BIJU PATNAIK INSTITUTE OF INFORMATION TECHNOLOGY & MANAGEMENT STUDIES (BIITM), BHUBANESWAR

Plot No. F/4, Chandaka Industrial Estate, Infocity, Patia, Bhubaneswar-24

Approved by AICTE, Govt. of India | Affiliated to BPUT, Odisha | NAAC Accredited | ISO 9001 : 2015

SUMMER INTERNSHIP PROJECT 2023

REPORT TITLE

ENHANCING ASSET PERFORMANCE: SAP BEST PRACTICES AT NALCO

SUBMITTED BY

RATAN KUMAR ROUT
2-year MBA Batch: 2022-24
University Regd. No: 2206258215

Faculty Guide

Mr. Ajitav Acharya
Asst. Prof. (Finance)
BIITM, Bhubaneswar

Corporate Guide

Mr. Jyoti Ranjan Mohanty
Senior Manager
(Marketing Finance),
NALCO, Bhubaneswar

CERTIFICATE OF INTERNAL GUIDE

This is to certify that Mr Ratan Kumar Rout bearing university registration 2206258215 of 2022-24 batch, has completed his summer internship at NALCO from 01.09.2023 to 03.10.2023 under the supervision of Mr. Jyoti Ranjan Mohanty (corporate guide) and has submitted this project report under my guidance in partial fulfilment of the requirements for award of the degree of Master of Business Administration at Biju Patnaik Institute of Information Technology and Management Studies, Bhubaneswar. To the best of my knowledge and belief, this project report has been prepared by the student and has not been submitted to any other institute or university for the award of any degree or diploma.

Date: 04.10.2023 Signature of the Internal Guide

Place: Bhubaneswar Name :

Designation:

DECLARATION

I, Mr/Ms Ratan Kumar Rout Bearing university registration 2206258215 (2022-24 batch), hereby declare that the project report titled Enhancing Asset Performance: SAP Best Practices at NALCO is based on my internship at NALCO, Bhuabneswar, during the period 01.09.2023 to 03.10.2023 and is an original work done by me under the supervision of Mr Jyoti Ranjan Mohanty (Corporate Guide) and Mr Ajitav Acharya (Internal Guide). This report is being submitted to Biju Patnaik Institute of Information Technology and Management Studies, Bhubaneswar, affiliated to Biju Patnaik University of Technology, Odisha, in partial fulfilment of the requirements for the award of the degree of Master of Business Administration. This project report has not been submitted to any other institute/university for the award of any degree or diploma.

Date: 04.10.2023

Place: Bhubaneswar Signature

ACKNOWLEDGEMENT

Firstly, I would like to thank Mr. Jyoti Ranjan Mohanty, Senior Manager, Marketing Finance NALCO, Bhubaneswar for giving me the opportunity to do an internship within the organization. I also would like to thank all the people that worked along with me in Finance Department Nalco which helped in creating an enjoyable working environment. It is indeed with great sense of pleasure and gratitude that I acknowledge the help of these individuals.

I am highly indebted to Mr. Ajitav Acharya, Assistant Professor, Finance from Biju Patnaik Institute of Information Technology and Management Studies, Bhubaneswar for the guidance provided to accomplish this internship.

I am extremely grateful to all my friends who helped me in successful completion of this internship.

Date: 04.10.2023

Place: Bhubaneswar Signature

TABLE OF CONTENTS

ABSTRACT

The convergence of SAP (Systems, Applications, and Products in Data Processing) with finance in the manufacturing sector creates a dynamic synergy that drives operational excellence and financial resilience. SAP serves as a robust ERP (Enterprise Resource Planning) platform that seamlessly integrates financial processes with manufacturing operations. This abstract highlights SAP's pivotal role in enhancing asset lifecycle management, depreciation within the manufacturing sector. By fusing technology and finance, organizations can achieve heightened efficiency, competitiveness, and sustainability. SAP's capabilities, including general ledger accounting, accounts payable, accounts receivable, asset accounting, and financial reporting, ensure accurate financial data recording, real-time insights, and regulatory compliance. The seamless integration of SAP modules further bolsters operational efficiency, making it an indispensable tool for modern businesses pursuing financial excellence and compliance in today's evolving global marketplace.

CHAPTER-1

INTRODUCTION

ASSET

An asset refers to a valuable resource possessed or governed by an individual, company, or nation, with the anticipation that it will yield a future advantage. An asset represents a resource with a financial worth that an individual, business entity, or nation possesses or oversees, all in the anticipation of reaping future advantages. These assets are recorded on a company's balance sheet and are either acquired or developed to enhance the company's overall worth or improve its operational efficiency. Assets have the potential to generate revenue, reduce expenses, or augment future sales, which could encompass items such as manufacturing machinery or patents.

ASSET CLASSIFICATION

- **Current Assets**: "Current assets" pertain to assets anticipated to be converted into cash within a year. They encompass cash and cash equivalents, accounts receivable, inventory, and prepaid expenses. Accountants regularly assess inventory levels and outstanding receivables, and if there are indications that receivables may not be collected, they are written down.
- **Fixed Assets**: Fixed assets, such as plants, equipment, and buildings, are long-lasting items. Regular charges, known as depreciation, are applied to reflect the aging of fixed assets.
- **Financial Assets**: Financial assets comprise investments in assets and securities of other entities. These encompass stocks, government and corporate bonds, preferred stock, and other hybrid securities.
- **Intangible Assets**: Intangible assets represent valuable assets that lack a physical presence. This category includes patents, trademarks, copyrights, and goodwill.

ASSET MANAGEMENT

Asset management is a multifaceted discipline that lies at the core of an organization's ability to strategically harness its resources for sustained growth, profitability, and competitive advantage. It encompasses a diverse array of tangible and intangible assets, from physical infrastructure and machinery to intellectual property and brand equity. At its essence, asset management is the systematic approach to acquiring, deploying, maintaining, and ultimately retiring assets in a manner that optimizes their value while mitigating associated risks. In today's complex business landscape, where organizations face increasing pressure to do more with less, effective asset management has emerged as a critical strategic imperative. It transcends mere bookkeeping or maintenance; it is a holistic framework that integrates financial, operational, and strategic considerations to ensure that an organization's assets are not just managed but leveraged to their fullest potential. Asset management encompasses the entire lifecycle of assets, from their initial acquisition or creation to their eventual disposition. It involves making informed decisions at every stage, from selecting the right assets to meet specific needs to determining when an asset has reached the end of its useful life and should be retired or replaced. Within this comprehensive framework, asset managers grapple with a myriad of challenges and considerations. They must assess the performance and condition of assets,

develop and execute maintenance strategies, adhere to regulatory requirements, optimize asset utilization, and control costs effectively.

Moreover, asset management is closely tied to financial management. Accurate asset valuation, depreciation accounting, and capital allocation are essential for financial reporting, taxation, and investment decisions. Understanding an organization's assets and their financial implications is vital for stakeholders, including investors, lenders, and government agencies.
In recent years, technological advancements have transformed the landscape of asset management. Innovative software solutions, often referred to as Computerized Maintenance Management Systems (CMMS) or Enterprise Asset Management (EAM) systems, have empowered organizations to streamline asset tracking, automate maintenance processes, and enhance data-driven decision-making. These digital tools have revolutionized how assets are managed, providing real-time insights and predictive capabilities that were once unimaginable.

KEY ASPECTS OF ASSET MANAGEMENT

- **Asset Types**: Assets can be tangible (physical) or intangible (non-physical). Tangible assets include buildings, machinery, vehicles, and equipment, while intangible assets include patents, trademarks, software, and intellectual property.
- **Asset Planning**: Strategic asset planning involves making decisions about when to acquire, upgrade, or dispose of assets. This decision-making process considers factors like asset performance, technological advancements, and financial constraints.
- **Asset Lifecycle Management**: Asset management covers the entire lifecycle of assets, from acquisition or creation to disposal. The stages include planning, procurement, utilization, maintenance, repair, upgrade, and retirement or disposal.
- **Maintenance and Repairs**: Regular maintenance and timely repairs are critical for ensuring that assets remain in optimal working condition. Asset managers schedule and oversee maintenance tasks to prevent breakdowns, extend asset life, and minimize downtime.
- **Asset Valuation**: Asset management also involves determining the financial value of assets, which can be crucial for financial reporting, taxation, and decision-making. Asset valuation methods can vary depending on the asset type and accounting standards.
- **Risk Management**: Asset managers assess and manage risks associated with asset ownership and operation. This includes mitigating risks related to asset depreciation, compliance, safety, and environmental concerns.
- **Cost Control**: Asset management aims to control costs related to asset ownership, maintenance, and operation. This involves optimizing maintenance schedules, reducing energy consumption, and minimizing waste.
- **Asset Utilization**: Maximizing the utilization of assets is a key goal of asset management. It involves ensuring that assets are used efficiently and that they contribute to the organization's objectives.
- **Technology and Software**: Many organizations use specialized asset management software and technology like Enterprise Asset Management (EAM) systems, to streamline asset tracking, maintenance scheduling, and reporting.

SAP, which stands for Systems, Applications, and Products in Data Processing, is a globally recognized multinational software corporation. It specializes in providing enterprise software solutions designed to help organizations effectively manage and optimize their complex business operations. SAP software is renowned for its Enterprise Resource Planning (ERP) systems, which serve as the backbone for countless businesses worldwide. These ERP solutions enable companies to streamline their financial processes, manage inventory, enhance procurement, boost sales, and integrate various other core functions within a centralized and unified platform. One of the distinctive features of SAP software is its modular architecture. The software comprises a range of individual modules, each dedicated to addressing specific business functions. These modules include SAP Finance (SAP FI) for financial management, SAP Supply Chain Management (SAP SCM) for logistics and procurement, SAP Human Capital Management (SAP HCM) for workforce management, and many more. Organizations can customize and configure these modules according to their unique requirements, tailoring SAP software to suit their specific needs.

Another hallmark of SAP software is its strong emphasis on integration. The software is designed to facilitate seamless data exchange and process synchronization across different modules and external systems. This integration capability eliminates data silos, improves data accuracy, and enhances visibility throughout an organization's operations. Businesses can make more informed decisions and execute their processes more efficiently, thanks to the integrated nature of SAP software. In addition to its core ERP functionality, SAP offers robust reporting and analytics tools. These tools empower users to extract meaningful insights from their data, enabling data-driven decision-making. Furthermore, SAP provides industry-specific solutions tailored to various sectors, such as retail, manufacturing, healthcare, and more. These industry solutions come with pre-configured processes and best practices, allowing businesses to meet sector-specific requirements and regulations effectively.

SCOPE

The scope of "Optimizing Asset Management: SAP Implementation at NALCO" defines the project's boundaries and objectives. It encompasses the implementation of SAP to improve asset management, covering asset lifecycle management, maintenance optimization, financial control, data accuracy, and operational efficiency. This scope emphasizes the integration of asset management with other critical functions, mobile accessibility for field operations, compliance with regulations, and a commitment to sustainability. By adhering to this scope, the project aims to enhance NALCO's asset management practices, reduce costs, ensure compliance, and lay the foundation for future growth and adaptability in line with the organization's strategic goals.

Holistic Asset Lifecycle Management: Implementing SAP to comprehensively manage company's diverse assets, from acquisition through to disposal, ensuring precise tracking, efficient documentation, and data accuracy throughout their operational life.

Strategic Maintenance Enhancement: Employ SAP to bolster organisation's maintenance strategies, including the adoption of preventive and predictive practices. This approach will minimize unplanned downtime, extend asset lifespans, and optimize maintenance schedules, aligning with NALCO's operational goals.

Financial Precision: Utilizing SAP to automate depreciation calculations, ensure precise asset valuation, and uphold compliance with accounting standards specific to the industry. This will result in heightened financial control, bolstering NALCO's financial management and reporting accuracy.

Streamlined Operations: Implementing SAP to streamline business asset-related workflows, eliminating manual processes, and facilitating real-time decision-making. This will boost operational efficiency, aligning with company's commitment to operational excellence.

Integration and Scalability: Seamlessly integrating asset management with organisation's other critical functions, such as procurement, finance, and customer relationship management, to improve cross-functional collaboration and efficiency. Additionally, adopting scalable SAP solutions will ensure the business can adapt to its evolving asset management needs while adhering to its commitment to sustainable practices and technological advancements in asset management.

OBJECTIVE

An objective serves as a concrete target or aim, providing a sense of purpose and direction for individuals, teams, or organizations. It's a well-defined statement that outlines what needs to be accomplished and often includes details about how success will be measured and within what timeframe.

The Objective is to:

- Asset Management: Asset creation, modification and optimisation of the lifecycle of assets, reducing manual work and data errors.
- Enhance Financial Control: SAP asset working process, Asset listing and depreciation calculation comply with accounting standards for improved financial management.

METHODOLOGY

Research methodology encompasses the systematic methods and techniques researchers employ to gather, analyze, and interpret data, ensuring the credibility and rigor of their findings. It serves as the guiding framework for the research process, facilitating the pursuit of knowledge across diverse fields.

Research Design: For this study, we will employ a mixed-methods research design, combining quantitative and qualitative approaches. This comprehensive design will enable us to thoroughly investigate asset management practices within NALCO's SAP system. By integrating both types of data, we aim to gain a holistic understanding of the topic.

Data Collection Methods:

- **Quantitative Phase:** In the quantitative phase of our research, we will utilize a structured questionnaire survey. This survey will be administered to NALCO employees who are directly involved in asset management processes within the SAP system. The questionnaire will seek to collect data on system usage, efficiency, and user satisfaction. By gathering quantitative data, we can assess the performance and overall satisfaction levels regarding SAP-based asset management.

- **Qualitative Phase**: In the qualitative phase, we will conduct semi-structured discussion with key stakeholders at NALCO. These stakeholders include Managers, Executives and Employees. Through these interviews, we aim to gain deeper insights into the challenges faced, best practices employed, and future improvements envisioned in asset management within the SAP system. Qualitative data will provide a richer context to complement the quantitative findings.

Sampling: To ensure representative and meaningful data collection, we will implement different sampling methods for each phase. In the survey, we will employ stratified random sampling to select participants from various personnel and levels within NALCO. For the interviews, purposive sampling will be used to choose individuals with relevant expertise and experiences related to SAP asset management.

CHAPTER 2

NALCO- A “NAVARATNA” CPSE

NALCO, or the National Aluminium Company Limited, is a prominent Indian public sector enterprise that plays a pivotal role in the aluminium industry. Established on January 7, 1981, NALCO has its registered office in Bhubaneswar, Odisha, India. The company is classified as a Schedule 'A' Navratna CPSE (Central Public Sector Enterprise) and is known for its integrated Bauxite-Alumina-Aluminium-Power Complex, making it one of the largest of its kind in India. NALCO's operations encompass mining bauxite, refining alumina, producing aluminium products, and generating power. The Government of India holds a 51.28% stake in the company. At its core, NALCO is engaged in the entire aluminium production cycle, from mining bauxite to refining alumina and finally, producing a diverse range of aluminium products that cater to a myriad of industrial applications. This vertically integrated approach has solidified NALCO's reputation as one of Asia's largest and most sophisticated aluminium complexes, boasting an impressive track record of excellence.

One of the fundamental pillars of NALCO's operations is bauxite mining, where it harnesses the earth's resources responsibly. Bauxite, the primary raw material for aluminium production, is extracted with a commitment to sustainable mining practices, ensuring minimal environmental impact. This eco-conscious approach aligns with NALCO's dedication to environmental stewardship and corporate social responsibility. The heart of NALCO's operations lies in the refining of alumina, a critical intermediate material in the aluminium production process. NALCO's state-of-the-art alumina refinery facilities adhere to the highest global standards for quality, safety, and efficiency. These refineries are instrumental in producing high-purity alumina that meets the stringent requirements of the global aluminium industry. Beyond refining, NALCO operates cutting-edge aluminium smelters that transform alumina into an array of aluminium products, NALCO's unwavering commitment to quality assurance and technological innovation has made its aluminium products a trusted choice among discerning customers worldwide.

MISSION, VISION AND VALUES

VISION

To be a Premier and Integrated company in the Aluminium value chain with strategic presence in Mining both domestic & global, Metals and Energy sectors.

MISSION

To sustainably grow multi-fold in Mining, Alumina and Aluminium business along with select diversification in Minerals, Metals and Energy sectors, while continuously improving on efficiency and business practices thus enhance value for all stakeholders.

VALUES

Prioritizing Stakeholders: NALCO is deeply committed to the satisfaction and well-being of its stakeholders. This commitment centres on exceeding customer expectations, valuing reliable suppliers, and fulfilling broader responsibilities to employees, shareholders, and communities.

Commitment to Excellence: NALCO upholds the highest standards of quality across its operations, embracing continuous improvement, innovation, and technological advancements to enhance product quality and operational efficiency.

Environmental Responsibility: NALCO is dedicated to environmental sustainability, relentlessly pursuing practices to reduce its footprint, conserve resources, and support communities through various social and environmental initiatives.

Trust & Integrity: Trust and integrity are fundamental to NALCO's identity. Ethical conduct guides all actions, fostering strong, enduring relationships with stakeholders through dignity, transparency, and accountability.

PRODUCTS OF NALCO

Alumina: NALCO is a significant producer of alumina (aluminium oxide). The alumina is primarily derived from bauxite ore through the Bayer process. High-quality alumina is used as a feedstock for the production of aluminium metal.

Aluminium: NALCO produces aluminium metal in various forms, including ingots, billets, and rolled products. These aluminium products are used in a wide range of applications, such as aerospace, automotive manufacturing, construction, and packaging.

Aluminium Hydrate: Aluminium hydrate, also known as hydrate alumina or trihydrate, is a product derived during the alumina refining process. It has applications in the production of various chemicals and as a flame retardant.

Calcined Alumina: Calcined alumina is a high-purity, heat-resistant form of alumina. It finds applications in ceramics, refractories, abrasives, and other specialized industries. Zeolites: NALCO produces synthetic zeolites, which are used in detergents, petrochemical refining, and environmental applications like wastewater treatment and air purification.

Specialty Alumina: The Company also manufactures specialty alumina products tailored to specific industrial requirements. These products may include activated alumina and high-purity alumina used in catalysts, adsorbents, and other advanced applications.

Power: NALCO generates electrical power through its captive power plants (CPPs), which supply electricity to support its aluminium production processes and other operational needs.

Renewable Energy: NALCO has ventured into renewable energy production, including wind power and solar power. The company's wind power plants and rooftop solar installations contribute to India's clean energy goals.

PRODUCTION PROCESS

Bauxite Mining: The aluminium production process starts with the mining of bauxites, an aluminium rich mineral in the form of aluminium hydroxide.

Alumina Production: Bauxite is crushed, dried and ground in special mills where it is mixed with a small amount of water. This process produces a thick paste that is collected in special containers and heated with steam to remove most of the silicon present in bauxites.

Reduction Process: At an aluminium smelter, alumina is poured into special reduction cells with molten cryolite at 950°C. Electric currents are then induced in the mixture at At an aluminium smelter, alumina is poured into special reduction cells with molten cryolite at 950°C. Electric currents are then induced in the mixture at 400 kA or above; this current breaks the bond between the aluminium and oxygen atoms resulting in liquid aluminium settling at the bottom of the reduction cell.

Primary Aluminium: Primary aluminium is cast into ingots and shipped to customers or used in the production of aluminium alloys for various purposes.

Aluminium Alloys: The process where the aluminium is shaped to its required form. This process is used for making the vast majority of aluminium products from spectacle frames, telephone bodies, aeroplane fuselages or spaceship bodies.

Recycling: Unlike iron, aluminium is corrosion resistant so it can be re-melted and reused an in infinite number of times. The added bene t is that recycling aluminium requires only 5% of the energy needed to make the same amount of primary aluminium.

OPERATING UNITS

Bauxite Mines

On Panchpatmali hills of Koraput district in Odisha, a fully mechanized opencast mine is in operation since November, 1985, serving feedstock to Alumina Refinery at Damanjodi located on the foothills. Present capacity of Mines is 68.25 lakh TPA. Panchpatmali plateau stands at elevation of 1154 m to 1366 m above mean sea level. Bauxite occurs over the full length of the Panchpatmali plateau, which spans over 18 kms.

Alumina Refinery

The Alumina Refinery is located at Damanjodi, Odisha, approximately 14 KM from the bauxite mine at Panchpatmali. The mined-out bauxite is transported from captive mine to refinery by a 14.6 KM long single-light multi-curve 1800 tonnes per hour (TPH) capacity cable belt conveyor. The alumina produced is transported to aluminium smelter at Angul (Odisha) and to Vizag (Andhra Pradesh) port by rail. The present capacity of Alumina Refinery is 22.75 lakh TPA. Alumina produced is used to meet Company's requirements for production of primary aluminium at smelter.

Aluminium Smelter

The present capacity of smelter is 4.60 lakh TPA. The Plant is situated at Angul, Odisha. Alumina is converted into primary aluminium through a smelting process by using electrolytic reduction. From the pot-line, the molten aluminium is routed to either the casting units, where the aluminium can be cast into ingots, sow ingots, tee ingots, billets, wire rods, cast strips and alloy ingots, or to RPU where the molten aluminium is rolled into various cold-rolled products or cast into aluminium strips.

Captive Power Plant

Presently the Captive Thermal Power Plant has a generation capacity of 1200 MW (10X120MW). While the captive thermal power plant provides entire electric power requirement of aluminium smelter, it also feeds for approximately 35 MW of the power requirement to the alumina refinery through the State Grid. The location of captive thermal power plant at Angul is also strategic to the availability and supply of coal from nearby Talcher Coalfields.

Port Facilities

On the Northern Arm of the Inner Harbour of Visakhapatnam Port on the Bay of Bengal, Nalco has established mechanized storage and ship handling facilities for exporting Alumina in bulk and importing Caustic Soda. It has maximum ship size for loading Alumina is 40,000MT DWT and maximum Alumina loading rate of 2,200 TPH.

PERFORMANCE HIGHLIGHTS

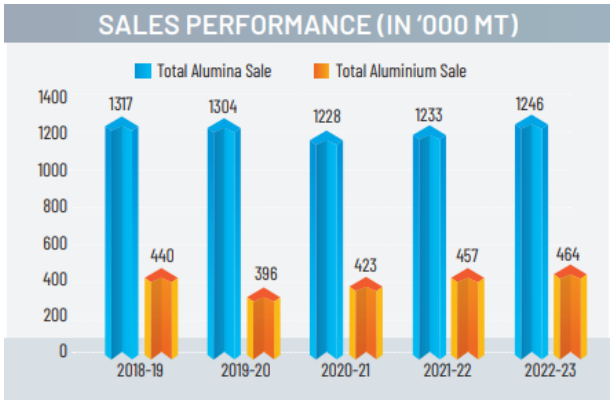
Physical Performance

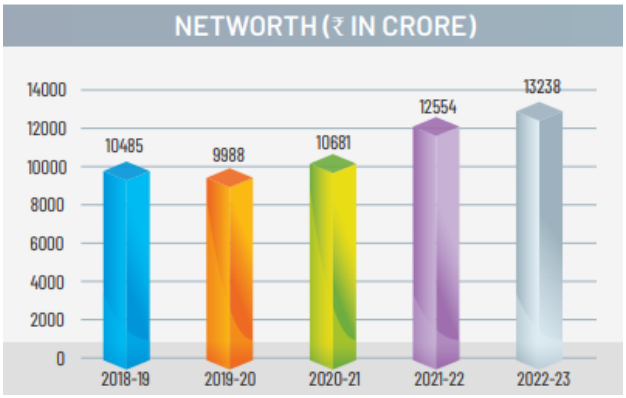
Production	Unit	2022-23	2021-22
Bauxite	MT	74,56,776	75,11,075
Alumina Hydrate	MT	21,23,000	21,22,000
Aluminium	MT	4,60,000	4,60,000
Electricity (Net)-CPP	MU	5788	5712
Wind Energy (Net)	MU	280	320

Alumina Refinery achieved Alumina Hydrate production of 21.23 lakh MT against normative capacity of 21.0 lakh MT, which is 101.1% capacity utilization. Aluminium Smelter achieved full capacity production of 4.6 lakh MT, with all 960 pots in operation for the 2nd consecutive year.

Sales Performance:

Description	Unit	2022-23	2021-22
Export			
Alumina	MT	1,182,054	1,154,691
Aluminium	MT	25,214	133,085
Domestic			
Alumina and Hydrate	MT	64,583	77,995
Aluminium	MT	438,876	323,809
Total Metal Sale	**MT**	**464,090**	**465,893**
Total Chemical Sale	**MT**	**1,246,637**	**1,232,686**





FINANCIAL PERFORMANCE

Profit & Loss Account

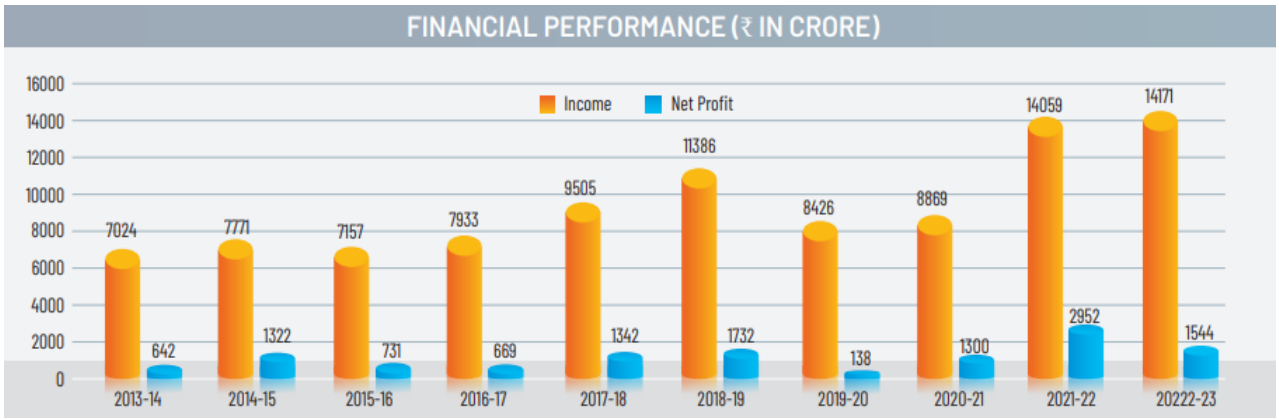
Standalone Figures in Rs Crores

PARTICULARS	Mar 2019	Mar 2020	Mar 2021	Mar 2022	Mar 2023
Net Sales	11,499.32	8,471.84	8,955.79	14,214.58	14,254.86
Total Expenditure	8,612.46	7,983.96	7,437.50	9,666.03	11,815.68
Operating Profit	2,886.86	487.88	1,518.29	4,548.55	2,439.18
Other Income	331.54	273.93	411.13	266.04	249.58
Interest	2.38	5.74	7.08	23.13	17.97
Depreciation	476.1	529.83	605.82	836.59	715.8
Exceptional Items	0	0	0	0	0
Profit Before Tax	2,739.92	226.24	1,316.52	3,954.87	1,954.99
Tax	1,007.52	88.01	16.99	1,002.90	410.5
Net Profit	**1,732.40**	**138.23**	**1,299.53**	**2,951.97**	**1,544.49**
Adjusted EPS (Rs.)	**9.29**	**0.74**	**7.08**	**16.07**	**8.41**

Cashflow Statement

Standalone Figures in Rs Crores

PARTICULARS	Mar 2019	Mar 2020	Mar 2021	Mar 2022	Mar 2023
Profit from operations	2,739.92	226.24	1,316.52	3,954.87	1,954.99
Adjustment	296.3	317.31	557.22	691.73	582.46
Changes in Assets & Liabilities	393.52	-791.65	423.18	158.52	-882.52
Tax Paid	-1,020.89	-100.46	-97.52	-755.51	-746.69
Operating Cash Flow	2,408.85	-348.56	2,199.40	4,049.61	908.24
Investing Cash Flow	-531.85	872.72	-1,403.70	-2,735.92	-334.25
Financing Cash Flow	-1,730.75	-677.29	-600.65	-1,114.41	-923.5
Net Cash Flow	**146.25**	**-153.13**	**195.05**	**199.28**	**-349.51**



Balance Sheet

Standalone Figures in Rs Crores

PARTICULARS	Mar 2019	Mar 2020	Mar 2021	Mar 2022	Mar 2023
Equity and Liabilities					
Share Capital	932.81	932.81	918.32	918.32	918.32
Total Reserves	9,551.70	9,055.26	9,762.38	11,636.32	12,320.13
Borrowings	0	0	0	0	0
Other N/C liabilities	1,757.33	1,841.53	1,980.08	1,689.05	2,118.77
Current liabilities	2,905.12	2,720.02	2,174.35	3,310.18	2,885.65
Total Liabilities	**15,146.96**	**14,549.62**	**14,835.13**	**17,553.87**	**18,242.87**
Assets					
Net Block	7,285.78	7,484.77	7,660.46	7,343.21	7,302.83
Capital WIP	843.91	1,177.16	1,180.95	1,763.42	2,744.95
Intangible WIP	38.8	249.54	394.5	471.4	523.97
Investments	175.78	277.25	313.25	313.25	325.25
Loans & Advances	804.98	784.81	838.46	1,166.46	2,027.13
Other N/C Assets	397.01	18.29	16.63	16.07	22.57
Current Assets	5,600.70	4,557.80	4,430.88	6,480.06	5,296.17
Total Assets	**15,146.96**	**14,549.62**	**14,835.13**	**17,553.87**	**18,242.87**

MAJOR ACHIEVEMENTS

- The Company achieved full capacity production of 4.6 lakh tonne, with all 960 POTs in operation in its Aluminium Smelter for the first time since inception.
- The Company achieved highest ever Bauxite production of 75.11 lakh tonne in FY 2021-22.
- Alumina Refinery achieved Alumina Hydrate production of 21.22 lakh tonne in Alumina Refinery, which is 101.05 % capacity utilization.
- Highest ever sales revenue of Rs.14,181 Crore achieved during 2021-22, surpassing the previous best of Rs.11,499 Crore achieved. (FY 2018-19)
- Highest ever PAT of Rs. 2,952 Crore achieved during 2021-22, surpassing the previous best of Rs. 2,381 crore achieved. (FY 2006-07)
- 5th stream refinery expansion project boundary wall construction completed on 11.02.2022.
- Utkal D & E Coal Mining Agreement Signed with MDO in Mar' 2022.
- Lean Slurry ash disposal system of CPP was commissioned on 31st July'21. This facilitates pumping of ash slurry from CPP to mine void of Talcher coal fields.
- Total procurement through GeM portal is Rs. 1,828.32 Crores (excluding Caustic Soda) in FY 2021-22, which is about 433% more than FY 2020-21. (Rs.343.19 Crores)

INDUSTRY ANALYSIS

SWOT ANALYISIS

SWOT analysis is a study which is undertaken by the majority of companies to determine their core strengths, weaknesses, opportunities and threats. It is a framework that is used to evaluate a company's competitive position which later helps in strategic planning.

Strengths:

- Essential Goods Producer: NALCO produces key raw materials like Bauxite & Aluminium, ensuring consistent sales and revenue.
- Strong Market Performance: High stock ratings across durability, valuation, and momentum indicate growth potential.
- Large Power Production: NALCO is a significant renewable energy producer, contributing to sustainability and revenue.
- Quality Metal Production: Efficient production processes result in high-quality metal.
- Skilled Workforce: Competent employees drive NALCO's success.
- Code of Conduct: Commitment to well-being and social responsibility.

Weaknesses:

- Scattered Plant Sites: Efficiency challenges due to scattered locations.
- Dependency on LME Quotes: Vulnerability to London Metal Exchange price fluctuations.
- Research and Development: Relatively lower R&D spending compared to competitors.
- Workforce Diversity: Local workforce dominance may hinder talent acquisition.
- High Employee Turnover: Costly turnover and training due to high attrition.
- Technology Investment: Need for increased technology investment for integration.
- Limited Expansion in New Segments: Challenges in diversifying beyond core business.

Opportunities:

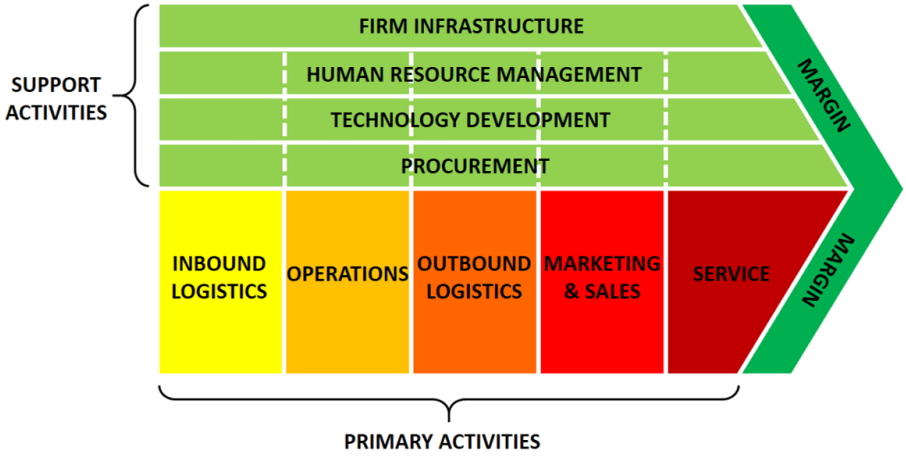
- Social Media: Leveraging social media for marketing and customer engagement.
- Growing Transport Industry: Increased demand for NALCO products in the expanding transport sector.
- Globalization: Opportunity to expand operations internationally.
- Population Growth: Potential for a larger customer base with a growing population.
- Expansion to New Markets: Focus on entering Asian markets to acquire new customers.

Threats:

- LME Price Instability: Dependency on fluctuating London Metal Exchange prices.
- High Tariffs: Imposed tariffs can impact product prices and sales.
- Cheap Metal Dumping: Competition from European countries selling metal at lower prices.
- Competitors in Product Development: Rival mining companies catching up with market trends.
- Government and Environmental Regulations: Stringent government and environmental laws affecting the mining industry.

PORTER'S VALUE CHAIN ANALYSIS

The Porter's Value Chain is a business analysis framework developed by Michael Porter which breaks down a company's internal activities into two primary activities and support activities. This framework helps companies identify areas for competitive advantage, reduce costs, and optimize processes and help businesses make strategic decisions to improve overall performance, allocate resources effectively.



Primary Activities:

- **Inbound Logistics:**
  - Procurement of Bauxite: NALCO procures bauxite, the primary raw material for aluminium production, from various sources. Efficient procurement is essential to ensure a stable supply.
- **Operations**:
  - Aluminium Smelting: This is the core operation where bauxite is processed into aluminium through smelting, electrolysis, and casting.
- **Outbound Logistics:**
  - Distribution: NALCO must efficiently distribute its aluminium products to customers, including manufacturers of aluminium products and traders, both domestically and internationally.
- **Marketing and Sales:**
  - Product Promotion: NALCO needs to market its aluminium products effectively, highlighting their quality, purity, and other competitive advantages.
  - Sales and Customer Relationship Management: Managing relationships with customers, understanding their needs, and providing appropriate solutions are crucial.
- **Service**:
  - After-Sales Support: NALCO may provide support services to its customers, such as technical assistance or quality assurance, to ensure customer satisfaction and long-term partnerships.

Support Activities:

- **Firm Infrastructure:**
  - Management and Planning: Efficient management and strategic planning are essential to optimize production and overall operations.
  - Quality Control: Ensuring the quality of aluminium products through quality control measures is vital.
- **Human Resources:**
  - Skilled Workforce: NALCO requires a skilled workforce for its operations, including engineers, technicians, and management personnel.
  - Training and Development: Continuous training and development programs are essential to keep the workforce updated with industry standards and technologies.
- **Procurement**:
  - Supplier Relationships: Building and maintaining relationships with suppliers of bauxite and other materials are critical to ensure a stable supply chain.
  - Cost Management: Effective procurement practices can help manage costs related to raw materials.
- **Technology Development:**
  - Research and Development: Investment in R&D for improving smelting techniques, energy efficiency, and product quality is important for competitiveness.

MARKETING STRETEGY

Product Portfolio and Sustainability:

- Diversify product offerings across automotive, aerospace, and packaging industries with a strong emphasis on quality and eco-friendly production processes. This approach positions NALCO as a prominent provider of environmentally responsible aluminium products.

Market Segmentation and Maximized Penetration:

- Identify distinct market segments based on industry, location, and unique needs. Tailor marketing messages and product offerings to cater to the specific requirements of each segment, ultimately maximizing market penetration through targeted approaches.

Branding, Positioning, and Quality Commitment:

- Forge a robust, eco-conscious brand image for NALCO. Establish NALCO as an industry pioneer in innovation and sustainability. Stand out as a dependable aluminium producer unwaveringly committed to top-notch quality.

Distribution, Sales, and Relationship Building:

- Develop efficient distribution networks that encompass both domestic and international markets. Cultivate and fortify relationships with distributors. Additionally, create direct sales channels, especially for key customers, to drive increased sales and strengthen bonds.

Customer Relationship Management and Loyalty:

- Implement a CRM system to track interactions and gather valuable feedback. Ensure the provision of exceptional after-sales support and technical assistance to foster long-term customer relationships and build loyalty.

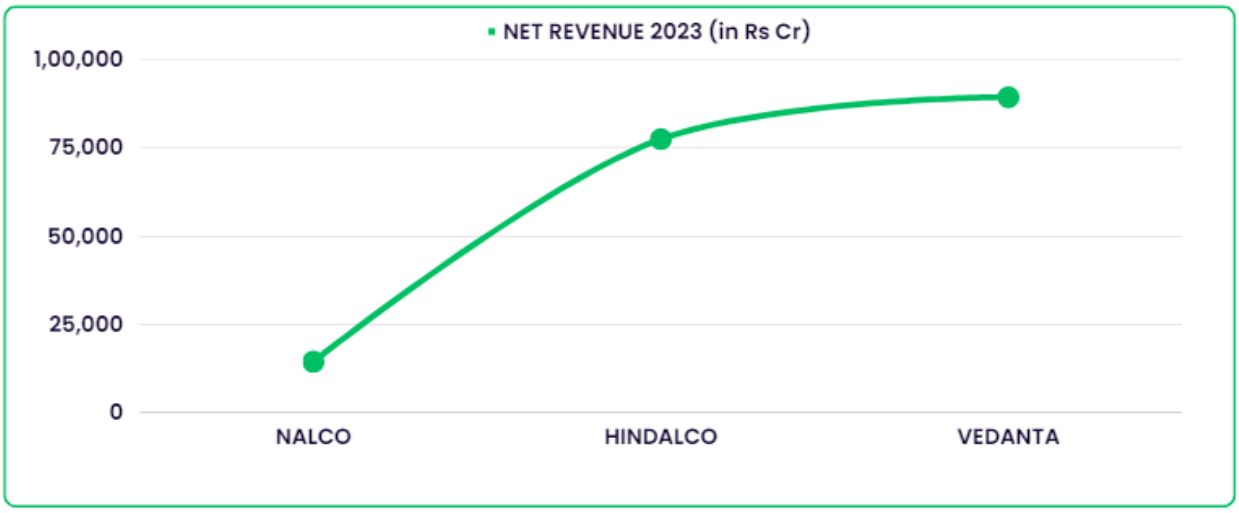
CHAPTER-3

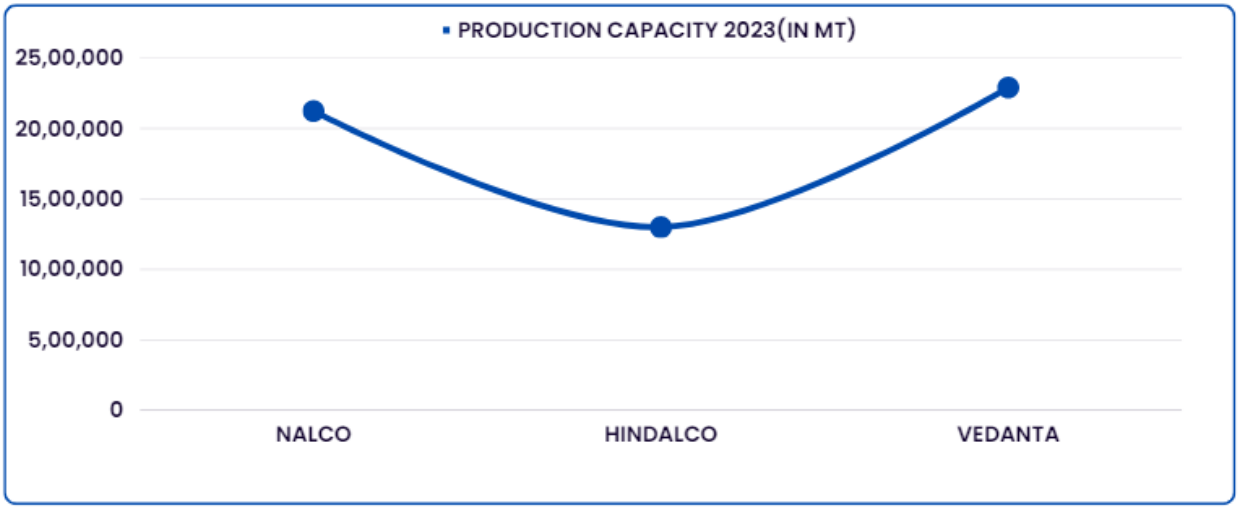
COMPETITORS ANALYSIS

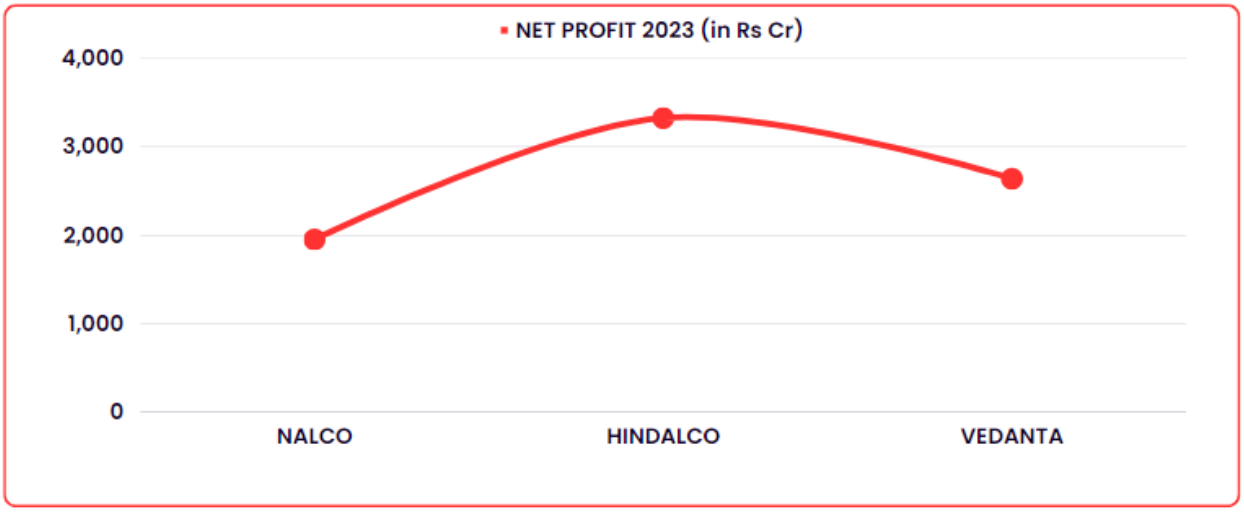
In the competitive aluminium and mining industry, NALCO, Hindalco, and Vedanta are significant players. A concise comparative analysis of these companies is vital to understand their market presence, product range, revenue, profits, geographical reach, sustainability efforts, and technological advancements. This analysis offers insights into their competitive positioning and helps stakeholders make informed decisions. In the following sections, we explore these key aspects to gain a comprehensive view of the industry landscape.

Aspect	NALCO (National Aluminium Company Limited)	Hindalco Industries Limited	Vedanta Limited
Ownership	Government-owned CPSE (Central Public Sector Enterprise).	Part of the Aditya Birla Group, a private conglomerate.	Part of Vedanta Group, a private conglomerate.
Industry Focus	Aluminium and alumina production, power generation.	Diversified metals and mining, including aluminium and copper.	Diversified metals and mining, including aluminium and copper.
Size and Scale	Significant presence in the Indian aluminium industry.	One of India's largest aluminium producers.	A diversified conglomerate with a global presence.
Diversification	Primarily focuses on alumina and aluminum.	Diversified metals and mining operations, including copper.	Diversified metals and mining operations, including zinc, iron ore, and oil & gas.
Geographic Presence	Primarily operates in India.	Global operations, including India and international locations.	Global operations with a strong presence in India.
Renewable Energy	Involved in renewable energy projects (wind and solar power).	Invests in sustainability and renewable energy projects.	Active in the renewable energy sector.
Financials and Revenue	Publicly traded; financial performance influenced by aluminium prices.	Part of Aditya Birla Group; diversified revenue streams.	Part of Vedanta Group; diversified revenue streams.
Copper Business	Not involved in copper production.	Produces copper products.	Produces copper products.
Diversification Beyond Metals	Focused on aluminium and related operations.	Diversified business interests including cement, chemicals, and financial services.	Diversified business interests including zinc, oil & gas, and steel.

Company	Revenue(Cr)	Net Profit(Cr)	Market Capitalization(Cr)	ROE	Production Capacity(MT)
Nalco	14,490.49	1,955	18,237.75	11.98 %	21,23,000
Hindalco	77,464	3,326	1,11,765.31	5.87 %	13,00,000
Vedanta	89,342	2,640	87,800.24	37.69 %	22,90,000







CHAPTER-4

CUSTOMER ANALYSIS

Customer analysis for NALCO involves understanding the various customer segments the company serves and their specific needs, behaviours, and preferences. While NALCO caters to a wide range of industries and customers,

- **Industry Segmentation**: NALCO serves diverse industries, including automotive, aerospace, construction, packaging, power, and more. Understanding the unique requirements of each industry segment is essential for tailoring products and services.
- **Global Customer Base**: NALCO exports its aluminium products globally, which means it interacts with customers from different countries and regions. Analysing international customers' preferences and compliance standards is crucial for successful export operations.
- **Quality and Compliance Standards**: Many of NALCO's customers, especially in industries like aerospace and automotive, have stringent quality and compliance standards. NALCO must ensure its products meet these standards to maintain customer trust and satisfaction.
- **Distribution and Logistics**: Understanding the distribution channels and logistics preferences of customers is vital for ensuring timely and efficient deliveries, both domestically and internationally.
- **Repeat Business and Loyalty**: Building long-term relationships with customers is a priority for NALCO. Analysing customer retention rates, repeat business, and loyalty can help in strengthening these relationships.
- **Market Expansion**: NALCO may consider targeting emerging industries and markets within India to diversify its customer base and adapt to changing market demands.

MARKET SEGMENTATION

Domestic Market: In India, NALCO serves various industries, ensuring high-quality aluminium supplies. Building trust with domestic customers is a priority. NALCO focuses on market expansion, emerging sectors, and adapting to evolving domestic demands. Here are some potential customers

- **NMDC Steel Ltd**: National Mineral Development Corporation (NMDC) is a public sector enterprise in India primarily involved in the exploration and extraction of various minerals, including iron ore, copper, and limestone.
  Alumina exported: 20.6 Crores
- **Zetwerk Manufacturing Business Pvt Ltd:** Zetwerk is an Indian company that operates in the manufacturing and supply chain sector. Zetwerk provides a platform that connects businesses with manufacturing partners for various engineering and fabrication needs.
  Alumina exported: 17.42 Crores
- **NSIC Ltd:** The National Small Industries Corporation Ltd is a government-owned enterprise in India that focuses on promoting and supporting MSMEs and provides different services like technology assistance, facilitates export opportunities and government procurement access. **Alumina exported: 42 Crores**

Export Market: NALCO exports aluminium products globally, catering to industries with stringent quality standards. Strong partnerships with international distributors are crucial. NALCO adapts products and logistics to meet diverse regulations. Some of the Potential customers are:

Alumina

- Parthnon Derivatives- Singapore – 11 Cr
- Rescom Resources Ltd- United Arab Emirates–11.2 Cr
- Pt. Ascon Indonesia Internasional- Jakarta, Indonesia
- Kineta International- United Arab Emirates
- Zed Trading- United Arab Emirates
- Vedanta Resources Ltd- London, UK– 10.48 Cr

Aluminium Metal

- Trafigura- Singapore–11.45 Cr
- Glencore- Baar, Switzerland– 12.58 Cr
- IXM S.A-Geneva, Switzerland–11.58 Cr

COMPETITIVE ADVANTAGE

Competitive advantage refers to the unique strengths or attributes that allow a business or organization to outperform its competitors in a specific market or industry. These advantages enable the company to achieve superior performance, gain a larger market share, and ultimately, attain sustainable profitability.

- **Vertical Integration**: NALCO's control over the entire aluminium production value chain, from bauxite mining to aluminium smelting, ensures operational efficiency and cost control.
- **High-Quality Products**: NALCO is renowned for producing premium-quality aluminium and alumina products, which enhances its competitiveness and customer trust.
- **Renewable Energy**: NALCO's significant investment in renewable energy, particularly wind power, not only supports sustainability goals but also reduces energy costs.
- **Strong Government Backing**: Being a government-owned entity provides NALCO with financial stability and government support, enhancing its competitive position.
- **Environmental Stewardship**: NALCO's commitment to sustainable practices and greener manufacturing processes aligns with global environmental concerns, making it a preferred choice for eco-conscious customers.
- **Strong Dealer Network**: NALCO has built strong relationships with its dealers, facilitating the distribution of its products and promoting brand loyalty.
- **Financial Stability**: The company maintains a strong financial position with consecutive profits over the years and accumulated profit reserves, which can be utilized for future expenditures or marketing activities.
- **Global Expansion Plans**: NALCO's plans to expand its international activities, particularly in Asia, provide opportunities for acquiring new customer bases and markets.

CUSTOMER RELATIONSHIP MANAGEMENT (CRM)

Customer Relationship Management (CRM) methods adopted in NALCO (National Aluminium Company Limited) aim to build and maintain strong relationships with customers, enhance customer satisfaction, and improve overall business performance.
NALCO's top five CRM methods are:

- **Customer Database Management**: NALCO maintains a comprehensive customer database to track customer information, transactions, preferences, and feedback, enabling personalized interactions.
- **Segmentation and Targeting**: NALCO segments its customer base to tailor marketing efforts and communication to specific industry, location, and customer needs.
- **Feedback Collection**: Regularly soliciting feedback from customers through surveys and feedback forms helps NALCO gather insights into customer satisfaction and areas for improvement.
- **After-Sales Support**: NALCO provides excellent after-sales support, including technical assistance and complaint resolution, to build and maintain long-term customer relationships.
- **Digital Engagement**: Utilizing digital channels like email marketing and social media, NALCO engages with customers, providing valuable content and updates to enhance customer relationships.

ATTENTION, INTEREST, DESIRE, AND ACTION (AIDA) MODEL

The AIDA model (Attention, Interest, Desire, and Action) is a marketing and advertising framework used to guide the customer through a series of steps, ultimately leading to a desired action, such as making a purchase.

Attention:
NALCO grabs attention through eye-catching advertising campaigns that highlight its high-quality aluminum products, sustainability initiatives, and industry leadership. Their active social media presence ensures they capture the interest of the target audience by showcasing engaging content that highlights the company's innovations and contributions to the aluminium industry.

Interest:
NALCO nurtures interest through the dissemination of educational content, including articles, videos, and webinars that educate potential customers about the benefits of aluminium in various industries. Furthermore, sharing success stories and testimonials from satisfied customers generates interest and trust in NALCO's products and services.

Desire:
NALCO cultivates desire by emphasizing what sets its aluminium products apart, including quality, sustainability, and versatility. Special promotions and discounts create a sense of urgency, stimulating desire among customers to choose NALCO over competitors.

Action:
To prompt action, NALCO includes clear and compelling calls to action (CTAs) in its marketing materials, encouraging potential customers to visit the website, request a quote, or contact the sales team. Moreover, their user-friendly website streamlines the action phase, allowing customers to make online purchases efficiently.

CHAPTER-5

SAP FI (Financial Accounting) is one of the core modules within the SAP ERP (Enterprise Resource Planning) system. It is responsible for managing an organization's financial data and is integral to the overall financial and accounting processes. The SAP FI module enables businesses to record, track, and manage financial transactions and provides comprehensive financial reporting and analysis capabilities. Here are the key aspects and functionalities of the SAP FI module:

- **General Ledger Accounting (GL):**
  - The GL component is the central repository for financial data in SAP FI. It allows organizations to record financial transactions, such as revenue, expenses, assets, and liabilities.
  - It create and manage various types of accounts, including balance sheet accounts (assets and liabilities) and profit and loss accounts (revenue and expenses).
  - It supports multiple ledgers for parallel accounting, such as local GAAP, IFRS, or tax accounting.
- **Accounts Payable (AP):**
  - This submodule focuses on managing an organization's payables, including vendor invoices and payments.
  - It enables the creation of vendor master records, invoice processing, payment processing, and managing accounts payable aging.
- **Accounts Receivable (AR):**
  - Accounts Receivable deals with managing customer invoices, payments, and receivables.
  - It facilitates customer master data management, invoice creation, dunning (reminders for overdue payments), and customer account reconciliation.
- **Asset Accounting (AA):**
  - Asset Accounting within SAP FI manages fixed assets throughout their lifecycle.
  - It handles asset acquisition, depreciation, transfers, retirements, and reporting.
  - Integration with the General Ledger ensures accurate financial reporting.

ASSET ACCOUNTING IN SAP

Asset accounting in SAP software is a module within the SAP Enterprise Resource Planning (ERP) system that allows organizations to manage their fixed assets efficiently and effectively. Fixed assets typically include tangible assets like buildings, machinery, vehicles, and intangible assets like patents and trademarks. Asset accounting in SAP helps organizations track the acquisition, depreciation, and disposal of these assets, ensuring compliance with accounting standards and providing valuable financial insights.

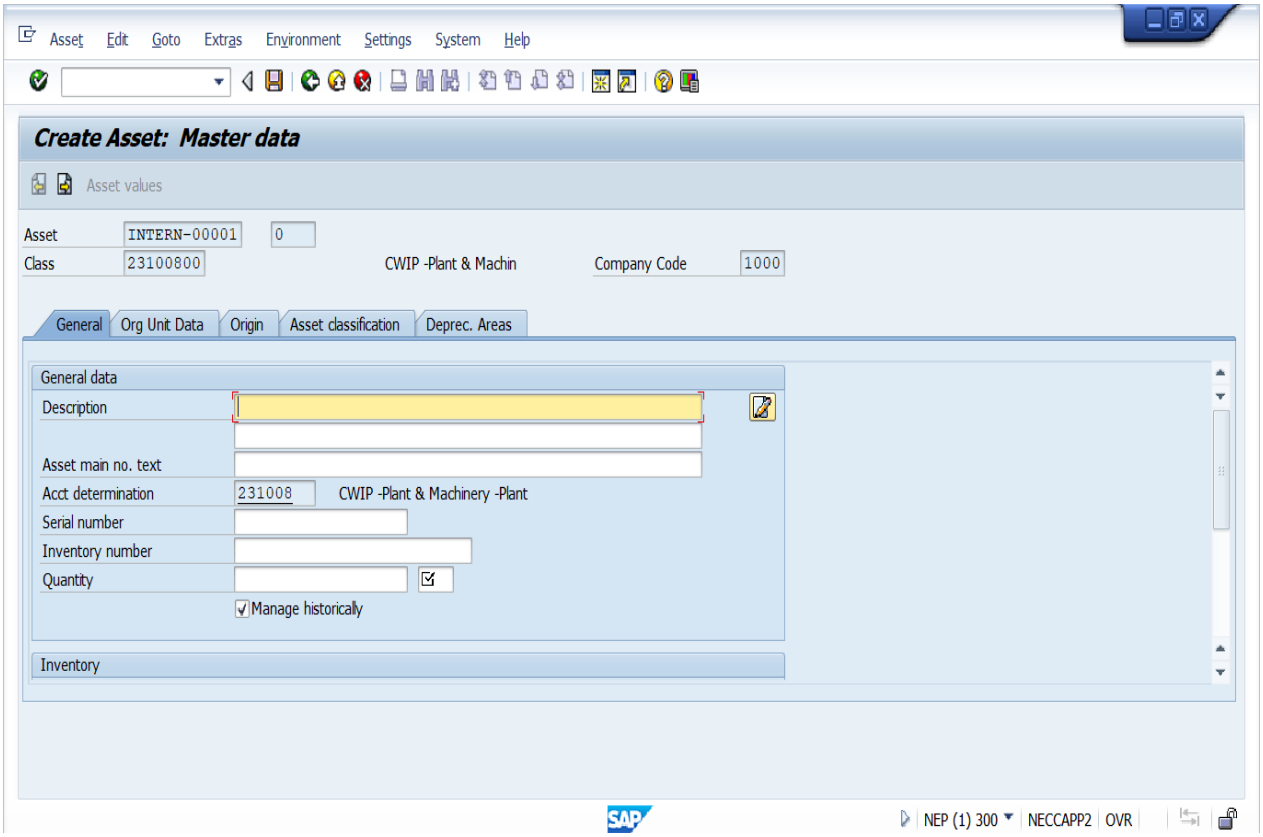
- Master Data: Asset accounting starts with the creation of master data records for each fixed asset. This includes details like asset description, location, cost center, depreciation area, and useful life.

- Acquisition: Asset acquisitions can be recorded in SAP through various methods, such as purchase orders, goods receipts, or manual journal entries. The system calculates the asset's initial value based on these entries.
- Depreciation: SAP allows for the automated calculation of depreciation for each asset based on accounting principles and methods chosen by the organization (e.g., straight-line, declining balance). Multiple depreciation areas can be maintained for reporting purposes, like statutory and management depreciation.
- Transfer and Retirement: You can use SAP to record transfers of assets between departments or locations, as well as asset retirements or disposals. The system handles the necessary accounting entries and updates the asset's status accordingly.
- Depreciation Forecasting: Asset accounting in SAP can provide depreciation forecasts and projections, which help in financial planning and budgeting.
- Integration: Asset accounting is integrated with other SAP modules like General Ledger (GL), Controlling (CO), and Materials Management (MM), ensuring that financial transactions involving assets are seamlessly incorporated into the organization's financial statements.
-

T-CODES FOR ASSET ACCOUNTING IN SAP

- AS 01-Creation of asset
- AS 02-Asset Modification
- AS 03-Asset View
- ABAVN-Asset Write Off
- ABUMN- Asset Capitalization

AS 01-CREATION OF ASSET



- **Asset Class**:The Asset class under which you want to create this Asset should be entered.

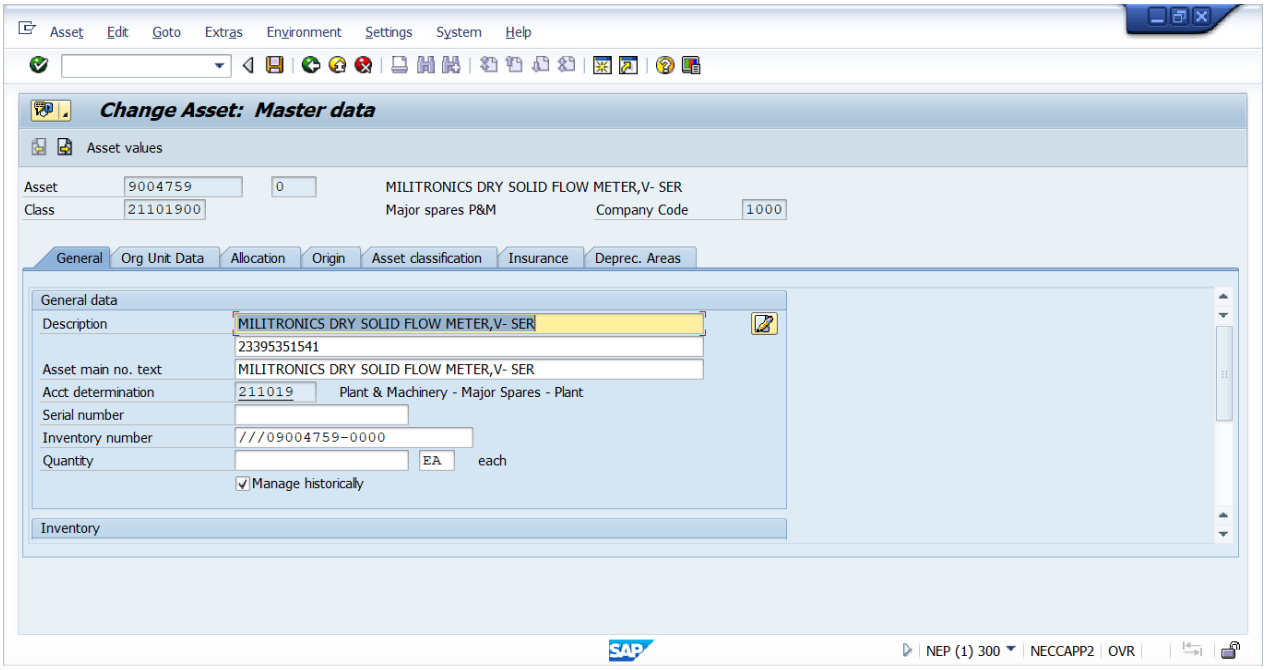
- **Company Code**:The company code under which this asset should be created must be entered.
- **Number of similar Assets**:Usually, 1 is left as the value. The number of assets you want to create will be specified in here by SAP.
- **Description**:The asset's primary identification is served by this field, with information that assists in the recognition of the asset.
- **Additional Description**:This field is used for the inclusion of extra details or specifications about the asset.
- **Asset Main Number Text**:In this field, a custom name can be assigned to the asset's main number. This name is utilized in reports and when total values per asset main number are viewed.
- **Inventory Number**:The unique inventory number that distinguishes this asset.
- **Quantity**:The quantity of identical assets represented by this entry is indicated. For example, the number of assets is mentioned if there are multiples of the same item.

Journal Entry

Particulars	L/F	Debit	Credit
Asset A/c……Dr To GR/IR A/c (Being Asset purchased on…of the amount…in GR/IR)		XXXX	 XXXX

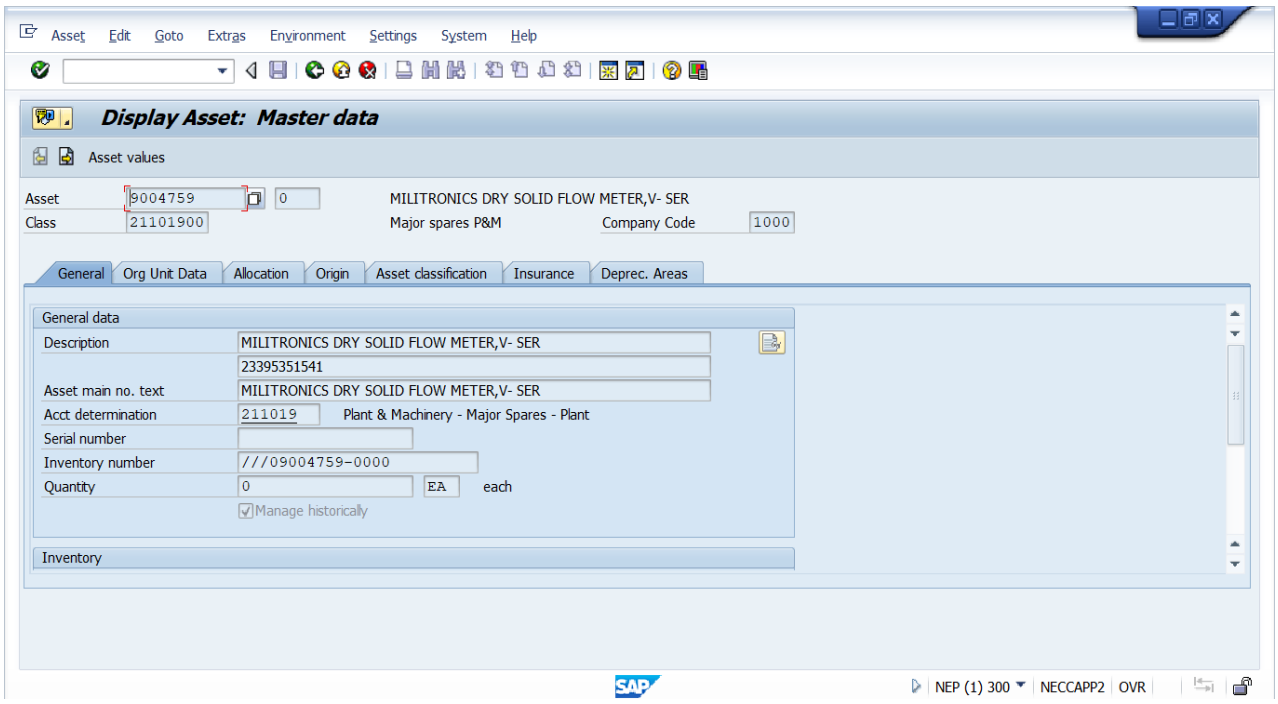
AS 02-MODIFICATION OF ASSET

AS 02 is used to modify or change existing asset master data. After an asset is created, there may be changes or updates required, such as altering the asset's description, changing its location, or adjusting its useful life.



AS 03-ASSET VIEW

AS 03 is used to view the details of an asset. It allows users to access and display the information stored in an asset master record. This can be useful for checking the details of an asset without making any changes to the data.



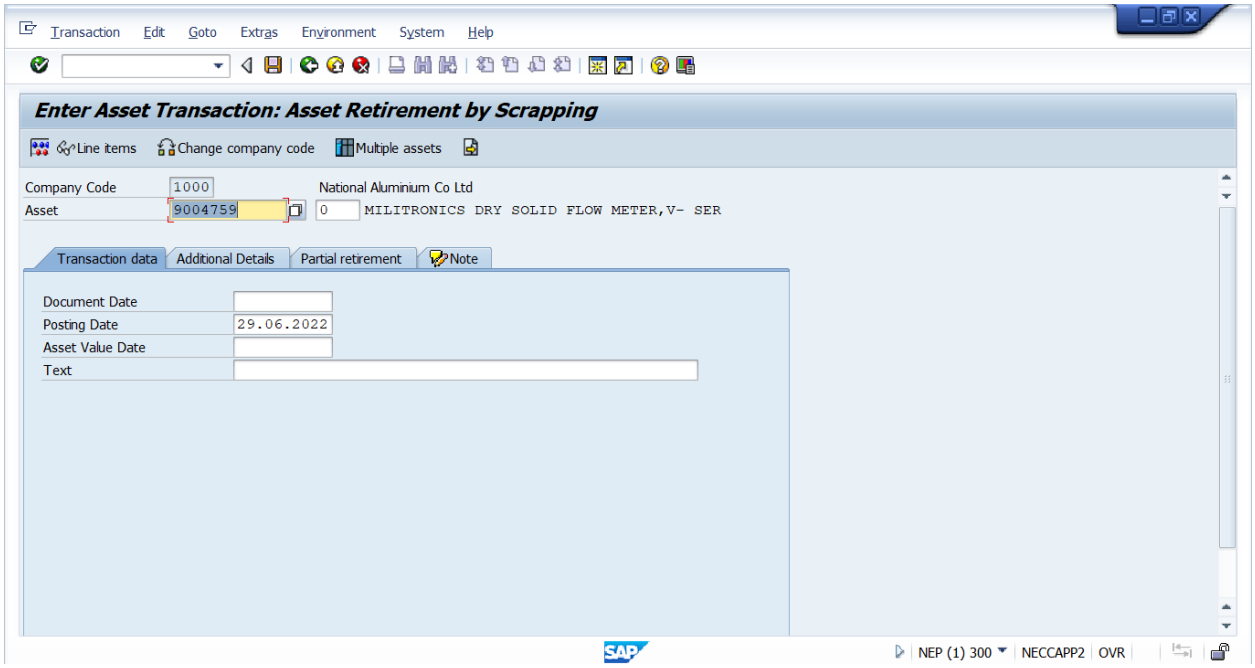
ABAVN- ASSET WRITE OFF

Asset Retirement refers to the process of removing or retiring an asset from the accounting records because it is no longer in use or has reached the end of its useful life. This process involves transferring the asset's remaining book value and accumulated depreciation to appropriate accounts and may also include recording any gains or losses associated with the retirement.

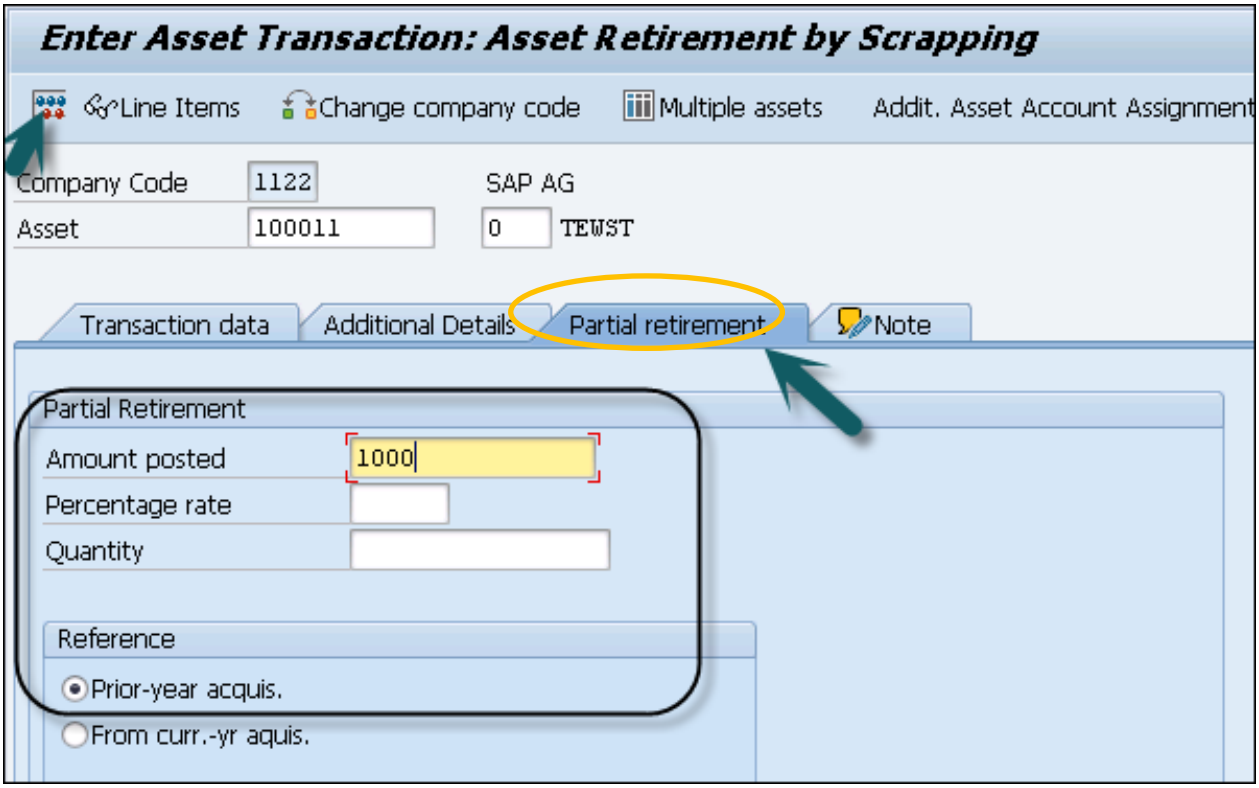
- Identify the asset for retirement, considering reasons like disposal, scrapping, sale, etc.
- Select the appropriate retirement transaction from options like ABAVN
- Enter retirement details, including the asset, date, reason, and financial information.
- SAP generates accounting entries: debit accumulated depreciation, debit gains or losses, and credit the asset account for removal from the balance sheet.

Journal Entry

Particulars	L/F	Debit	Credit
Cummulative DepreciationA/c…….Dr To Asset A/c (Being Asset depreciated on…of the amount.. of asset A/c)		XXXX	 XXXX



Partial Retirement



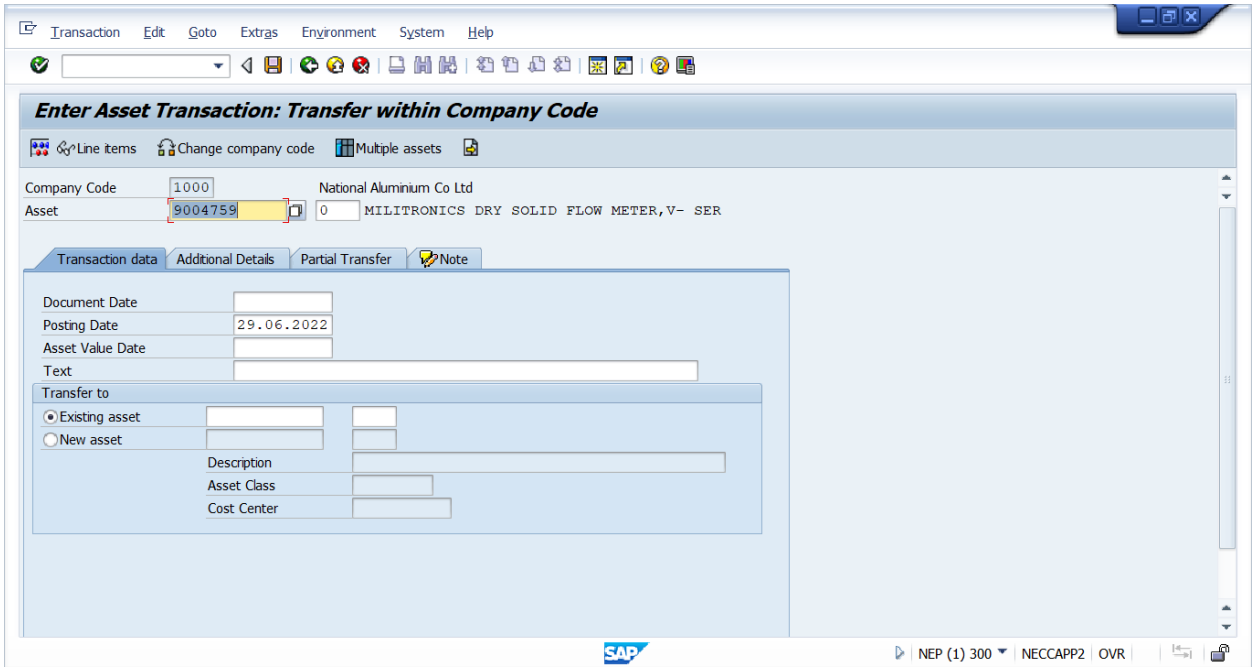
- **Amount Posted**: Represents the financial value involved in the partial retirement, such as sale proceeds or adjusted book value.
- **Percentage Rate**: Indicates the proportion of the asset being retired, helping calculate the portion relative to the total asset.
- **Quantity**: Denotes the count or amount of units retired, quantifying the extent of the asset no longer in use.

ABUMN- ASSET CAPITALIZATION

Transaction code ABUMN in SAP is used for transferring assets from one company code to another within the same client system. This transaction allows you to move an asset's financial values and accounting records, including its book value, accumulated depreciation, and other relevant data, from one company code to another while maintaining proper accounting and financial controls.
An Intercompany asset transfer may be required for one of the following reasons:

- The organizational structure of the corporate group has changed, requiring reassigning the asset to another company code
- The physical location of the asset has changed, making it essential to assign the asset to a new company.

If we want to transfer an asset from one company to another, it is not possible to change the organizational assignment of the asset by changing the master records. To transfer an asset, we need to have an asset master record created in receiving the company code.



Asset Transfer: From CWIP to main Asset
Upon capitalization amount will be transferred from CWIP to Main Asset (Depreciable group)

*CWIP- Capital Work In Progress

IMPORT CYCLE

Advance Payment:

In case of Imported Consignments, Import Cycle starts with advance payment made from Corporate Office against LC. & the same is being debited to GIT Account
(GL 233097- Stk-GIT-CWIP-Imp-T) (SAP T Code F-48)

Customs MIRO:

On entry of goods at Indian Territory Customs MIRO (Movement In Receipt Out) is made by port offices to enable payment of Customs duties. (SAP T Code –ZMIRO)

Vendor MIRO:

Subsequent to payment of imported consignments, invoice copies, copies of bill of lading along with bank payment details are sent to site fortnightly.

Based on the advises received, Vendor MIRO is being prepared at site & consequently, GRIR account is debited & vendor liability is created. (SAP T Code –MIRO)

It may be noted that in case of import cycle Vendor MIRO precedes Goods Receipt (GR) to capture the actual foreign exchange rate at the time of payment.

Goods Receipt (GR):

Post confirmation of completion of Customs MIRO & Vendor MIRO, GR is being made by Stores on receipt of goods at site thereby debiting CWIP account & crediting GRIR account. (SAP T Code-MIGO)

Quality Inspection:

Quality inspection is being done by the Stores upon acceptance/rejection by User in SAP transaction QA32 thereby transferring the stock item from quality inspection to unrestricted use stock**.**

Clearing of GRIR & Advance liability set off:

Post Quality inspection which is a pre requisite of for squaring off the advance & liability.

The GR is sent from stores to Finance for necessary clearing of GRIR, Customs & import expense clearing (SAP T codes F-03, F.13, F-44)

Import cycle gets completed post clearing of accounts.

DEPRECIATION AREA TAB

Depreciation can be defined as a continuing, permanent and gradual decrease in the book value of fixed assets. This type of shrinkage is based on the cost of assets utilised in a firm and not on its market value. Depreciating an asset means allocating its value over several years, a time frame finance people call "useful life" or "operating life." Only fixed assets -- also known as capital resources or tangible assets -- are subject to depreciation.

- **Depreciation Key** – represents a crucial element in asset accounting. It defines the method and parameters used to calculate depreciation for an asset over its useful life. Depreciation keys are associated with specific asset depreciation areas and are essential for accurately reflecting an asset's depreciation in financial accounting.
- **Useful Life** – The asset's expected useful life is indicated.
- **Prd(Product Requirement Document)** – Useful life is measured in periods. For example, if an asset is expected to last 5 years and 10 months, it is entered as 5 in the year field and 10 in the period field.
- **Dep Start** – The month from which depreciation calculations commence is specified. For instance, if an asset is purchased on 2/1/2019, the depreciation start date is determined by the

period control in the depreciation key, which may set the start date to 1/1/2019, 2/1/2019, or another date based on the configuration.

DEPRECIATION POLICY:

Sl .no	Asset		Particulars	Dep key	Useful life
1	Land	i)	Free hold land	ZRL0	0
		ii)	Lease hold land- Lease Deed made	Period of Deed	
		iii)	Lease hold land- Lease Deed not made	ZRL0	20
2	Buildings	i)	Buildings (civil construction) - considered as part of P&M	Same as P &M	
		ii)	Factory building (Excluding offices,godowns,staff quarters)	ZRL0	30
		iii)	Other than Factory building: RCC Frame	ZRL0	60
		iv)	Other than Factory building: Non RCC Frame	ZRL0	30
		v)	Fences, Wells and Tube wells	ZRL0	5
		vi)	Others (including temporary structures)	ZRL0	3
3	Bridges and culverts		All bridges and culverts	ZRL0	30
4	Roads	i)	Carpet Roads-RCC	ZRL0	10
		ii)	Carpet Roads- NON RCC	ZRL0	5
		iii)	Non Carpet roads	ZRL0	3
5	Plant and machinery	i)	Special Plant and machinery- bauxite crushing, Hydrate production, calcinations and aluminium production	ZRL5	40
		ii)	Bauxite conveying system, Alumina storage, handling & bagging plant at Refinery, Carbon plant & casting facility at Smelter	ZRL5	25
		iii)	Power generation and transmission	ZRL5	40
		iv)	Power distribution	ZRL5	35
		v)	Water distribution plant including pipeline relating to CPP & SPP	ZRL5	30
		vi)	Telecommunication transceivers, switching centers, transmission and network equipment	ZRL0	13
		vii)	Telecom ducts, cables and optical fiber	ZRL0	18
		viii)	Earth moving machinery (dozzers,loaders,dumpers,shovels)-In Open cast areas and Other areas	ZRL5	8
		ix)	Other heavy mining equipments	ZRL5	25
		x)	Equipments-Civil construction	ZRL0	12
		xi)	Plant and machinery in medical and surgical operation- Electrical machinery	ZRL0	13
		xii)	Other hospital equipmesnts	ZRL0	15
		xiii)	Other P&M (incl at Port and misc. workshop equipments)	ZRL5	15
		xiv)	Red mud pond, ash pond and Plant and machinery	ZRL0	Remaining life
		xv)	Power supply facility (other than generation,transmission,and distribution)	ZRL5	25

		xvi)	water supply facility (other than generation)	ZRL5	25
		xvii)	Water supply in township and non plant area	ZRL5	15
		xviii)	Water treatment in plant in manufacturing units	ZRL0	25
		xix)	Water treatment in non plant in township	ZRL5	15
6	Furniture and fixtures	i)	Furniture and fittings -(in schools, Guest house, community Centre, Clubs)	ZRL0	8
		ii)	General Furniture and fittings	ZRL0	10
7	Motor vehicles	i)	Motor cycles, scooters, mopeds	ZRL5	10
		ii)	Motor bus, motor lorries, motor cars, Vans, tractors a, trucks and other heavy vehicles	ZRL5	8
8	Railway facilities and Rolling stock		Railway sidings, locomotives, rolling stocks, containers, MGR system	ZRL5	15
9	Office Eqiupments		All office equipments-fax,xerox,time machine,weighing,time recording	ZRL0	5
10	Computers and data processing	i)	Servers and network	ZRL0	6
		ii)	End user- Desk top, laptop, printer, scanner	ZRL0	3
11	Laboratory and equipments		Laboratory and equipments and R&D equipments	ZRL0	10
12	Electrical installations equipments	i)	Other then power generation, transmission and distribution-In plant township	ZRL0	10
		ii)	Electrical operated equipments-T.V,refrigerators,Air conditioners, water coolers, Air coolers, inverters,fans etc.	ZRL0	10

(How depreciation is added on Assets)
[Useful Life=Year, Prd=Month]

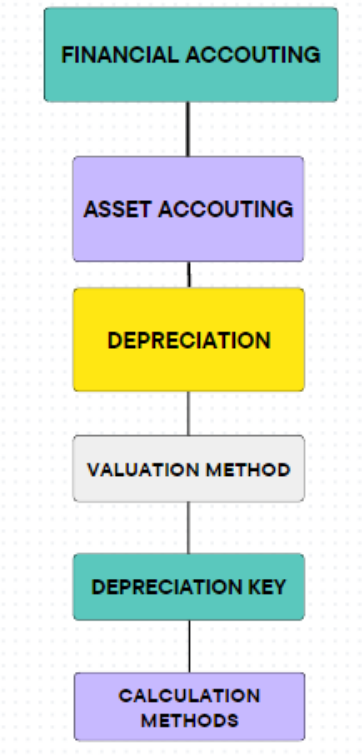
Residual Value: It is also known as Salvage Value, the projected value of a fixed asset when it's no longer useful or after its lease term has expired. Generally the length of an asset's lease period or useful life is inversely proportional to its residual value.
[Residual Value= Estimated Salvage Value-Cost of Asset Disposal]

DEPRECIATION CALCULATION

In SAP, depreciation calculation refers to the systematic reduction in the value of a fixed asset over its expected economic lifespan due to factors such as usage and wear and tear. SAP offers multiple depreciation calculation methods, and the choice of method depends on the specific needs and preferences of the business.

Depreciation Run: To calculate and post depreciation for your assets, you can use Tcode AFAB. This transaction code allows you to schedule and execute depreciation runs. You can specify the company code, asset values date, and other parameters for the depreciation calculation.

Path to Depreciation in SAP



Calculation Method

Although there are several methods of depreciation calculation but there are mainly two types of methods used across industry

1. Straight Line Method
2. Written Down Value

Straight Line Method

The straight-line method of depreciation is a commonly used accounting approach for spreading the cost of a fixed asset evenly over its expected useful life. Under this method, the asset's value decreases by the same amount each accounting period until it reaches its salvage value or zero. This consistent reduction simplifies financial reporting and helps allocate costs more evenly over time.

Example

Asset Name - Automatic Die Casting Machine
Asset purchased on 2018 whose value is INR 12,00,000. **Depreciation rate is 18**%
What is the Value of the asset in 2023?

Solution:
Given Data:
Initial Value (Cost) = INR 12,00,000
Depreciation Rate = 18%
Year of Purchase = 2018
Current Year = 2023

Depreciation= 18% (1200000)
=216000
INR 216000 will be charged every year
Asset value for the year 2019= 12,00,000-216,000
=984,000
Asset value for the year 2020=984,000-216,000
=768,000
Asset value for the year 2021= 768,000-216,000
=552,000
Asset value for the year 2022=552,000-216,000
=336,000
Asset value for the year 2023=336,000-216,000
=120,000

Result: Value of Asset in 2023 will be INR 120,000

Written Down Value Method

The written-down value depreciation method, also known as the declining balance method, is an accounting approach used to calculate depreciation. In this method, the asset's value decreases by a fixed percentage each accounting period, typically a higher rate than the straight-line method, applied to the remaining book value (or carrying amount) of the asset.

Example
Asset Name - Automatic Die Casting Machine
Asset purchased on 2018 whose value is INR 12,00,000. **Depreciation rate is 1**8%
What is the Value of the asset in 2023?

Solution:
Given Data:
Initial Value (Cost) = INR 12,00,000
Depreciation Rate = 18%
Year of Purchase = 2018
Current Year = 2023
1st Depreciation= 18% (12,00,000)

=216,000

Book Value in the year 2019= 12,00,000-216,000

=984,000

2nd Depreciation= 18% (984,000)

=177,120

Book Value in the year 2020=984,000-177,120

=806,880

3rd Depreciation=18% (806,880)

=145,238.4

Book Value in the year 2021=806,880-145,238.4

=661,642

4th Depreciation=18% (661,642)

=119,096

Book Value in the year 2022=661,642-119,096

=542,546

5th Depreciation=18% (542,546)

=97,658.2

Book Value in the year 2023=542,546-97,659

=444,887

[Net book Value= the value at which the company reports an asset on its Balance Sheet The value of fixed asset after deducting the accumulated depreciation]

CALCULATION THROUGH SAP

Step-by-step process with SAP Transaction Codes (Tcodes) for calculating depreciation for a laser cutting machine using the straight-line method:

Step 1: Create Asset Master Record

- Use Transaction Code AS01 (Create Asset Master Record) to create a new asset master record for the laser cutting machine.
- Enter the necessary information for the asset, including the asset description, acquisition and any other relevant details.

Step 2: Assign Depreciation Key

- In the asset master record you just created, navigate to the "Depreciation" tab.
- Assign a depreciation key for the straight-line method. If it's not already defined in your SAP system, you may need to create it using customizing Tcodes. Let's assume the key is named "SL" for straight-line depreciation.

Step 3: Run Depreciation

- Use Transaction Code AFAB (Unplanned Depreciation) to post the depreciation for the laser cutting machine.
- Specify the asset you want to calculate depreciation for.
- Enter the posting date for the depreciation. Typically, you'd do this at the end of each fiscal year.

- SAP will calculate the annual depreciation amount based on the straight-line method automatically and post it to the appropriate accounts.
- Repeat Step 3 Annually
- Repeat Step 3 for each fiscal year until you have completed the asset's useful life (8 years in this case).
- After 8 years, the book value of the asset should reach its scrap value, and no further depreciation is necessary.

National Aluminium Company Limited (NALCO) is a employs the straightforward and widely **adopted straight-line depreciation method** for its plant assets. The straight-line method is the simplest and most straightforward approach to calculate depreciation. It is particularly effective when an asset experiences a consistent and gradual decrease in value over time.

The methodological reason for using straight-line depreciation for plant assets is that it evenly spreads the asset's cost over its estimated useful life. This method assumes that the asset's utility or economic benefit is consumed at a constant rate over time. By allocating an equal amount of depreciation expense each year, it simplifies financial reporting, budgeting, and compliance with accounting principles, providing a consistent and straightforward way to reflect the asset's gradual consumption and maintain a systematic record of its value reduction.

QUESTIONNAIRE

The Questions are designed with an objective to study the behaviour of employees towards implementation of SAP in NALCO. It is aimed to collect the feedback and analyse the satisfaction level of employees and effectiveness of SAP Module.

1. Would you rate SAP FI module implemented in NALCO Finance?

- ☐ Highly Satisfactory
- ☐ Satisfactory
- ☐ Average
- ☐ Poor

2. How has the implementation of SAP in both finance and Plant management benefited NALCO?

- ☐ Improved operational efficiency
- ☐ Enhance Cost control
- ☐ better decision making
- ☐ all the above

3. What percentage of SAP Fi Module is used for financial record keeping, processing of bills, etc?

- ☐ >80%
- ☐ 50-80%
- ☐ 30-50%
- ☐ <30%

4. Is SAP improved the accuracy of data processing at NALCO?

- ☐ Strongly agree
- ☐ Agree

- ☐ Neutral
- ☐ Disagree

5. How has SAP Finance contributed to better financial decision-making at NALCO?

- ☐ Faster access to financial data
- ☐ Improved financial forecasting
- ☐ Enhanced budget control
- ☐ All the above

6. Which financial processes have been most positively impacted by SAP Finance?

- ☐ Accounts Payable
- ☐ Accounts Receivable
- ☐ Asset Accounting
- ☐ All the Above

7. Has SAP Fi improved the accuracy and reliability of financial data at NALCO?

- ☐ Strongly Agree
- ☐ Agree
- ☐ Neutral
- ☐ Disagree

8. How would you rate the overall effectiveness of SAP Finance in NALCO?

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5

9. What challenges or issues do you face while working with SAP ERP Software?

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

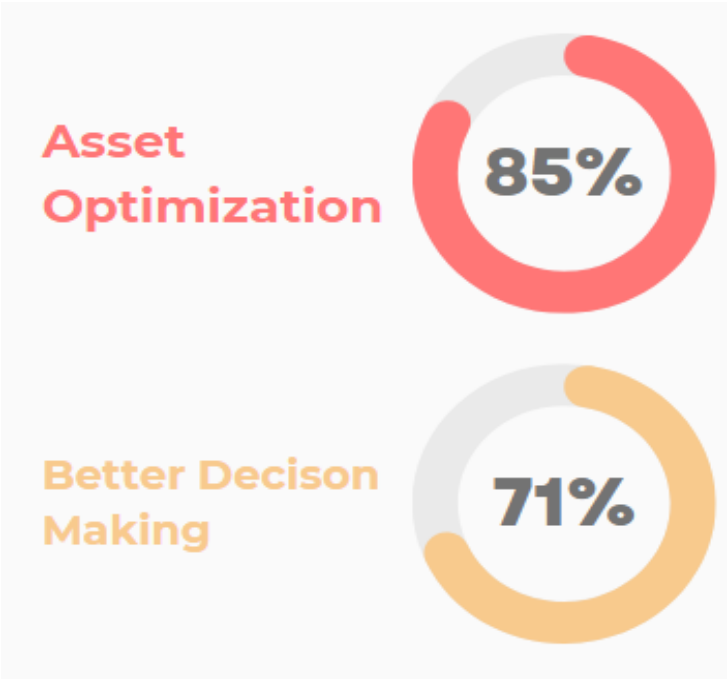
10. What would you recommend any improvements or suggestions to the SAP system?

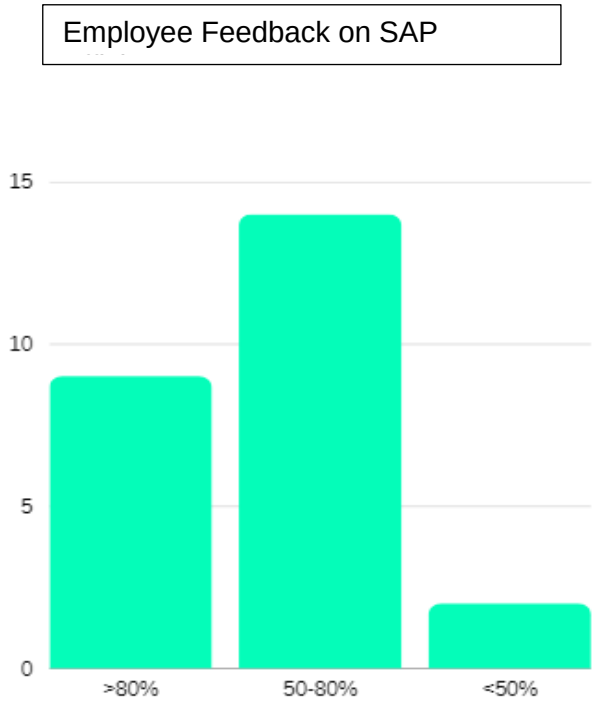
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

ANALYSIS AND FINDINGS

The provided feedback from 25 employees using SAP suggests a generally positive outlook in two key areas: asset optimization and better decision-making. A significant majority, 21 employees i.e.

85%, reported that they found asset optimization to be effective; indicating that SAP's asset accounting system is likely contributing positively to the organization's asset management. Furthermore, 71% of employees mentioned experiencing improved decision-making, suggesting that SAP's tools or processes have a positive impact on data-driven choices.





CHAPTER-6

CHALLENGES

Working in SAP Asset Accounting can present several challenges, depending on the complexity of your organization's asset management processes and the specific SAP configuration. Here are some common challenges that users may face when working in SAP Asset Accounting:

- Complex Configuration: SAP Asset Accounting can be highly configurable to meet various accounting standards and organizational requirements. Configuring and maintaining depreciation areas, asset classes, and other settings can be complex and require expertise.
- Data Entry and Maintenance: Maintaining accurate asset master data is crucial. Errors in asset data, such as incorrect acquisition values or depreciation keys, can lead to financial inaccuracies.
- Integration: SAP Asset Accounting needs to integrate smoothly with other modules like General Ledger, Controlling, and Materials Management. Ensuring proper integration and data consistency can be challenging.
- Multiple Depreciation Methods: Organizations often use various depreciation methods for different asset types. Managing and applying these methods correctly can be a challenge.
- Depreciation Forecasting: Accurately forecasting asset depreciation for financial planning and budgeting can be challenging, especially in organizations with a large number of assets.
- Retirements and Transfers: Properly handling asset retirements, transfers, and disposals can be complex, as these transactions impact financial reporting.

SUGESSTIONS

To enhance SAP Finance's effectiveness, organizations should prioritize user training across all levels, equipping them with proficiency in SAP Finance modules through comprehensive training programs and user-friendly documentation. Customization and configuration should be meticulously executed to align SAP Finance with the organization's unique financial processes and reporting requirements. Additionally, automating routine financial tasks like invoice processing and payment approvals, coupled with streamlining workflows to minimize bottlenecks, will reduce manual effort and improve overall efficiency, making SAP Finance a more productive and user-friendly tool for financial operations.

CONCLUSION

Based on the project conducted on asset accounting in SAP, asset lifecycle management, and asset depreciation methods, it is evident that SAP environment is a complex yet crucial aspect of an organization's financial management. This project highlighted the significance of understanding the entire lifecycle of assets, starting from creating an asset master data, maintaining it and depreciating with proper valuation emphasizing the importance of efficient processes and meticulous record-keeping for optimal asset utilization and accurate financial reporting. Additionally, the choice of depreciation method plays a pivotal role in financial statements and strategic decision-making, aligning with accounting standards and regulations and the methods used are very vital for proper asset utilization. Integration within SAP enhances efficiency, while automation streamlines processes and frees up resources. Furthermore, data analysis revealed valuable insights for cost savings and improved asset management strategies. In conclusion, asset accounting in SAP is a multifaceted discipline that demands precision, regulatory compliance, and data-driven decision-making for an organization's financial well-being and future success.

BIBLIOGRAPHY

- https://blogs.sap.com/
- https://help.sap.com
- Nalco 42nd Annual Report 2023
- Nalcoindia.com
- SAP Fixed Assets Accounting by Jörg Siebert, Dieter Schlagenhauf
- Strategic Decision-Making with Asset Data in SAP: Case Studies from Industry." Journal of Business Analytics