assist me with physical counts each day, because you cannot trust the system to produce orders and sporadic cycle counts are not enough” (Participant 05, personal communication, May 4, 2021). Furthermore, P01 advised inventory with negative balances are not caught in a timely manner because of the randomly selected inventory items. P09 and P17 felt the infrequent cycle counts are the reason production is not aware of raw material and finished good shortages until they get ready to run an order or prepare the shipment.

Throughout the observation phase, the researcher discovered Sage was only utilized to track inventory balances, bills of materials (BOMs), and inventory prices. Several participants discussed concerns about Sage dependency and believed Sage could be a great asset after a thorough clean up. Operating under a manual inventory system restricted the production team from processing real-time inventory deductions. In addition, P01 provided insight on the incorrect BOMs and the need for updates based on current product requirements. Another participant stated, “We are aware the BOMs do not match the materials we currently use on the production line. It makes controlling the inventory errors even harder” (Participant 09, personal communication, May 4, 2021). The researcher questioned how scrap values were recognized and P01 advised, “We do not account for scrap on the BOMs in Sage. This is why we keep the few

valuable raw material items on a spreadsheet in attempt to track them closer” (Participant 01, personal communication, May 12, 2021).

Some participants felt Sage needs an overhaul and expressed the benefits of rectifying the inventory discrepancies to boost operational proficiency. Two of the participants discussed how the errors in inventory pricing hindered performance on a daily basis. The reservations related to inventory valuation issues and the ability to match pricing when invoicing customers and paying vendors. In addition, the two participants explained poor controls over inventory values will impact the amounts on the balance sheet and the costs on the profit and loss statement. One of the interviewees stated, “Inventory pricing errors occur often, especially due to the pandemic inflation on everything we buy, and have to be verified with the vendor before Sage can be updated” (Participant 04, personal communication, May 12, 2021). The other interviewee added, “Improper valuation influences the financial numbers I have to provide to senior leaders to show them how we are performing compared to the budget. I discover pricing of bought and sold inventory is frequently off” (Participant 11, personal communication, May 12, 2021).

***Theme Two: Inventory and Time Management.*** Research participants conveyed strong views that incorporation of automation throughout the company would enable better inventory management practices and save time. The majority of the interviewees noted a desire to have all the systems streamlined to make traceability of the inventory items more manageable. Participants noted the fact that most materials are nonperishable, and the finished goods have a long shelf life, which would make implementing any inventory management technique less complex. P05 highlighted the Just-in-time (JIT) technique has been pitched to senior leaders numerous times, but stressed the need for an automated inventory system to achieve the best results. Another participant added, “JIT would resolve our various inventory mistakes, increase

our warehouse space, and give us a competitive advantage” (Participant 06, personal communication, May 12, 2021). Furthermore, a participant stated, “JIT would reduce the amount of required inventory on hand. Many days we have spent hours searching for inventory based on the system or spreadsheet and that is wasting valuable time” (Participant 13, personal communication, May 4, 2021).

Some participants felt an automated inventory system would improve the internal communication between the departments and the communication with external parties. Participants believed streamlined systems with vendors and customers would improve the accuracy of order information and increase the revenue. An interviewee stated, “Faster communication would help us catch and correct inventory errors in a timely manner” (Participant 17, personal communication, May 10, 2021). Similarly, one participant emphasized, “An automated system will give us access to more vendors and explore the opportunity to obtain international customers” (Participant 03, personal communication, May 5, 2021). Another participant provided insight from a financial perspective, with this remark, “With automated systems, you can run real-time inventory reports, prepare future forecasts, and close the books every month with confidence. I could trust the numbers” (Participant 09, personal communication, May 4, 2021).

A few participants also referenced the labor constraints with COVID-19 makes daily tasks harder to complete and deviations to standard operating procedures are implemented to save time. For example, P15 admitted to receiving inventory without physically counting the contents and just using the quantity on the vendor’s paperwork to adjust the inventory balance. One participant mentioned, “I try to cross train to cover labor shortages and prevent lags in receiving materials in the system. There have been times when we had a two-day lag”

(Participant 06, personal communication, May 12, 2021). Another participant stated, “We have brought on a lot of temps to help with the labor issues, but we are also seeing more inventory errors from the increase in temp labor, especially with labelling” (Participant 09, personal communication, May 4, 2021).

***Theme Three: Sales and Profitability Uncertainties.*** The interviewees voiced concern about the consequences of manual inventory errors and the negative impact on financial growth and productivity. Participants stressed that minimizing inventory errors would increase sales and prevent rework or production shutdowns. Several participants discussed the short shipments because of the inventory errors. One participant explained, “We have sent out short shipments and even turned trucks away because we have incorrectly labeled product or have inventory shortages because of incorrect numbers in the system versus the floor” (Participant 15, personal communication, May 10, 2021). Another participant stated, “We have worked orders while trucks wait because management told us this is for a big customer or it will gain us a large amount of revenue” (Participant 07, personal communication, May 4, 2021). Furthermore, another participant shared, “Our freight expenses are hurting the bottom line.... and over six figures last month. We are paying high fees to expedite inventory in from vendors and when trucks have to wait” (Participant 04, personal communication, May 12, 2021).

The financial strain behind inventory errors was expressed by several participants. One interviewee said, “Product analysis is not being done. Executive leaders decide to cancel product lines without considering the root cause issues and profitability potential” (Participant 12, personal communication, May 5, 2021). During an observation, P08 shared the weight of the boxes caused bottles to burst open because the boxes were stacked so high. P13 added all old product is thrown away, but they try to salvage the liquids for reuse. In addition, some



participants noted they have found obsolete product, while trying to find or count other inventory items. One participant added, “Inventory write-offs every month adds up quickly and negatively impacts our cash flow. Inventory errors on the balance sheet limits our investment and banking opportunities” (Participant 11, personal communication, May 12, 2021).

***Theme Four: Unwilling to Implement Organizational Changes.*** Study participants felt the inventory errors were going to continue until senior leadership implemented changes. All participants agreed that the manual inventory processes have to be revamped for inventory errors to decrease. There were requests for changes to be introduced in stages to help explore different strategies and make cost effective decisions. One participant stated, “I was told change is too costly. If one plant changes, then all plants have to make that same change too” (Participant 14, personal communication, May 10, 2021). Another participant said, “Automation switches are costly because you have to pay for installation of software and training. If leadership is not connected to the vision, then the change is irrelevant and a waste of money” (Participant 05, personal communication, May 4, 2021).

A few participants expressed change would never happen because senior leaders do not listen to the ideas of employees. Interviewees felt senior leaders are content with the current business practices and will continue to adjust the manual inventory practices to fit the changes in the industry. One participant stated, “I am convinced upper management does not like change. All of the ideas I have mentioned have seem to fall on deaf ears” (Participant 15, personal communication, May 10, 2021). Equally, a participant added, “Upper management is not ready for change because in their world everything is fine” (Participant 18, personal communication, May 5, 2021). From the financial perspective, a participant voiced, “Since orders are still coming in and going out, upper management thinks business is good. I think a few small changes, like

inventory locations, will improve financial outcomes on the income statement” (Participant 04, personal communication, May 12, 2021). Another participant said, “Change will never happen here. I asked if we could at least get scanners, but higher ups want to pocket all of the profit for themselves instead of spending money to make more” (Participant 01, personal communication, May 12, 2021).

### Representation and Visualization of the Data

The purpose of this study was to investigate the financial impact of the manual inventory errors at Slick Automotive. The data in Figure 2 represents the types of inventory errors experienced by the 18 participants of this research study. This aids as visual support to explain the company’s most common inventory errors throughout the organization that impacts their financial well-being.

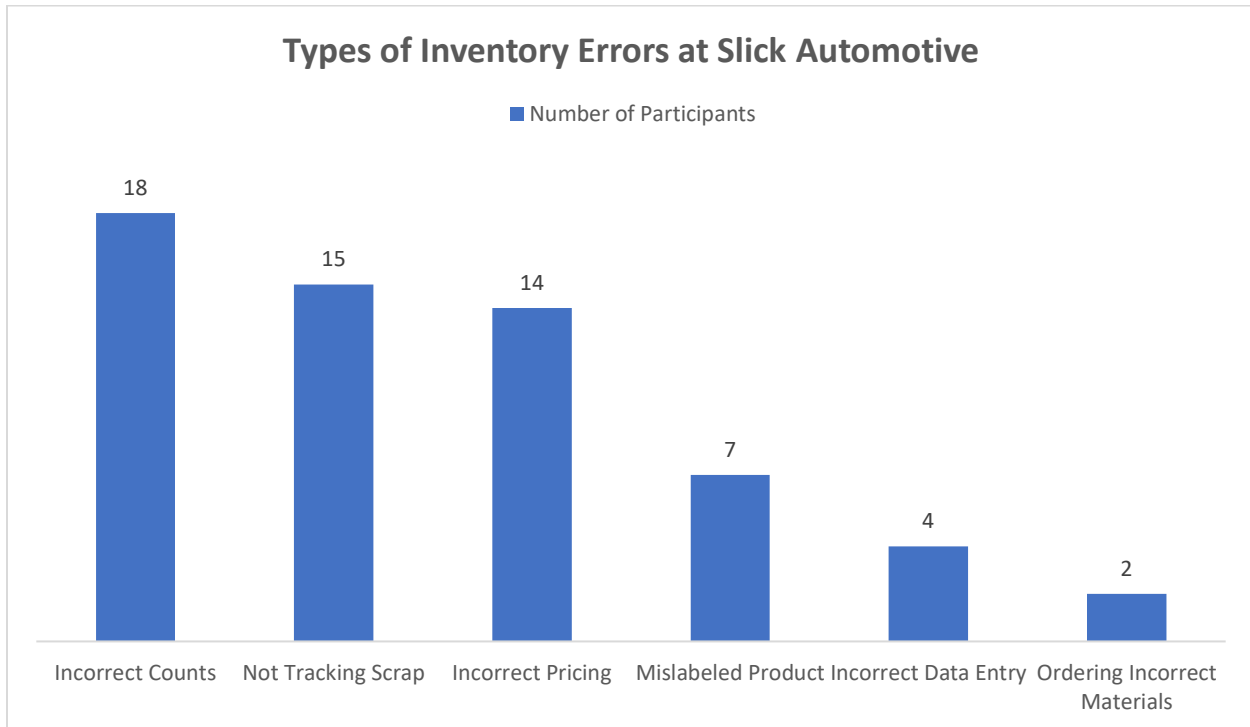


Figure 2. Types of inventory errors experienced at Slick Automotive.

During the interviews and observations, participants voiced the inventory errors were causing increases in the cost of raw materials and freight, which minimized the budget sales for the month. Table 3 contains financial information from a section of Slick Automotive's income statement, which was approved and compiled by the accounting department. The information shows a comparison of the first three months of actual sales and material costs and the forecasted numbers for 2021 in millions.

Table 3

*Quarter 1 Actual Sales and Material Cost Compared to Quarter 1 Forecast*

	<b>Qtr. 1 2021</b>	<b>Qtr. 1 2021</b>
	<b>Actual</b>	<b>Forecast</b>
Sales Revenues- Products	\$6,968	\$7,691
Product Discounts	(1)	0
Product Returns	(1)	(1)
Sales- Other Product Sources	0	0
<b>Total Sales Revenues</b>	<b>6,966</b>	<b>7,690</b>
<b>Outbound Freight Costs</b>		
Less Outbound Freight	(254)	(180)
<b>Total Outbound Freight Costs</b>	<b>(254)</b>	<b>(180)</b>
<b>Total Manufacturing Revenues</b>	<b>6,712</b>	<b>7,510</b>
<b>Direct Materials Cost</b>		
Purchased Raw Materials	4,560	3,935
Packaged Materials	0	4
Add Incoming Freight	324	260
Other Direct Material Costs	0	0
<b>Total Direct Material Cost</b>	<b>4,884</b>	<b>4,199</b>

The responses from the interviews were the main mechanism in the study to generate the themes. The collection of data for each interview question was compiled to illuminate words and phrases that complimented each other for the purpose of this study. The information displayed in Table three is a visual of how the selected participants' interview responses produced the four themes for this research study.

Table 4

*The Evolution of Themes from Participants' Responses*

<b>Themes</b>	<b>Interview Question(s) Where Theme Appeared</b>	<b>Participant Codes Related to Themes</b>	<b>A Participant's Response Related to the Theme</b>
Inventory Control	2,3,4,5,6	P02, P07, P08, P09, P10, P13, P17, P18	"Inventory is out of control! The processes change so much because there is not a functional system in place. It seems like the inventory is controlling us rather than us controlling the inventory." P09
Inventory and Time Management	1,3,4,5,6	P01, P05, P06, P11, P12, P14, P15	"There have been raw material packages sitting outside for days because no one noticed them or because we do not have space for them. We are so consumed by trying to locate things that we do not have time to organize the inventory" P15
Sales and Profitability	1,2,4,7,8	P01, P03, P04, P05, P07, P08, P10, P11, P12, P13, P15	"I am the gatekeeper of inventory because it is the biggest asset on the balance sheet next to equipment. It is my job to ensure the inventory quantities and prices are correct because ultimately, this is how

			we make money, so frequent errors have to be rectified immediately to meet or exceed the monthly sales forecast” P11
Organizational Change	5,6,7,8	P01, P02, P03, P04, P05, P06, P09, P11, P14, P15, P16, P18	“We definitely need to change over to automated systems to organize and watch inventory. Plus, our equipment is old, so production probably takes longer than normal, but the higher ups are satisfied with what we have, and they do not see the need for any changes” P16

For the first theme, inventory control, the entire group of participants voiced concerns about the current poor inventory control practices throughout the supply chain. Although every participant shared different experiences, the responses were heavily generated from the Production Specialist participants. Every interview participant had answers that included “lack of inventory controls”, “no manual inventory structure”, and “no inventory guidelines”, which helped in formulating the theme.

The second theme of inventory and time management derived from all the interview questions except for one and seven. The main topic of discussion from the participants was the need for automation to aid in managing the inventory errors and to save time. All of the participants provided feedback to promote the emergence of theme two, but participants with production management roles provided the most in-depth answers. P01, P05, and P06 elaborated on their view of how to implement JIT and the benefits of the inventory management technique when coupled with automated processes. The responses from the remaining participants were

centered around automated inventory systems enabling better lines of internal communication, tracking and storing inventory, and alleviating labor constraints.

For the emergence of theme three, the main source of information came from accounting, sales, and the production management teams. Participant P11 shared the financial impact the inventory errors have on profitability, inventory valuation, and how those errors effect different categories on the financial statements. P04, also from the accounting department, provided information on the cost drivers from the frequency of the manual inventory issues and the expense increases reflected on the income statement. The participants from the sales department voiced their experiences with difficulties forecasting sales numbers and relying on the system to schedule weekly customer orders. The production management team discussed cancelling orders right before production, holding trucks to complete shipments, and releasing partial shipments because of inventory issues.

Lastly, theme four was guided by the quotes surrounding senior leaders' hesitancy to accept organizational changes need to happen to mitigate the manual inventory errors. The participants emphasized executive management was afraid of changing the manual inventory processes because of costs of automation, contentment with current business practices, and personal greed. Furthermore, the participants agreed management's expectation was to remain operating with the current manual procedures and the reality of changes was out of scope for the near future. One production manager expressed their request to slowly incorporate automation was denied, and another participant felt all suggestions are ignored by upper management.

### **Relationship of the Findings to the Research Questions**

***Research Question 1.*** What inventory errors do organizations in the automotive liquids manufacturing industry experience with using a manual inventory management system?

All of the study participants agreed inventory errors were present in connection with using a manual inventory management system. Study participants shared their experiences with the various inventory errors throughout their time with the company. All participants said they have encountered inventory balance errors in the system and spreadsheet. Gaps in the inventory control process threatens the inventory balances and compromises the efficiency of production (Karim et al., 2018). The majority explained the inventory balance errors are caused by incorrect data entry and the absence of frequent cycle counts. Additionally, three of the participants mentioned the incorrect inventory data entries derive from the inventory being received by the bill of lading rather than physically counting the contents. The receiving team has the responsibility of checking for inventory discrepancies before entering the materials into the designated inventory system (Alfares & Attia, 2017). Two of the participants stated the lag time in adding inventory before it is used on the production line and removing inventory from the system contributes to inaccurate inventory balances. Of the participants interviewed, some stated they were aware of labeling errors on the finished good boxes. Four of the participants added they have received return orders from customers because the pallets had mixed product on them because of incorrect product labels on some of the boxes. Other inventory errors discussed by five participants were incorrect pricing, not recognizing production scrap, missing part numbers, and inaccurate BOMs in the system.

***Research Question 2.*** How does the experiences with a manual inventory management system influence the decisions related to reducing inventory record errors?

Study participants were on one accord that the existence of consistent inventory errors made them think twice before performing specific job functions. Nearly half of the participants stated having a peer to review their data entries has been helpful in mitigating the inventory

record errors. Dolgov and Kaltenbach (2017) advised automated systems are sufficient for minimizing inventory errors and requires less human interaction with entering data into the inventory system. Two participants explained how they decided to select two other employees to assist them with performing at least one cycle count per week based on the inventory items needed to complete orders. The remaining half of the participants expressed they have learned to ask questions more and communicate with other internal departments. Several of the participants pointed out deciding to communicate with others influenced how much inventory was ordered, how they relayed financial outlooks to senior leaders, and whether to perform intercompany inventory transfers. Communication is quicker and more accurate with the use of automation, especially when the inventory can be managed internally and externally (Sharma et al., 2020). Additionally, a few participants felt communicating the errors directly to the person, so they can learn from their mistakes will assist in minimizing repetitive inventory errors.

***Research Question 3.*** How do inventory record errors impact productivity and the financial statements?

When participants were asked how inventory errors impact the job duties, all of them stated inventory records errors cause production shutdowns and loss in sales. Over half of the participants referenced a loss in time when searching for inventory items based on differences between the system and production floor. Yan et al. (2019) stated consistently tracing inventory issues suppresses productivity, which can jeopardize the financial health of the business. Several of the participants felt inventory errors impacted the forecasting for weekly orders and knowing how to schedule orders for production. The remaining half of the participants addressed the increases in expenses because of hinderances with running production. Some of the increased expenses noted for the production hinderances were labor from rework or shutdowns, freight



from expedited inventory orders or trucks waiting for orders, and ordering excessive amounts of unwarranted inventory items. From the financial perspective two participants provided details about the impact to the financial statements. Khanna et al. (2020) found improper valuation is caused by inconsistencies in the quantity and the buying prices from vendors and the selling price for finished products. 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. Other less mentioned risks about the impact of inventory record errors were pertaining to upset customers and losing a competitive edge.

***Research Question 4.*** Why is a manual inventory management system utilized instead of a barcode inventory system within the manufacturing industry?

Most of the study participants recommended JIT as a good solution to assist in minimizing inventory errors. Lean manufacturing allows businesses to cutdown inventory balances to control inventory and scrap issues (Shokri, 2019). In addition, participants expressed that senior management was not receptive to organizational change. Therefore, they felt implementation of an automated inventory system was not a priority and they would be stuck using a manual system. Study participants pointed out the costs associated with purchasing an automated inventory system and operational training for the employees. Management has to test the internal controls to ensure the selected automated inventory system is suitable for business operations (Nugroho & Zhu, 2019). Almost a third of the participants believed senior management felt business was doing great, so the current manual inventory practices were effective. Adversely, four study participants indicated greed and senior management were not interested in reinvesting their money into the company. Overall, the participants were in

consensus that senior management is the main reason why they are still operating with a manual inventory system and changes in the future was unforeseeable.

### **Relationship of the Findings to the Conceptual Framework**

**Contingency Theory.** The decision-making process for any management leadership style can be difficult at some point. There is more than one path to arrive at a decision and senior management must recognize this fact when leading an organization (Calabrese & Costa, 2015). Despite the internal and external strains created by the manual inventory errors, the majority of the participants believed management would not decide to replace the current manual inventory practices with automated inventory systems. The findings showed the operational procedures were solely guided by the senior leaders of the company. In connection to the contingency theory, the researcher analyzed the responses of the participants and observed they felt their feedback was not accepted by the upper management team. For instance, one participant stated, “Management should consider the views of the employees when making decisions about operational processes because we put action to those decisions. We are the heartbeat of the company and have hands on experience, not them” (Participant 18, personal communication, May 5, 2021).

**Inventory.** Inventory is money for any manufacturing company and inventory is necessary to financially sustain the business. Therefore, management should have procedures in place to safeguard the inventory movement throughout the supply chain and have actions to promote accountability (Ciftci & Darrough, 2019). This entire research study is centered around inventory, and all participants acknowledged the importance of having the correct inventory items to produce a finished product to create revenue. A participant advised, “People often miss the concept of inventory being one of the largest assets on the balance sheet. When inventory is

misused and not controlled properly, people need to think of money being lost” (Participant 11, personal communication, May 12, 2021).

***Inventory Classification.*** The assignment of inventory items aids companies in maintain an organized plan of tracing the conversion of inventory throughout the supply chain (Gallmann & Belvedere, 2011). The interviewees continuously expressed a need for inventory classes to help with tracking inventory and organizing the warehouse. Some interviewees also stated inventory classes would make analysis easier and to concentrate on the most important production items based on customer orders.

***Inventory Storage.*** In conjunction with inventory classification, study participants voiced the lack of warehouse space contributed to the various inventory errors. Lee et al. (2015) emphasized a warehouse management plan is essential for materials to flow without interruption in the supply chain and to keep inventory turnover up to company standard. The majority of the participants stated inventory is all over the place and stacked up to the ceiling. Additionally, participants emphasized the difficulties in locating inventory to prepare for production orders and performing monthly cycle counts, which consumed a great deal of time. One participant explained, “Warehouse space is so tight, it is impossible to use the forklift in most areas. We have to physically move boxes to the warehouse from the production area” (Participant 13, personal communication, May 4, 2021).

***Inventory Control.*** Inventory controls in manufacturing prevent errors from occurring on a repetitive basis (Mbuvi et al., 2016), especially in a manual inventory environment. Participants stressed the need for continuous improvement on the current processes. The list of controls the participants conveyed were better internal communication, refresher and cross training, and creating an inventory team for more frequent cycle counts. One participant advised,

“We do not have any structured inventory controls in place. We just correct errors when we find them and move forward” (Participant 15, personal communication, May 10, 2021).

***Company Financial Performance.*** The financial well-being of a business in manufacturing is determined by the company’s ability to provide a desirable product to consumers consistently. Continuous threats to operational procedures can prevent businesses from achieving profitability goals, which can force downsizing and eventually bankruptcy (Bhimani et al., 2018). Many interviewees stated excessive inventory errors increase the expenses and minimizes the company’s earning potential. Some participants shared experiences with shipping short orders, cancelling orders, and not being able to find inventory for production, all of which negatively impact the financial statements. One of the participants explained, “Most of the time you do not know you are short on inventory items until you get ready to run the order and we are unable to meet our sales goal for the month” (Participant 03, personal communication, May 5, 2021).

### **Relationship of the Findings to the Anticipated Themes**

An overview of the completed interview information collected for this study revealed the presence of several anticipated themes. The researcher linked the purpose, framework, and literature review to the findings, which held true to the themes.

***Theme One.*** One of the most prevalent themes was that while the business was still profitable, the poor inventory controls prohibited the company from maximizing their earning potential. In addition, the overwhelming responses from participants voicing the need for structured guidelines for handling inventory movement and routine cycle counts alerted the researcher to consider inventory controls as a theme. The findings showed inventory control plans must be tested and maintained continuously to effectively safeguard the inventory items

throughout the supply chain. Although the Excel spreadsheet contained only a few of the most expensive raw material items, there were no checks and balances to prevent the users from making careless data entry mistakes. All the participants agreed inventory controls were lacking in every part of the supply chain and this was the root cause of the manual inventory errors experienced in their job functions.

**Theme Two.** The second anticipated theme directly correlated with the inventory controls theme. All inventory control plans are most effective when aligned with an inventory management plan. Although the two themes are tremendously similar, the researcher felt tracing inventory movement and managing the whole outlook of inventory deserved separate acknowledgement. The majority of the participants indicated the use of manual inventory practices hindered the possibility of implementing reliable sales forecasts, accurately tracking inventory balances, and organizing the warehouse space. The emphasis on wasting time searching for inventory items shifted the original anticipated theme to incorporate time management. JIT was the most recommended inventory management technique by the group of study participants. All participants elaborated on how the low inventory requirements and automation would contribute to the reduction in inventory errors and allow them time to focus on other tasks.

**Theme Three.** The third anticipated theme presented by the participants was the worries about sales and profitability because of the inventory errors. There was an overwhelming response from participants who addressed their concerns about failed attempts at completing production runs and orders. The responses ranged from holding trucks, pushing out due dates for orders, and sending out partial shipments. Incorrect inventory counts was the reason for the

inconsistencies in the production of goods and the missed sales. According to participants, the partial monthly cycle counts are not sufficient enough to repair the inventory balance issues.

The absence of tracking waste was a contributing factor to the productivity of the business. Over half the participants in the study mentioned there was no record for measuring the amount of scrap for any of the materials. Participants stated there was no process for accumulating scrap totals during production runs or estimating reorder points for low stocked goods with manual inventory systems. One participant stated no scrap allowances understates the inventory on the balance sheet and forces the need to excessively order materials to avoid stockouts, which increases the inventory expenses.

The two participants in the accounting department advised the combination of inventory errors increased the expenses on the income statement. Additionally, the accounting interviews revealed the expenses budget was exceeded or doubled most months. In the interviews, the participants advised the inventory errors resulted in overtime hours for workers to catch up on production orders and search to possibly locate misplaced product, which jeopardized the monthly allowance for expenses. Participants recalled working seven days a week for an extended period of time to assist in reducing the wait time for trucks and freight charges. In addition, participants explained the additional work hours was used to create some space in the warehouse and attempt to categorize the inventory items. Even with the extra time, participants advised the inventory errors still occurred and the efforts of organizing and recovering inventory was temporary.

**Theme Four.** The last theme to emerge from the study's information was management's unwillingness to implement organizational changes, which was not anticipated. The evolution of technology and the ongoing changes in the market led the researcher to believe most

manufacturing businesses would embrace the opportunity to convert to automated systems to mitigate inventory mistakes. From observing the manual inventory processes and the perceptions of the participants, the findings supported the theory that decision-making for management requires more than one view to lead a business. Some of the participants explained the challenges with getting upper management to acknowledge their concerns and suggestions with reducing inventory errors. The study participants highlighted the management's inability to adopt new strategies rested on their hesitancy to change. The majority of participants settled on senior leaders were being reluctant to organizational changes because of fear. When specifically discussing technological changes to the inventory system, the consensus was senior management was afraid of the costs to reinvest in the company and minimizing their personal financial gains.

#### **Relationship of the Findings to the Literature**

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. The participants confirmed the frequent inventory errors caused inefficiencies in the daily flow of production and the overall financial stability of the company. This section provides comparisons and differences between the finalized results and the literature pertaining to inventory record errors.

*Relationship of Theme One to the Literature.* The views of the participants revealed with manually tracking valuable inventory on a Microsoft Excel spreadsheet required a system of controls to trace entries and enforce accountability for errors. 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 & Kaltenbach, 2017; Mbuvi et al., 2016). For example, scanned inventory to the incorrect part number or inventory received as the

wrong quantity can still cause inventory issues. 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 & Kaltenbach, 2017; Karim et al., 2018; Sharma et al., 2020).

Previous literature found controlling the inventory effectively can produce higher quality metrics in production of goods and decrease the threats to generating revenues (Alfares & Attia, 2017; Karim et al., 2018; Phornlaphatrachakorn, 2019). Khanna et al. (2020) stated businesses can be so fixated on the control processes that they neglect the quality of the inventory and jeopardize sales to customers. Participants of the research study neglected to mention quality controls and were only worried about tighter inventory controls.

Many participants complained about the lack of full inventory counts during the year. Cycle counting on a regular schedule can help with accounting for inventory in stock and deter unexpected threats that interfere with inventory gatekeeping (Snell & Dean, 1992). Participants advised the current cycle count schedule is monthly and only requires the observation of 20 randomly selected parts. Frequent inventory audits can assist companies from suffering with lingering inventory errors and provides an opportunity to detect and correct costly inventory mistakes in a reasonable timeframe without halting production (Gallmann & Belvedere, 2011; Shteren & Avraham, 2017; Udeh, 2019).

***Relationship of Theme Two to the Literature.*** The second theme encompassed inventory and time management when it came to manual inventory items. The vast majority of participants stated an automated inventory system along with a suitable plan for inventory management and controls would completely eliminate the occurrences of inventory record errors. While researchers believed automated systems assisted in minimizing inventory errors, the presence of



inventory errors still exist (Cannella et.al, 2017; Dolgov & Kaltenbach, 2017; Shteren & Avraham, 2017).

Some participants across different departments felt the automated systems would improve the internal and external communication for the business. In comparison, researchers advised updated technology allows for real-time information to be extracted from the system to enhance sales and budget forecasts to predict the financial outlook internally (Alfares & Attia, 2017; Drakaki & Tzionas, 2019; 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). Customers can process orders faster and the forecast demands have a higher level of accuracy for inventory needs for each production run. Using an automated system for communication to handle inventory movement helps diminish the possibility of human mistakes, so businesses can maximize their assets (Dolgov & Kaltenbach, 2017; Mbuvi et al., 2016; Shteren & Avraham, 2017).

Along with communication, researchers stated proper inventory management avoids time traps some businesses struggle with because of ineffective inventory tracking guidelines (Gallmann & Belvedere, 2011; Karim et al., 2018; Mbuvi et al., 2016; Nugroho & Zhu, 2019; Yan et al., 2019). 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 interviews and observations showed time was lost tracking inventory and often went unaccounted for when preparing for production runs and loading customer shipments. According to the participants, missing opportunities to manage time created a list of

canceled orders, risks of late orders with possible increased lead times, and misplaced inventory items.

*Relationship of Theme Three to the Literature.* The sales and profit theme uncovered the participants' concerns with the inventory errors derailing production orders and sales goals. The level of consideration in the management of inventory is reflected directly through sales and indirect expenses (Akhtar & Liu, 2018; Chuang & Oliva, 2015; Gallmann & Belvedere, 2011; Kroes & Manikas, 2018; Lee et al., 2015). Many participants stated the risk of inventory shortages or not being able to find materials on the floor has caused a loss in sales. A few interviewees emphasized canceled orders, short shipments, and delays occur at least two times per week. Furthermore, inventory errors can show up as increases in labor because of product rework and overtime (Chuang & Oliva, 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). Kroes and Manikas (2018) added low finished good consumption by customers hinders the opportunity to maintain revenue requirements to operate a business. Some participants recommended the JIT technique to assist with minimizing the scrap and lowering inventory levels. However, some researchers found that without a tight sales forecast and a compatible software system, JIT is not efficient in resolving waste issues (Bevilacqua et al., 2016; Dolgov & Kaltenbach, 2017; Erkayman, 2019; Shokri, 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; Wang et al., 2016). 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).

During an observation, one participant shared the impact of inventory errors are reflected on the income statement under the manufactured yield section, which includes material costs and freight. Shortages of inventory requires continuous materials orders and can increase freight costs when trying to meet tight shipping deadlines to customers (Akhtar & Liu, 2018; Sharma et al., 2020; Wang et al., 2016). Prior research has found poor vendor relationships can prevent businesses from fulfilling production metrics and stifle positive expectations of financial results (Alfares & Attia, 2017; Yan et al., 2019). Therefore, the costs for materials could rise significantly when inventory is mishandled during production or in the warehouse (Gallmann & Belvedere, 2011; Shokri, 2019). Some interviewees recalled experiences with returned orders because the incorrect inventory was shipped out to the customer, which can threaten the earning potential.

Many participants expressed the warehouse space was very tight and inventory was stacked up to the ceiling all over the warehouse and production floor. Previous research confirmed overstocking materials that are obsolete or stagnant can consume space necessary for products that are actually in demand (Gallmann & Belvedere, 2011; Sharma et al., 2020; Shokri, 2019). Excessive inventory storage problems can impact a company's revenues through the expense of paying for extra warehouse space (Ciftci & Darrough, 2019; Gallmann & Belvedere, 2011). One participant explained unnecessary inventory expenses and write-offs impacts the income statement, but also the cash flow financial statement. Bhimani et al. (2018) stated the inability to estimate the financial performance of the company through budgeting and forecasting is a risk to addressing any uncertainties that may impact future decisions. Akhtar and Liu (2018)

advised poor financial health can limit the accessibility to operations investments and deter potential stakeholders from investing into the vision of the company.

*Relationship of Theme Four to the Literature.* The final theme about senior management's unwillingness to change derived from the participants' views on their personal recommendations to alleviate the inventory errors. 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.

The hesitancy of decision-making can lead to implementing new changes with a weak strategy (Calabrese & Costa, 2015; Ciftci & Darrough, 2019). A series of activities being incorporated can often present a false representation to decision makers that business is going well. The results from the study showed senior management was reluctant to making decisions because the business was still profitable. Khanna et al. (2020) advised decisions about organizational change must be predicated on developing a sound plan for the current practices in the right timing.

Another reason for management's resistant to change was the costs connected to incorporating automated inventory systems across the organization. The participants' opinions and current literature are aligned in stating that resisting to upgrade the technology in business can result in forfeiting short-term and long-term planning of performance goals not just money (DuHadway & Dreyfus, 2017; Kourentzes et al., 2020; Yan et al., 2019). Depending on the size and needs of the business, several cost-effective options for technological implementation are

available to enable management to guide the company to successful outcomes (Calabrese & Costa, 2015; Ciftci & Darrough, 2019; Nugroho & Zhu, 2019). When decisions to accomplish inventory business objectives are neglected, management takes the risk of losing valuable time and employees (Ciftci & Darrough, 2019; DuHadway & Dreyfus, 2017). From observing and interviewing the participants, the confidence in senior leaders has declined and the morale may show signs of suffering soon.

### **Relationship of the Findings to the Problem**

In relationship to the problem, the study's findings proved that automotive liquid manufacturers in the United States do experience issues with inventory records and financial loss using a manual inventory system. The interviewees explained the most common errors were inaccurate inventory balances, the absence of BOM scrap, and incorrect product costs, which all contribute to negative impact on the financial statements. In addition, the participants emphasized the need for a better structure of internal controls and poor guidelines on how inventory managed throughout the supply chain led to the mistakes. There were uncertainties expressed with the possibility of inventory changes being implemented, especially concerning the outlook of technological advancements. Participants doubted senior managements' ability to make the decisions to incorporate new inventory processes and automated systems because of fear of costs and sacrificing their personal wealth. Most participants felt the opportunity to improve the outlook on manual inventory errors and the loss of revenues was predicated on converting to automated inventory systems.

### **Summary of the findings.**

This qualitative case study revealed four themes that explain inventory and financial problems relating to the use of manual inventory practices in the manufacturing environment.

The purpose of this research was to enhance the current literature about inventory errors and challenges managing inventory with manual operations. The data was collected from 18 participants through interviews and observations in various areas of the organization. Each participant was over 18 years of age and met the one-year tenure requirement. In addition, all participants had direct work relations with inventory and consented to partake in the demographics survey and the interview process. The researcher used all the resources collected in the field to perform analysis and started identifying commonalities throughout the information. The researcher read through every interview to get familiar with the information and highlighted keywords and phrases linked to the purpose of the study.

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 choose to function under manual operations rather than an automated system.

### **Application to Professional Practice**

The objective of this study was to investigate the financial impact of common inventory issues in a manual manufacturing setting and add knowledge to the existing body of work. The research presented on automated inventory systems is abundant and continues to flourish as technology evolves. Although technology continues to evolve, there was still a necessity for research on manual inventory issues because manufacturing companies with manual practices still exist.

The four themes represented in the findings were based on the information collected from the participants of this study. Using qualitative research techniques, themes were revealed to highlight the financial effects of manual inventory errors. Inventory is money and mismanaged inventory is equivalent to financial unrest. Businesses must strategize ways to minimize inventory loss as the inventory flows through the supply chain. This part of the study applied information from the research findings to assist businesses with strategic planning and enhancing the current business operations.

### **Improving General Business Practice**

For businesses to exist, a source of inventory must be established to generate profit and sustainability. Inventory is the key component to any business's daily operations. When a business neglects to acknowledge the inventory amounts on hand, there is a risk of missing potential profit and customer satisfaction (Khanna et al., 2020). Therefore, the upkeep of accurate inventory balances and pricing is necessary to maintain the value of the asset. Proper

maintenance of inventory enables a company to prepare strategically, and plan effectively based on their financial position.

The control of inventory is one of the most vital parts to protecting assets and enhancing the earnings for the business. Whether the production method utilized by a business is manual or automated, management needs to integrate inventory control guidelines to meet the productivity requirements (Karim et al., 2018). Without the proper inventory controls, businesses are open to threats such as, obsolescence and theft. A proper inventory control system enables a business to accurately access the demand of the inventory and prevent situations of low inventory levels or overstocking the warehouse with unnecessary materials.

Another key element for any business carrying inventory includes a sound process to manage the inventory. Good management over the inventory starts with accessing all the raw materials required for manufacturing the finished product and how the company will track movement of the inventory (Sharma et al., 2020). Businesses have to establish a plan to acquire quality materials from dependable vendors, procedures to place the items into inventory, and how to account for the inventory once orders are shipped out to customers (Yamazaki, 2017). Once the inventory controls are developed, management needs to identify the weak areas of the supply chain. This is imperative to promote better efficiency, reduce expenses, reliable forecasting and budgeting, organized inventory arrangements, and maximizing profitability.

Businesses must frequently examine the controls and inventory management practices to ensure the profit goals are meeting or exceeding expectations (Conley et al., 2019). Any roadblocks, such as tracking inventory through spreadsheets and no specific inventory locations, can cause bottlenecks in the remaining sections of the supply chain. A business with overstocked inventory items or understated inventory levels may experience obsolescence and missed



production orders. In order for businesses to survive, the inventory turnover must be consistent enough to produce a profit (Hançerlioğulları et al., 2016). When inventory amounts are inconsistent, profitability is hard to measure and cash flow is uncertain. Providing customers with quality products within the established timeframe guarantees inventory is selling rather than remaining stagnant in the warehouse. Therefore, effective inventory movement is critical for businesses to compete and financially survive to cover costs for business expenditures.

Every good plan for operations starts with the decisions of executive leaders of the business. Senior leadership is responsible for birthing an affordable business strategy for monitoring and sustaining the inventory amounts on hand for production and selling goods to consumers (Phornlaphatrachakorn, 2019). The strategy developed must contain the proper tools to successfully govern the inventory and make decision-making easier in the future. Decisions should be centered around mitigating inventory issues and incorporating solutions to keep customers satisfied and increase efficiency. A good strategic plan for inventory management and controls focuses on growth techniques to eliminate scrap, wasted time, and organized workspaces. Continuously reviewing the strategy is required to ensure the current guidelines remain effective and sales are not declining.

### **Potential Application Strategies**

When the strategic plans are completed, the management team must form guidelines to incorporate the strategies into the daily operations (Modof, 2015). The plans must be tested before management can deem the original strategy is sufficient or if the plans require revisions to yield the desired results. A successful strategy can elevate the current practices by removing existing roadblocks that hinder businesses from reaching organizational goals. The final results

from this research study can assist manufacturing businesses with potential strategies to minimize inventory errors and prevent financial weaknesses.

For strategy application to happen, upper management must recognize the problems and be willing to explore solutions for change. Many study participants expressed the uncertainties of change were derived from the actions of fear by the senior leadership team. Some participants also felt their input on the inventory errors were not considered by management. Decision makers have the obligation to collect evidence to identify the root cause and brainstorm solutions to rectify the issue (Khanna et al., 2020). Part of the collection process includes gathering insight from those directly impacted by the issue and incorporating the feedback into the resolution.

There was an overwhelming response from the participants regarding the need to implement an automated technology system, but senior leaders were concerned about the related expenses. Management has to assess the costs of the new technological changes and develop a plan that is affordable, but effective for the organization (Ciftci & Darrough, 2019). One participant stated they suggested to start with implementing barcode scanners to assist with organizing the inventory and then gradually incorporate other elements later to keep cost manageable. When businesses desire to change inventory practices, senior leaders can analyze different costs 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. Techniques, such as JIT, ABC, and FIFO, aid businesses in eliminating discrepancies with inventory valuation, high-cost drivers, and unorganized storage areas. Erkeyman (2019) found JIT supports the need for lower inventory items on hand and running production orders in real-time. ABC ranks high priority and low priority inventory items based on the importance to

production activities (Fu et al., 2016). The FIFO method monitors inventory movement when first received, which means production would use the materials first to create the finished good (Conley et al., 2019).

Based on the resources available to the business, managers can incorporate different strategies to organize various areas of the production floor. Gallmann and Belvedere (2011) stated a warehouse management map enables strategic placement of inventory based on the frequency of use or by inventory classification. For instance, distribution leaders may position the popular finished goods near the shipping dock for easy access. With a clean storage space, workers have better visibility to quickly identify low inventory levels or slow-moving materials, both of which can both impact the revenue. In addition, technological advancements accelerates the ability to incorporate inventory locations, which can make inventory movement and cycle counting less stressful.

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 inventory team would handle the inventory receipts, the placement and removal of inventory stock, and the inventory audits. Furthermore, they would track all inventory problems and investigate the best solutions for the root cause. All dealings with inventory would be centralized and controlled by knowledgeable employees. Companies could have time to concentrate on other areas of the business rather than worrying about the financial setbacks of improper inventory practices.

### **Summary of Application to Professional Practice**

When owners birth a vision for a manufacturing business, there is a plan to outline what goods or services will be provided, a plan to obtain and sustain the inventory, and how to market

and sell the inventory to the customers. The participants of this study complained the reasons for the inventory errors was neglecting to update the inventory control and management procedures and leadership's fear to enforce change. The process of continuously revisiting the operational plans to fix any gaps was lacking and resulted in negative outcomes on the financial statements. A consistent habit of strategic planning is a guaranteed task to ensure inventory management goals are precise and the business remains profitable (Modof, 2015).

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. Inventory variances and misplaced inventory initiate high costs for inventory replacement orders, freight, variable overhead, and labor (Fan & Liu, 2017). The type of inventory management system utilized must be examined frequently as the demand shifts and as technology advances in society. By proactively accessing the internal and external environments frequently, senior leaders can combat threats to inventory early to prohibit unsatisfactory financial results.

### **Recommendations for Further Study**

The recommendations for this qualitative study derived from the fieldwork and extensive review of professional literature. One recommendation for further research is to perform the same study across different manufacturing environments with manual inventory operations. This can assist with the knowledge expansion of inventory errors and financial implications beyond this study's findings. Additionally, there are opportunities to draw similarities and differences between the variety of manufacturers outside of North Carolina.

The second recommendation would entail further research assisting manufacturing companies with converting to automated systems. The leaders in this study were defined as fearful of making change. The participants also noted senior leaders were hesitant of implementing automation because of costs. Future research could take the findings from this study and work with leaders on cost effective ways to incorporate automated process. This would guide leaders to make better choices in confidence, while making changes to alleviate the manual inventory issues.

The third recommendation for this study would be to research the impact manual inventory errors have on the company's morale. Not only can inventory errors affect the production and profits, but the manual errors can also negatively impact the human inventory (Emami-Mehrgani et al., 2016). The consequences of consistently tracking inventory errors include stress, frustration, and eventually high attrition rates.

### **Reflections**

Every manufacturing business requires some form of inventory to provide to consumers for revenues. In return, consumers need manufacturers to produce reputable goods for daily life tasks. While conducting this study, the researcher obtained a greater understanding of inventory protection and errors and applied the findings to biblical references.

### **Personal & Professional Growth**

The researcher gained a wealth of knowledge and experience throughout the course of this study. Although the researcher gained insightful information from the doctoral course studies, the interaction with the participants and on-site observations provided a deeper connection to the purpose of the study. The fieldwork with the participants allowed the

researcher to gain different aspects of dealing with manual inventory problems and learn new information about inventory management techniques.

Despite having limited resources, the observations showed how the participants worked through various inventory obstacles and imparted creative workarounds to minimize the inventory errors. The researcher learned to appreciate the front-line workers in manufacturing and the labor behind the scenes to convert raw materials into quality finished products. The participants explained how they combined certain raw materials to produce hand sanitizer to remain essential during the pandemic. The COVID-19 pandemic revealed millions of consumers depend on numerous products provided by manufacturers. Furthermore, there are many manufactured goods people cannot properly function without daily.

Prior to pursuing a doctoral degree, the researcher seldomly engaged in extensive writing and was unfamiliar with the qualitative method. During the doctoral journey, the researcher discovered educational writing resources and engaged in the course textbooks and professional sources to sharpen her skills. Additionally, the researcher utilized the educational tools and the information gathered from the participants to execute each task in the dissertation process. Discipline and organization are definitely requirements for any successful doctoral student. The researcher was able to establish a rhythm to organize a research plan and develop a reasonable timeline to complete the work required for each section of the dissertation. The researcher witnessed growth in the areas of time management and communication, which funneled into her home life and professional work career.

### **Biblical Perspective**

In the business world, inventory is the largest asset, and the level of protection reflects the financial outcome for any business. Businesses use the inventory to provide consumers with

reputable goods and services that are in the best interest of all parties. In the same manner, Keller and Alsdorf (2014) advised God created us as inventory in various forms, so we can work together to fulfill the Great Commission.

A leading topic from this study's participants emphasized the need for tighter inventory controls to mitigate the inventory issues. Proverbs 10:4 (KJV) states "he becometh poor that dealeth with a slack hand: but the hand of the diligent maketh rich." Businesses that choose to loosely monitor their inventory jeopardizes the ability to accumulate wealth. Management must carefully implement guidelines to keep eyes on the inventory through every step of the supply chain. Kok and Shang (2007) advised one major misstep in the handling of inventory can cause a business to lose profits and not be able to recover. God keeps a close watch on his sheep and provides around the clock protection for us all (Proverbs 27:23, KJV).

A good senior leadership team knows the products they sell for profit and the material costs associated with making each product. There should be procedures to direct the employees on how to govern the inventory from inception to the shipping date. Acceptable procedures to account for inventory should include inventory counts, external inventory audits, and a comprehensible structure of the inventory in the warehouse (Chuang & Olivia, 2016; Yamakazi, 2017). When inventory mistakes occur, the process should include seeking a solution to correct the issue. God is our manager, and he maintains a frequent headcount of those striving for eternal life. For those who have sinned, God provides the process of correction for the act of sin and starting over with a clean slate (Acts 3:19, KJV). The ten commandments are a resource for believers of Christ to follow and direct them on the path of righteousness (Exodus 20:1-17; Deuteronomy 5:6-21, KJV). God knows who has accepted him wholeheartedly and he continuously pursues to save the souls that are lost to add to his inventory (Luke 19:10, KJV).

To securely track the inventory, the right people must be in place based on their skillset to prevent manual inventory errors. Working in a manual environment requires employees to combine efforts to control inventory abuse and keep inventory visible. The inventory balances should be kept precise, pricing updated accordingly, the warehouse properly organized, and the inventory turnover should remain consistent to generate sales (Hançerlioğulları et al., 2016). Ephesians 4:16 (KJV) advises “from whom the whole body fitly joined together and compacted by that which every joint supplieth, according to the effectual working in the measure of every part, maketh increase of the body unto the edifying of itself in love.” When everyone works hard in their designated area of the business, the outcome produces harmony and prosperity in the workplace. Operating in harmony alleviates the ongoing occurrences of inventory errors and preventive measures to manage the inventory placement is suitable to support the vision of the company.

When making business decisions, a level of commitment is required to consider all of the options (Gamme & Lodgaard, 2019). This may require decision makers to exert more time and energy than anticipated to ensure the correct information is gathered to select the best solution for the business. Participants in this study explained fear halted management from making sound decisions relating to corrections to the inventory errors and replacing manual practices with automation. God desires us to seek him in our time of difficulty and to never fear because he is our refuge (Isaiah 41:10, KJV). Operating a business with the right morals entails including good principles in all aspects of the business, which promotes confidence in every operational decision (Keller & Alsdorf, 2014). God is so confident in his children that when one of us strays away, and makes the decision to leave the others to come rescue the one (Matthew 18:21, KJV).



### **Summary of Reflections**

This study has strengthened the researcher's writing skills and provided a broader understanding on the importance of inventory management. Refinement of time management and minimizing distractions were accredited to the researcher's ability to persist in the doctoral program. The researcher converted the data into a composition that adds depth to the professional work in the business field. The information gathered can be applied to any business that holds inventory regardless of the sector or type of inventory system.

God is with us at all times and cares for us all despite our differences. He manages our lives for the good and provides us with endless protection beyond this world. God expects us to honestly share our talents in the workplace and govern ourselves accordingly to protect assets. Additionally, God corrects our errors, chases us to prevent us from committing the same sins, and allows us the freedom to decide to pursue eternal life.

### **Summary of Section 3**

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. The impact of the manual inventory errors manifested through four anticipated themes. The themes were weak inventory controls, inconsistent inventory management procedures, uncertainties in sales and profitability, and the senior leadership team's challenges to consider operational changes.

The participants' interviews and observations were used to further analyze the problem of the study and to report the answers to the research questions. The participants shared the most common inventory errors were connected to inventory balances being off, BOMs not showing

the correct components, and buying and selling price differences. The participants voiced the consequences behind not locating inventory in a timely manner and the limited warehouse space. They felt sales would increase and expenses would decrease with the incorporation of an inventory team and inventory management technology.

Although participants were discouraged about the possibility of changes to improve the inventory practices, participants shared their own amendments to the current inventory processes to minimize the inventory issues. The senior management team's absence of strategic planning led the participants to believe fear and the associated costs were the catalysts to ignoring the need for organizational changes. The oversight of inventory process improvements leads to more costly inventory challenges that impact the overall efficiency of the business (Calabrese & Costa, 2015).

For any company, a business plan must be established to set goals and to work towards a mission. The vision of the company should encompass all the components that are necessary to reach success. In general, all inventory classes require specific guidelines to prevent waste, obsolete materials, and warehouse misplacement, which can cause financial hardship. Frequently testing the supply chain can heighten the awareness of bottlenecks and enables inventory issues to be resolved before they evolve into repeated mistakes.

The researcher learned from this study that a higher level of dedication and sacrifice is required to keep moving through the dissertation process. The researcher showed growth in the areas of professional writing and organization as the course progressed. Through God's promises, the researcher remembered God gifts us with the talents needed to pursue our passions (Keller & Alsdorf, 2014). As God's inventory, God provides protection to cover us from harm

and allows unlimited forgiveness when we make mistakes. Businesses must also provide a plan to safeguard the inventory and have a plan to continuously track and correct inventory errors.

### **Summary and Study Conclusions**

The phenomenon of this study under examination was the financial impact of the manual inventory issues at Slick Automotive. There were 18 face-to-face interviews facilitated with individuals directly working with inventory to highlight the problem. Additionally, observations were conducted in various departments to further investigate the manual inventory mistakes and the financial impact. All interviews were handwritten or typed in Microsoft Word for transcribing and coding to discover potential themes. The four themes that emerged from this study were internal controls structured for manual practices, time and inventory management, sales and profitability uncertainty, and leadership's unwillingness to implement changes. All participants shared comparable information, which contributed to the saturation of the data and providing a deeper understanding of the phenomenon.

Previous scholarly work, introduced in Section one, supplemented the participants' experiences shared to add depth to the current knowledge pertaining to manual inventory errors and financial stability in the manufacturing industry. The findings from this study could assist senior management in reviewing all options to strategize operational plans that are effective for organizational success. Furthermore, the finalized data could offer senior management important information and general techniques to mitigate the frequent occurrences of inventory errors and decreased revenues.

### References

- Akhtar, S., & Liu, Y. (2018). SMEs' use of financial statements for decision making: Evidence from Pakistan. *Journal of Applied Business Research (JABR)*, 34(2), 381-392.  
doi:10.19030/jabr.v34i2.10138
- Alcaraz, J. L. G., Macías, A. A. M., Luevano, D. J. P., Fernández, J. B., López, Alfonso de Jesús Gil, & Macías, E. J. (2016). Main benefits obtained from a successful JIT implementation. *International Journal of Advanced Manufacturing Technology*, 86(9-12), 2711-2722. doi:10.1007/s00170-016-8399-5
- Alfares, H. K., & Attia, A. M. (2017). A supply chain model with vendor-managed inventory, consignment, and quality inspection errors. *International Journal of Production Research*, 55(19), 5706-5727. <https://doi.org/10.1080/00207543.2017.1330566>
- Ali, M., & Khan, W. U. (2019). Effect of routing flexibility on the performance of manufacturing system. *International Journal of Production Management and Engineering*, 7(2), 133-144. doi:10.4995/ijpme.2019.8726
- Atieh, A. M., Kaylani, H., Al-abdallat, Y., Qaderi, A., Ghoul, L., Jaradat, L., & Hdairis, I. (2016). Performance improvement of inventory management system processes by an automated warehouse management system. *Procedia CIRP*, 41, 568-572.  
doi:10.1016/j.procir.2015.12.122
- Avinadav, T., & Henig, M. I. (2015). Exact accounting of inventory costs in stochastic periodic-review models. *International Journal of Production Economics*, 169, 89-98.  
doi:10.1016/j.ijpe.2015.07.024

- Avinadav, T., Chernonog, T., Lahav, Y., & Spiegel, U. (2017). Dynamic pricing and promotion expenditures in an EOQ model of perishable products. *Annals of Operations Research, 248*(1), 75-91. doi:10.1007/s10479-016-2216-2
- Barratt, M., Kull, T. J., & Sodero, A. C. (2018). Inventory record inaccuracy dynamics and the role of employees within multi-channel distribution center inventory systems. *Journal of Operations Management, 63*(1), 6-24. doi:10.1016/j.jom.2018.09.003
- Beemsterboer, B., Teunter, R., & Riezebos, J. (2016). Two-product storage-capacitated inventory systems: A technical note. *International Journal of Production Economics, 176*, 92-97. doi:10.1016/j.ijpe.2016.03.015
- Bevilacqua, M., Ciarapica, F. E., & De Sanctis, I. (2016). Lean practices implementation and their relationships with operational responsiveness and company performance: An Italian study. *International Journal of Production Research, 55*(3), 769-794. doi:10.1080/00207543.2016.1211346
- Bhimani, A., Sivabalan, P., & Soonawalla, K. (2018). A study of the linkages between rolling budget forms, uncertainty, and strategy. *The British Accounting Review, 50*(3), 306-323. doi:10.1016/j.bar.2017.11.002
- Briginshaw, J. (2010). Teaching accounting for inventory by calling on students' personal experiences. *American Journal of Business Education, 3*(3), 63-70. doi:10.19030/ajbe.v3i3.400
- Böhn, S., & Deutscher, V. K. (2020). Development and validation of a learning quality inventory for in-company training in VET (VET-LQI). *Vocations and Learning*, doi:10.1007/s12186-020-09251-3

- Bond, P. L., Green, K. W., & Inman, R. A. (2019). Relationships among JIT practices: An interpretive modeling approach. *Production Planning & Control*, , 1-12.  
doi:10.1080/09537287.2019.1640405
- Bruce, A., Beuthin, R., Sheilds, L., Molzahn, A., & Schick-Makaroff, K. (2016). Narrative research evolving: Evolving through narrative research. *International Journal of Qualitative Methods*, 15(1), 160940691665929. doi:10.1177/1609406916659292
- Brunaud, B., Láinez-Aguirre, J. M., Pinto, J. M., & Grossmann, I. E. (2019). Inventory policies and safety stock optimization for supply chain planning. *AIChE Journal*, 65(1), 99-112.  
doi:10.1002/aic.16421
- Calabrese, A., & Costa, R. (2015). Strategic thinking and business innovation: Abduction as cognitive element of leaders' strategizing. *Journal of Engineering and Technology Management*, 38, 24-36. doi:10.1016/j.jengtecman.2015.06.001
- Cannella, S., Dominguez, R., & Framinan, J. M. (2017). Inventory record inaccuracy – the impact of structural complexity and lead time variability. *Omega (Oxford)*, 68, 123-138.  
<https://doi.org/10.1016/j.omega.2016.06.009>
- Cheek, C., Hays, R., Smith, J., & Allen, P. (2018). Improving case study research in medical education: A systematised review. *Medical Education*, 52(5), 480-487.  
doi:10.1111/medu.13469
- Cheng, Y., Matthiesen, R., Farooq, S., Johansen, J., Hu, H., & Ma, L. (2018). The evolution of investment patterns on advanced manufacturing technology (AMT) in manufacturing operations: A longitudinal analysis. *International Journal of Production Economics*, 203, 239-253. doi:10.1016/j.ijpe.2018.06.019

- Chuang, H. H., & Oliva, R. (2015). Inventory record inaccuracy: Causes and labor effects. *Journal of Operations Management*, 39-40(1), 63-78.  
doi:10.1016/j.jom.2015.07.006
- Chuang, H. H., & Oliva, R. (2016). Erratum to 'Inventory record inaccuracy: Causes and labor effects'. *Journal of Operations Management*, 42-43(1), 96-110.  
doi:10.1016/j.jom.2016.01.002
- Ciftci, M., & Darrough, M. (2019). Inventory policy choice and cost of debt: A private debtholders' perspective. *Journal of Accounting, Auditing & Finance*, , 148558.  
doi:10.1177/0148558X19848881
- Ciurariu, G. (2014). Profitability analysis based on income statement. *The Yearbook of the "Gh.Zane" Institute of Economic Research*, 23(Supplement), 167.
- Conley, K., Natarajathinam, M., Lu, W., & Rangan, S. (2019). Effect of accounting policies on effectiveness of inventory management strategies. *Engineering Management Journal*, 31(4), 246-256. doi:10.1080/10429247.2019.1652056
- Creswell, J. W. & Poth, C. N. (2018). *Qualitative inquiry & research design: Choosing among five approaches* (4th ed.). Sage Publications. ISBN: 9781506330204.
- Disman, D., Ali, M., & Syaom Barliana, M. (2017). The use of quantitative research method and statistical data analysis in dissertation: An evaluation study. *International Journal of Education (Bandung, Indonesia)*, 10(1), 46-52. doi:10.17509/ije.v10i1.5566
- Dolgov, I., & Kaltenbach, E. K. (2017). Trust in automation inventories: An investigation and comparison of the human-computer trust and trust in automated systems scales. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 61(1), 1271-1275. doi:10.1177/1541931213601799

- Drakaki, M., & Tzionas, P. (2019). Investigating the impact of inventory inaccuracy on the bullwhip effect in RFID-enabled supply chains using colored petri nets. *Journal of Modelling in Management*, 14(2), 360-384. <https://doi.org/10.1108/JM2-08-2017-0081>
- DuHadway, S., & Dreyfus, D. (2017). A simulation for managing complexity in sales and operations planning decisions: A simulation for managing complexity. *Decision Sciences Journal of Innovative Education*, 15(4), 330-348. doi:10.1111/dsji.12134
- Emami-Mehrgani, B., Neumann, W. P., Nadeau, S., & Bazrafshan, M. (2016). Considering human error in optimizing production and corrective and preventive maintenance policies for manufacturing systems. *Applied Mathematical Modelling*, 40(3), 2056-2074. doi:10.1016/j.apm.2015.08.013
- Erdil, N. O., Aktas, C. B., & Arani, O. M. (2018). Embedding sustainability in lean six sigma efforts. *Journal of Cleaner Production*, 198, 520-529. doi:10.1016/j.jclepro.2018.07.048
- Erkayman, B. (2019). Transition to a JIT production system through ERP implementation: A case from the automotive industry. *International Journal of Production Research*, 57(17), 5467-5477. doi:10.1080/00207543.2018.1527048
- Faber, N., De Koster, R. B. M., & Smidts, A. (2017;2018;). Survival of the fittest: The impact of fit between warehouse management structure and warehouse context on warehouse performance. *International Journal of Production Research*, 56(1-2), 120-139. doi:10.1080/00207543.2017.1395489
- Fan, Y., & Liu, X. K. (2017). Misclassifying core expenses as special items: Cost of goods sold or selling, general, and administrative expenses? *Contemporary Accounting Research*, 34(1), 400-426. doi:10.1111/1911-3846.12234



- Fletcher, M., Zhao, Y., Plakoyiannaki, E., & Buck, T. (2018). Three pathways to case selection in international business: A Twenty-Year review, analysis and synthesis. *International Business Review*, 27(4), 755-766. doi:10.1016/j.ibusrev.2017.12.004
- Fu, Y., Lai, K. K., Miao, Y., & Leung, J. W. K. (2016). A distance-based decision-making method to improve multiple criteria ABC inventory classification. *International Transactions in Operational Research*, 23(5), 969-978. doi:10.1111/itor.12193
- Gallmann, F., & Belvedere, V. (2011). Linking service level, inventory management and warehousing practices: A case-based managerial analysis. *Operations Management Research*, 4(1-2), 28-38. doi:10.1007/s12063-010-0043-1
- Gamme, I., & Lodgaard, E. (2019). Organizational or system boundaries; possible threats to continuous improvement process. *Procedia CIRP*, 79, 505-510. doi:10.1016/j.procir.2019.02.107
- Graves, S. C., & Schoenmeyr, T. (2016). Strategic safety-stock placement in supply chains with capacity constraints. *Manufacturing & Service Operations Management*, 18(3), 445-460. doi:10.1287/msom.2016.0577
- Groddeck, V. v. (2011). Rethinking the role of value communication in business corporations from a sociological perspective - why organisations need value-based semantics to cope with societal and organisational fuzziness. *Journal of Business Ethics*, 100(1), 69-84. doi:10.1007/s10551-011-0769-1
- Groenewald, T. (2018). Reflection commentary on a past article: A phenomenological research design illustrated. *International Journal of Qualitative Methods*, 17(1),1-3. doi:10.1177/1609406918774662

- Hançerlioğulları, G., Şen, A., & Aktunç, E. A. (2016). Demand uncertainty and inventory turnover performance: An empirical analysis of the US retail industry. *International Journal of Physical Distribution & Logistics Management*, 46(6/7), 681-708.  
doi:10.1108/IJPDLM-12-2014-0303
- Hansen, V. J. (2020). The unintended consequences of internal controls reporting on tax decision making. *The Journal of the American Taxation Association*, 42(1), 83-102.  
doi:10.2308/atax-52514
- Huang, L., Wu, C., & Wang, B. (2019). Challenges, opportunities and paradigm of applying big data to production safety management: From a theoretical perspective. *Journal of Cleaner Production*, 231, 592-599. doi:10.1016/j.jclepro.2019.05.245
- Ivanov, D., Tang, C. S., Dolgui, A., Battini, D., & Das, A. (2021). Researchers' perspectives on industry 4.0: Multi-disciplinary analysis and opportunities for operations management. *International Journal of Production Research*, 59(7), 2055-2078.  
<https://doi.org/10.1080/00207543.2020.1798035>
- Karim, N. A., Nawawi, A., & Salin, A. S. A. P. (2018). Inventory control weaknesses – a case study of lubricant manufacturing company. *Journal of Financial Crime*, 25(2), 436-449.  
doi:10.1108/JFC-11-2016-0077
- Keller, T. & Alsdorf, K.L. (2014), *Every good endeavor: Connecting your work to God's work*. New York, NY: Dutton. ISBN: 9781594632822.
- King James Bible. (2017). King James Bible Online. <https://www.kingjamesbibleonline.org/>  
(Original work published 1769)

- Kok, A. G., & Shang, K. H. (2007). Inspection and replenishment policies for systems with inventory record inaccuracy. *Manufacturing & Service Operations Management*, 9(2), 185-205. doi:10.1287/msom.1060.0136
- Kourentzes, N., Trapero, J. R., & Barrow, D. K. (2020). Optimising forecasting models for inventory planning. *International Journal of Production Economics*, 225, 107597. <https://doi.org/10.1016/j.ijpe.2019.107597>
- Kroes, J. R., & Manikas, A. S. (2018). An exploration of 'sticky' inventory management in the manufacturing industry. *Production Planning & Control*, 29(2), 131-142. doi:10.1080/09537287.2017.1391346
- Kumar, A., & Evers, P. T. (2015). Setting safety stock based on imprecise records. *International Journal of Production Economics*, 169, 68-75. doi:10.1016/j.ijpe.2015.07.018
- Laosirihongthong, T., Adebajo, D., Samaranayake, P., Subramanian, N., & Boon-itt, S. (2018). Prioritizing warehouse performance measures in contemporary supply chains. *International Journal of Productivity and Performance Management*, 67(9), 1703-1726. doi:10.1108/ijppm-03-2018-0105
- Lee, H., Zhou, J., & Hsu, P. (2015). The role of innovation in inventory turnover performance. *Decision Support Systems*, 76, 35-44. doi:10.1016/j.dss.2015.02.010
- Liu, H., Wei, S., Ke, W., Wei, K. K., & Hua, Z. (2016). The configuration between supply chain integration and information technology competency: A resource orchestration perspective. *Journal of Operations Management*, 44(1), 13-29. doi:10.1016/j.jom.2016.03.009

- McAdam, R., Miller, K., & McSorley, C. (2019). Towards a contingency theory perspective of quality management in enabling strategic alignment. *International Journal of Production Economics*, 207, 195-209. doi:10.1016/j.ijpe.2016.07.003
- Manary, M. P., Wieland, B., Willems, S. P., & Kempf, K. G. (2019). Analytics makes inventory planning a lights-out activity at Intel corporation. *Interfaces (Providence)*, 49(1), 52-63. doi:10.1287/inte.2018.0976
- Manthou, V., & Vlachopoulou, M. (2001). Bar-code technology for inventory and marketing management systems: A model for its development and implementation. *International Journal of Production Economics*, 71(1-3), 157-164. doi:10.1016/s0925-5273(00)00115-8
- Mbuvi, L., Namusonge, G., & Arani, W. (2016). Factors affecting automation of inventory management in micro, small and medium enterprises: A case study of Kitui county. *International Journal of Academic Research in Business and Social Sciences*, 6(1) doi:10.6007/IJARBSS/v6-i1/1973
- Millstein, M. A., Yang, L., & Li, H. (2014). Optimizing ABC inventory grouping decisions. *International Journal of Production Economics*, 148, 71-80. doi:10.1016/j.ijpe.2013.11.007
- Mishra, A., & Lsoni, M. (2012). ABC analysis technique of material towards inventory management. *International Journal of Management Research and Reviews*, 2(12), 2092.
- Mitreva, E., Taskov, N., Krivokapić, Z., & Jovanovic, J. (2018). Building partnership with suppliers of Macedonian companies. *Calitatea*, 19(163), 43-46.
- Modof, A. (2015). Strategic planning and forecasting; A finance director's metrics, techniques, and implementation strategies. *Internal Auditing*, 30(6), 40.

- Moheb-Alizadeh, H., & Handfield, R. (2018). The impact of raw materials price volatility on cost of goods sold (COGS) for product manufacturing. *IEEE Transactions on Engineering Management*, 65(3), 460-473. doi:10.1109/tem.2018.2796447
- Momeni, Z., & Azizi, A. (2018). Current order and inventory models in manufacturing environments: A review from 2008 to 2018. *International Journal of Online Engineering*, 14(6), 223-248. doi:10.3991/ijoe.v14i06.8055
- Moore, A., & Komesaroff, P. (2012). Contextualising the use of qualitative and quantitative research methodologies in Chinese medicine: Epistemological and ethical issues. *Australian Journal of Acupuncture and Chinese Medicine*, 7(2), 21-26.
- Morgan, S. J., Pullon, S. R. H., Macdonald, L. M., McKinlay, E. M., & Gray, B. V. (2017). Case study observational research: A framework for conducting case study research where observation data are the focus. *Qualitative Health Research*, 27(7), 1060-1068. doi:10.1177/1049732316649160
- Morse, J. M. (2016). Underlying ethnography. *Qualitative Health Research*, 26(7), 875-876. doi:10.1177/1049732316645320
- Myrelid, A., & Olhager, J. (2015). Applying modern accounting techniques in complex manufacturing. *Industrial Management & Data Systems*, 115(3), 402-418. doi:10.1108/IMDS-09-2014-0250
- Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, 16(1), 160940691773384. <https://doi.org/10.1177/1609406917733847>

- Nugroho, Y. K., & Zhu, L. (2019). An integration of algal biofuel production planning, scheduling, and order-based inventory distribution control systems. *Biofuels, Bioproducts and Biorefining*, 13(4), 920-935. <https://doi.org/10.1002/bbb.1982>
- Oláh, J., Lakner, Z., Hollósi, D., & Popp, J. (2017). Inventory methods in order to minimize raw materials at the inventory level in the supply chain. *LogForum*, 13(4)  
doi:10.17270/J.LOG.2017.4.5
- Otley, D. (2016). The contingency theory of management accounting and control: 1980–2014. *Management Accounting Research*, 31, 45-62. doi:10.1016/j.mar.2016.02.001
- Phornlaphatrachakorn, K. (2019). Internal control quality, accounting information usefulness, regulation compliance, and decision-making success: Evidence from canned and processed foods businesses in Thailand. *International Journal of Business*, 24(2), 198-215.
- Ponte, B., Costas, J., Puche, J., Pino, R., & de la Fuente, D. (2018). The value of lead time reduction and stabilization: A comparison between traditional and collaborative supply chains. *Transportation Research Part E*, 111, 165-185. doi:10.1016/j.tre.2018.01.014
- Purvis, L., Spall, S., Naim, M., & Spiegler, V. (2016). Developing a resilient supply chain strategy during ‘boom’ and ‘bust’. *Production Planning & Control*, 27(7-8), 0-0.  
doi:10.1080/09537287.2016.1165306
- Rekik, Y. (2011). Inventory inaccuracies in the wholesale supply chain. *International Journal of Production Economics*, 133(1), 172-181. doi:10.1016/j.ijpe.2010.02.012
- Sahin, E., & Dallery, Y. (2005). Improving the performance of inventory systems subject to errors by deploying the RFID technology. *Journal of Decision Systems*, 14(4), 427-449.  
doi:10.3166/jds.14.427-449

- Schwartz, J. D., & Rivera, D. E. (2010). A process control approach to tactical inventory management in production-inventory systems. *International Journal of Production Economics*, 125(1), 111-124. doi:10.1016/j.ijpe.2010.01.011
- Sharma, S., Abouee-Mehrizi, H., & Sartor, G. (2020). Inventory management under storage and order restrictions. *Production and Operations Management*, 29(1), 101-117. doi:10.1111/poms.13097
- Shokri, A. (2019). Reducing the scrap rate in manufacturing SMEs through lean six sigma methodology: An action research. *IEEE Engineering Management Review*, 47(3), 104-117. doi:10.1109/EMR.2019.2931184
- Skouri, K. (2018). An EOQ model with backlog-dependent demand. *Operational Research*, 18(2), 561-574. doi:10.1007/s12351-016-0279-0
- Shteren, H., & Avraham, A. (2017). The value of inventory accuracy in supply chain management: Case study of the Yedioth communication press. *Journal of Theoretical and Applied Electronic Commerce Research*, 12(2), 71-86. doi:10.4067/S0718-18762017000200006
- Snell, S. A., & Dean, J. W. (1992). Integrated manufacturing and human resource management: A human capital perspective. *Academy of Management Journal*, 35(3), 467-504. doi:10.2307/256484
- Srivastava, P., Iyer, K. N. S., & Rawwas, M. Y. A. (2017). Performance impact of supply chain partnership strategy-environment co-alignment. *International Journal of Operations & Production Management*, 37(7), 927-949. doi:10.1108/IJOPM-09-2015-0586
- Sunder M, V., & Prashar, A. (2020). Empirical examination of critical failure factors of continuous improvement deployments: Stage-wise results and a contingency theory

- perspective. *International Journal of Production Research*, 58(16), 4894-4915.  
doi:10.1080/00207543.2020.1727044
- Taleizadeh, A. A., Khanbaglo, M. P. S., & Cárdenas-Barrón, L. E. (2016). An EOQ inventory model with partial backordering and reparation of imperfect products. *International Journal of Production Economics*, 182, 418-434. doi:10.1016/j.ijpe.2016.09.013
- Tejesh, B. S. S., & Neeraja, S. (2018). Warehouse inventory management system using IoT and open-source framework. *Alexandria Engineering Journal*, 57(4), 3817-3823.  
doi:10.1016/j.aej.2018.02.003
- Teplická, K., & Seňová, A. (2020). Inventory valuation methods and their impact on the company's profit generation. *Acta Logistica*, 7(3), 201-207. doi:10.22306/al.v7i3.178
- Udeh, I. (2019). Observed effectiveness of the COSO 2013 framework. *Journal of Accounting & Organizational Change*, 16(1), 31-45. doi:10.1108/JAOC-07-2018-0064
- Wang, K., Huang, Y., & Tung, C. (2016). A return-policy contract with a stock-dependent demand and inventory shrinkages. *Asia Pacific Management Review*, 21(3), 154-160.  
<https://doi.org/10.1016/j.apmr.2016.02.001>
- White, A. S., & Censlive, M. (2013). Using control theory to optimise profit in APVIOBPCS inventory systems. *Journal of Manufacturing Systems*, 32(4), 680-688.  
doi:10.1016/j.jmsy.2013.06.002
- Yamazaki, K. (2017). Inventory control for spectrally positive Lévy demand processes. *Mathematics of Operations Research*, 42(1), 212-237.  
doi:10.1287/moor.2016.0801



- Yan, H., Yano, C. A., & Zhang, H. (2019). Inventory management under periodic profit targets. *Production and Operations Management*, 28(6), 1387-1406.  
doi:10.1111/poms.12986
- Yang, L., Li, H., Campbell, J. F., & Sweeney, D. C. (2017). Integrated multi-period dynamic inventory classification and control. *International Journal of Production Economics*, 189, 86-96. doi:10.1016/j.ijpe.2017.04.010
- Yin, R. K. (2014). *Case study research: Design and methods*, (5th ed.). Sage Publications, Inc.
- Zadeh, A.H., Sharda, R., & Kasiri, N. (2016). Inventory record inaccuracy due to theft in production-inventory systems. *The International Journal of Advanced Manufacturing Technology*, 83(1), 623-631. doi:10.1007/s00170-015-7433-3
- Zhao, Y., Zhao, C., He, M., & Yang, C. (2016). A State-Feedback approach to inventory control: Analytical and empirical studies. *Production and Operations Management*, 25(3), 535-547. doi:10.1111/poms.12522

**Appendix A: Pre-Interview Demographic Survey Questionnaire**

Dear Respondents,

I am currently conducting a research study on manual inventory records errors with a concentration of documenting and examining the financial impact in the automotive manufacturing setting. Your name will not be required, and the demographic information you provide will not be revealed at any time during the study. Additionally, I would like to request you follow the directions below to provide your answer for the survey questionnaire. Thank you for your time and willingness to participate!

**For questions 1-5, please circle or write in your answer in the provided space where applicable.**

1. What is your gender?      Male                  Female

2. What is your age range?

18-25                  26-35                  36-45                  Above 45

3. How long have you been with the company?

1-5                  6-10                  11-20                  Over 20 years

4. Please state your job title and email address. \_\_\_\_\_

5. Do you work directly with inventory?      Yes                  No

**Appendix B: Semi-Structured Interview Guide Questions**

Dear Respondents,

I am currently conducting a research study on manual inventory records errors with a concentration of documenting and examining the financial impact in the automotive manufacturing setting. Your identity and experiences will remain confidential throughout the research interview process and will be secured after the process concludes. You will be permitted to review all work relating to the information you submit to the researcher. In order to accomplish a better understanding of the manual inventory processes, your interview answers are needed to provide workable solutions. Thank you for your time and willingness to participate!

1. What are your experiences working with the manual inventory system?
2. How does your job position involve managing the inventory?
3. What are the most common manual inventory record errors you encounter in your job position?
4. How do the manual inventory errors directly impact your job duties?
5. How are inventory errors communicated within your department?
6. What specific actions are taken to correct the inventory errors?
7. How do the manual inventory errors influence the decisions in your job position?
8. What other inventory management techniques would you recommend?