ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

EFFECT OF PROJECT MANAGEMENT ON AIRCRAFT REDELIVERY PROJECT: THE CASE OF AVIATION OPERATOR INDUSTRY IN ETHIOPIA.

BY

YOHANNES BELAY MEKONNEN

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DECLARATION

I, Yohannes Belay, student at St. Mary's University hereby declare that the thesis in the title, "Effect of project management on aircraft redelivery project: The case of aviation operator industry in Ethiopia" is my original work prepared under the guidance of Temesgen Belayneh (PhD). All sources that have been referred to and quoted have been duly indicated and acknowledged with complete references. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institutions for the purpose of earning any degree.

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LIST OF ABBRIVATION AND ACRONYMS

AD	Airworthiness Directive
APU	Auxiliary Power Unit
BtB	Back to Birth
DFDR	Digital Flight Data Recorder
DFP	Dirty Fingerprint
EAL	Ethiopian Airlines
EASA	European Aviation Safety Agency
ECM	Engine Condition Monitoring
EIS	Entry into Service
FAA	Federal Aviation Administration
GPA	Guinness peat Aviation
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
LLP	Life Limited Part
PMA	Parts Manufacturer Approval
MRO	Maintenance, Repair, and Overhaul
OCCM	On-Condition Component Monitoring
SPSS	Statistical Package for the Social Sciences
STC	Supplementary Type Certificate
TWA	Trans World Airlines

DEFINITION OF TERMS

Conceptual definition

Aircraft: A transport vehicle which is certified as airworthy by a competent aeronautical authority.

Aircraft lease: a legal agreement for a person or an organization to pay to use an aircraft for a particular period. (Cambridge)

Aircraft lease agreement: the bargain, with respect to the lease, of the lessor and the lessee in fact as found in their language or by implication from other circumstances including course of dealing or usage of trade or course of performance as provided in this article. Unless the context clearly indicates otherwise, the term includes a sublease agreement (Law insider).

Lessor: the owner of an aircraft.

Lessee: the party who is leasing the aircraft.

Aircraft redelivery: a process of returning aircraft from the lessee to the lessor at the end of the leasing agreement (IATA2017).

ABSTRACT

The purpose of the study is to investigate the aircraft redelivery project management effects in the aviation operator's business, particularly in the MRO division of Ethiopian Airlines. Standardized lease agreements and their controlling system comply with projected aircraft return circumstances with lessor interest, even if a company (operator) has faith in the functioning of the rented aircraft. Ignoring return requirements might result in serious problems that impact the next lease's thrust and total business revenue. Unsatisfactory returns and redelivery frequently result in poor-quality work, which highlights how crucial it is for project managers to maintain team confidence and trust in members and input. For the lessee and lessor to operate under a mature lease arrangement, a well-executed redelivery project plan is essential. This research was conducted using data collected from Ethiopian Airlines employees through an explanatory survey design. A questionnaire was distributed to 320 employees, with 258 responses (80.625%) returned and analyzed using descriptive and inferential statistical methods. Stratified random sampling techniques were employed to select sample elements from the employees who participated in the aircraft redelivery project. The study utilized a five-point Likert scale to measure variables such as project team performance feedback and causes of redelivery delay as motivational factors affecting aircraft redelivery projects and aircraft lease management and used rating questionnaires as aircraft type, aircraft age, challenges for on-time and on-budget, and engine-related complications, and the redelivery process typically begins. Data analysis was performed using SPSS. The results revealed that aircraft type, aircraft age, project team performance feedback, engine-related complications, and challenges for on-time and on-budget are key factors influencing leased aircraft return conditions at Ethiopian Airlines MRO. The study recommends enhancing the aircraft type and aircraft age, strengthening team feedback and performance mechanisms, revising engine-related complications, and reducing the overall challenge regarding the time and cost evaluation system.

***Key words**: lease management, team performance, engine related complication, lessor, lessee, lease agreement, cause of redelivery delays.1*

CHAPTER ONE

INTRODUCTION

This chapter describes research questions, the problem statement, and context are all included in this chapter. Additionally provided were the study's significance, scope, limitations, definitions of terms, general and objectives.

1.1 Background of the Study

Aviation industry a complex business on cargo and passenger operators the past, present, and future aviation business trend shows a positive market for sector; through this situation, Ethiopian Airlines is one of the most the most vital and biggest sub-Saharan aviation operators. In terms of market strategy, leasing an aircraft meant paying less upfront than buying and without needing a sizable down payment. Financing and aircraft acquisition choices are crucial to airline operations, among other reasons.

Market trend: The global aircraft leasing market is expected to grow annually 11.1% to the next 8 years (2024-2032). According to the last 15 years data, Ethiopian airlines passengers increased by 1.5M yearly in average. This increment indicates the airline is preferrable for Africa business in terms of airworthy service and optimum travel time. Airworthiness includes updated and comfortable aircraft preparation. So, operators fulfill the aircraft needs in different ways like owed by purchase, owed by lease, rent per fleet. Also, airlines have turned to leasing companies to source its fleet as it sought to maintain its growth despite aircraft delivery delays from manufacturers. Now a days air operators leasing fuel efficient models to expansion of their fleet. Ethiopian airlines use the leased aircrafts for some extent of fleets that cover as per business required.

Aircraft redelivery is the process of returning an aircraft to the lessor or owner after a lease period or after the aircraft has been decommissioned or returned to service. The primary reason for redelivery, which often includes lease expiration, the sale of the aircraft, or end-of-service. Ethiopian often use aircraft leases to manage their fleet size and adapt to changing demand, meaning they may need to redeliver aircraft when they are no longer needed. The aircraft

redelivery process often throws up anomalies that may become both contentious (means disputed) as well as extremely costly. This includes maintaining accurate maintenance logs, ensuring compliance with all regulatory requirements, and addressing any outstanding discrepancies well in advance. By doing so, both parties not only mitigate potential disputes but also enhance the overall efficiency of the redelivery process. Late returning aircraft can be due to any number of problems or issues including those directly connected with lease agreement and project implementation.

One view of this type studying area considers discrepancies between the Continuous Airworthiness Management Organization's (CAMO) status and work packages, airframes, engines, APUs, aircraft technical logbooks, and other shop visit reports can result in a conflict between record retention and lessor responsibilities.

Most MRO is not aware Component age requirement and will fit as a matter of expediency any serviceable & regulatory compliant component. Unfortunately, the subsequent replacement of such components can be very costly and time-consuming. Leased aircraft required special skills or expertise on the lease agreement condition that may be difficult on redelivery or back to lessor phases and that follows overspend time, significantly increase redelivery cost on average $1.65M more than they need.

The gap in the perception of lessee and lessor in respect to whether lessees' engagement sufficiently enough in the redelivery process in redelivery project. Previous studies show the lessee engaged too late on at least 50% of returns. This data drive to what looks like the challenge variables who affect the redelivery that led to late redelivery on the context of Ethiopian airlines condition.

To facilitate a smooth transfer for the subsequent lessee, the aircraft leasing agreement outlines the redelivery condition. To minimize paperwork problems upon return, operators typically aim to fly the aircraft without significant unscheduled repair for a while up to the entire scheduled maintenance (C-check) interval. The technical points cover the leasing agreement, including the aircraft's physical components, maintenance records, and airworthiness regulations. financial importance requires a significant portion of the conversation. The standard clauses addressing the necessity to return the aircraft with met technical redelivery conditions are found in most

lease agreements. Redelivery delays are one of the major problems with on-time and budget constraints; avoiding these delays should address compliance with the regulations that will impact the lessor's ability to redeploy lessor assets efficiently. Efficient management of these timelines is crucial, as any prolonged redelivery can lead to increased costs and operational disruptions. Therefore, both parties prioritize clear communication and adherence to mitigate potential financial repercussions.

The process of the leased aircraft return project involves certified aircraft components, and inventories of that part or component will be confirmed physically. The aircraft redelivery project required balancing regulation and prioritizing implementation of the lease return condition as per the lease agreement. This meticulous approach ensures that all aspects of the aircraft are following the stipulated requirements, minimizing potential disputes between the lessor and lessee. Furthermore, thorough documentation and inspection processes are essential to facilitate a smooth transition and uphold the integrity of the leasing arrangement.

The effect of aircraft redelivery project management is the process of outlining the critical steps in the redelivery process, including inspection, maintenance, refurbishment, documentation, and legal/contractual obligations. Challenges in the redelivery process include identifying issues such as damage assessments, discrepancies in maintenance records, the condition of the aircraft, and any delays. Another effect of redelivery project management is that it ensures the aircraft return to service quickly, facilitating fleet management for airlines and lessors; including the redelivery process is crucial to the availability of aircraft in the secondary market for leasing, sales, or retrofitting. This efficiency not only maximizes the utilization of assets but also enhances the overall profitability of the airline industry. By streamlining the redelivery process, stakeholders can better respond to market demands and optimize operations within a competitive landscape.

Technical Considerations of aircraft redelivery project Management is

Condition of the Aircraft: that describe the typical requirements regarding the physical and operational condition of the aircraft such as maintenance status, modifications, updates.

Technical Documentation: emphasize the importance of keeping detailed records for the aircraft, which include maintenance logs, service bulletins, modifications, and inspection reports.

Aircraft Modifications: explain how modifications during the lease period (e.g., interior or avionics upgrades) can affect the redelivery process.

In summary, aircraft redelivery project management involves the systematic planning, executing and oversighting of tasks related to return aircraft to its owner or lessor after a lease term or sale. Project planning, inspection and assessment, maintenance and modification, documentation management, coordination with stakeholders and final inspection before aircraft handover to confirm that all requirements have been met.

Effective project management in aircraft redelivery ensures compliance, minimizes delays, optimizes cost, ultimately leading to a smooth transition for all stakeholders involved.

1.2 Background of the Organization

The aviation industry contains many stakeholders, such as passengers, loan providers, manufacturers, component suppliers, auditors, customs, and aviation security. This makes the industry complex, and the success of a business depends on its performance, which is measured based on time, cost, and mileage of beneficiary competition completion within the budget, required quality standards, and the customer's satisfaction.

To function and handle the workload efficiently, the company may need to regularly adjust its approach. There are two seasons in business: peak load and light load. Therefore, to get ready for the busiest travel season, businesses must have all the necessary infrastructure in place for travelers, including ramps, aircraft, welcome areas, and enough personnel. The assignment of projects to various departments within divisions that are suitable is the most crucial operation among these. Each project's objective is to ensure that related initiatives achieve their objectives, are finished on time, and stay within a certain budget. It is coupled with a difficult assignment that the manager is working on and may assign to the division director.

The plan may encourage leasing aircraft with a solid lease agreement in this project line. For the duration of the lease, ET will provide aircraft as the lessee in accordance with the terms of the lease. Therefore, to collaborate and avoid the issues that ETH encountered during earlier delivery activities and the repercussions of redelivery, a delivery team must be formed.

The delivery project manager will work closely with the team members. He shall include other team members in coordination with the Director of Aircraft Engineering and Planning and other concerned departments when required.

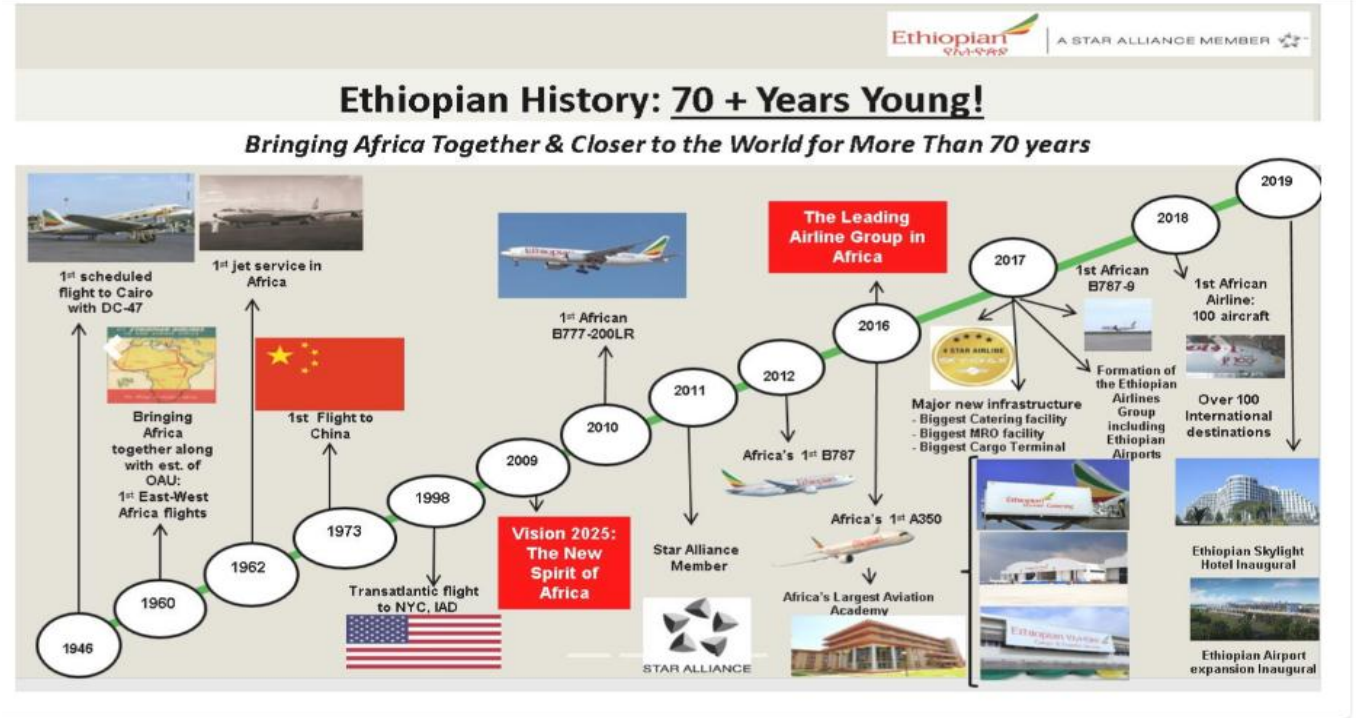
Ethiopia's flag carrier, Ethiopian Air Lines (EAL), is owned entirely by the government of Ethiopia. Negotiations were initiated by the Ethiopian government with Transcontinental Air Transport and Western Air Express, which subsequently amalgamated to form Trans World Airlines (TWA). EAL was established on December 21, 1945, and started operating on April 8, 1946. In 1951, it started operating international flights. In 1965, the company changed its name from Ethiopian Air Lines to Ethiopian Airlines and became a share corporation. , Ethiopian has been growing in leaps and bounds and has kept on introducing new aviation technology and systems, with so many firsts in the history of Africa aviation as an aircraft technology leader; providing the first jet service in the continent, availing the first African B767, the first African B777-200LR in 2010 and the first African and second only to Japan B787 Dream liner in 2012. In a continuation of that tradition, Ethiopian was the first in Africa to acquire Airbus A350XWB, introducing the extra effect to the African continent. Leading the way once again Ethiopian was the first African Airlines to operate the latest Boeing 787-9 in 2017. For the past 78 years, EAL has been vital to the advancement of the nation's economic development. It provides service to a network of 68 freighter destinations and 155 passenger destinations, of which 22 are domestic. West Africa Togo and Malawi are included in the major hub and headquarters of Addis Ababa. Ethiopian Airlines ranks fourth in the world for the number of countries it serves, and it is the biggest airline in Africa in terms of people transported, destinations served, fleet size, and income. By expanding its destinations and forming subsidiaries with other African airlines, such as Asky Airlines (27%), Malawi Airlines (49%), Zambia Airways (45%), Guinea Airways (49%), DHL and Ethiopian Airlines logistics service (51%), and Sky Technologies (which produces airframe blankets) (51%), which able to grow its business. As of November 2023, Ethiopia employed around 18,000 people. Ethiopian runs over 144 aircraft plus an extra 33 aircraft for training to support the company's goals and objectives. Several delivery and redelivery projects were periodically required to meet the growing demand from stakeholders, customers, technology, and the economy. EAL has managed more than 15 redelivery initiatives during the past two years.

Redelivery is where a lessee is required to turn the aircraft at the expiry of the lease to its lessor. The condition under which the aircraft must be returned are outlined in the delivery condition. (Enda Clarke).

When the lease period expires, the lessee can rely on professional redelivery management by Establish projects to handle the complicated return process and guarantee that all contractual obligations are met. This is known as aircraft redelivery.

To facilitate an effective and transparent transaction, the established redelivery project entails the comprehensive planning, execution, and responsibility of activities related to the return of leased aircraft. These activities include technical inspection, maintenance task check, documentation review, and negotiation between parties.

This project considers cost optimization by minimizing downtime, avoiding lease penalties, and streamlining process to achieve aircraft turnaround time. It also involves inherent risk, technical discrepancy, regulatory noncompliance task, and dispute.



1.3 Problem Statement

The main point of a problem statement for an Aircraft Redelivery Project typically focuses on identifying the challenges and issues involved in returning the aircraft to its owner or lessor in a timely, cost-effective, and compliant manner. It highlights the difficulties in meeting the required standards for condition, documentation, and regulatory compliance, while also managing the complexity of coordinating various stakeholders and minimizing potential delays or costs. The Aircraft Redelivery Project faces challenges in ensuring the timely return of the aircraft in full compliance with the lease agreement and regulatory standards. These challenges include:

Meeting Redelivery Condition Standards: Ensuring that the aircraft is returned in the condition specified in the lease agreement, which may involve complex maintenance, repairs, or modifications.

Time Constraints and Downtime: Managing the project timeline to minimize aircraft downtime and avoid operational disruptions, while still addressing all technical, maintenance, and administrative requirements.

Stakeholder Coordination: Coordinating across multiple parties (lessors, lessees, maintenance teams, legal departments, and regulators) to ensure smooth communication and completion of the redelivery process.

Cost Overruns: Managing unanticipated maintenance costs, upgrades, or repairs that may arise during the redelivery process, while ensuring the project stays within budget.

Regulatory Compliance: Ensuring all necessary certifications, inspections, and regulatory requirements are met to avoid any legal or operational issues during the redelivery process.

The problem statement essentially underscores the need for an efficient, coordinated process that addresses all the technical, logistical, financial, and regulatory aspects of returning the aircraft while ensuring the least amount of disruption or additional cost.

Studies on previous aircraft redelivery projects typically focus on several key indicators and findings that help to identify best practices, challenges, and solutions within the process. These studies often examine historical case examples, performance metrics, and lessons learned to draw

conclusions on how to improve future redelivery projects. Here are some of the main indicators that previous aircraft redelivery project studies highlight:

On timeline delays: - The time it takes to complete redelivery compared to the original project timeline. And findings on these studies often identify common causes of delays, such as unexpected maintenance issues, paperwork and documentation bottlenecks, and waiting for regulatory approvals or certifications. Readers learnt from this lesson the importance of thorough upfront assessments, contingency planning, and realistic scheduling to avoid delays.

On Cost Management and Overruns: - The actual cost of redelivery versus the initial project budget. Findings show many studies reports cost overruns due to unforeseen technical issues, additional maintenance needs, or regulatory compliance requirements. Learnt from this lesson is a strong cost-control framework, including detailed risk assessments and proactive budgeting, is crucial to minimizing unexpected expenses.

On Condition of Aircraft at Redelivery: - condition of the aircraft when it is returned, including any necessary repairs or upgrades. The finding indicates the aircraft's condition may differ significantly from the expectations set in the lease agreement, often requiring significant maintenance or modifications to meet the terms. The lesson learnt from this issue is that accurate initial inspections and a clear understanding of the redelivery condition requirements can help avoid these surprises. Surprises can lead to disputes between lessors and lessees, often resulting in costly delays and legal challenges. Therefore, establishing a comprehensive checklist and standardized procedures for inspections at the outset can greatly enhance transparency and mutual understanding throughout the lease term.

On Stakeholder Coordination and Communication: - The effectiveness of communication between lessors, lessees, maintenance teams, regulatory authorities, and other stakeholders. Findings were poor communication and coordination among the parties involved can lead to misunderstandings, delays, or even legal disputes. Acted on this issue by establishing clear channels of communication, regular updates, and proactive problem-solving is essential for smooth redelivery execution. Additionally, implementing standardized procedures and utilizing technology for real-time communication can significantly enhance collaboration. By fostering a

culture of transparency and accountability, all parties can work more efficiently together to mitigate risks and ensure successful outcomes.

On Maintenance and Technical Issues: - The number and severity of technical issues, such as maintenance, repairs, and upgrades, discovered during the redelivery inspection. The findings were that aircraft often require significant repairs or upgrades that were either unforeseen or not initially addressed during the lease term. The solution to learnt is having a clear and accurate assessment of the aircraft's condition before the end of the lease can help in anticipating required repairs or upgrades, preventing surprises during redelivery.

On Documentation accuracy: - completeness and accuracy of documentation, including maintenance logs, airworthiness certificates, and other necessary records. Findings were incomplete or inaccurate documentation can lead to delays, regulatory issues, or disputes between the lessor and lessee. This has led to learnt ensuring that all documentation is up to date, accurate, and compliant with the lease agreement, which is critical to avoid complications. Complications can not only hinder operational efficiency but also result in significant financial repercussions. Therefore, regular audits and training sessions for staff involved in documentation processes are essential to foster a culture of diligence and accountability.

Overall Findings and Lessons Learned from Previous Studies

- Effective planning, early engagement with all stakeholders, and clear communication are key to avoiding delays, cost overruns, and compliance issues.
- Incorporating risk assessments and contingency plans, along with realistic budgeting for maintenance and compliance, significantly improves project success.
- Ensuring that all documentation is accurate and regulatory requirements are met helps avoid unnecessary complications and legal challenges.
- Incorporating technology, such as maintenance tracking systems and project management software, can enhance efficiency and reduce errors in the redelivery process.
- Developing a plan for post-redelivery support or audits is beneficial in maintaining relationships and ensuring long-term success for all parties involved.

1.4 Research Questions

As we try to know how the study concept, the basic questions to be ensured by the study are:

1. Process and Efficiency

- How can the aircraft redelivery process be optimized to reduce downtime and minimize operational disruptions for Ethiopian airlines and lessors?
- What are the best practices for ensuring the redelivery of an aircraft is completed on time and within budget?
- How do different aircraft redelivery timelines affect the cost and efficiency of the overall project management?

2. Cost and Financial Management

- What are the key factors contributing to cost overruns during the aircraft redelivery process, and how can they be mitigated?
- How can aircraft owners or lessors balance the cost of maintenance and repairs with the overall value of the aircraft during redelivery?
- What role does forecasting maintenance and repair costs play in managing the financial aspects of aircraft redelivery?

3. Stakeholder Coordination

- How do the roles and responsibilities of various stakeholders (lessors, lessees, maintenance teams, regulators) impact the success of an aircraft redelivery project?
- What communication strategies can be implemented to improve coordination and reduce delays during the redelivery process?

4. Legal and Regulatory Compliance

- What are the challenges associated with ensuring compliance with international aviation regulations during the redelivery project process?
- How do changes in aviation regulations affect the requirements for aircraft redelivery projects?

- What legal challenges arise during the aircraft redelivery process, and how can they be addressed to ensure smooth project completion?

And others try to touch in this study is:

5. What is the effective project management in aircraft redelivery process?
6. What is the drawback of an aircraft lease agreement on aircraft redelivery projects?
7. What are challenges countered and what action taken in the redelivery process?
8. What is the effect of project management on aircraft redelivery?
9. Is redelivery project practice participatory?

1.5 Objective of the study

1.5.1 General Objective

The objective of an Aircraft Redelivery Project Management is to ensure the smooth and efficient process of returning an aircraft to its owner or lessor at the end of its lease period or after it has been sold. This involves a wide range of activities, including compliance with contractual obligations, technical inspections, maintenance checks, and ensuring the aircraft is in the condition required by the terms of the lease or sale agreement.

1.5.2 Specific Objective

- **Compliance with Lease Agreement**: Ensuring the aircraft is returned in accordance with the conditions set out in the lease or sale agreement, which could include specifications for maintenance, modifications, and equipment.
- **Condition Assessment:** Performing a detailed technical assessment to evaluate the aircraft's physical condition, including systems, structure, and interior. Addressing any maintenance or repair needs to meet redelivery standards.
- **Documentation and Reporting:** Managing all documentation related to the aircraft, including technical logs, maintenance records, airworthiness certificates, and any other required documentation to ensure the aircraft is compliant to assess professional project members and project management collaboration on the technical decision.

- **Financial Management:** Managing the financial aspects of the redelivery process, including the cost of repairs, maintenance, and any necessary upgrades to return the aircraft to the lessor or new owner in the required condition.
- **Minimizing Downtime:** Managing the project timeline to minimize aircraft downtime, ensuring the redelivery process is efficient and timely to avoid delays that could incur additional costs.
- **Legal and Regulatory Compliance:** Ensuring all regulatory requirements are met, including aviation safety standards and certification processes, as well as complying with international aviation regulations.
- **Stakeholder Coordination:** Collaborating with various stakeholders (lessors, lessees, maintenance teams, legal departments, etc.) to ensure smooth communication and successful completion of the redelivery project.
- **Risk Management:** Identifying and mitigating potential risks that could affect the redelivery process, such as unforeseen maintenance issues, delays in parts, or regulatory challenges.

In essence, the objective of Aircraft Redelivery Project Management is to complete the process efficiently, meeting all contractual, regulatory, and operational requirements, while ensuring the aircraft is ready for the next phase of its lifecycle.

1.6 Significance of Study

This study has important in below perspectives.

- To preserve the study, serve for further guideline and detail research of the same study that pertains to the management redelivery project, therefore commercial aircraft lease agreement, delivery and redelivery project members as work force that become the driving force to realize the effective project redelivery management goal that include lessen the risk of delays.
- The study serves as a policy or strategy input for the improvement of overall projects management performance in aircraft redelivery as per lease agreement requirement and enhance the delivery of project within the set period. The project management capacity

increases and hence the understanding of implementing good project control tools and techniques increases.

1.6.1 Scope of Study

The scope of aircraft redelivery project research is wide-ranging and can address a variety of technical, financial, operational, and regulatory challenges. This study is conducted on the operation level of the aviation industry that signed lease agreements for commercial air transport in different statuses and worked on aircraft redelivered for the past 4 years (2020-2024) and focused on specific areas that need improvement or further exploration. Additionally, by exploring the areas mentioned below, this study can contribute to improving the efficiency, cost-effectiveness, and success rates of aircraft redelivery projects:

- How to improve the overall management and execution of aircraft redelivery projects.
- Researching the technical side of aircraft redelivery, especially in terms of condition assessments and maintenance requirements.
- Investigating how risks are identified, assessed, and mitigated in the context of aircraft redelivery projects.
- Understanding how different stakeholders interact during the redelivery process and how to optimize communication.
- Using quantitative data from redelivery projects to identify trends, cost-saving opportunities, and risk factors.
- using project management methodologies and tools applied to redelivery project processes to determine their relative effectiveness.

1.6.2 Limitation of the Study

In the context of Aircraft Redelivery Project Management, the study raises several limitations that are due to various factors, including data availability, the complexity of the process, and the dynamic nature of the aviation industry. Aircraft redelivery projects often involve proprietary or sensitive information. Each aircraft redelivery project is unique, influenced by factors such as the

type of aircraft, the terms of the lease, the specific needs of the parties involved, and the regulatory environment at the time. Regulations governing aviation, airworthiness, and safety standards are constantly evolving and can vary significantly across regions and governing bodies. Aircraft redelivery projects involve multiple stakeholders, including lessors, lessees, regulatory bodies, maintenance providers, and insurance companies. Each stakeholder may have different priorities and objectives, which can complicate project management. Financial considerations often play a major role in aircraft redelivery projects, where cost overruns due to maintenance, repairs, or unforeseen issues can limit the scope of the redelivery process. Although technology plays an increasingly important role in managing aircraft redelivery, the aviation industry still faces barriers in adopting new technologies, including high upfront costs, lack of standardization, or resistance to change. Leese's companies and organizations face previous history data to share or to collaborate due to confidentiality agreements, competition, or concerns about the potential risks of revealing inefficiencies. Aircraft redelivery projects often occur on tight timelines, and delays can impact the scheduling of research or the ability to observe a complete cycle of the redelivery process. Aircraft redelivery projects require coordination among diverse teams, and human factors, such as decision-making under pressure, leadership, and conflict resolution, can significantly impact project success. Global events such as economic recessions, pandemics, or geopolitical tensions like the COVID-19 pandemic can disrupt the aviation industry and affect aircraft redelivery schedules, costs, and regulations.

As conclusion, research in Aircraft Redelivery Project Management holds significant potential to improve efficiency, reduce costs, and ensure compliance, several limitations can constrain the scope and depth of these studies. These challenges can be mitigated with careful planning, industry collaboration, and the use of adaptive research methods. By addressing these limitations, researchers can provide valuable insights that lead to more effective and efficient aircraft redelivery processes in the future.

1.7 Ethical Consideration

Ethical considerations in Aircraft Redelivery Project Management are critical to ensure that the process is conducted fairly, transparently, and in a manner that respects the rights and interests of all stakeholders involved. Ethical issues may arise in a variety of areas, including financial

management, stakeholder communication, environmental responsibility, and regulatory compliance. The key ethical considerations in the context of aircraft redelivery:

- The accurate and transparent documentation of the aircraft's condition, maintenance records, and compliance with contract terms is essential to maintain trust between stakeholders.
- The allocation of costs for repairs, maintenance, or modifications should be transparent, fair, and in line with the terms of the lease agreement.
- Aircraft redelivery projects often involve sensitive data, including financial information, proprietary maintenance schedules, and operational details.
- All stakeholders involved in an aircraft redelivery project should be treated fairly, with respect to their roles and responsibilities.
- Aircraft redelivery projects may involve various environmental concerns, including the disposal of parts, waste management, and energy consumption during maintenance or repair activities
- Adhering to all relevant aviation regulations, safety standards, and airworthiness requirements during the redelivery process is crucial to ensuring both legal compliance and the safety of future operators.
- Project managers, contractors, and other involved parties must avoid situations where personal interests or relationships could interfere with their professional duties.
- Both lessors and lessees are bound by the terms of the lease agreement during the redelivery process, and ethical project management requires strict adherence to those terms.
- Ethical project management requires accountability for the outcomes of the redelivery process, including both successes and failures.
- Stakeholders should consider the broader societal impact of their decisions during the aircraft redelivery process, including their role in promoting safety, fairness, and environmental responsibility.

To conclude, Ethical considerations in Aircraft Redelivery Project Management are essential for maintaining trust, ensuring legal compliance, promoting fairness, and fostering sustainability. By addressing these ethical challenges, stakeholders can work together to achieve efficient,

responsible, and successful redelivery projects. Ethical project management not only helps prevent legal or financial repercussions but also upholds the reputation of the organizations involved.

1.8 Organization of the Research Report

The thesis contains five chapters: Chapter one describes an introductory part containing background study, research problem, Research question, objective of the research, significance and scope of research. Chapter two presents literature reviews the area of aircraft lease and return condition management. Chapter three discusses research design and methodology. Chapter Four justifies the result and discussion. Chapter five contains a summary, conclusion and recommendations based on previous chapters.

CHAPTER TWO

REVIEW OF RELATED LITERATURES

Introduction

2.1 Theoretical Review

2.1.1 Project Management Approach

Project management is turning ideas into sustainable reality (Maltzman, R. & Shirley, D. 2013). This concept serves as the foundation for reality, which can take the form of inventions, new opportunities, problem-solving techniques, or new creations. Project management offers a means of making ideas visible. However, depending on the realized unit, the transfer should include formal project management tools and processes. The realized unit may also be exchanged to develop, alter, and destroy others.

Aviation project management is a complex field that requires a deep understanding of industry behavior, including its highly regulated rules, policy, critical safety standard and operational practice. Aviation projects managed by managers that can contribute success to advancement of industry. Its focused-on projects related to (but not limited to) aviation infrastructure, aircraft modification or manufacturing and compliance of regulatory body airworthiness's (SOFEMA, 2024). To properly design and execute a redelivery project, effort and time must be invested. This involves breaking down all operations and milestones into three distinct project phases: the beginning phase, the operating phase, and the redelivery phase. (IATA, 2017). This section therefore examines the theoretical and empirical research on aircraft redelivery project management and effects an organization's success.

Generally, the literature review aims to focus on the following:

- The definition and principles of project mgmt. on aircraft redelivery
- Approach and model for understanding aircraft redelivery
- Obstacle associated with aircraft redelivery
- The effect of redelivery project management strategy on an organization performance

- Professionalism, experience, working culture and employee motivation elements influence an organization’s performance.

2.2 The Definition and Principles of Project Mgmt. on Aircraft Redelivery

Aircraft redeliveries are complex contractual transactions involving multiple stakeholders. Delays have significant financial ramifications; the previous studies estimated a typical narrow body overspend can be around $2M with wide bodies even more costly at $4.5M at lease end. The parties concerned face numerous, often interdependent, challenges, each with different consequences for timescales and having varied financial impacts. (IBA 2023). The handover procedure known as "aircraft redelivery" occurs when the functional operators who rent the aircraft for a certain amount of time (referred to as the lessee) and the property owner (referred to as the lessor) exchange roles. In accordance with their respective interests, which are reflected in the terms of the master lease agreement created by IATA, both parties negotiate and handle the lease duration condition. These processes consist of inspecting the aircraft and related documentation to confirm that the lessee has fulfilled its obligation to return the aircraft to the lessor in accordance with the redelivery conditions set forth in the lease.

It can be difficult to manage an aviation project when you must deal with complicated needs, constrained resources, and tight timelines. To reach objectives, whether management creates a new aircraft, improving an old system, or putting in place a safety program, must successfully plan, carry out, and oversee your project. Based on industry standards and best practices, discuss some of the greatest strategies in this research to help and maintain aviation project on schedule and on budget.

The principle of redelivery project management is considered on pre-redelivery and return or post data approval process. Pre-redelivery phase consists of pre-redelivery meeting, Aircraft maintenance record review, physical team (aircraft Inspection and technician task team). To address redelivery technical issues (such as redelivery conditions, physical inspections, record status, operator capability, etc.), a scheduled meeting should be devised with the aim of thoroughly evaluating and recording the aircraft status in relation to lease return requirements (Ackert ,2014) Because pre-redelivery matters financially to both the airline(operator) and the lessor, it frequently occupies a significant portion of the total conversation.

To successfully accomplish aims and objectives within this industry, project management considers the following principles: integration, scope, time, cost, quality, resource, communication, risk, procurement, and stakeholder expectations.

One goal of this research is to identify and indications that the redelivery plan does not align with practical measures like review records that serves as a lease term operated with the lessee, performing physical work, on-condition component monitoring (OCCM), life limited part (LLP) traceability and verifying that engineering airworthiness requirements may necessitate a back-to-birth (BtB) history. Since back-to-birth data is increasingly in demand in the aftermarket, the record review process can be time-consuming, particularly if the aircraft or asset has a varied history. An essential process for any aircraft is the records review. This would typically involve gathering all relevant data to ascertain the aircraft's current maintenance and airworthiness status, identifying any discrepancies with respect to a regulation or agreement delivery clause, deciding on the appropriate corrective actions, and reporting all findings and pertinent data in an extensive report. “If the aircraft lose its records, it will have no value at all.” (Malcolm Chandler, 2021)

The pre-redelivery phase is a critical stage in the aircraft lease return process that typically begins 24 months before the redelivery date and continues until six to four months before the final transition (Smith, 2023)

The recommended redelivery period is between six to nine months in advance of the redelivery date (Ackert, 2014). Lease agreement “For a period commencing nine (9) months and no less than six (6) months prior to the proposed redelivery date, Lessee and Lessor will agree to conduct a pre-redelivery meeting for the purpose of:

a. Reviewing the upcoming work scopes for the aircraft redelivery check and, if applicable, any engine, APU, or Landing Gear shop visit, and

b. Reviewing all documentation to be provided by the lessee in preparation for the upcoming Aircraft Documentation Review.” (Sample contract agreement).

Return conditions outline the item's state for successful redelivery, including physical condition and specific documentation required by the lessee, lessor and maintenance provider during the lease.

Major returns on majority conditions are:

- The aircraft airworthiness,
- The technical status of the aircraft and its position in its maintenance cycle,
- The technical status of the engines, landing gears, auxiliary power unit (APU) and thrust reversers as they form a substantial part of the total value of the asset,
- Requirements regarding lifetime of the aircraft, engines and components.
- General conditions defined as minimum standards for specific areas of the aircraft such as the cabin.

2.3 Aviation Management Approach and Model for Understanding Aircraft Redelivery

The leased aircraft redelivery needs ensuring and properly understanding that lease return is managed effectively with cost transparency with comprehensive processes. According to artificial intelligence and LinkedIn community, the project management can avoid scope creep, which is the propensity to add additional work or change the requirements without modifying the budget or timeframe, by clearly outlining the scope and objectives. Additionally, we can meet the project requirements and expectations of all parties involved, including sponsors, consumers, regulators, and team members.

Make a thorough project plan that details the tasks, resources, schedule, budget, and risks associated with the project after defining its goals and scope. A project plan is a written document that directs the execution and management of the project and facilitates the dissemination of project updates to stakeholders. Create project plan using a variety of tools and techniques, including earned value management (EVM), network diagrams, Gantt charts, work breakdown structures (WBS), earned value management (EVM), and risk assessments. A project plan needs to be flexible, realistic, and updated frequently to account for any problems or changes that might occur while working on the project.

Effectively assembling and managing of project team is another essential component to keeping aviation project on schedule and within budget. A project team is a collection of individuals that collaborate to accomplish project goals and produce project results. The project team members

choose based on their skills, experience, availability, and compatibility with the project goals and culture. Also assign roles and responsibilities, defined expectations and performance standards, provide training and support, and foster collaboration and communication among project team members. The project manager uses a range of strategies and instruments, including the team charter, RACI matrix, feedback, motivation, and conflict resolution, to oversee the project team.

Measuring, comparing, and reporting project progress, quality, costs, and risks against the project plan and objectives is known as project monitoring and controlling of project performance in the aviation industry. It can address and resolve any problems or deviations that may delay the project's completion and making clever decisions and modifications to maintain the project on schedule and within budget. The project manager can track and oversee the progress of the project using a variety of tools and metrics, including dashboards, change requests, variance analysis, status reports, and corrective actions.

Controlling stakeholder expectations and communication is one of the last and best strategies to maintain an aviation project's budget and schedule, such as with the owner, customers, sponsors, regulators, team members, and suppliers, to build trust and rapport, avoid misunderstandings and conflicts, and guarantee project success and satisfaction. Stakeholder analysis, communication plans, stakeholder registers, feedback, and meetings are just a few of the tools and techniques a project manager can use to understand and manage stakeholder expectations and communication.

2.4 Obstacle Associated with Aircraft Redelivery

Acumen claims that organizing the aircraft's return condition is the hardest part of aircraft redelivery. The redelivery procedure may be affected by professional problems (Experienced technicians, expertise, engineers, logistics problems, maintenance inconsistencies), as well as by miscommunication. Keeping track of deadlines, coordinating the project's activities, and managing required paperwork, such dirty fingerprint (DFP) records, are typical redelivery challenges. Legal specialists are essential during the lease agreement's assessment and negotiation. Every challenge carries the risk of financial loss for both parties (lessor to postpone the next lessee agreement and/or penalty to the lessee).

According to Lee Smith (2022), technical logs, pilot reports, work orders, dirty fingerprints, alterations, repairs, etc., generate tens of thousands of pages of data. As part of the aircraft redelivery procedure, these must be given to the lessor for review.

Organizing components placed in returning aircraft is another challenge in redelivery projects. To reduce the possibility of last-minute component changes, good component planning and management enable parts to be replaced sooner if access and downtime are available. In the absence of this, the project may incur unanticipated extra expenses because of the unidentified cost of the component, its lead time, and the availability of workers to repair it during final maintenance.

The redelivery procedure may be impacted by any modifications made to an aircraft's supplementary type certificate (STC) throughout the leasing period. During aircraft operation and redelivery, it can be a difficult and time-consuming activity if improperly handled. If errors are found in the modifications carried out on an aircraft, more paperwork may be needed, necessitating a physical inspection and confirmation of the modification status. In the worst-case scenario, if the modification document is unclear about instructions and the alteration was not made in compliance with data permitted by the regulatory authority, it might be necessary to completely remove the modification upon redelivery.

The preparation of regulatory body airworthiness and safety requirements, such as the certificate of airworthiness (C of A) planning document, AD status report, LLP report, maintenance logbook, Digital Flight Data Recorder (DFDR) report, Life Limited component status report, aircraft certificate of insurance, etc., is impacted by and requires management action when it comes to the lack of support and resources used for the aircraft renewal certificate.

To guarantee stakeholder interest within lessee organization obligations during the return process through record preparation, physical inspection, engine and APU inspection, and final acceptance, the redelivery project management team presents a lease agreement interpretation that breaks down the important points.

2.5 Redelivery Project Management Strategy on an Organization Performance

Any projects focusing on strategic initiatives are critical to an organization's competitiveness and sustainability of long-term success. Organizations spend $100 billion a year on creating competitive strategies. 90% of them fail due to poor execution of the project. (Morgan et.al., 2007)

Effective project management brings numerous benefits to organizations. It improves efficiency by optimizing resource utilization, streamlining processes, and minimizing delays and rework. It enables effective cost control by tracking expenses, managing budgets, and identifying cost-saving opportunities (Impact of project management on organization performance, KEBS). Collaboration in project management is used to address proactively challenges overcome, the strategy to overcome them. The delivery project ensures that aligned with the goal of lessee or lease agreement.

Give top priority to project tasks that primarily impact redelivery progression and ongoing communication, such as supplying parts manufacturer approval (PMA) certifications and coordinating with component suppliers, overseas repair shops, and original equipment manufacturers (OEM). Effective resource allocation is a key component of every operator or lessee strategic objectives, and they consistently deliver value and rate at each progress status evaluation meeting. Each project participant in this study primarily oversees and participates in decision-making on intricate project procedures and tasks. Every development and condition specified in the lease redelivery agreement ought to be meticulously recorded and closely coordinated with one another.

Other angle of project management effect on lessee redelivery side:

- Predetermine the time and place to visit work scopes
- Define redelivery package plan on task level.
- Follow up redelivery package execution as per the project plan and any finding raised by Lessor against his/her group members.
- Assist the Lessor's physical inspector.

- Contact Lessor representative for any issue pertinent to physical works and any issue that related to his/her group members.
- Provide the engine trend monitoring report (ECM or EHM) and APU shop visit document or report. Borescope inspections (BSI) examine the engine's and the blades' internal conditions. The condition evaluation provides an in-depth look at the internal health of the turbine engine, highlighting any wear, damage, or possible problems. The hot section usually has the most wear.
- The project manager in the redelivery must pay attention to the repetitive task that is complied with by intervals of cycles or hours and provide an update report on the latest last done and next due condition.
- Provide the scheduled redelivery status awareness meeting.
- Give priority to cause major delay redelivery tasks, like structural or air frame tasks, and paint.
- Close all open items raised against his/her group members.

Among the project team technical project manager take an action item on.

- Provide the Critical Path Gantt Chart that helps the project track a project’s progress and manage the associated tasks to stay on time and on budget, also to include MRO plan.
- Continuous communication with the aircraft maintenance program with the consideration of mandatory maintenance tasks and much other information that is important to check.
- Provide updated technical progress reports for regular meetings. It may help to lessor aircraft delivery to another lessee. (IALTA 2024)

According to the most recent reports, the most common causes of delayed redelivery (aircraft return) include unscheduled repairs, inadequate BSI maintenance, absence of preparation, the airline's emphasis on flying operations rather than returning, the absence of lead times for resources and materials, the misalignment of lessor return expectations, the parties' lack of communication, and the late engagement.

Most challenging redelivery process demanding in terms of cost and timescales is engine, record accuracy and completeness, addressing structural damage, material lead time, modification and component LLP respectively. Material lead times carrying greater significance in 2023’s survey

compared with previous years. The most cause for engine redelivery complications are engine shop visit and turnaround time, BSI and BtB trace on LLP respectively. A reasonable conclusion is that lessees are assessing engines before lessors so they can avoid last-minute delays because of Borescope l failures.

The creation of the lessee redelivery team states that one method to assess an organization's effectiveness is by its term of reference and responsibilities. The aircraft redelivery team follows this term of reference as a guide to ensure a seamless return of the leased aircraft to the lessor. The team members, project manager, and general coordinators bear accountability for any delays and quality problems that arise during the project's duration. The team members are responsible to Work under the direction of the Department Project Manager and respective hierarchy, work extra miles with commitment to finalize the specific assigned task, but not limited to, for the best interest of the company.

2.6 Empirical Literature Review

This study tries to summarize the existing literature on the area that done at different countries. An empirical literature review on an aircraft redelivery project involves analyzing various studies, reports, and articles that provide data-driven insights and findings about the process, challenges, and best practices related to aircraft redelivery.

Bourjade, Sylvain & Huc, Regis & Muller Vibes, Catherine (2017) conducted empirically measure the impact of aircraft leasing choices on airlines financial performance. They use public data on 73 airlines operating worldwide over the period 1996–2011. And the result of the paper was first they identify a non-monotonic and concave effect of leasing on an airline’s profit margin, suggesting decreasing marginal returns to leasing in this sector. Second, they show that the impact of leasing on an airline’s operating profit is stronger for Low Cost Carriers than for Full Cost Carriers: deviating from the optimal level of leasing might be more harmful for a LCC than for a legacy carrier. Finally, we analyze how an airline’s experience affects the relationship between leasing and profitability.

International Aviation Lease Training Association, (2024) study under the subtitle “End-of-Lease: Return Conditions and Transitions” The final stage of the leasing lifecycle involves the aircraft’s return to the lessor from the lessee. A thorough inspection defined by lease agreements

and not airworthiness conditions alone ensure the aircraft meets the pre-defined return conditions, addressing any maintenance or repair requirements. The lessor then prepares the aircraft for its next chapter, whether it's a new lease, sale, conversion, or retirement. The paper concludes and suggests the process often includes updating documentation and maintenance records, as well as ensuring that all necessary modifications are completed to meet the next lessee's specifications. By carefully managing this transition, lessors can maximize the aircraft's value and maintain a strong leasing portfolio.

Donal Patrick Hanley (2021) considering the patterns that emerge in cases of developing a standard form of aircraft operating lease from different jurisdictions and current literature in the field is safety issues and lessor's liability.

Hanley, D.P. (2011) Aircraft operating leasing: according to this author perspective of view redelivery in required redelivery condition, consequences of delay and/or failure so to redeliver are of vital consequence to the aircraft operating lessor. The main components of redelivery are timely redelivery in the condition required by the lease agreement, with physical delivery of the aircraft, together with all records, and, often, deregistration of the aircraft. Disputes between lessors and lessees are not infrequent here since, if upon tender for redelivery, the lessor successfully asserts that the aircraft is not in the required redelivery condition, not only must the airline incur additional cost in order to meet the redelivery conditions, but rent will continue to accrue, with the lease sometimes providing for an increasing, in this author's experience, of one and a half to two times the normal rent if the delay in redelivery continues beyond a certain agreed time period. In timely redelivery, the lessee refuses or fails to redeliver the aircraft at the end of the lease for whatever reason. One of refusal or failure is the tort of conversion. He listed the illegal act of conversion's three primary characteristics.

(1) whether the defendant's conduct was inconsistent with the rights of the owner (or other person entitled to possession)
(2) whether the conduct was deliberate rather than accidental and
(3) whether the conduct was "so extensive an encroachment on the rights of the owner as to exclude him from use and possession of the goods.

In this study, the author considered redelivery in redelivery condition, timely redelivery, non-compliance with redelivery condition, residual value guarantee, and records areas. These are factors that play a crucial role in determining the overall efficiency and effectiveness of the redelivery process. By analyzing these components, the author aims to provide insights that could enhance operational practices and compliance in future redelivery scenarios.

And conclude this issues by suggestions such as Redelivery condition is a frequently disputed issue between lessor and lessee. The foregoing review does not reveal any provisions of public or private air law instruments therewith. This is not surprising as this is a dispute inter partes which generally involves contractual requirements to meet a condition better than that simply of the existence of a certificate of airworthiness. Cases have been dealt with under the governing law of the lease and respectfully disagreeing with the decision, is concerned by the refusal of the court in the case to require precise compliance with the contractually agreed redelivery condition.

IBA, last year's engines redeliveries revisit reports study the key issues influencing schedules and considers whether the major causes of delay have altered over time, combined with quality issues affecting aircraft engines and airframe manufacturing, aircraft deliveries have not fulfilled demand. most organizations don't have the support of dedicated engineering, technical and records personnel to manage redeliveries, airlines and their representatives consider structural damage and material lead times as major drivers in redelivery costs, records accuracy is again quoted as a lessor concern.

2.7 Summary of Empirical Literature

All the above literature agreed on a divide between lessee and lessor responses regarding redelivery process. Airlines don't place the same emphasis on protecting the aircraft's value as an asset as lessors do; engines have a substantial bearing on financial challenges. Aviation stakeholders could not come to a governing lease agreement, and that led to discrepancies between lessors and lessees. Typically arise differences in understanding, expectations, or performance related to the term and condition of the lease agreement. These discrepancies can lead to challenges during the redelivery process and may include the following key areas:

1. Aircraft Condition at Redelivery
    - Wear and Tear vs. Expected Condition
    - Deferred Maintenance
2. Maintenance and Modifications
    - Scheduled Maintenance
    - Unapproved Modifications
3. Documentation Issues
    - Incomplete Maintenance Records
    - Discrepancies in Aircraft History
4. Repair Costs and Financial Responsibility
    - Cost Allocation for Repairs
    - Depreciation and Financial Terms
5. Return Timeline and Delay
    - Delayed Redelivery
    - Scheduling and Operational Delays
6. Return Condition Interpretations
    - Interpretation of Return Conditions
    - Dispute over “Wear and Tear

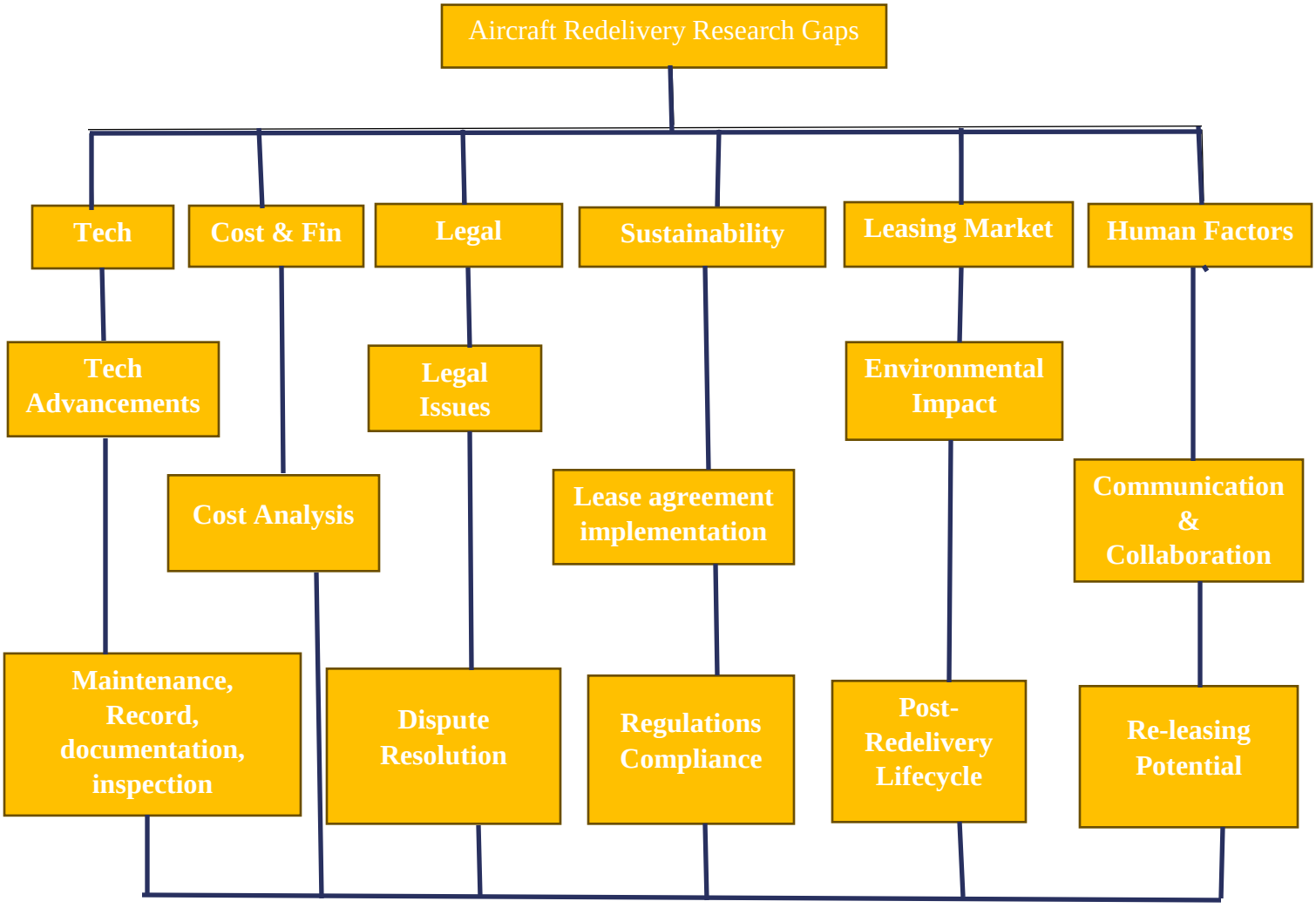
Conclusion

Discrepancies between the lessor and lessee during aircraft redelivery primarily stem from differences in understanding and interpretation of the lease agreement’s terms, particularly regarding the aircraft’s condition, maintenance, repairs, documentation, and compliance with

regulations. Clear communication, well-documented processes, and proactive planning can help minimize these issues and ensure that both parties meet their obligations as outlined in the lease agreement.

2.8 Research Gap

- This study tries to involve recognizing areas that have been underexplored or where current research does not fully address practical challenges or emerging trends in Ethiopian aviation industries. Identify the challenges faced and why not get an effective solution on an effective aircraft redelivery project. The analysis highlights various factors, such as communication gaps and insufficient resources, that hinder progress. By addressing these issues, the study aims to propose strategies that can enhance the efficiency and success of future aircraft redelivery initiatives. These strategies may include improving stakeholder collaboration, investing in training for personnel involved in the redelivery process, and leveraging technology to streamline communication. Ultimately, fostering a more integrated approach will not only mitigate the challenges currently faced but also pave the way for sustainable growth in the Ethiopian aviation sector. Such as
- Impact of Technological Advancements on Aircraft Redelivery Processes
- Challenges in Aircraft Redelivery
- Sustainability Considerations in Aircraft Redelivery
- Role of Aircraft Redelivery in the Global Aircraft Leasing
- Human Factors and Stakeholder Communication in Redelivery



Research gap Diagram

2.9 Conceptual Framework of Study

A conceptual framework for an aircraft redelivery project helps define the key components, relationships, and processes involved in returning an aircraft at the end of a lease. It is a structured way of understanding the various factors that affect the redelivery process, from maintenance and legal aspects to the human and financial components. This framework can guide research, practice, or decision-making in aircraft redelivery projects.

Components of the Conceptual Framework

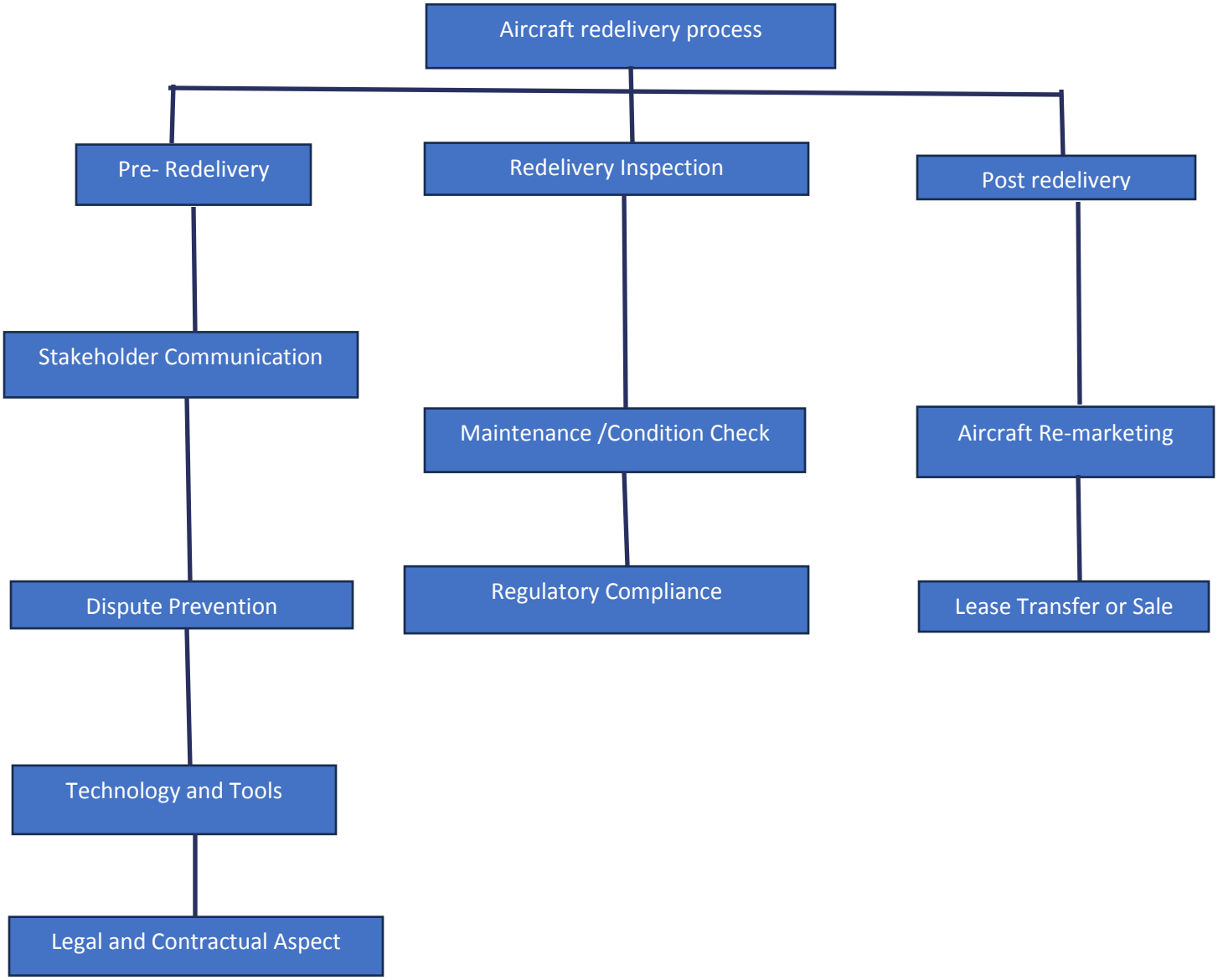
- Stakeholders Involved (Lessor, Lessee, Maintenance Providers, Regulatory Bodies)
- Phases of the Aircraft Redelivery Process (Pre-Redelivery, Redelivery Inspection, Dispute Resolution, Post-Redelivery)
- Critical Factors in Aircraft Redelivery (Condition of the Aircraft, Financial Aspects, Legal and Contractual Framework, Regulatory Compliance)
- Factors Influencing the Redelivery Process (Lease Terms and Conditions, Maintenance History, Market Conditions)
- Technology and Tools (Digital Inspection Tools, Data Analytics, Blockchain Technology)

Relationships in the Conceptual Framework: Effective communication between the lessor, lessee, maintenance providers, and regulatory bodies is critical for ensuring a smooth redelivery process. A lack of communication can lead to delays, disagreements, or misunderstandings. The lease agreement forms the foundation for the redelivery process. Both the lessor and lessee must understand and agree upon terms related to aircraft condition, penalties, maintenance, and dispute resolution. Technology plays a crucial role in simplifying and ensuring transparency during redelivery. Digital inspection tools, maintenance tracking software, and predictive analytics can reduce the risk of errors, lower costs, and help meet redelivery requirements. Aircraft must meet all applicable safety and environmental standards when returned. Regulatory bodies must be involved to verify compliance, and failure to meet these requirements can result in penalties or delays. Economic conditions and market trends may influence the cost and timing of the redelivery process. If market demand for aircraft is high, the lessor may be more flexible in accepting aircraft with minor discrepancies. Conversely, in a weak market, the lessor might enforce stricter conditions. Once the aircraft is returned, its future use (e.g., remarketing, reselling, or re-leasing) depends on its condition, market demand, and the effectiveness of the redelivery process.

Conclusion

The conceptual framework for an aircraft redelivery project is a comprehensive model that captures the complex interactions between stakeholders, technological tools, financial considerations, legal and regulatory requirements, and the critical phases of redelivery. By

structuring the redelivery process into distinct components and their interrelationships, this framework can serve as a guide for managing, researching, or improving redelivery operations in the aircraft leasing industry.



A conceptual framework diagram for an aircraft redelivery project

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The research approach utilized to examine the procedures and difficulties associated with aircraft return after lease end in Ethiopia's aviation industry is covered in this chapter. It first goes over the methodology and study design. The study's population, sampling strategies, data sources, data gathering processes, data analysis tools, and statistical reporting approaches are then covered respectively. Lastly, ethical considerations bring this chapter to a close.

3.2 Study Design and Approaches

To comprehend important facets of aviation, like economic trends, the effectiveness of ground operations, sustainability and environmental impact, and passenger satisfaction, research design, data gathering and analysis is essential. While quantitative data enables the measurement, evaluation, and forecasting of trends, such as the safety levels in an aviation setting, qualitative data provides us with first-hand recollections and non-numerical discoveries, such as passenger perception and customer happiness. (UNSW) A research design is a plan that offers a framework for data collection and addresses research issues. An excellent research design guarantees that the information gathered will enable us to address research requests more fully. Researchers plan their overall research design and specific research methods in a purposeful way so that they can acquire data relevant to their research problem and subproblems. (Leedy, 2015). The choice of research design is based on considering these three elements as well as the research problem in the study, the personal experiences of the researcher, and the audiences for whom the research study will be written. (Creswell, 2014). According to Cresswell, these research designs complied with three types of research designs: Qualitative, Quantitative and mixed methods. By gathering qualitative and quantitative data on current phenomena, our research specifically identifies and addresses the problem of aircraft return conditions at lease period end of an Ethiopian aviation service operator. In this study, the researcher chooses on explanatory design and apply qualitative and quantitative method approach. Explanatory research design is more convenient to deepen than describing what is happening of a problem. To explain the cause for company

dissatisfaction, turnover, relationship and performance including evaluation of provided platform that to perform this project behind the condition observe. In this study questionaries, a few interviews with anonymous people who were unwilling to come to the floor were used in depth and historical documents applied in detail in this study.

3.3 Quantitative Research Approach

In quantitative research, theories are developed deductively by reviewing the body of current literature. The ability to draw generalizations is a benefit of well-planned and executed quantitative research. At least in theory, quantitative research methods adhere to standardized processes for sample selection, instrument design, execution, and analysis to improve the generalizability of findings (Tsegaye 2020). Airline companies gather a vast amount of information about their operations, financial performance, and business ventures. The airline's engineers gather data on aircraft performance to see whether there may be a problem with their safe flying and maintenance schedule. An airline's sustainability and MRO operation management analysts gather data regarding the state of the fleet of aircraft that are dispatched for operations to comprehend the overall performance of the aircraft and to prevent unscheduled repair actions. To secure important agreements with other airlines or businesses that function as aircraft owners or lessors, the managers in the operational area gather data regarding the degree of dependability with which the airline manages its leases in relation to their mission and how the business is operated. The drawback of quantitative research is that it is predicated on the idea that standardizing research methods such as designing instruments, choosing samples, and implementing them will produce trustworthy results. Exploratory and interpretive analysis of a research problem seems to be absent from pure quantitative research designs as well. In this paper, one factor to generalization of quantitative research is the lessee and lessor side individual interests different from location to location, lessor to lessor, and lessee to lessee. This variability can significantly influence the outcomes of quantitative analyses, as differing motivations and priorities may lead to diverse interpretations of data. Consequently, understanding these individual interests is crucial for developing a more comprehensive framework for generalizing research findings across various contexts.

3.4 Qualitative Research Approach

Qualitative research methods are employed to gather and examine non-numerical data, including text, photographs, and observations, in quantitative research, which is primarily concerned with numerical data and statistical analysis. To obtain a deeper knowledge of phenomena, qualitative research methods are employed to gather and analyze non-numerical data, such as texts, photos, or observations. Its complex phenomena that cannot be easily measured or quantified. (Tamplin, 2023)

In a qualitative study, "research design should be a reflexive process operating through every stage of a project" (Hammersley & Atkinson, 1995). The activities of collecting and analyzing data, developing and modifying theory, elaborating or refocusing the research questions, and identifying and addressing validity threats are usually all going on simultaneously, each influencing all of the others.(Maxwell, 2013) The major dimensions that this paper proposes as useful in defining the quality of any service and our suggestions about how this relates to Passengers often prioritize aspects such as seating comfort, in-flight entertainment options, and overall cleanliness of the aircraft. By focusing on these dimensions, airlines can enhance the travel experience and foster greater customer loyalty for airline services in terms of aircraft convenience for passengers. It means airline service should be tangible, reliable, responsive, assurance, and empathy. Depending on this, the airline's reputation and customer loyalty can significantly improve. When passengers feel valued and understood, they are more likely to choose that airline for future travel and recommend it to others. The lease agreement must be updated to current aircraft technology to keep passengers interested, like entertainment on the flight. Age of aircraft, type of aircraft, aircraft storage for carry-on baggage, on-time flight, direct flight routines, focus on customer-compliant handling, plan to increase percentage of first-class (business) class flying passengers, easy inflight service for elders and children, and smoking policy consider in quality of lease management to phase out old aircraft and lease or enter to service new aircraft. New aircraft acquisitions will not only enhance operational efficiency but also improve passenger comfort and satisfaction. By prioritizing modern fleets and maintaining a strong focus on customer service that helps to create a more enjoyable travel experience for all passengers. Another perspective is airlines partnering with equivalent airlines to facilitate revenue, but all alliance groups have policies and standards that must fulfil the requirement; each

airline enhances their aircraft to meet minimum requirements. This collaboration not only allows for a more seamless travel experience for passengers but also enables airlines to share resources and reduce operational costs, ultimately benefiting both the companies and their customers. In this research, use interviews to collect data from individuals, asking open-ended questions to explore their experiences and opinions. These interviews can provide rich, qualitative insights that quantitative methods may not capture. By allowing participants to express themselves freely, researchers can uncover nuanced perspectives that contribute to a deeper understanding of the topic at hand. Applying these qualitative techniques to detailed and descriptive data is advantageous. Examine the problem from each participant's or respondent's point of view and experience for a deeper understanding. Flexibility allows the researchers to modify the surveys according to the situation. A more sophisticated approach is made possible by condition, which enables researchers to explore the complex nature of social phenomena and human conduct. By accepting this flexibility, researchers can modify their questions to better capture the nuances of participants' emotions and ideas, which will improve the overall calibers of the data gathered.

By reverse, it takes time to collect data from respondents, including repetitive reminders and briefings on issues; the respondent interpretation missing the main purpose and aligning the scope is another impact. This misalignment can lead to incomplete or skewed data, ultimately compromising the integrity of the research findings. Additionally, when respondents do not fully grasp the objectives, their feedback may lack relevance, further complicating the analysis process.

All things considered, a useful qualitative research methodology with several applications in diverse sectors. Researchers can better comprehend the subtleties and complexity of human behavior by employing the qualitative analysis method. This method makes it possible to examine participants' viewpoints and offers deep insights that quantitative approaches could lack. To improve the efficacy of interventions in a variety of contexts and phenomena, qualitative research is therefore essential in guiding policies and practices.

3.5 Target Population

The target population consists of Ethiopian Airlines employees who serve in the MRO division. This specifically refers to technicians, engineers, managers, supervisors, and other support staff

engaged in aviation maintenance and associated activities. Using probability sampling techniques, the sample size will be decided by taking representativeness and statistical power into account. The sample size will be determined based on considerations of statistical power and representativeness, employing probability sampling techniques such as stratified random sampling or cluster sampling to ensure adequate coverage of diverse roles and responsibilities within the department. Therefore, the total population size for this research will be 1597.

3.6 Sampling Techniques and Sample Size

Next generation aircraft and employees with expertise and skill are essential to the aviation industry to better grasp the dynamics of the sector and increase efficiency. Targeting technical personnel and redelivery project team employees who have worked for the airline for at least 25 years and have a direct participation in aircraft technical return condition was crucial. This focused strategy guarantees that this staff knowledge and perspectives will make a substantial contribution to the decision-making process of lease agreement. The airline may improve its competitive edge and operational efficiency in a market that is changing quickly by utilizing their experience. This is to make the research more feasible, as the issue requires a deeper understanding of technicalities to respond to some of the research questions better. Therefore, the target population for this research was employees who participate in lease management and redelivery projects within Ethiopian airline operators. which helped get a full picture of the study subject. This approach not only facilitated a more comprehensive analysis but also ensured that the insights gathered were relevant and actionable for improving lease management practices. By focusing on employees directly involved in these projects, the research aimed to uncover specific challenges and opportunities within the operational framework of Ethiopian airline MRO.

3.6.1 Demographic Representation of Sampling

The total number of employees who can participate in the redelivery project was 1597, which is 28 % of the total ET-MRO employees, but practically assigned project team members were 320, which is 20.03% of professionals (1597) and 5.62 % of total ET MRO employees. This discrepancy highlights the selective nature of team assignments within the project, suggesting that only a small fraction of the workforce is directly involved in the initiative. The limited number of assigned members may indicate the need for specialized skills or the project's focused

No		Total number of employees	Total number of MRO employees (Population)	Sample size	percentage
	Ethiopian Airlines	18000	5,695	320	31.6%
Department under MRO for redelivery (aircraft return condition) project.					
1	AEP		138	29	9.0 %
2	BMT		889	176	55.0%
3	CMT		310	62	19.3%
4	EMT		213	43	13.4%
5	QA		47	10	3.2%
Total			**1597**	**320**	

Scope Yaro Yamane Statistical Formula for finding sample size of a finite population. This method is only applicable when the numerical strength of the population is known. The formula is

$$n = \frac{N}{[1 + N(e)^2]}$$

Where:

n is the sample size, N is the population size, 1 designates the probability of the event occurring and e is the level of precision. (Sampling error that can be tolerated which is 5%). Assuming 95% confidence level and p =0.5, we get the sample size as:

This formula to the above statement; we get:

$$n = \frac{1597}{[1+1597(0.05)^2]} \cong 320$$

Therefore, the total sampling size for this research will be 320.

Where:

n_0 = is the sample size = 320

N = is the population size = 1597

Now, suppose we want to calculate the sample size for the population of our study (n)

If $\frac{n0}{N}$ = 0.2 is negligible then n_0 is satisfactory approximation to the sample size.

3.7 Data Type and Source

Researchers typically gather information through two main sources: The primary data was collected through surveys and interviews, allowing participants to share their firsthand experiences and insights. In contrast, the secondary data consisted of existing literature and reports, which provided a broader context and background for the findings.

3.7.1 Primary Data

Information gathered especially for the current study subject. This referred to as the important advantage of immediately addressing the study's particular goals. The researcher utilized an ordinal scale to create closed-ended questions in this instance. Respondents were able to rank how much they agreed or disagreed with the variables that were presented using this scale. The study's main source of data came from these questionnaires, which were given to Ethiopian Airlines' MRO staff. The answers gathered from these surveys offered insightful information about how the staff members felt about different airline operations. The researcher may find patterns and opportunities for development by evaluating this data, which would ultimately help the business make better decisions.

3.7.2 Secondary Data

Encompasses information that has already been collected by others. This type of data serves valuable purposes in research. In this study, secondary data was used to validate and compare the findings from the primary data (questionnaires) with existing knowledge including library resources, international journals, research papers, relevant online sources (e-sources) and

previous history that was recorded and archived. This comparison not only strengthens the reliability of the research outcomes but also provides a broader context for understanding the implications of the primary data. By integrating secondary data, researchers can identify trends, patterns, and gaps in knowledge that may not be evident from the primary data alone.

3.7.4 Validity

"…validity is foremost on the mind of those developing measures and that genuine scientific measurement is foremost in the minds of those who seek valid outcomes from assessment." (Bond (2003, p. 179) comment). Validity is a complex concept regarding assessment results. It seen valuational judgement on the inference of assessment result or test score. These evaluation judgements need to be correct and reflective of the truth. This also refers to the appropriateness of the inference made about the result of an assessment. Validity, secondly a matter of degree and not specific value. Thirdly, it applied to specific purposes or use. validity is concerned with an evaluative judgment about an assessment.

When assessing the validity of research, there are two important factors to consider (Winter, 2000). First, how accurate are the tools used to acquire the data? Secondly, are these tools measuring the things they are supposed to measure? Ritchie and Lewis (2003) go on to say that the accuracy and correctness of the research findings are really what constitute research validity. These factors emphasize how crucial it is to use sound techniques and make sure the instruments are both dependable and pertinent to the research subject. Researchers can improve the overall integrity of the research process and increase the credibility of their findings by taking care of these factors.

Validity is addressed in this research by creating the instruments under the advisor's careful supervision. To pre-test the instrument, it is also working with six Ethiopian Airlines MRO staff on a pilot study. Finding any problems with the questionnaires, such as their phrasing, order, or clarity, was made possible by the pilot study.

Based on the pilot study results, it was made necessary modifications to the instrument. This included revising questionnaire formats and completely removing 11 unclear questions. Finally, the improved version of the questionnaire's link was distributed to the target respondents through email.

3.7.5 Reliability

Testing for reliability is important as it refers to the consistency across the parts of a measuring instrument (Huck, 2007). By creating cut-off points on the questionnaires and research participants and assigning ratings of mandatory, alert, or normally suggested, this study attempts to test reliability. Determining and comprehending even how to improve the research's high, moderate, and low reliability is made easier.

To measure data reliability, Cronbach's Alpha is used. Field (2006) highlighted that Cronbach's Alpha assesses the validity of the results, which should yield similar generalized results if the sample size is increased. The Alpha value ranges from a maximum of 1.0 for perfect reliability to a minimum of zero. According to Neuman (2007), a good measure of Alpha should be 0.70 or higher. William and Barry (2010) further specified that scales with a coefficient alpha between 0.80 and 0.96 have very good reliability, between 0.70 and 0.80 have good reliability, between 0.60 and 0.70 have fair reliability, and below 0.60 have poor reliability. Based on these criteria, the Cronbach's Alpha values for all the listed variables from the survey indicate good reliability, as shown in the table below.

Reliability Statistics

Reliability Statistics for	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Aircraft participation/age:	.702	.697	5
Project Team Performance Feedback	.985	.798	23
Causes of Redelivery Delays Feedback	.970	.970	13
Engine-Related Complications	.702	.764	8
Challenges for On-Time and On-Budget	.726	.717	5

Source: IBM SPSS Statistics, 2024

Model specification and Variables

The model specification could be approached using various methodologies depending on the type of analysis. In this study considered a Regression Model for predicting redelivery impact on costs, time and project outcomes. The variable of this model is classified by outcome variables

(aircraft model, aircraft age, recording and related disputes, and redelivery conditions), Lease terms (lease duration, maintenance requirements), Aircraft condition at redelivery (repair, modification status), Regulatory compliance (safety), Market conditions (aircraft demand), Coefficients (the strength of the relationship between independent and dependent variables). and Error term (random variation not captured by the model).

"**Aircraft Age and Model**" are key variables to consider in an aircraft redelivery project because they can significantly influence the outcome of the redelivery process, including redelivery costs, timeliness, condition at redelivery, and disputes. These variables have a direct relationship with the maintenance requirements, depreciation, performance, and market value of the aircraft at the time of redelivery.

Measurement: Years since aircraft manufacture or years since the aircraft was first delivered. (Old, Medium, New), Categorical variable representing different aircraft models (B737, B747, B757, B767, B777, B787)

Both aircraft age and aircraft model are crucial variables in an aircraft redelivery project, influencing costs, timeliness, and the likelihood of disputes. Older aircraft may require more maintenance and incur higher costs, while aircraft models with higher market demand may streamline the redelivery process. By quantifying these variables in a regression model.

"**Project Team Performance Feedback**" can be an important variable in the context of an aircraft redelivery project, as the team's ability to manage the complex tasks involved in aircraft redelivery (e.g., meeting deadlines, ensuring compliance, quality of repairs and maintenance, and communication) directly influences the overall success of the project. The feedback collected on the team's performance provides valuable insight into areas of strength and areas for improvement, which can affect both timeliness and cost-efficiency in the redelivery process.

Measurement: using quantitative approaches (Poor, Needs improvement, Satisfactory, Good,. Excellent).

Incorporating Project Team Performance Feedback as a variable in an aircraft redelivery project allows to assess how the team's efficiency, communication, and problem-solving abilities impact the redelivery outcomes. A positive feedback score is expected to correlate with lower costs,

fewer disputes, and timely redelivery, while negative feedback could indicate delays, higher costs, or disputes. By quantifying this variable and analyzing it in regression models.

"**Primary Cause of Redelivery Delay**" is a crucial variable in an aircraft redelivery project because it helps to identify and understand the factors that lead to delays in returning an aircraft to the lessor. Delays in redelivery can be costly and disruptive, affecting both the lessor and the lessee. By systematically identifying and measuring the primary causes of these delays, project managers can take corrective actions, optimize processes, and improve the efficiency of future redeliveries.

Measurement: Categorical (Late Engagement, Material Lead Time, Lack of Planning, Communication Between Parties, Travel/Mobility Restrictions, Disputes Over Aircraft Condition at Return, Unscheduled Repairs or Failed Borescope, Airline Prioritizing Operations Over Redelivery, Misalignment of Lessor Expectations, Lack of Resources, Disputes Over Lease Financial Terms, Disputes Over Aircraft Records Condition, and MXi Operating System Support Issues)

The Primary Cause of Redelivery Delay is an important variable to understand, measure, and track in an aircraft redelivery project. It can influence costs, timeliness, and the likelihood of disputes. By identifying the key factors behind delays, can take proactive steps to mitigate them and improve the overall efficiency of the redelivery process. Quantifying and categorizing these causes allow us to incorporate them into regression models to predict the effects of delays on project outcomes.

"**Engine-Related Complication**" is a crucial variable in an aircraft redelivery project since the aircraft engine is one of the most critical and complex components that directly impact the performance, safety, and overall condition of the aircraft. When issues arise with the engine, it can lead to significant delays, unexpected costs, and logistical challenges in meeting the redelivery requirements set out in the lease agreement.

Measurement: Categorical (shortly such as Mechanical failure, Engine overhaul, Engine performance degradation, Corrosion/wear, Parts replacement). Refer questionnaires for detail.

Engine-Related Complication as a variable in aircraft redelivery project provides valuable insight into how engine issues impact costs, timeliness, and disputes. By quantifying the frequency, severity, and type of engine complications, can predict their influence on the overall project and take preventive measures in future redeliveries. This variable helps identify areas for process improvement, ensuring that redelivery is conducted efficiently and in compliance with contractual obligations.

"**Challenges for On-Time and On-Budget Delivery**" is an important variable to consider in an aircraft redelivery project, as it directly affects the success of the redelivery process. The ability to meet on-time and on-budget targets is a key objective for both lessors and lessees, and understanding the challenges faced in achieving these objectives can provide valuable insights for improving future aircraft redelivery projects.

Measurement: Categorical (Engines, Record Accuracy and Completeness, Structural Damage, Material Lead Times, Certification/Modifications, Component Life Requirements)

"Challenges for On-Time and On-Budget Delivery" variable is a significant factor in understanding the complexities of aircraft redelivery projects. By identifying the key challenges, such as maintenance issues, supply chain disruptions, and regulatory delays, and measuring their frequency, severity, and impact on the project, can develop strategies to mitigate these challenges in future projects. This helps to ensure smoother and more predictable redelivery processes, ultimately benefiting both lessors and lessees.

3.8 Data Analysis

Quantitative methods including regression analysis, correlation analysis, and descriptive statistics are used in data analysis. This method makes it possible to examine the interactions between variables in a sophisticated way and makes it easier to generate ideas that can be put into practice. Analysts can use these methods to spot patterns, forecast outcomes, and guide strategic choices. Furthermore, incorporating qualitative data into the study might improve it and give a more thorough grasp of the underlying causes of the patterns that have been noticed. The Statistical program for Social Sciences (SPSS) (IBM SPSS Statistics) application software program was used to analyze the questionnaire data. According to the researcher, SPSS is a simple and accessible analysis tool for both descriptive and inferential statistics. Data.

Furthermore, the software offers a strong platform for carrying out different statistical tests, allowing the researcher to effectively extract significant insights from the data gathered. Many people in the social sciences choose SPSS because of its accessibility and user-friendliness.

Thomas (2020), quoting Boone and Boone (2012), states that data from the Likert scale are examined using the interval measurement scale. Consequently, the interval scale is used to assess the composite score for Likert scales. Standard deviations are used for variability and means for central tendency in descriptive statistics for items on interval scales. The statistical package for social sciences (SPSS) software (IBM SPSS Statistics) is used in inferential statistical analysis to use correlation and multiple linear regression techniques. P-values are used to measure statistical significance, which enables researchers to evaluate the degree of correlation between variables. In social science research, this thorough method facilitates a deeper comprehension of the data and promotes stronger findings.

3.9 Ethical Considerations

Ethical guidelines such as informed consent, confidentiality, and respect for the autonomy of participants were maintained throughout the entire research procedure. Measures were put in place to reduce potential hazards and protect participants' welfare, and ethical approval was acquired from the appropriate institutional review boards (American Psychological Association, 2017, pp 4-5). By taking these safeguards, the study was able to uphold the highest standards of honesty and reliability while permitting subjects to participate freely and candidly. In addition, the researchers kept a close eye on the study's effects and were prepared to handle any unanticipated ethical problems that might come up while the study was being conducted.

Every participant will be asked for their informed consent. Additionally, the anonymity of the data will be maintained during the entire research process. This will entail keeping all personal data safe and granting only authorized people access. Participants will also have the freedom to leave the study at any moment without facing any consequences.

The applicable institutions' ethical standards will be adhered to. This guarantees that every research is carried out in accordance with accepted norms of accountability and integrity. Our goal is to safeguard the rights and welfare of all parties concerned by giving ethical issues top priority.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

4.1 Introduction

This chapter provides a thorough analysis of the findings and describes the methodology used to arrive at them. To put the data in context, it starts by giving background information on the respondents. The chapter then goes into further depth about the descriptive analysis, including the many statistical techniques that were employed to examine the data. A comprehensive assessment of the results, emphasizing significant themes and patterns that arose from the investigation, closes the chapter. It also discusses the study's possible shortcomings and offers directions for further research to expand on these findings.

It covers correlation analysis and multiple regression analysis in detail, both of which were carried out with SPSS version 20. These analyses' outcomes are then carefully contrasted with those of previous empirical research to see if they support or contradict previous conclusions.

Ethiopian Airlines MRO staff made up the study's sample, guaranteeing that the results are applicable to this population. In addition to validating the data, this comparative method places them in the larger framework of relevant research, offering a thorough and solid comprehension of the findings.

4.2 Response Rate

A total of 320 individuals were sent the questionnaire via email to answer honestly; 258 (80.5%) of them returned it, and the results were examined using both descriptive and inferential statistics. For research, a response rate of 70% or higher is deemed excellent (Saunders, et al. 2007).

4.3 Demographic data of respondents

Employees of Ethiopian Airlines make up the respondents to this distributed questionnaire, which represents a wide range of demographics. To comprehend the context of the responses and make sure the study takes into consideration all the variables that could affect employee views

and experiences, demographic data collection is crucial. Key characteristics including age, sex, section/department, years of experience (years spent on the job) with the airline, current position, and education/training are all included in the demographic section of the questionnaire. This data enables a more sophisticated assessment of the data and gives a view of the makeup of the workforce. The table below describes the fundamental features of the sample data:

Variable	Group	Frequency	percent
Age	23-28	48	18.6
	29-34	94	36.4
	35-40	63	24.4
	41-45	53	20.5
	Total	258	100
Sex	Male	237	91.9
	Female	21	8.1
	Total	258	100
Location	Maintenance (Hangar & shop)	145	56.2
	Engineering	61	23.6
	Documentation/ Record	32	12.4
	Planning	20	7.8
	Total	258	100
Service year on current position	0-5	15	5.8
	6-10	141	54.7
	11-15	68	26.4
	16-20	34	13.2
	Total	258	100
Position	Assistant	21	8.1
	Professionals (level I.II, III, IV)	178	69.0
	Expertise	50	19.4
	First level leaders	9	3.5
	Total	258	100

Respondents profile summary

4.5 Data Interpretation of Frequency and Percentages

The data is being categorized both physically and demographically (age, sex, interval, department/section, years of experience, and employment position) to be interpreted. Aircraft Participation (aircraft type, aircraft age), Role on Redelivery Project (role during the redelivery project in the space), Project Team Performance Feedback(experience working with teams/roles during the aircraft redelivery process), Causes of Redelivery Delays (indicate the significant factors in causing delays), Challenges for On-Time and On-Budge (areas most challenging for redelivering aircraft on time and within budget), Engine-Related Complications (indicate engine-related issues contribute to redelivery complications), Engagement Timeline (redelivery project process typically begins), Frequency of Missed Return Conditions (return conditions fall short), Lessee Feedback and Key Challenges for Lessees. Each category provides insights into the demographics and professional characteristics of a group of 258 individuals.

Age Interval: - From the data statistics result, below age 23-28: 48 individuals (18.6%), age 29-34: 94 individuals (36.4%), age 35-40: 63 individuals (24.4%) and age 41-45: 53 individuals (20.5%).

Analysis: Most participants are between the ages of 29 and 34, suggesting a young workforce. Those between the ages of 23 and 28 have a very low percentage (18.6%), followed by those between the ages of 35 and 40 (almost 24.4%) and those between the ages of 41 and 45 (20.5%).

This suggests that the MRO work force may have a predominantly young workforce with fewer employees in older age brackets or more senior (elder age) teams in the redelivery project.

Sex: - Male: 237 individuals (91.9%) and Female: 21 individuals (8.1%)

Analysis: With men making up more than 91.9% of the entire population examined, the gender distribution in this dataset demonstrates a notable male dominance. This highlights possible areas for improvement the next time and calls into question the gender diversity of the MRO department's participants in the aircraft return condition project.

Location: The individuals found in each department under Maintenance: 145 individuals (56.2%), Engineering: 61 individuals (23.6%), Documentation/Record: 32 individuals (12.4%), and Planning: 20 individuals (7.8%).

Analysis: - With more than half of the redelivery project workforce employed in maintenance, employee distribution demonstrates the importance of this area. While the smaller percentages in Engineering, Documentation/Record, and Planning indicate specialized roles that support the project manager's and overall project, this allocation suggests a priority on physical work efficiency takes place in the project management and to meet lease agreement and lessor interest.

Service year on current position: - From an experience point of view, 0-5 years: 15 individuals (5.8%), 6-10 years: 141 individuals (54.7%), 11-15 years: 68 individuals (26.4%), and 16-20 years: 34 individuals (13.2%).

Analysis: - This distribution highlights a significant concentration of individuals with 6–10 years of experience, suggesting that this group may possess a substantial level of expertise on the redelivery project. Additionally, the data indicates a gradual decline in the number of individuals as experience increases beyond 10 years, which could reflect various factors such as career transitions, resignations, or retirements from concerned or stakeholder departments.

Position: - The project's respondent position point of view reveals that there are nine first-level leaders (3.5%), 178 professionals (levels I, II, III, and IV) (69.0%), 50 experts (19.4%), and 21 assistant-level people (8.1%).

Analysis: This distribution shows that there are a lot of professionals working on the project, emphasizing how important qualified people are to its success. The very low proportion of first- and assistant-level leaders points to a system that values seasoned workers over entry-level positions. Therefore, meeting aviation aircraft return condition standards does not demonstrate a lack of professionalism on the part of the project manager and its created team.

Aircraft Type: - Respondents Among those who had experience, 258 (100%) had returned B737 aircraft, 38 (14.7%) had returned B757 aircraft, and 106 (41.1%) had returned B767 aircraft. From these responses, the total number of responses is 402. It means 144 respondents work with more than one type of aircraft redelivery project.

Analysis: - The respondents' varied exposure to the many Boeing aircraft types is highlighted by this wide variety of experience. Such information can be very helpful for professionalism and

shows that there is a lack of experienced B757 and B767 individuals. This indicates that 144 respondents have experience with a variety of aircraft redelivery projects. This shows that the responders have a wide range of experience, underscoring the complexity and diversity of the aircraft redelivery projects they oversee.

Aircraft age: - Respondents that participate in redelivery projects experienced on old aircraft 14 (5.4%) individuals, on medium-age aircraft 215 (83.3%) individuals, and on new aircraft 14 (5.4%) individuals.

Analysis: - This distribution suggests that most respondents were engaged with medium-age aircraft, highlighting a potential area of focus for maintenance and operational improvements. Additionally, the low participation rates for both old and new aircraft indicate a need for further research into the factors influencing these engagement levels, and related to the above one, most B737 aircraft failed on medium-age aircraft.

Project Team Performance Feedback: - Individuals evaluate their perspective of the current and previous aircraft redelivery (aircraft return condition) project performances and give feedback. 28(10.9%) individuals give feedback on the project manager as poor position, 58(22.5%) suggest need improvement for the project manager, 88(34.1%) respondent feedback as the project manager on good performance, and 14(5.4%) feedback an excellent performance for the project manager.

Analysis: - This feedback highlights a diverse range of opinions regarding the project manager's effectiveness, indicating both strengths and areas for growth. Overall, it suggests that while a significant portion of individuals recognize good performance, there is a clear call for improvement from nearly half of the respondents, which could inform future training and development initiatives.

Performance feedback on	poor		Need improvement		satisfactory		Good		Excellent	
	I	%	I	%	I	%	I	%	I	%
Redelivery Project Manager	32	12.4	56	21.7	77	29.8	82	31.8	11	4.3
Assis. Redelivery Project Manager	34	13.2	56	21.7	75	29.1	83	32.2	10	3.9
Aircraft Maintenance Planning	34	13.2	104	40.3	39	15.1	46	17.8	35	13.6
Aircraft Maintenance Program Engineering	66	25.6	77	29.8	22	8.5	56	21.7	37	14.3
Aircraft Record Control	105	40.7	72	27.9	32	12.4	38	14.7	11	4.3
Aircraft Task Card Engineering	43	27.9	14	23.3	57	12.0	29	22.9	36	14.0
Ethiopian MRO Documentation	64	24.8	79	30.6	20	7.8	45	17.4	50	19.4
Aircraft Airframe Systems Engineering	4	1.6	35	13.6	117	45.7	43	16.7	58	22.5
Aircraft Avionics Systems Engineering	0	0.0	65	25.2	94	36.4	13	5.0	86	33.3
Aircraft Cabin/IFE Systems Engineering	0	0.0	94	36.4	51	19.8	37	14.3	76	29.5
Power plant Systems Engineering	27	10.5	52	20.2	106	41.1	25	9.7	48	18.6
Component Maintenance Overall Manager	0	0.0	48	18.6	107	41.5	65	25.2	38	14.7
Aircraft Base Maintenance Project Manager	10	3.9	77	29.8	101	39.1	25	9.7	45	17.4
Certifying Staff (CAT C)	1	0.4	106	41.1	72	27.9	31	12.0	48	18.6
Aircraft Structure Engineering	1	0.4	48	18.6	116	45.0	63	24.4	30	11.6
Production Planner	1	0.4	72	27.9	84	32.6	59	22.9	42	16.3
Avionics Maintenance	29	11.2	74	28.7	72	27.9	33	12.8	50	19.4
Cabin Maintenance	19	7.4	42	16.3	110	42.6	49	19.0	38	14.7
Aircraft Structure Maintenance	1	0.4	52	20.2	104	40.3	65	25.2	36	14.0
Engine Shop Overhaul Manager	1	0.4	100	39.1	96	37.2	58	22.5	2	0.8
Power plant Inspection	0	0.0	81	31.4	105	40.7	39	15.1	32	12.4
Engine Maintenance Technical Support Engineering	0	0.0	73	28.3	99	38.4	46	17.8	40	15.5
QA MRO	0	0.0	69	26.7	149	57.8	13	5.0	27	10.5

As the project performance feedback indicates for project members and the department they represent, 472 respondents give poor project performance (8.4% on average), 1546 give "need improvement" (26.8% on average percentile), 1905 say the project performance is satisfactory (31.6%), 1043 say the project is performing well (18.1% on average percentile), and 886 say the project is performing "excellently" (14.9% on average percentile).

This feedback distribution points to a big chance for focused actions meant to boost project performance. Departments can create specialized strategies to increase outputs and results overall by concentrating on the areas where respondents indicated a need for improvement. This outcome aids in the evaluation of cost, schedule, and deliverables, among other project performance measurement techniques that lead to project performance analysis.

Challenges for On-Time and On-Budget: - The engine case accounts for 157 (30%) of the first most challenging for delivering aircraft on time, according to the responses of 523 respondents. The next highest on-time redelivery challenge is the record-related case, which receives 142 (27.2%) of the responses; structural damage accounts for 70 (13.4%), material lead time delay for 56 (10.7%), modification certificate delay for 56 (10.7%), and component-related challenges for delivering aircraft on time is 42 (8.0%)

Analysis: - These findings highlight the critical areas that require attention to mitigate delays in the process. By addressing the engine case and record-related issues, organizations can significantly enhance their operational efficiency and reduce turnaround times.

Redelivery time prior begins: - response to promptly begin the project before the deadline 47 (18.2%) respondents select 9 months before the due date, 77 (29.8%) select 6 months before the due date, and 68 (26.4%) recommend 12 months before the due date. 18% of respondents recommend 3 months, while the remaining 19 (7.4%) believe that a year prior to the deadline and less than three months is sufficient to demonstrate an efficient handover.

Analysis: - This data indicates a clear preference for starting the project well in advance of the deadline, with most respondents advocating a timeline of at least six months. Such early engagement could facilitate smoother transitions and allow for any necessary adjustments along the way, ultimately enhancing project outcomes.

Experience on Frequency of Missed Return Conditions: - The percentage of respondents who look at how frequently return conditions fall short is as follows: 33 (12.8%) never fall short, 142 (55%) very often fall short, 66 (25.6%) sometimes fall short, and 17 (6.6%) rarely fall short.

Analysis: - This data highlights a significant concern regarding return conditions, as most respondents indicate that these conditions frequently fail to meet expectations. Understanding the underlying reasons for these shortcomings may help organizations improve their return policies and enhance customer satisfaction.

For the questionnaire, "What are the key challenges your team faces during the redelivery process?" Respondents emphasize on:

- time,
- documentation and inventory,
- Shortage of manpower for physical work,
- The agreement consistently disadvantages ETH, with poor management and unresolved escalated issues. Additionally, the lessor often raises unreasonable requests, seemingly as a tactic to delay the process.
- Lack of documentation and traceability.
- Lack of awareness of lease return condition especially on life limited aircraft end engine parts.
- Unorganized project plan and execution.
- Lack of teamwork and collaboration between technical sections.
- multiple assignments.
- There is no clear re delivery standards, parts and materials longest lead time, short TAT.
- knowing the responsibility.
- Unscheduled plan and inappropriate completion of documents.
- Lesser acceptance of the work done.

4.6 Data Analysis, Interpretation and Discussion

Regarding the performance evaluation and its effect on redelivery, respondents were asked to rate their agreement or disagreement with several research questions. For this, a 36-point Likert scale was employed, with 1 representing poor/very significant and 5 representing excellent/not significant. The intermediate choices were 2 (need improvement/significant), 3 (satisfactory/moderately significant), and 4 (good/slightly significant). The respondents' attitudes and the strength of their comments about the assessment system and the MRO aircraft return condition project experience are captured by this scaling approach. This method not only provides a quantitative measure of respondents' perceptions but also allows for a nuanced understanding of their feedback. By analyzing the results, researchers can identify specific areas requiring attention and improvement, ultimately enhancing the overall effectiveness of the assessment system.

Descriptive Statistics

Variable Mean and standard deviation

Variables	N	Mean	Standard deviation
Aircraft Participation/Age	258	2.6378	.63282
Project Team Performance Feedback	258	2.5835	.69072
Primary Causes of Redelivery Delays	258	2.6156	.63187
Engine-Related Complications	258	2.5355	.58397
Key Challenges for On-Time and On-Budget	258	2.6907	.59429

Source: IBM SPSS Statistics, 2024

To understand the impact of the project performance evaluation system on aircraft return condition, particularly in the context of Ethiopian Airlines Maintenance, Repair, and Overhaul (MRO), the provided data is analyzed per below. The variables presented include average Role on Redelivery Project, Project Team Performance Feedback, Causes of Redelivery Delays, Challenges for On-Time and On-Budget, and a dependent variable representing overall redelivery condition performance. By examining these variables, we can identify key factors that

influence the efficiency and effectiveness of the redelivery process. This analysis aims to uncover patterns that may inform improvements in MRO practices, ultimately enhancing the operational reliability of Ethiopian Airlines' fleet.

4.7 Interpretation of Results

All the factors' means fall somewhere in the middle (between 0.0 and 3.0), indicating that Ethiopian Airlines MRO staff members typically view their performance review system as being neither totally ineffective nor very clear. Although there is room for change, this nuanced view shows that employees see some benefits in the current system. Management may think about asking for input to pinpoint areas that need improvement or clarification to increase engagement and satisfaction.

Aircraft Participation

Many project participants are on the B737, as indicated by the comparative mean for average aircraft type (2.6378), and the project difficulty and differentiation are typically evident on this aircraft redelivery project. This suggests that the operational area's responsible parties need to take some sort of action. Nonetheless, it can be deduced from the standard deviation that most actions must take place in the same airplane locations. This implies that some problems pertaining to the B737 redelivery procedure call for a focused effort. Project participants can improve overall efficiency and guarantee more seamless operations going forward by concentrating on the areas that have been highlighted.

Project Team Performance Feedback

The redelivery performance feedback mean (2.5835) suggests that there may be communication between project management and MRO management on performance standards and possibilities for growth that are essential to improving aircraft return condition. This disparity could impede cooperative attempts to increase operational efficiency and result in misconceptions regarding priorities. Goal alignment and making sure both teams are successfully pursuing the same objectives depend on closing these gaps.

Primary Causes of Redelivery Delays

With reward and recognition scoring less performance feedback but still at a medium average (mean = 2.6156), it implies that while some acknowledgement exists within the organization, it may not be sufficient to motivate project members effectively or foster high levels of engagement. This suggests that the organization may need to enhance its strategies for recognizing and rewarding contributions to ensure that team members feel valued. By implementing more robust recognition programs or providing timely feedback, the organization could potentially boost morale and drive better performance outcomes.

Key Challenges for On-Time and On-Budget:

The mean score (2.691) for challenge-based evaluations suggests significant room for improvement in how challenges are assessed; this could lead to more document recording practice and commitment among team members that their skills are undervalued or inadequately recognized. To address this issue, by doing so, teams can enhance motivation and encourage a more collaborative environment, ultimately leading to better performance outcomes.

In summary, while Ethiopian Airlines MRO should establish a redelivery project process performance evaluation system, its current state appears insufficiently effective based on respondent perceptions across key metrics (questionnaires) such as aircraft type and age sections, project team performance feedback, causes of redelivery delays, and key challenges for on-time and on-budget. Addressing these concerns could significantly enhance both individual members satisfaction and overall aircraft return condition.

Outliers' assumption

The outlier assumption is a common requirement in many statistical tests used in research. It refers to the idea that the errors (or residuals) of a statistical model are independent and normally distributed around a mean of zero (Field, 2013).

First, this study assessed univariate outliers in the data set. Univariate outliers were examined by standardized Z scores within ± 3.29 range. However, the result of standardized Z-scores indicated that all cases of extreme univariate outliers (above ± 3.29) needed to be removed. This removal process ensured that the data set was refined and more representative of the underlying

population. Subsequently, further analyses could be conducted on the adjusted data to draw more accurate conclusions about the research questions posed.

Univariate outliers

Variables	Z-standard		
	N	Min	Max.
Aircraft Participation/Age	258	0.00	1.00
Project Team Performance Feedback	258	2.14	3.027
Primary Causes of Redelivery Delays	258	-2.09	1.67
Key Challenges for On-Time and On-Budget	258	-1.609	2.263
Engine-Related Complications	258	-0.235	2.173
Note: n=258; if Z value out of interval ±3.29n is considered as outlier.			

Source: IBM SPSS Statistics, 2024

Normality assumption

The normality assumption is a fundamental concept underlying many statistical tests employed in research. It posits that the errors (or residuals) of a statistical model are normally distributed around a mean of zero (Sekaran & Bougie, 2016).

The assumption states that the analysis's mistakes should be distributed in a bell-shaped curve, with most of them centered around the mean and fewer at the extremes. Skewness and kurtosis values, which must fall within 1 and 3, respectively, are used to evaluate the normality assumption for the responses. In addition to the idea of normalcy, skewness and kurtosis are statistical measurements that characterize the form of a data distribution. These metrics provide insights into the asymmetry and peaked ness of the distribution, allowing researchers to determine whether the data meets the necessary conditions for various parametric tests. Understanding these characteristics is crucial for ensuring the validity of the analytical results and making informed decisions based on the data.

Skewness:

Skewness measures the asymmetry of a distribution. Imagine a bell curve representing a normal distribution. A perfectly symmetrical distribution would have a skewness of zero. However, real-world data often deviates from this ideal. The positive skewness distribution has a longer tail on the right side, indicating more frequent values above the mean. (Think of a distribution tilted to the left). And the negatively skewed distribution has a longer tail on the left side, with more frequent values below the mean. (Think of a distribution tilted to the right) (Howell, 2011). If values are closer to zero, they indicate a more symmetrical distribution. very high positive or negative skewness suggests a significant deviation from normality. This can have important implications for statistical analysis, as many statistical tests assume a normal distribution. When skewness is substantial, researchers may need to consider data transformation or use non-parametric methods to achieve valid results.

Kurtosis:

Kurtosis measures the "peakedness" or "tailedness" of a distribution compared to a normal curve. There are different types; mesokurtosis (normal kurtosis) has a peaked ness like a normal curve in its data distribution. Leptokurtic (high kurtosis) data distribution has a sharper peak, and heavier tails compared to a normal curve. (Imagine a distribution with a sharper center and more extreme values). Platy kurtosis (Low Kurtosis): The distribution has a flatter peak, and lighter tails compared to a normal curve. (Imagine a distribution with a broader center and fewer extreme values) (Field, 2013). If values are closer to 3 (the theoretical kurtosis of a normal distribution), they indicate a distribution closer to normal in terms of peaked ness. Extremely high or low kurtosis values suggest a significant departure from normality. This departure can impact statistical analyses, as many parametric tests assume normality in the data. Consequently, it is crucial for researchers to assess kurtosis along with other measures of distribution shape, such as skewness, to fully understand the characteristics of their dataset.

Variables	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Aircraft Participation/Age	258	0.347	0.152	0.458	0.302
Project Team Performance Feedback	258	-0.033	0.152	2.008	0.302
Primary Causes of Redelivery Delays	258	0.477	0.152	-0.632	0.302
Engine-Related Complications	258	-0.156	0.152	0.058	0.302
Key Challenges for On-Time and On-Budget	258	0.244	0.152	-2.199	0.302

Source: IBM SPSS Statistics, 2024

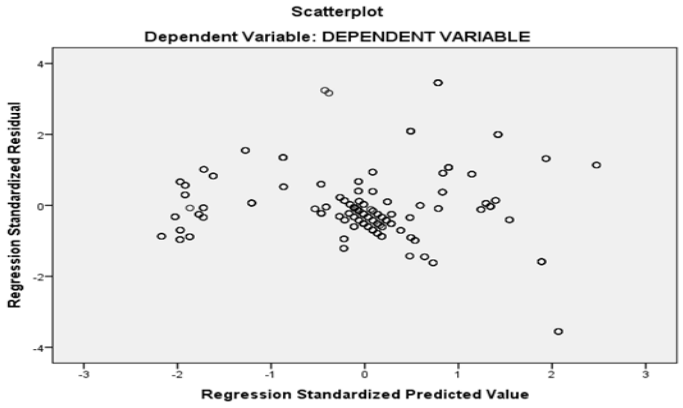
From the above SPSS data, all variables show skewness values that are relatively close to zero, indicating that none exhibit extreme asymmetry. And the kurtosis values for all variables are below 3, suggesting that they have lighter tails compared to a normal distribution.

Based on these analyses, the distributions for all variables can be considered approximately normal due to their low skewness and kurtosis values being less than three. Generally, while there are slight deviations from perfect normality (particularly in terms of kurtosis), overall, these variables can be treated as normally distributed for practical purposes in statistical analysis.

Heteroscedasticity

Heteroscedasticity is a term used in regression analysis to describe a situation where the variance of the errors (residuals) is not constant across all levels of the independent variable(s). In simpler terms, the spread of the data points around the best-fit line is not consistent (Field, 2013). The assumption of homoscedasticity (constant variance) is often made in regression analysis. When heteroscedasticity is present, it can lead to several issues, such as unreliable standard errors, invalid p-values, and inefficient estimates. Plotting the residuals against the predicted values is one way of identifying heteroscedasticity. Look for patterns in the spread of the residuals. A random scatter suggests homoscedasticity, while funnel-shaped or fan-shaped patterns indicate heteroscedasticity. To address heteroscedasticity, researchers may consider transforming the dependent variable or using weighted least squares regression. Additionally, robust standard errors can be employed to mitigate the impact of non-constant variance on statistical inference.

The homoscedasticity assumption can be verified by visually examining a plot of the standardized residuals against the regression standardized predicted values (Osborne & Waters, 2002). In the below Figure, the scatterplots show that the data distribution is randomly scattered with an even spread of residuals at all predicted values. This suggests that homoscedasticity, or equal variance of errors across all levels of the independent variables, is present. Hence, the assumption of homoscedasticity for the variables is satisfied (Hair et al., 2010).



Homoscedasticity Scatter plot

Source: IBM SPSS Statistics, 2024

Multi-collinearity

Multi-collinearity is a significant concern in regression analysis, a statistical method used to model the relationship between a dependent variable and one or more independent variables. It arises when there's a high degree of correlation between the independent variables themselves (Hair et al., 2019). Imagine two independent variables that almost perfectly predict each other. This creates a situation where it becomes difficult to isolate the unique effect of each variable on the dependent variable.

Evaluation of Collinearity in the Provided Data: - To evaluate collinearity in the provided on the above regression output, it must analyze the key statistics: Tolerance and Variance Inflation Factor (VIF). These metrics help determine whether independent variables are highly correlated with each other, which can affect the stability and interpretability of regression coefficients. In this statistic Tolerance indicates how much of the variance in a particular independent variable is

not explained by other independent variables in the model. A tolerance value close to 0 suggests high multicollinearity.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.423	.078		5.392	.000		
	Aircraft Participation/Age	.258	.051	.275	5.038	.000	.257	3.886
	Project Team Performance Feedback	.183	.046	.213	4.020	.000	.273	3.663
	Engine-Related Complications	.419	.052	.445	8.081	.000	.253	3.959
	Key Challenges for On-Time and On-Budget	.007	.043	.007	.162	.872	.422	2.371

Source: IBM SPSS Statistics, 2024

Variance Inflation Factor (VIF): VIF is calculated as VIF=1/Tolerance. A VIF value greater than 10 is often considered indicative of significant multicollinearity.

Let's break down the collinearity statistics for each variable:

1. Aircraft Participation/Age: Tolerance: 0.257; VIF: 3.886: The tolerance value of 0.257 indicates that about 25.7% of the variance in this variable is not explained by other predictors, suggesting moderate independence from other variables. The VIF of 3.886 is below the threshold of 10, indicating no serious multicollinearity issues.
2. Project Team Performance Feedback: Tolerance: 0.273; VIF: 3.663: Like the previous variable, a tolerance of 0.273 suggests that approximately 27.3% of its variance is unique, while a VIF of 3.663 also indicates no significant multicollinearity.
3. Engine-Related Complications: Tolerance: 0.253; VIF: 3.959: With a tolerance value of 0.253, this variable has about 25.3% unique variance, and a VIF of 3.959 confirms that it does not exhibit problematic multicollinearity.

4. Key Challenges for On-Time and On-Budget: Tolerance: 0.422; VIF: 2.371: This variable shows a higher tolerance at 0.422, meaning it has more unique variance compared to others, and its VIF value of 2.371 further supports that there are no significant collinearity concerns.

Based on the above analysis, all variables have tolerances above the critical threshold (typically >0.1), indicating they are reasonably independent. And all VIF values are below the common cut-off point (10), suggesting that there is no severe multicollinearity issues present among these predictors. In general, while some correlation may exist among these independent variables, it does not appear to be strong enough to warrant concern regarding collinearity affecting model estimates or interpretations.

Linear Regression:

To check the linearity assumption, regression analysis was performed and the scatter plot of residuals revealed that multivariate relationship was linear. Linear regression is a statistical method used to model the relationship between a dependent variable (the variable you're trying to predict) and one or more independent variables (the variables you believe influence the dependent variable). Linear regression assumes a linear relationship between the independent and dependent variables. This means that for any change in the independent variable(s), there is a corresponding straight-line change in the dependent variable. However, it's crucial to verify the linearity assumption before interpreting the results of a linear regression analysis (Field, 2013). The below is to visually inspect a scatter plot of the independent variable(s) vs. the dependent variable. Look for a pattern that resembles a straight line. Deviations from a straight line suggest potential non-linearity.

Residual Value:

Residuals are a crucial concept in regression analysis. They represent the difference between the observed values of the dependent variable (what is trying to predict) and the predicted values generated by the regression model (Field, 2013). In simpler terms, residuals tell how much each data point deviates from the best-fit line in a linear regression model. Here the below is the result from SPSS data.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.881[a]	.777	.774	.28268	2.425

Source: IBM SPSS Statistics, 2024

To evaluate the provided data for residual value, we need to analyze each component of the output given. The data includes several statistical metrics that are commonly used in regression analysis. Here's a breakdown of each component:

Model: This indicates the specific model being evaluated. In this case, it appears to be a single regression model.

R Square (R^2): The R^2 value is 0.777, which means that approximately 77.7% of the variance in the dependent variable can be explained by the independent variables included in the model. This is a strong indication that the model fits the data well, as values closer to 1 suggest a better fit.

Adjusted R Square: The adjusted R^2 is 0.774, which adjusts the R^2 value based on the number of predictors in the model relative to the number of observations. This metric is particularly useful when comparing models with different numbers of predictors; it penalizes excessive use of uninformative predictors and provides a more accurate measure of goodness-of-fit.

Standard Error of the Estimate: The standard error is reported as 0.282682, which quantifies how much the observed values deviate from the predicted values by the regression model on average. A lower standard error indicates that predictions are closer to actual outcomes.

Durbin-Watson Statistic: The Durbin-Watson statistic is 2.425, which tests for autocorrelation in residuals from a statistical regression analysis. Values close to 2 suggest no auto correlation; values below 1 or above 3 indicate potential issues with autocorrelation in residuals. A value of 2.425 suggests that there may not be significant autocorrelation present.

Summary Evaluation

- The R^2 and Adjusted R^2 values indicate a strong explanatory power for this regression model.
- The Standard Error suggests reasonable accuracy in predictions.

- The Durbin-Watson statistic implies that there is likely no significant autocorrelation among residuals, which supports valid inference from this model.

In conclusion, based on these statistics, we can infer that this regression model has a good fit and reliability for predicting residual values related to whatever dependent variable was analyzed.

ANOVA Test

ANOVA test table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	80.935	4	20.234	253.207	.000[b]
	Residual	23.254	254	.080		
	Total	104.189	258			

a. Dependent Variable: Primary Causes of Redelivery Delays

b. Predictors: (Constant), Aircraft Participation/Age AND Key Challenges for On-Time and On-Budget, Aircraft Participation/Age, Engine-Related Complications

Source: IBM SPSS Statistics, 2024

The ANOVA table provides valuable information regarding the overall fit of the regression model. The analysis involves a dependent variable, identified as Primary Causes of Redelivery Delays and four predictors: Aircraft Participation/Age, Project Team Performance Feedback, Key Challenges for On-Time and On-Budget AND Engine-Related Complications. Here is a detailed interpretation of the given data.

The model summary shows the regression and residual components. For the regression, the sum of squares is 80.935, with 4 degrees of freedom (df). This indicates the variation in the dependent variable that is explained by the independent variables in the model. The mean square for the regression is calculated as 20.234 by dividing the regression sum of squares by its degrees of freedom (80.935 / 4). The F-value, which measures the overall significance of the model, is 253.207. This high F-value suggests that the model explains a significant portion of the variation in the dependent variable. The significance level (Sig.) associated with the F-value is .000, indicating that the regression model is statistically significant ($p < 0.05$) (Field, 2013; Pallant, 2020).

The residual, or error term, shows a sum of squares of 23.254 with 254 degrees of freedom. This represents the variation in the dependent variable that is not explained by the model. The mean

square for the residuals is 0.092, calculated by dividing the residual sum of squares by its degrees of freedom (23.254 / 254).

The total sum of squares, which combines the regression and residual sums of squares, is 104.189 with 258 degrees of freedom. This represents the total variation in the dependent variable. The degrees of freedom for the total sum of squares are the total number of observations minus one.

To summarize, the regression sum of squares (80.935) indicates the variation explained by the model, while the residual sum of squares (23.254) represents the unexplained variation. The total sum of squares (104.189) shows the overall variation in the dependent variable. The F-value of 253.207, derived from the mean squares, is a crucial statistic that indicates the model's explanatory power. The p-value of .000 signifies that the regression model is statistically significant, suggesting that the independent variables collectively have a significant impact on the dependent variable.

In conclusion, the ANOVA table confirms that the regression model is statistically significant, as evidenced by the high F-value and the p-value less than 0.05. This indicates that the predictors (aircraft participation/age, project team performance feedback, primary causes of redelivery delays, and key challenges for on-time and on-budget) collectively explain a substantial portion of the variance in the dependent variable.

Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.423	.078		5.392	.000
	Aircraft participation/age	.258	.051	.275	5.038	.000
	Project team performance feedback	.183	.046	.213	4.020	.000
	Engine-Related Complications	.419	.052	.445	8.081	.000
	Key Challenges for On-Time and On-Budget	.007	.043	.007	.162	.872

Source: IBM SPSS Statistics, 2024

Table: Regression Coefficients

The multiple regression analysis's coefficients, including the unstandardized and standardized coefficients, t-values, and significance levels (p-values), are shown in the table. The purpose of this analysis is to determine how various predictors affect the dependent variable. Researchers can ascertain which predictors have the greatest impact on the dependent variable and whether these effects are statistically significant by looking at the coefficients. Future studies and real-world applications in the sector can be guided by this realization.

The dependent variable in this model is labelled as primary causes of redelivery delays, with predictors including Project team performance feedback, Aircraft participation/age, and Key Challenges for On-Time and On-Budget. The constant (intercept) has an unstandardized coefficient (B) of 0.423, a standard error of 0.078, a t-value of 5.392, and a significance level (p-value) of 0.000. This indicates that when all independent variables are zero, the predicted value of the dependent variable is 0.423. The intercept is statistically significant, as its p-value is less than 0.05 (Field, 2013).

For the predictor **Aircraft participation/age**, the unstandardized coefficient (B) is 0.258, with a standard error of 0.051, a standardized coefficient (Beta) of 0.275, a t-value of 5.038, and a significance level (p-value) of 0.000. A 1 percent increase in the average clarity of performance objectives is associated with a 0.258-unit increase in the dependent variable. The standardized coefficient indicates the relative importance of this predictor. This predictor is statistically significant, with a p-value less than 0.05.

Project team performance feedback has an unstandardized coefficient (B) of 0.183, a standard error of 0.046, a standardized coefficient (Beta) of 0.213, a t-value of 4.020, and a significance level (p-value) of 0.000. A 1 percent increase in feedback and development is associated with a 0.183-unit increase in the dependent variable. The standardized coefficient indicates the relative importance of this predictor. This predictor is statistically significant, with a p-value less than 0.05.

Engine-Related Complications show an unstandardized coefficient (B) of 0.419, a standard error of 0.052, a standardized coefficient (Beta) of 0.445, a t-value of 8.081, and a significance level (p-value) of 0.000. A 1 percent increase in reward and recognition is associated with a 0.419-unit increase in the dependent variable. The standardized coefficient indicates that this is

the most influential predictor among those listed. This predictor is statistically significant, with a p-value less than 0.05.

Key Challenges for On-Time and On-Budget has an unstandardized coefficient (B) of 0.007, a standard error of 0.043, a standardized coefficient (Beta) of 0.007, a t-value of 0.162, and a significance level (p-value) of 0.872. A 1 percent increase in competency-based evaluation is associated with a negligible 0.007-unit increase in the dependent variable. The standardized coefficient indicates an insignificant impact on the dependent variable. This predictor is not statistically significant, with a p-value greater than 0.05.

In conclusion, the significant predictors of the dependent variable are Aircraft participation/age, Project team performance feedback, Engine-Related Complications and Key Challenges for On-Time and On-Budget, all having p-values less than 0.05. Among these, Engine-Related Complications has the highest standardized coefficient (Beta = 0.445), indicating it has the strongest effect on the dependent variable (Redelivery Delays). Key Challenges for On-Time and On-Budget is not a significant predictor, as indicated by its high p-value (0.872). On time and on budget is not implement alone its relatively with aircraft type and aircraft age, depends on age performance feedback and complication with lease agreement and mostly determine by both parties' negotiation. These results suggest that improving lease Aircraft participation/age, Project team performance feedback, and Engine-Related Complications can significantly enhance the dependent variable, while competency-based evaluation has a negligible effect (Green & Salkind, 2016; Field, 2013; Pallant, 2020).

4.8 Discussion on the Result

The aircraft redelivery project process is crucial for both the lessor and lessee because it ensures that the aircraft is in the condition specified in the lease, and both parties fulfill their contractual obligations. The success, challenges, and significance of the redelivery process are influenced by several variables, including aircraft age and model, project team performance, primary causes of delays, engine-related complications, and key challenges for on-time and on-budget delivery. Let's break down each of these variables in terms of their significance, the problems they may cause, and their impact on the success of the redelivery project:

Aircraft Age and Model: The age of the aircraft and its model play a critical role in the redelivery process because they influence the aircraft's condition, its residual value, and the potential for repairs or upgrades. Newer models are often in better condition and require fewer repairs, whereas older aircraft may need more extensive maintenance to meet the agreed-upon return conditions. The problem is older aircraft requiring more maintenance or replacement of components. This can lead to delays and increased costs in the redelivery process. Outdated models may also face difficulties in meeting the latest regulatory standards or safety requirements, leading to additional inspections or modifications. The advantage is choosing newer aircraft models generally have fewer technical issues and require less maintenance, leading to a smoother and timelier redelivery. Modern models have higher market demand, making them more attractive to potential future lessees, improving the likelihood of a successful redelivery and minimizing downtime.

Project Team Performance: The significance of performance of the project team is central to the efficient management of the redelivery process. A highly skilled and well-coordinated team can expedite repairs, inspections, and administrative processes, ensuring that the aircraft is returned on time and in good condition. The problem is Poor project team performance, such as lack of coordination, delays in decision-making, or insufficient skills, can lead to significant delays in the redelivery process. Lack of communication between the lessee, lessor, and third-party service providers (e.g., maintenance contractors, inspection bodies) can cause misunderstandings and inefficiencies, further delaying the process. The success was a well-trained and experienced project team can ensure that the redelivery process runs smoothly by managing repairs, inspections, and documentations promptly. Clear communication and coordination between all parties (lessor, lessee, service providers) help in resolving issues quickly and avoiding delays.

Primary Causes of Redelivery Delays: the significance is understanding the primary causes of delays in the redelivery process is key to mitigating these challenges in future projects. Delays can be caused by a variety of factors, such as maintenance issues, parts shortages, or regulatory approvals. The problem was Maintenance issues that require unscheduled repairs or overhauls, supply chain issues that delay the acquisition of parts or materials necessary for maintenance, regulatory delays such as waiting for certifications, inspections, or airworthiness approvals and disputes between the lessee and lessor over the aircraft's condition or repair responsibilities. The

success factor is analyzing the causes of delays, stakeholders can implement proactive measures to avoid similar issues in the future, such as better planning, more reliable suppliers, or clearer communication between the parties. Predictive tools and risk management strategies can help anticipate and address these delays before they escalate.

Engine-Related Complications: significance is Engine-related complications are one of the most critical aspects of the aircraft redelivery process. The engine is one of the most complex and expensive components of an aircraft, and issues with it can significantly delay the redelivery process or result in unexpected costs. Problem factor is Engine malfunctions, performance degradation, or wear and tear require immediate attention, often involving complex and costly repairs or overhauls., delays in engine repairs or the need for unplanned overhauls can extend the redelivery timeline and increase the overall cost, parts availability issues (e.g., waiting for specific engine components) may cause further delays, regulatory requirements for engine inspections or overhauls can lead to extended downtime. Success is ensuring that engines are maintained according to the agreed-upon maintenance schedule and can reduce the likelihood of issues arising during the redelivery process. Preemptive maintenance and early detection of engine issues (through regular inspections) can help avoid major disruptions.

Key Challenge for On-Time and On-Budget Delivery: significance of the key challenge for on-time and on-budget delivery refers to the obstacles that make it difficult for the redelivery process to be completed as scheduled and within the agreed financial constraints. This challenge is often multifaceted, involving delays, cost overruns, and unforeseen complications. problem factors are unforeseen repairs or maintenance complications, especially if the aircraft's condition is worse than expected at the time of redelivery, can push costs beyond the agreed budget. Supply chain disruptions, labor shortages, or unexpected weather conditions can extend the timeline for redelivery, affecting the on-time goal. Disputes or misunderstandings about the redelivery condition, maintenance responsibilities, or payments can also cause delays and budget issues. The Success Factors are effective planning and scheduling help mitigate delays by accounting for potential issues in advance.

Close monitoring of budget forecasts and proactive management of unforeseen issues can help maintain the budget and timeline. Clear communication and expectations between the lessor and

lessee, with regular status updates, can prevent misunderstandings and conflicts, thus improving the likelihood of a smooth, on-time, and on-budget redelivery process.

Conclusion

The aircraft redelivery project is a complex process, and several variables significantly impact its success, including aircraft age and model, project team performance, primary causes of delays, engine-related complications, and the key challenges for on-time and on-budget delivery. These variables interplay in ways that can either contribute to a smooth, successful redelivery or cause significant setbacks.

To improve the success rate of redelivery projects, stakeholders must:

- Plan effectively by considering potential challenges related to aircraft age, maintenance schedules, and engine performance.
- Focus on strong project team performance and ensure proper communication among all involved parties.

  Identify and address the primary causes of delays to mitigate risks before they become critical issues.

- Preemptively manage engine-related issues and ensure regular maintenance is done to avoid last-minute complications.
- Manage the challenges of staying on time and on budget by monitoring schedules, costs, and the redelivery conditions consistently.

By addressing these factors, both lessors and lessees can navigate the aircraft redelivery process more smoothly, ensuring timely and cost-effective redelivery while meeting regulatory and contractual obligations.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter deals with summary, conclusions and recommendation of the research.

5.1 Summary of Major Findings

Respondents to questionnaires about project on-time completion frequently bring up the force gap. Ethiopian MRO operations are employing a younger workforce, with fewer workers in senior teams or older age groups; this clearly indicates that the MRO is losing its most seasoned staff. Because the younger workers may not have as much experience, this change in the workforce provides issues for mentorship and information transfer. To close this gap, skills and knowledge are effectively and continuously maintained and transmitted. Ethiopian MRO may need to put in place strategic training initiatives.

Regarding aircraft participation/age: the leasing agreement should be based on the aircraft's age. Although it gives guidance on return conditions and influences the quality and specifics of redeliveries, it might not be consistent with actual practice. This could lead to discrepancies in the redelivery process, which might affect the overall efficacy and contentment of both sides.

Project team performance feedback: Potential problems between the lessor and operator or lessee on performance, expectations, and opportunities to improve project efficiency are addressed by the project team's performance feedback. Enhancing this feedback is essential to aligning the goals of all stakeholders and ensuring that performance measures are understandable and achievable.

With engine-related complications: Handle the complexity of engine-related problems and high costs, redelivery projects require strong action on engine maintenance capabilities and inspection. Improved support systems and channels for monitoring engine health will make sure that everyone is informed of the challenges encountered. In addition to reducing delays, this proactive strategy improves communication and cultivates a cooperative atmosphere among stakeholders. In the end, giving engine maintenance and inspection top priority will result in redelivery projects that are more cost-effective and operationally efficient.

All these variables have significant p-values (less than 0.05), indicating that improvements in these areas will lead to a significant increase in aircraft return condition. Therefore, Hypothesis 1 is supported. This support underscores the importance of focusing on both team performance and the technical aspects of aircraft management. By addressing these factors, organizations can enhance operational efficiency and ensure higher standards of aircraft maintenance.

On time and within budget one of the main obstacles to staying on time and within budget, this variable has a small and insignificant effect on the project's success. The high F-value and p-value < 0.05 in the ANOVA result demonstrate that a considerable amount of the variance in the dependent variable may be addressed by the predictors (key challenges for on-time and on-budget, project team performance feedback, aircraft participation/age, and engine-related complications).

In general, the model explains a significant amount of the variance in MRO aircraft redelivery; the overall statistical significance of the regression model is confirmed by the ANOVA findings. Engine-related issues had the biggest impact on MRO aircraft redelivery. The existing redelivery project management system or technique is more than moderately successful; it is highly effective in enhancing the redelivery of MRO aircraft. This indicates that the current strategies employed are significantly improving the redelivery process, thereby validating the importance of addressing engine-related issues in MRO operations. Future research could explore additional factors that may further optimize this system and lead to even more efficient aircraft redeliveries.

Therefore, the above result in project management or respondent perceptions regarding various aspects of the project evaluation terms/variables: a lack of coordination, documentation, capability, or confidence qualities across all dimensions, such as aircraft participation/age, project team performance feedback quality, engine-related complications practices, and key challenges for on-time and on-budget, indicating potential barriers to maximizing aircraft return condition in MRO. This highlights the need for a comprehensive review of these variables to identify critical areas for improvement.

5.1.1 Conclusion

This study aimed to assess the effect of project management on the aircraft redelivery project at Ethiopian Airlines MRO challenges of on time redelivery. Through a comprehensive analysis of

demographic data and a detailed examination of key variables, the research provided critical insights into the perceptions and experiences of the employees that participate in aircraft redelivery projects at different professions and positions regarding the existing aircraft lease management.

The findings indicate that while the project management on the aircraft redelivery is established, its effectiveness is perceived as moderate. Key areas such as aircraft participation/age, project team performance feedback, and Causes of Redelivery Delays show considerable room for improvement on aircraft return condition. The demographic data revealed a predominantly young workforce with a lack of project experience with varying levels of position, but primarily mid-career professionals positioned mostly at expert levels rather than managerial roles. This workforce composition underscores the importance of a well-structured project and evaluation system to harness the potential.

The statistical analysis, including descriptive statistics and multiple regression analysis, highlighted critical insights into the current effect of project management on the aircraft redelivery project at Ethiopian Airlines MRO. The mean score for aircraft participation/age indicates variability in aircraft type, age, and lease agreement understanding, suggesting a need for better-defined roles and objectives to align project actions and implementations with organizational goals. Project team performance feedback received a low mean score, revealing potential coordination gaps between internal management (team members and project managers) and interests regarding lessor expectations and possible opportunities.

The causes of redelivery delays, though present, are inadequate, as indicated by their mean score. This highlights the need for specific methods and fair causes of redelivery delays, including team motivation and project member engagement. Engine-related practices received the lowest mean score, suggesting significant room for improvement in how members skills are assessed, coached and how members not fully engaged in the project they perform work with daily duty. But, based on regression coefficients, the significance indication result shows it doesn’t have significance (negligent significance value) on the dependent variable.

Ensuring that project members’ feelings and their competencies are valued and recognized is essential for project implementation and aircraft return condition. Overall, addressing these areas

can significantly improve the effectiveness of the project management on the aircraft redelivery and, consequently, organizational aircraft lease management.

Regarding with given hypothesis, Hypothesis 1 is supported: Implementing a structured aircraft return condition process with regular feedback mechanisms and agreement settings will lead to a significant improvement in aircraft lease management of the Ethiopian Airlines MRO. Hypothesis 2 is not supported: The current aircraft lease management system used in the Ethiopian Airlines MRO division is highly effective in organizational level, not just moderately effective. Hypothesis 3 is partially supported: The currently implemented aircraft lease management system at Ethiopian Airlines Maintenance Repair and Overhaul division does not negatively impact aircraft return condition, redelivery, and lease agreement, necessitating improvements in specific areas like engine-related complications.

5.1.2 Recommendations

To address the identified concerns and enhance the effectiveness of the aircraft redelivery project with the aircraft lease management system, the following recommendations are proposed to be implemented by Ethiopian Airlines for the aircraft redelivery project and lease management within the MRO division:

Aircraft type participation/age: Ensure all aircraft operate towards common organizational goals; it's crucial to be clear, specific, and measurable lease objectives for each role. These objectives should be well-defined, regularly monitored through documents, records, meetings, amendments, and revisions; managed by the system; and discussed in ongoing leased aircraft and interactions to ensure understanding and alignment with the business interest and the company's strategic goals. Linking all this directly to broader organizational goals helps to effectively return conditions to the effect on the redelivery project and the organization’s success.

Project team performance feedback: To strengthen feedback and team performance, implement a structured feedback process with regular performance reviews and check-ins across all departments to ensure project progress. Promote open communication and strong coordination and provide training opportunities to redelivery feedback and actions while promoting a project implementation culture. Enhance project members by creating personal duty kickoff meeting and open item list charts, offering continuous meeting, and establishing mentorship programs.

Encourage workshops and seminars and update them with aviation industry lease management trends. Additionally, foster a supportive, nonstop business and redelivery process environment that promotes timesaving and records documentation of physical works efficiency in the project, helping the redelivery project aircraft return condition and both parties' goals.

Engine-Related Complications: To improve engine-related complications, establish a transparent structure with clearly defined and consistently applied criteria. Regularly acknowledge and celebrate stakeholder contributions through daily briefings, lessor and lessee recognition, and attention for BtB documents and DFPs. Project members create diverse solution methods, including monetary systems, full-time dedication working days, professional opportunities, and lesser acknowledgement, to cater to different operator experience references. These initiatives foster a collaborative environment where innovation thrives, ultimately leading to enhanced operational efficiency and reduced risks in engine management. By valuing diverse perspectives and promoting open communication, the project team can effectively navigate challenges and implement effective solutions tailored to each stakeholder's needs.

Regarding key Challenges for On-Time and On-Budget; In some airlines there is not enough discussion between the technical, legal and finance staff. Technical people sometimes fail to realize how important it will be for the future to have everything well defined. Legal and finance staff sometimes lack knowledge of how complex this can be. Since two different results were found in the regression on mean score and significance result, it is still requiring further research on this issue to improve the overall aircraft lease management.

Improving the lease management in Ethiopian Airlines MRO requires both project structure and physical work enhancements. Project Structurally, implementing an integrated team spirit of individuals with confidence management, will streamline goal setting, feedback, and revision processes, ensuring easy accessibility and a user-friendly order of historical and archived documents. Regular reviews and updates will keep the project on time, redeliver, and hand over without any additional cost of organization while keeping industry standards.

Physical work, fostering continuous improvement, and involving additional professionals in task completion that will promote a capability growth on physical work professionals' performance. Leadership commitment is crucial; leaders should exemplify effective project-leading

management by providing regular feedback, achievements on both sides, and supporting project management. These measures will enhance both parties' satisfaction, drive the redelivery project process, and contribute to the long-term growth and competitiveness of the aircraft redelivery project and lease management in the aviation industry.

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APPENDICES

Questionnaire

Effect of Project Management on Aircraft Redelivery Project in Ethiopia Aviation Industry Survey

Dear Respondent,

Greetings!

Thank you for taking the time to participate in this survey. I am conducting research to better understand the factors impacting the redelivery process within Ethiopian Airlines.

Your honest feedback is essential to this study. Your responses will help identify areas where current redelivery practices can be improved to support professional development, foster teamwork, and enhance the overall efficiency and effectiveness of the process.

This survey is completely anonymous, and your responses will remain confidential, used only for research purposes. The survey should take approximately 5-10 minutes to complete. Please answer all questions to the best of your ability.

Your participation is greatly appreciated and contributes to the partial fulfillment of the requirements for the MBA in Project Management at St. Mary University.

If you have any questions or concerns about this survey, please feel free to contact me on +251 911 17 20 13.

Adviser: Dr. Temesgen Belayneh

St. Mary University

Thank you for your valuable insights and time in completing this survey. Your feedback will help me make meaningful improvements to the aircraft redelivery process.

SECTION - 1: Aircraft Participation.

Please indicate which aircraft are most involved in redelivery, and the typical age of those aircraft.

Aircraft Type:

- B737
- B747
- B 757
- B767
- B777
- B787
- Other
- Add option

Aircraft Age:

- Old (20-30 years)
- Medium (10-20 years)
- New (0-10 years)

SECTION - 2: Role on Redelivery Project

Please specify your role during the redelivery project in the space provided below:

SECTION - 3: Project Team Performance Feedback.

Rate your satisfaction as follows.

1. Poor
2. Needs improvement
3. Satisfactory
4. Good
5. Excellent

Please rate your experience working with the following teams/roles during the aircraft redelivery process.

- Redelivery Project Manager
- Assistant Redelivery Project Manager
- Aircraft Maintenance Planning
- Aircraft Maintenance Program Engineering
- Aircraft Record Control
- Aircraft Task Card Engineering
- Ethiopian MRO Documentation
- Aircraft Airframe Systems Engineering
- Aircraft Avionics Systems Engineering
- Aircraft Cabin/IFE Systems Engineering
- Powerplant Systems Engineering
- Component Maintenance Overall Manager
- Aircraft Base Maintenance Project Manager
- Certifying Staff (CAT C)
- Aircraft Structure Engineering
- Production Planner
- Avionics Maintenance
- Cabin Maintenance
- Aircraft Structure Maintenance
- Engine Shop Overhaul Manager
- Powerplant Inspection
- Engine Maintenance Technical Support Engineering
- QA MRO
- Others (please specify):

SECTION - 4: Primary Causes of Redelivery Delays

Rate your satisfaction as follows.

1. Very Significant
2. Significant
3. Moderately Significant
4. Slightly Significant
5. Not Significant

Please indicate the significance of the following factors in causing delays.

1. Late Engagement
2. Material Lead Time
3. Lack of Planning
4. Communication Between Parties
5. Travel/Mobility Restrictions
6. Disputes Over Aircraft Condition at Return
7. Unscheduled Repairs or Failed Borescopes
8. Airline Prioritizing Operations Over Redelivery
9. Misalignment of Lessor Expectations
10. Lack of Resources
11. Disputes Over Lease Financial Terms
12. Disputes Over Aircraft Records Condition
13. MXi Operating System Support Issues

SECTION - 5: Key Challenges for On-Time and On-Budget

Which areas do you find most challenging for delivering aircraft on time and within budget? (Select all that apply)

- Engines

- Record Accuracy and Completeness
- Structural Damage
- Material Lead Times
- Certification/Modifications
- Component Life Requirements
- Other

SECTION - 6: Engine-Related Complications (For Powerplant and Engine Support Teams)

Please indicate which of the following engine-related issues contribute most to redelivery complications: (Select all that apply)

- Engine Performance Trend/Run Data
- Borescope Inspection (BSI)
- Time on Wing Build Standard
- BtB Trace on LLP's
- Non-OEM Repairs
- OEM Maintenance Program
- PMA Parts
- Engine Shop Visit Turnaround Time
- Engine Preservation/Storage Findings
- Other…

SECTION - 7: Engagement Timeline

When do you feel the redelivery process typically begins?

- 12 Months Prior
- 9 Months Prior
- 6 Months Prior
- 3 Months Prior
- Less Than 3 Months Prior
- Other…

SECTION - 8: Frequency of Missed Return Conditions

How often do return conditions fall short?

- Very Often
- Sometimes
- Rarely
- Never

Please explain any common reasons for this: (optional):

SECTION - 9: Lessee Feedback

How often do you find that your internal teams engage too late in the redelivery process?

SECTION - 10: Key Challenges for Lessees

What are the key challenges your team faces during the redelivery process?