A REPORT ON BUSINESS IMMERSION

AT

HINDUSTAN AERONAUTICS LIMITED

SUBMITTED TO R V INSTITUTE OF MANAGEMENT

(AUTONOMOUS INSTITUTION AFFILIATED TO BCU)

IN PARTIAL FULFILLMENT OF THE

REQUIREMENT FOR THE DEGREE OF

MASTER OF BUSINESS ADMINSTRATION

SUBMITTED BY

KEERTI BAGEWADI

REG NO: - P18FW22M05026

UNDER THE GUIDANCE OF

Mr. Rajesh Kudva
Chief Manager (Finance Dept)
Hindustan Aeronautics Limited

N Nagasubba Reddy
Asst. Professor
R V Institute of Management

R. V. INSTITUTE OF MANAGEMENT

CA 17, 36th Cross, 26th Main, 4th "T" Block, Jayanagar, Bangalore-560041.

(Autonomous Institution Affiliated to BCU)

2023

DECLARATION BY THE STUDENT

I, hereby declare that the Report on Business Immersion at HINDUSTAN AERONAUTICS LIMITED submitted in partial fulfillment of the requirement for the award of the degree of Master of Business Administration is my original work under the guidance and supervision of Nagasubba Reddy, RV Institute of Management **(Autonomous Institution Affiliated to BCU)**

This report has not been submitted to any other institution or university for the award of any other degree or diploma or any other similar titles.

Date :-
Place :-

KEERTI BAGEWADI
Reg no :- P18FW22M015026

ACKNOWLEDGEMENT

I received a wonderful opportunity for learning and professional advancement during my business immersion programme with **HINDUSTAN AERONAUTICS LIMITED (HAL)**. I therefore think of myself as a really fortunate person because I was given the chance to take part in it.

I'd like to take this opportunity to express my heartfelt gratitude and special thanks to my guide, **Mr. Rajesh Kudva** of Hindustan Aeronautics Limited , who, despite his busy schedule, took the time to hear, guide, and keep me on the right track while allowing me to complete my internship at their esteemed organization. I would like to thank **Mr. Nagaraja** for participating in important decisions and providing necessary advice and guidance.

I want to express my gratitude to my mentor **N Nagasubba Reddy**, for all of his help and advice in getting this business immersion completed. I want to express my appreciation to **RV Institute of Management** for providing me with this chance.

I'm also grateful to **Dr. Purushottam Bung** (Director), who gave me the chance to prepare this report on the business immersion programme at Megh Computing Private Limited. I also want to express my gratitude to my parents and other sources that provided me with the inspiration and support I needed to write this report.

RASHTREEYA SIKSHANA SAMITHI TRUST®
RV INSTITUTE OF MANAGEMENT
CA 17, 26 Main, 36th Cross, 4th T Block, Jayanagar
Bengaluru, Karnataka 560 041
(Autonomous Institution Affiliated to BCU)

GUIDE CERTIFICATE

This is to certify that **KEERTI BAGEWADI** bearing Register Number **P18FW22M0151026**, student of II semester MBA Programme has satisfactorily completed the Business Immersion programme and prepared the Report under my guidance and supervision.

This Business Immersion Report has not been submitted to any other institution or university for the award of any other degree or diploma or any other similar titles.

Date :

Place: Bangalore

Prof. N. Nagasubba Reddy

Assistant Professor

ORGANISATION CERTIFICATE

मानव संसाधन विभाग
हेलिकॉप्टर प्रभाग (हैक)
हिन्दुस्तान एरोनाटिक्स लिमिटेड
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HELICOPTER DIVISION (HC)
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Ref: H/A/HR/CM (PR)/2023 *August 14, 2023*

CERTIFICATE

This is to certify that Ms. Keerti Bagewadi (Reg No. P18FW22M015026) student of MBA, RV Institute of Management, Bangalore has undergone "Internship" in Finance Department, HAL-Helicopter Division from 03.07.2023 to 14.08.2023.

2. Her Punctuality, Conduct, Behaviour and Progress during the period of "Internship" was Satisfactory.

3. We wish Ms. Keerti Bagewadi all the very best in all her future endeavors.

For HAL-Helicopter Division

14/8/23

(G H Raju)
Chief Manager (Public Relations)

www.hal-india.com

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COLLEGE CERTIFICATE

RV Institute of Management

Affiliated to Bangalore Central University | Approved by AICTE, NAAC 'A+' Accredited

This is to certify that Mr/Ms. **KEERTI BAGEWADI** bearing Register Number **P18FW22M015026** student of II semester MBA Programme, had undertaken an Business Immersion Programme at **Hindustan Aeronautics Limited** under the guidance of **Prof. N. Nagasubba Reddy** , Assistant Professor , RVIM.

This business Immersion Report has not been submitted to any other Institution or University for the award of any degree or diploma or any other similar titles.

Date: 26-08-2023

Place: Bangalore

Director

CA-17, 36th Cross, 4th Main, 4th T Block Jayanagar Bangalore - 560041

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EXECUTIVE SUMMARY

The MBA course offered by the Bangalore Central University, Karnataka, has its own uniquesyllabus which requires its MBA students to undertake a business immersion with any of the leading business houses for a period of 6 weeks during the second semester. For the purpose ofacquiring practical knowledge of the working and functioning of a company, Bangalore Central University has incorporated an in plant training into its Business Management schedule. This in plant training shows us how the different departments in an organisation work and wins as asingle unit.

Hindustan Aeronautics Limited organisation is monopoly of the aeronautical industry in Indiaand under the organisation Helicopter Division is the only division which produces helicopterslike Advanced Light Helicopter (ALH), Light Combat Helicopter (LCH), Rudra Attack Helicopter, Chetak and Cheetah Helicopters, Indian Multi-Role Helicopter (IMRH) (Under Development), Light Utility Helicopter (LUH) (Under Development), Composite Main RotorBlade for Mi-17 Helicopters.

The Helicopter Division of Hindustan Aeronautics Limited (HAL) has a rich history of contributing to India's aerospace industry through the design, development, production, and maintenance of helicopters. The Helicopter Division of HAL was established in 1962 with thegoal of indigenously designing and manufacturing helicopters to meet the diverse needs of India's armed forces and civilian sectors.

Throughout its history, the Helicopter Division of HAL has contributed significantly to India's defense and aerospace sectors, achieving milestones in indigenous helicopter design, production, and technology. Its achievements reflect India's commitment to self-reliance in thefield of aviation and its ability to develop advanced rotorcraft for a variety of applications.

The report consists of the study of the organisation. It involves the Brief profile of the company, establishment factors that prompted the establishment of the company, location matrix and milestones in the history of the company. Brief about the industry along with the history a Apartfrom this; a brief introduction has been given to the each department of the company. The organisation also implemented environment management systems and organisation health & safety policy in the organization.

CHAPTER 1: ABOUT THE FIRM

HELICOPTER DIVISION, HINDUSTAN AERONAUTICS LIMITED

An important aerospace and defense business with headquarters in India are called Hindustan Aeronautics Limited (HAL).

HISTORY

Welcome to Hindustan Aeronautics Limited's Helicopter Division.

In July 1970, the Helicopter Division was founded. To meet the market's expanding needs, thedivision produces both single- and twin-engine helicopters.

The Advanced Light Helicopter ALH-Dhruv and ALH-Rudra, LCH (Light Combat Helicopter), LUH (Light Utility Helicopter), Cheetah, Chetak, Cheetal, and Lancer helicoptersare all produced by the Helicopter Division.

The co-located Rotary Wing Research & Design Centre (RWR&DC) provides support for thedivision.

The MRO sector handles all aspects of helicopter maintenance, repair, and overhaul. The Rotory Wing Academy specialises in pilot training.

By signing a contract with M/s SUD-AVIATION (now M/s EUROCOPTER, France) to produce Aloutte III helicopters, HAL began producing helicopters in 1962. (Chetak). 'Fly Away's' initial Chetak (Aloutte III).

With M/s SNIAS (now M/s, Eurocopter), a licence agreement for the production of the Cheetah(LAMA SA 315-B) was signed in 1970. In 1976–1977, the first Cheetah made from scratch was delivered.

HAL created the "Lancer" light attack helicopter in the 1990s. The Cheetah helicopter, whichhas a solid reputation, served as the basis for the lancer's fundamental design. The front panelsof the helicopter are bulletproof. Each side is equipped with a gun cum rocket pod with a 70 mm rocket and a 12.5 mm gun. It has been equipped with an optical sight for precise firing.

A re-engineered version of the Cheetah helicopter is the Cheetal chopper. In 2006, the Cheetal chopper accomplished the highest landing in history at a location in the Himalayas called "Saser Kangri."682 single-engine helicopters have been successfully produced by the HAL Helicopter division.

In the design, development, and production of the twin engine Advanced Light Helicopter (ALH), HAL attained independence. The 5.5 tonne ALH helicopter is a multi-role, multi- mission, all-weather helicopter. Beginning in 2001–2002, the twin engine helicopter of domestic design went into series production. Division has created 336 ALH in various iterations.

LCH is a 5.8 Tonne dedicated combat helicopter that was created and manufactured domestically. specialised combat helicopter with high levels of dependability, agility, and manoeuvrability to operate in any weather and adverse climatic situations. The LCH will be able to operate at great altitudes and be built to fit into an anti-infantry and anti-armour role. Attack helicopter LCH has a tandem seating arrangement. Compared to the limited series production of LCH, Division has produced 10 LCH.

To fulfil the needs of the Indian Armed Forces, HAL developed the Light Utility Helicopter (LUH), a 3 tonne single-engine helicopter. This helicopter primarily serves in utility, observation, and reconnaissance roles. Additionally, helicopters in this category are in high demand on the civilian side in a growing country like India. At Tumkur, new facilities are beingbuilt to accommodate future demands. In December

2018, LUH was flown in the Helicopter Division's brand-new Tumkur facilities. manufacture against the restricted series manufacture of LUH has started in the division.

The division has AS 9100 'D' and ISO 14001:2004 accreditation.

Following certification by the Directorate General of Civil Aviation (DGCA), the division is also approved.

- Production Organization Exposition (POE) Under Civil Aviation Requirements – 21(CAR-21)
- Maintenance Organization Exposition (MOE)Under Civil Aviation Requirements – 145(CAR-145)
- Continuing Airworthiness Management Organization (CAMO)Under Civil AviationRequirements – M (CAR-M)
- DGAQA Certification Under AFQMS-2011(Approval of Firm and It's Quality Management System) and approved Type Certificate for Dhruv from DGAC, Chile.

The helicopter division at HAL, which has a track record of producing more than 1000 helicopters, has expanded its design, development, and production capabilities by producing new helicopters like the Weapon System Integrated (WSI) version of the Dhruv (dubbed the "Rudra"), the Light Combat Helicopter (LCH), and the Light Utility Helicopter (LUH).

VISION, MISSION, OBJECTIVES, VALUES, MILE STONES OF HELICOPTER DIVISION OF HINDUSTAN AERONAUTICS LIMITED (HAL)

VISION

To lead the world in helicopter design, production, and technology, helping India expand its aerospace industry and being a key player in the growth and development of the country.

MISSION

- Develop and produce cutting-edge helicopters for a variety of uses, satisfying

the demands of our clients and the needs of the country.

- Develop cutting-edge technology through innovation and teamwork to improve the effectiveness, safety, and performance of helicopters.
- Encourage our team members to uphold a culture of excellence, professionalism, and continual improvement.
- Objectives Assist India's aerospace sector in expanding and achieving technological independence in the field of helicopters.

OBJECTIVES

- Create and manufacture a variety of top-notch helicopters to serve the needs of the defence and civilian markets.
- Achieve operational excellence via cost-effective procedures, effective production processes, and quality control.
- Lead research and development initiatives to establish innovations in avionics, materials, and propulsion for helicopters.
- Form strategic alliances with major aerospace firms to advance our technological prowess and widen our customer base.
- Why Deliver exceptional customer service and support for the duration of our goods' useful lives to win over and keep over customers.

VALUES

- **Excellence:** Striving for the highest quality and performance standards in everything we do.
- **Innovation**: Embracing creativity and lifelong learning to propel technical progress.
- **Integrity:** Maintaining ethical standards, transparency, and responsibility in all relationships.
- **Teamwork:** Effectively collaborating within our organisation and with external partners to achieve common goals.
- **Safety:** We prioritise the safety of our staff, customers, and end users by implementing stringent safety procedures.

MILESTONES

- Launching and delivering a new generation of indigenous helicopters
- obtaining certifications and approvals from national and international aviation authorities.
- Building a strong global footprint through collaborations, partnerships, and export opportunities.
- Creating and integrating novel technologies that set new standards for helicopter performance and efficiency
- Recognising and celebrating milestone achievements in helicopter design, production, and operating capabilities**.**

OPERATIONS AREA AND BUSINESS, PRODUCT AND SERVICE PROFILE

1. **Design and Development:** This section is in charge of creating and developing a variety of helicopter platforms for various applications such as transport, reconnaissance, search and rescue, and combat. This entails developing, engineering, and testing new helicopter models.
2. **Manufacturing:** HAL's Helicopter Division produces helicopters, including numerous components, subsystems, and airframes. For the production of specialised parts, the division may also work with other divisions or enterprises.
3. **Testing and Certification:** The division conducts extensive testing and evaluation of helicopters to ensure they meet safety, performance, and regulatory standards. This includes flight testing, ground testing, and obtaining necessary certifications from aviation authorities.
4. **Testing and Certification:** The division thoroughly tests and evaluates helicopters to ensure they fulfil safety, performance, and regulatory requirements. This involves flight testing, ground testing, and acquiring appropriate aviation authority certifications.
5. **Maintenance, Repair, and Overhaul (MRO):** After helicopters are delivered to customers, the division performs maintenance, repair, and overhaul services to

assure the aircraft's continuous airworthiness and operational readiness.

6. **Upgrades and Modernization:** The division may be involved in the upgrade and modernization of existing helicopter platforms in order to incorporate new technology, increase performance, extend lifespan, and boost capabilities.
7. **Research and Development:** The division conducts research to develop advanced helicopter technologies such as avionics, materials, propulsion systems, and other advancements that lead to improved helicopter performance and efficiency.
8. **Training and Support:** The Helicopter Division of HAL may offer training to pilots, maintenance employees, and other stakeholders engaged in the operation and maintenance of helicopters. Furthermore, the division provides customer service and technical support to address any concerns that may emerge during helicopter operations.
9. **Export and International Collaboration:** To promote its helicopter products and technologies on the global market, the division may engage in export activities, working with foreign governments, defence forces, and aerospace firms.

PRODUCTS OF HELICOPTER DIVISION OF HAL

1. DHRUV (Advanced Light Helicopter)

The indigenously designed and developed Advanced Light Helicopter (ALH-DHRUV) is a 5.5 tonne twin engine, multi-role, multi-mission new generation helicopter. The basic helicopter is available in both skid and wheeled versions. Dhruv has been "type-certified" by the Centre for Military Airworthiness Certification (CEMILAC) for military operations and civil operations by the Directorate General of Civil Aviation (DGCA).

The utility military variant received certification in 2002, while the civil variant received certification in 2004. Production series helicopter deliveries started in 2001-2002. By October 2022, a total of 336 helicopters had been built. The primary ALH variations are categorized as

- Mk-I Traditional cockpit
- Glass cockpit Mk-II and Mk-III
- Maritime Role (Navy/ Coast Guard) MK-III
- MK-IV-armed variant

ALH-DHRUV Mk-III (Army)

ALH-DHRUV Mk-III (IAF)

ALH-DHRUV Mk-III (Navy)

ALH-DHRUV Mk-III (Coast Guard)

Technical Parameters		
	ALH Mk-III	ALH Mk-IV
Length	15.9 m	15.9 m
Width	13.2 m	13.2 m
Height	4.98 m	4.98 m
Max Take Off Weight	5500 kg	5800 kg
Never Exceed Speed (VNE)	292 Km/h	245 Km/h
Range	630 km	590 km
Endurance	3.65hr	3.8 hr
PAX	12 + 2	

Power Plant

› TM 333 – 2B2 (For Dhruv Mk-I and Mk-II) & ARDIDEN 1H1 (Shakti) (for Dhruv Mk III & Mk IV).

	TM 333 - 2B2	SHAKTI
- Dry wt.	167.5 kg	205 kg
- Max. Power	801 kW	1032 kW
- Specific Fuel Consumption	0.323 kg/kw hr	0.300 kg/kw hr

Shakti Engine (for ALH models III and IV)

- 12% more power than the TM 333 2B2 engine
- Assembly of two centrifugal compressors
- Blades made of a single crystal
- FADEC with dual channels

ALH Dhruv plays a significant part.

1. Flood relief and rescue
2. Slithering
3. Cargo Movement
4. Casualty evacuation
5. Troop transport
6. Maritime functions and coastal security

Features of ALH Dhruv

- Capable of operating in all-weather conditions while maintaining a high level of dependability and survivability.
- Powered by twin Shakti engines for exceptional high altitude performance.
- Outfitted with a glass cockpit and advanced avionics for enhanced mission effectiveness, including night flying capability.
- Dhruv incorporates cutting-edge technology such as hinge-less interchangeable main rotor blades, bearing-less tail rotor blades, an anti-resonance vibration isolation system, and redundancies for crucial components.
- Dhruv is an appropriate platform for working at various elevations ranging from sea level to high Himalayan altitudes, as well as in desert and saline atmospheric conditions with extreme temperature ranges.
- It is equipped with mission systems such as Helmet Pointing System (HPS), Electro Optic Pod, and Self-Protection system involving Electronic Warfare Suite, and has evolved from a basic utility version to a weaponised platform called Rudra in the 5.8 tonne class.

- It is equipped with mission systems such as the Helmet Pointing System (HPS), an Electro Optic Pod, and a self-protection system that includes an Electronic Warfare Suite.
- Rudra's weapons include a 20 mm turret gun, a 70 mm rocket, an air to air missile, and anti-tank guided missiles.
- It integrates with other systems such as VOR/ILS/DME, IR Suppressor, Digital Moving Map On Board Inert Gas Generation System, and so on.

2. CHETAK

After a contract with M/s SUD-AVIATION (now M/s AIRBUS (Former EUROCOPTER), France) for the production of Aloutte III helicopters (Chetak), HAL, Helicopter Division began manufacturing helicopters in 1962. The first Chetak (Aloutte III) was delivered in 'Fly Away' condition.

The Chetak Helicopter weighs two tonnes. The Chetak helicopter is adaptable, multifunctional, and large, with seven seats. Two pilots and five passengers are aboard the seven-seater intended for this purpose. It can accommodate six passengers and is licenced for single pilot flights.

The helicopter can be used for the following purposes:

- Passenger Transport
- Logistics Support (Cargo / Material Transport)
- Casualty Evacuation (CASEVAC)
- Search & Rescue (SAR) operations
- Off - shore operations

A single Turbomeca Artoustte III B turbo shaft engine powers the Chetak helicopter.

HAL has developed and sold 360 of these multifunctional Helicopters in India and overseas to dates.

Technical Parameters	
Length	12.82 m
Width	2.59 m
Height	2.97 m
MTOW	2200 kg
Cruise Speed	185 Km/h
Range	500 km
Endurance	3.00 hr
No. of Passengers	5 + 2

3. CHEETAH

HAL and M/s SNIAS secured a licence contract for the Cheetah in 1970. The first Cheetah built from the ground up was delivered in 1976-1977.

The Cheetah Helicopter is a high-performance helicopter that is identical to Eurocopter's LAMA SA 315B Helicopter. It is designed to work in a wide range of weight, centre of gravity, and altitude conditions. The Cheetah helicopter, which seats five people, is durable, adaptive, and versatile. It is the world's highest altitude flying helicopter in all helicopter classifications.

The Cheetah helicopter has five seats (one pilot and two or four passengers). The structure of this tough, multi-role helicopter allows for great manoeuvrability. Because of its excellent Power-Weight ratio, the Cheetah is one of the best helicopters for operations in hot tropical weather and missions at high altitude.It is the world's highest altitude flying helicopter in all helicopter classifications.

The helicopter can perform the following functions:

- Passenger Transport
- Logistics Support (Cargo / Material Transport)

- Casualty Evacuation (CASEVAC)
- Search & Rescue (SAR) operations
- Reconnaissance
- Under slung Operations.

The Cheetah chopper is powered by a single Turbomeca Artoustte III B turbo shaft engine.

HAL has produced and sold 279 of these adaptable helicopters to far, both in India and abroad.

Technical Parameters	
Length	12.92 m
Width	2.38 m
Height	3.09 m
MTOW	1950 kg
Cruise Speed	192 Km/h
Range	560 km
Endurance	3.10 hr
No. of Passengers	3 + 2

4. Lancer

In the 1990s, HAL developed the "LANCER" light attack helicopter. Hindustan Aeronautics Limited developed the Lancer Helicopter, a light assault helicopter, as a feasible airmobile area weapon system.

The Cheetah helicopter, which has a good reputation, served as the foundation for the basic design of the Lancer. The helicopter's crew seat and front panels are bulletproof.

Features

- Designed for counter-insurgency operations, close air support, enemy fire suppression, assault on vehicular convoys, demolition of enemy machine gun

positions, and anti-armour applications.

- Transports two jettisonable combination gun-rocket pods, one on either side of the armament pylon, on suspension points.
- A gun sight is supplied for the pilot's precision pointing and firing, and each pod contains one 12.7 mm gun and three 70 mm rockets.

Technical Parameters	
Length	12.92 m
Width	3.89 m
Height	3.09 m
MTOW	1950 kg
Cruise Speed	176 Km/h
Range	290 km
Endurance	2.50 hr

5. CHEETAL

The helicopter Cheetah has been redesigned as the Cheetal. The project, which began in 2002, aims to increase maintainability and high altitude operational capabilities while also providing a mid-life upgrade for safe and dependable operations. To boost performance, the Cheetah's Artouste-IIIB powerplant received a modern, fuel-efficient TM333-2M2 engine with FADEC. The engine also includes an automatic Backup Engine Control system (EBCB).There are several different tasks for which the cheetal helicopter is customised.

- Personnel transportation
- Logistics Assistance (Cargo/Material Transport)
- Evacuation of Casualties (CASEVAC)
- Surveillance
- Overslung Operations
- Operation Search and Rescue

Features

- Modified instrument panels and electrical system with Master warning flasher light and modular warning lights; new, fuel-efficient engines are more reliable as a result.
- The process of re-lighting is becoming faster and faster.superior power margins lead to superior high-altitude climb performance. Lessening ofthe volume.
- Lower specific fuel consumption (SFC) results in increased endurance, better range, and larger cargo.
- Improved right rudder margins make elevated helipad takeoff and landing easier.
- Cheetal's design has upgraded features such as a lightweight electrically driven Artificial Horizon, Directional Gyro, Flight Monitoring System (FMS), Cockpit Voice Recorder (CVR), Modular Warning Lights, Master Flasher Warning, and a modern electrical system.

To date, HAL has produced and sold 43 Cheetal Helicopters both in India and worldwide.

Technical Parameters	
Length	12.92 Mtrs
Width	2.38 Mtrs
Height	3.09 Mtrs
MTOW	1950 kgs
Cruise Speed	192 Km/h
Range	640 kms
Endurance	3.50 Hrs
No. of Passengers	3 + 2

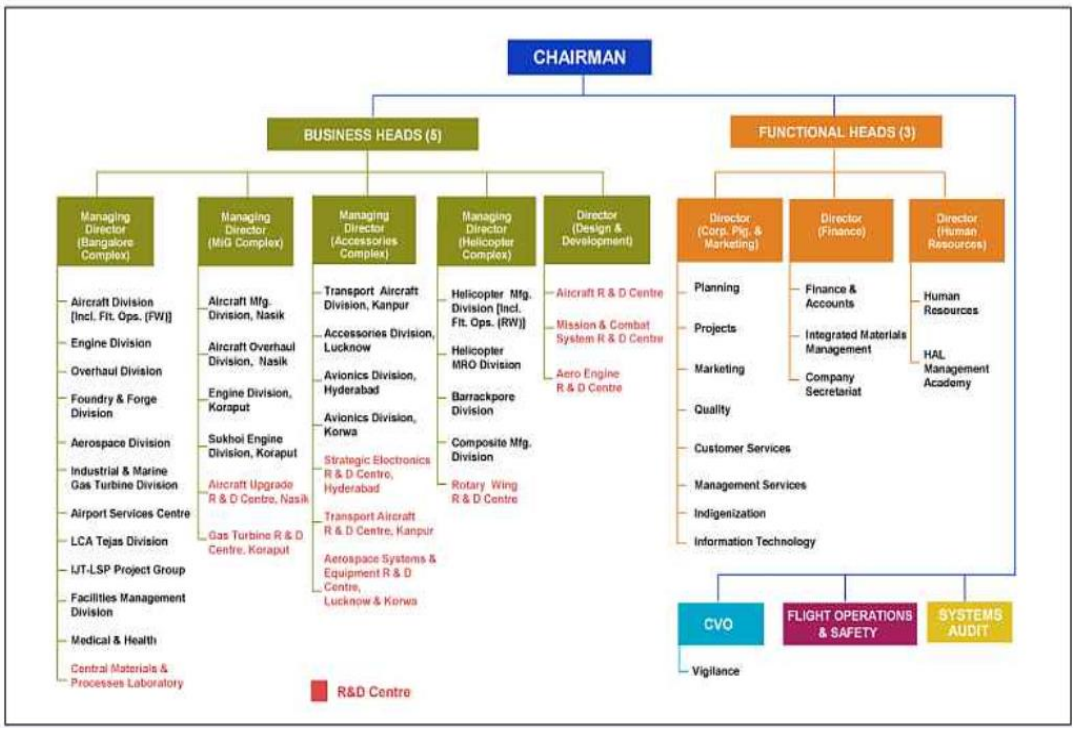
The Helicopter division offers service to customers for:

- Helicopter Upgrade
- Modifications to add new technology that improve performance and make helicopters more efficient and cost-effective
- Creation of adjustments as requested by customers
- Civil helicopter maintenance
- In-situ and in-house helicopter repairs
- Helicopter servicing, both scheduled and impromptu
- Supply of spares in response to AOG requests and on a clean exchange basis for civil helicopters
- Equipment supply for ground handling, ground service, and bay service.
- Assistance in Investigations of Accidents/incidents and Defects

- Life Extension Research
- Technical assistance in the form of responses to technical questions and Defect Investigations
- Spares management training, pilot ab-initio and conversion training, engineer and worker training for helicopter maintenance via in-plant training courses, maintenance workshops, and operators' conferences
- Technical services include product literature amendments such as the Illustrated Parts Catalogue (IPC), flight manuals, maintenance manuals, overhaul manuals, and repair manuals.

Civil Dhruv Helicopters are also serviced by the Helicopter Division. The Division is prepared to meet the needs of Defence, Export, and Civil customers.

ORGANISATION STRUCTURE/CHART, MANAGEMENT OR BOARD OF DIRECTOR



INDUSTRY STRUCTURE OF HINDUSTAN AERONAUTICS LIMITED (HAL)

Design Engineering & IT Solutions	Component Manufacture (Tier 3)	Component Manufacture (Tier 2)	Subsystems Manufacture (Tier 1)	Aircraft Assembly	MRO
• Aircraft and Subsystems Design • Avionics and Critical Components Design • Simulation and Testing Services • Component Design and IT Solution	• Casting,Frogings • Power and Electronic Components,Cables,Wiring • Sheet Metal Components • Aircraft Interiors, Seats, windows, Upholstery	• Hydraulic Systems • Electronic Systems • Avionic and Flight system Components	• Engine Manufacture • Avionic and Flight Control Systems • Wings and Landing Gear Assembly	• Full Aircraft Assembly • Aircraft testing and Validation • Fuselage,Empenage Assembly	• Engine MRO • Airframe MRO Services • Components MRO Services • Line Maintenance

MANAGEMENT OR BOARD OF DIRECTOR

Shri Mihir Kanti Mishra, CEO of HAL

From July 1, 2022, Shri Mihir Kanti Mishra will assume the role of Chief Executive Officer (CEO), Bangalore Complex, Hindustan Aeronautics Limited (HAL).

Shri Mishra, a Management Trainee from the 1987 batch, earned his bachelor's degree in mechanical engineering from Sambalpur University and his master's degree in aircraft production engineering from IIT, Madras. He has held numerous positions in Koraput, Corporate Office, TAD Kanpur, and Aerospace Division. Prior to his appointment as CEO(BC), Shri Mishra served as General Manager of HAL's Aerospace Division. He led the team that assisted ISRO in its role as a strategic partner for India's major space programmes. He was key in boosting corporate growth by moving up the value chain by establishing new facilities for cryo engine manufacturing and delivering end-to-end vehicle launch and integration services. Shri Mishra began his career in the manufacturing and assembly of MiG engines under the Transfer of Technology (TOT) programme at Engine Division, Koraput, where he worked on the absorption and assimilation of Technical Know-how as well as the proof-out of manufacturing

processes for MiG engine series production. He also played a vital role in the export of engine component build to print work-packages, which was a first for the Division in exploring such potential. He also held positions of increasing responsibility in the Corporate Export Marketing department, where he was in charge of developing the Company's marketing strategy and initiatives on business development, new market promotion, and industrial cooperation in order to increase the company's global footprint. He was instrumental in boosting export company growth by exporting many platforms, including helicopters and Dornier planes. He also completed a special mission as the Project Manager for the civil version of the Dornier DO-228 aircraft, including certification, in record time.

Shri C.B. Ananthakrishnan, Director (Finance) & CFO with Addl. Charge of Chairman and Managing Director

Shri C B Ananthakrishnan was appointed as the Company's Director (Finance) & CFO on August 1, 2018. He holds a Commerce degree and a postgraduate diploma in business administration from Madras University, and he is a member of the Institute of Cost Accountants of India. He also has management and leadership training from the Indian Institute of Management in Ahmedabad and the Institut Aeronautique et Spatiale (IAS) in Toulouse, France. He was instrumental in the Company's first public offering (IPO) and stock listing in March 2018. He helped secure orders for 83 LCA MK IAs and 15 LCHs.

Shri Jayadeva E. P, Director (operations)

Shri Jayadeva also has management and leadership training from Ahmedabad's Indian Institute of Management and Toulouse, France's Institut Aeronautique et Spatiale (IAS). He played a key role in the Company's initial public offering (IPO) and stock listing in March 2018. He was instrumental in securing orders for 83 LCA MK IAs and 15 LCHs. He worked in several divisions/offices, including the Overhaul Division, the Aircraft Division, the LCA Tejas Division, and the Corporate Office. He is well-known for his contributions to the management of new fighter aircraft manufacturing, overhaul, and upgrade projects from inception to completion. During his time at corporate planning, he was instrumental in developing the company's long-term plans. He was crucial in the construction of the Overhaul Division's Repair & Overhaul and Upgrade facility for Kiran, Hawk, and Mirage aircraft. He played a key role in the development of high-value indigenous Ground Support Equipment / Ground Handling Equipment for Overhaul and Upgrade lines. He has also served as a director on HAL's two (2) joint venture companies.

Shri. Jayadeva oversaw the completion of the 83 LCA MK1A contract with the IAF in February 2021. The contract is regarded the largest "Make in India" defence contract and would strengthen India's defence eco-system.

Dr. D. K. Sunil, Director (Engg & R&D)

Dr. D. K. Sunil earned his bachelor's degree in Electronics and Communication Engineering from Osmania University in Hyderabad and his master's degree in Aircraft Production Engineering from IIT Madras. In 2019, he also received his Ph.D. in Electronics Science from the University of Hyderabad. He began his career with Hindustan Aeronautics Limited (HAL) in 1987 as a Management Trainee and has over 33 years of experience in a variety of crucial capacities. He was instrumental in the certification of the first Airborne Radio for the Light Combat Aircraft, which flew successfully in 1993. In the year 2000, he was part of a team that designed the first

Secure Radio for the MiG-21 Upgrade programme, which was successfully certified in Russia and then mass-produced in significant quantities. He has concentrated his efforts in recent years on new areas such as Engine Control Systems, Design Perspective Plan, and enhancing collaboration with IITs and startups for new technologies. He has led design initiatives for aircraft and helicopters at both the equipment and system levels. His knowledge spans the entire spectrum of design activities carried out at HAL design institutes, from LRU to aircraft level. Dr. D K Sunil was the General Manager (SLRDC) in Hyderabad before to being Director (Engg and R&D).He is unrelated to any of the Company's other directors and does not own any stock in the company.

SWOT ANALYSIS OF HELICOPTER DIVISION OF HINDUSTAN AERONAUTICS LIMITED (HAL)

Strengths:

- **Technical Expertise:** The Helicopter Division benefits from HAL's extensive experience in aerospace engineering, design, and manufacturing.
- **Indigenous Capabilities:** The division has contributed to India's self-reliance in helicopter technology, developing and manufacturing indigenous helicopter platforms.
- **Diverse Portfolio:** HAL's Helicopter Division offers a range of helicopters for both civilian and defense purposes, catering to various customer needs.
- **Strategic Partnerships:** Collaborations with national and international partners have the potential to enhance technological capabilities and expand market reach.
- **Experienced Workforce:** The division boasts a skilled and experienced workforce of engineers, technicians, and aviation professionals.

Weaknesses:

- **Dependency on Defence Contracts:** The division's revenue may be sensitive to fluctuations in defence procurement budgets, potentially impacting financial stability.

- **Competition:** Facing competition from domestic and international helicopter manufacturers, the division needs to continually innovate to maintain its market position.
- **Regulatory Challenges:** Adhering to stringent aviation regulations and obtaining necessary certifications can be time-consuming and resource-intensive.
- **Production Delays:** Complex manufacturing processes and supply chain challenges can lead to delays in delivering helicopters to customers.
- **Limited Global Reach:** While the division exports helicopters, there may be opportunities to expand its international footprint further.

Opportunities:

- **Market Growth:** Increasing demand for helicopters in defense, civilian, and commercial sectors presents opportunities for expanding the division's market share.
- **Technological Advancements:** Investing in research and development can lead to innovations in areas such as advanced avionics, propulsion systems, and materials.
- **Modernization Programs:** Upgrading and modernizing existing helicopter platforms can attract customers seeking enhanced capabilities and performance.
- **Global Partnerships:** Strengthening partnerships with international companies can facilitate technology transfer, market access, and collaborative research.
- **Emerging Markets:** Exploring new markets in developing countries that require helicopters for various applications can lead to increased sales.

Threats:

- **Budget Constraints:** Government budget fluctuations and spending priorities can impact defense procurement and helicopter orders.
- **Rapid Technological Changes:** Keeping up with rapid advancements in aviation technology requires consistent investment and adaptation.
- **Global Competition:** Competing with established international helicopter manufacturers could pose challenges in terms of market share.

- **Geopolitical Factors:** Political instability, trade barriers, and international relations can affect export opportunities and collaborations.
- **Supply Chain Disruptions:** Disruptions in the supply chain, whether due to geopolitical factors or other issues, can impact production schedules.

APPLICATION OF McKinsey 7S MODEL TO HINDUSTAN AERONAUTICS LIMITED (HAL)

1. Strategy: The Helicopter Division's strategy is to design, manufacture, and support a range of advanced helicopters for both defense and civilian markets. They focus on indigenous innovation, technological excellence, and meeting the specific needs of customers.

2. Structure: The division follows a functional organizational structure with dedicated teams for design, engineering, manufacturing, quality control, customer support, and sales. Clear reporting lines and cross-functional collaboration are emphasized.

3. Systems: The division uses advanced computer-aided design (CAD) and manufacturing (CAM) systems to streamline helicopter development. They have established rigorous quality control systems and adhere to aviation regulations for safety and certification.

4. Shared Values: The division values innovation, safety, quality, and customer satisfaction. A culture of teamwork, professionalism, and continuous improvement is promoted throughout the division.

5. Skills: The workforce includes skilled engineers, technicians, designers, and support staff with expertise in aerospace engineering, avionics, materials science, and more. Continuous training programs keep employees updated on the latest technologies.

6. Style: Leadership within the division adopts a participative and transformational style. They encourage innovation, provide guidance, and maintain an open-door policy for communication.

7. Staff: The division employs a diverse workforce with various skill sets and roles, including design engineers, production technicians, quality inspectors, and customer support specialists.

CERTIFICATES

Certification	Accredited by
AS 9100 'C' (Aerospace Standard)	ANAB DEKRA CERTIFICATION INC
Production Organization Exposition (POE)Under Civil Aviation Requirements – 21 (CAR-21)	DGCA
Maintenance Organization Exposition (MOE)Under Civil Aviation Requirements – 145 (CAR-145)	DGCA
Continuing Airworthiness Management Organization (CAMO)Under Civil Aviation Requirements – M (CAR-M)	DGCA
DGAQA Certification Under AFQMS -2011(Approval of Firm and It's Quality ManagementSystem)	DGAQA
ISO 14001:2004 (Environment Management System Standard)	NVT-QC
ISO 14001:2018 (OHSMS-Occupational Health and Safety ManagementSystem)	QAIS
ISO/IEC 27001: 2013 (Information Security Management System)	QFS MANAGEMENT SYSTEMS LLP

ACHIEVEMENTS AND AWARDS

The Helicopter Division has received the following awards:

- **Jawaharlal Nehru Trophy** for Hindustan Aeronautics Limited's Best Production Division in 1992 and 1994.
- **Raksha Mantri Award** for Outstanding Innovation Performance in 2003-04 for re-engaging of Cheetah H/c with TM 333 2M2 engine.
- Received Hindustan Aeronautics Limited's **"BEST PERFORMING DIVISION"**

award in 2003 and 2004.

- National Safety Council - Karnataka Chapter Unnatha Suraksha Puraskara for 2005.
- Received the **Best Performing Division** award for the largest rise in outsourced part realisation for the fiscal year 2016-17.
- The Helicopter Division is awarded the **"Prakshalan Award"** for its exceptional contribution to 'Prakshalan Projects' as part of its Skill Development Initiatives in 2021-22.

FUTURE PLANS

- HAL intends to boost manufacturing of advanced light helicopters (ALH), light combat helicopters (LCH), light utility helicopters (LUH), intermediate jet trainers (IJT), and basic trainer aircraft for training purposes in the future.
- HAL intends to manufacture the SUKHOI Su-30MKI after obtaining a licence from Russia.
- LCH flight evaluation trials are underway on the two prototypes, and areas for improvement have been discovered, which will be addressed in the third prototype produced by HAL.
- The LUH, an original design, is expected to feature the highest level of indigenous content of any HAL helicopter.
- Manufacturing of Random for Light Combat Aircraft.
- Manufacturing of Random for Jaguar Darin 3 upgrade.

CHAPTER 2: ABOUT THE INDUSTRY

The Helicopter Division was established in July 1970. To fulfil the growing market demand, the division manufactures single and twin-engine helicopters. The Helicopter Division manufactures the ALH-Dhruv and ALH-Rudra Advanced Light Helicopters, as well as the LCH (Light Combat Helicopter), LUH (Light Utility Helicopter), Cheetah, Chetak, Cheetal, and Lancer.

The Rotary Wing Research and Design Centre (RWR&DC) is a division-wide research and development facility.

The MRO division is responsible for helicopter maintenance, repair, and overhaul. The Rotory Wing Academy specializes in pilot training.

HAL began manufacturing helicopters in 1962, when it signed an arrangement with M/s SUD-AVIATION (now M/s EUROCOPTER, France) to produce Aloutte III helicopters. (Chetak). In 1965, the first Chetak (Aloutte III) in 'Fly Away' condition was delivered.

In 1976-77, the first Cheetah made from raw materials was delivered.

HAL developed the "Lancer" light attack helicopter in the 1990s.

The lancer's basic structure is based on the trusted and proven Cheetah helicopter. The front panels of the helicopter are bulletproof. One gun cum Rocket pod (70 mm Rocket+12.5 mm Gun) is installed on either side. For accurate fire, an optical sight has been installed.

Cheetal helicopter is a re-engineered Cheetah helicopter. In 2006, the Cheetal helicopter set the world record for highest landing at 'Saser Kangri' in the Himalayas.HAL Helicopter division has produced 682 single engine helicopters with success.

HAL achieved self-sufficiency in the design, development, and manufacture of a twin-engine Advanced Light Helicopter (ALH). ALH is a 5.5-ton multi-role, multi-mission all-weather helicopter. The series production of the indigenously designed twin engine helicopter began in 2001-2002. Division has built 336 ALH in various configurations.

The LCH is a 5.8 Tonne Dedicated Combat Helicopter that was created and built in-house. Dedicated combat helicopter with exceptional reliability, agility, and manoeuvrability in all-weather and adverse climatic circumstances. The LCH will be able to operate at high altitudes and will be designed to be anti-infantry and anti-armour. The LCH is an attack helicopter with tandem seats. In contrast to the limited series

production of LCH, the division has produced ten LCH.

The Light Utility Helicopter (LUH) is a single-engine, three-ton helicopter conceived and developed by HAL to satisfy the needs of the Indian Armed Forces. This helicopter is mostly used for utility purposes, such as observation and reconnaissance. Furthermore, in a developing economy like India, civilian helicopters of this type are in high demand. Tumkur is building new facilities to fulfil the needs of the future. LUH was flown in December 2018 at the new Helicopter Division facilities in Tumkur. The division is AS 9100 'D' and ISO 14001:2004 certified.

The division has also been certified by the Directorate General of Civil Aviation (DGCA).

- Production Organization Exposition (POE) Under Civil Aviation Requirements – 21 (CAR-21)
- Maintenance Organization Exposition (MOE)Under Civil Aviation Requirements – 145 (CAR-145)
- Continuing Airworthiness Management Organization (CAMO)Under Civil Aviation Requirements – M (CAR-M)
- DGAQA Certification Under AFQMS-2011(Approval of Firm and It's Quality Management System) and approved Type Certificate for Dhruv from DGAC, Chile.

HAL's helicopter division has expanded its design, development, and production range by manufacturing new helicopters such as the Weapon System Integrated (WSI) version of Dhruv (christened "Rudra"), Light Combat Helicopter (LCH), and Light Utility Helicopter (LUH).

INDUSTRY STRUCTURE

Design Engineering & IT Solutions	Component Manufacture (Tier 3)	Component Manufacture (Tier 2)	Subsystems Manufacture (Tier 1)	Aircraft Assembly	MRO
• Aircraft and Subsystems Design • Avionics and Critical Components Design • Simulation and Testing Services • Component Design and IT Solution	• Casting,Frogings • Power and Electronic Components,Cables,Wiring • Sheet Metal Components • Aircraft Interiors, Seats, windows, Upholstery	• Hydraulic Systems • Electronic Systems • Avionic and Flight system Components	• Engine Manufacture • Avionic and Flight Control Systems • Wings and Landing Gear Assembly	• Full Aircraft Assembly • Aircraft testing and Validation • Fuselage,Empennage Assembly	• Engine MRO • Airframe MRO Services • Components MRO Services • Line Maintenance

APPLICATION OF PORTER FIVE FORCE MODEL

The Porter's Five Forces model is a strategic framework for analysing an industry's competitive forces. Applying this approach to Hindustan Aeronautics Limited's (HAL) Helicopter Division would provide insights into the competitive dynamics and factors influencing the division's market position. The model can be used as follows:

1. Threat of New Entrants:

- The helicopter manufacturing sector necessitates substantial financial expenditure, cutting-edge technology, and knowledge. New comers are discouraged by HAL's established reputation and indigenous capabilities.
- However, if other aerospace corporations or joint ventures decide to enter the Indian market, the possibility of new entrants may develop, thereby boosting competition.

2. Bargaining Power of Suppliers:

- Key component, material, and technology suppliers for helicopter manufacture may have some negotiation leverage. For many parts, HAL may rely on a network of vendors.
- If there are few suppliers or switching costs are significant, suppliers may have more sway over pricing and terms.
- HAL's strong indigenous skills may minimise this power to some extent, but it must still manage its supplier relationships efficiently.

3. Bargaining Power of Buyers:

- Government institutions such as the Indian Armed Forces and other defence agencies are the principal consumers of HAL helicopters. Because of their big purchase orders, these purchasers often have tremendous negotiation leverage.
- Buyers may demand favourable pricing, quality, and performance terms, affecting HAL's profitability and competitive position.
- However, HAL's proven track record, indigenous capabilities, and the crucial significance of defence contracts may help to balance this power.

4. Threat of Substitutes:

- Other modes of transportation and platforms employed for similar purposes, such as fixed-wing aircraft, ground vehicles, or maritime vessels, can serve as substitutes for helicopters.
- Helicopters' specialised mission profiles, such as search and rescue, medical

evacuation, and troop transport, frequently make them indispensable for certain applications.

- However, technical developments and shifting military strategies may introduce new replacements, albeit with little influence.

5. Intensity of Competitive Rivalry:

- In the defence sector, HAL competes for contracts and tenders with both domestic and international businesses. Other aerospace and defence businesses, both public and commercial, could be competitors.
- Market demand, pricing strategies, technological innovation, and the ability to deliver on schedule may all have an impact on the intensity of rivalry.
- HAL's well-established position, indigenous capabilities, and long-standing links with the Indian Armed Forces may help it gain a competitive advantage.

FORECASTING INDUSTRY ATTRACTIVENESS

1. Market Demand Analysis:

- Forecast future helicopter demand in both domestic and foreign markets. Think about things like defence modernization plans, disaster relief needs, and civilian applications.
- Examine previous growth rates to discover any developing trends that may have an impact on future demand.

2. Technological Advancements:

- Assess the possibility of technological advances in helicopter design, manufacture, and operation. Consider material advancements, propulsion systems, avionics, and automation.
- Evaluate HAL's R&D capabilities to determine its potential to innovate and remain competitive.

3. Competitive Landscape:

- Examine the helicopter industry's competitive landscape, including domestic and foreign competitors. Examine their strategies, strengths, and limitations.
- • Identify prospective disruptors, new entrants, and collaborations that could have an influence on HAL's market share.

4. Export Opportunities:

- Assess the potential for exporting HAL's helicopters to international markets.

Consider regulatory barriers, customer preferences, and geopolitical factors.

- Examine the viability of forming partnerships or joint ventures to gain access to new markets.

5. Government Policies and Funding:

• Keep an eye on changes in government policy concerning defence procurement, aerospace industry support, and research funding. These policies have the potential to drastically impact HAL's future.

6. Customer Relationships:

- Assess HAL's important client ties, particularly with the Indian Armed Forces. Consider the division's capacity to get contracts and keep customers satisfied.

7. Sustainability and Environmental Concerns:

- Consider the aircraft industry's growing emphasis on sustainability and environmental concerns. Examine HAL's capacity to comply with changing environmental requirements and laws.

8. Economic Factors:

- Examine macroeconomic trends such as economic growth, government spending, and currency exchange rates that may have an impact on the helicopter sector.

9. Supply Chain Resilience:

- Assess HAL's supply chain resilience and capacity to manage disruptions, shortages, and geopolitical concerns.

10. Investment and Capacity Expansion:

- Evaluate HAL's financial health and ability to invest in research, development, and capacity expansion.
- Keep an eye out for any announcements or plans for new helicopter models, modifications, or production facilities.

11. Industry Partnerships and Collaboration

- Think about forming alliances with other aerospace businesses, research institutions, or technology providers to expand HAL's capabilities and market reach.

CHAPTER 3 : ABOUT THE FUNCTIONAL AREAS

ABOUT THE FUNCTIONAL AREAS

The Helicopter Division of Hindustan Aeronautics Limited (HAL) consists of numerous functional areas that collaborate to design, develop, produce, repair, and service helicopters. These operational areas are crucial to the division's success and the delivery of high-quality helicopters to customers. The key functional areas of the Helicopter Division are as follows:

HR Department

One of the most crucial parts of a company's growth is hiring the right people. Human resource employees are examined based on their knowledge and talents before being hired if they are qualified for the position. The process in HAL, on the other hand, is different; here, a test is offered, and if the candidate passes, the next step (explained below) is taken.

Candidate selection at Hindustan Aeronautics Limited:

- An interview and an all-Indian online selection test would be part of the selection process.
- Candidates will be asked to take an online selection test if their qualifications exceed the firm's standards, which vary based on the departmental opening.
- Candidates must present one of the Original Identity Cards (i.e., Voters ID Card, Driving Licence, Aadhaar Card, Passport, PAN Card, ID Cards issued by Central/State Government/PSU for their employees, ID Cards issued by Government Agencies authorised for the purpose, College ID card where the candidate has most recently studied, along with a copy duly attested by the Gazetted Officer) to the invigilator to prove their identity.
- The examination will last approximately two and a half hours. The exam will be broken into three sections, each of which will comprise multiple-choice questions (MCQs). Part I will consist of 20 general knowledge multiple-choice questions. Part II will consist of 40 multiple-choice English and logic problems. Part III will include 100 multiple-choice questions (MCQs) about the subject. The exam is available in both English and Hindi.

- Based on their performance in the online test, candidates will be shortlisted for interviews at a ratio of 1:5 to the number of vacancies available in each subject and area. The reserved category is handled in the same way. All unreserved applicants, as well as candidates from the SC, ST, OBC(NCL), and EWS categories who do not qualify for any exemption, will be pooled together and ranked in descending order of merit for each discipline and post. A weighted average of 85% for the online test and 15% for the interview will be used to create the final merit list. The entire selection procedure, including minimum qualifications.

Because applicants are only chosen based on their exam results, the HR department is in charge of promoting candidates, recognising and praising employees' accomplishments, and rewarding them.

Marketing Department

Hindustan Aeronautics Limited's marketing is unique because HAL's clients include the Indian Air Force, Indian Navy, and other international governments. As a result, HAL hosts an annual "Air Show" at which high-ranking officials can view the numerous aircrafts created by HAL.

Functions of departments are

- **Market Research and Analysis**: Researching market trends, customer wants, and competitors. This data aids in product development and positioning efforts.
- **Product Promotion and Communication:** Create marketing campaigns, advertisements, and promotional materials to raise awareness and interest in HAL's helicopter offerings.
- **Customer Relationship Management (CRM):** Establishing and sustaining relationships with clients, both military and civilian, in order to understand their needs and provide specialized solutions.
- **Brand Management:** Managing the brand identity of the HAL Helicopter Division, ensuring consistent messaging and visual representation across all marketing materials.
- **Events and Exhibitions:** Participating in aerospace exhibitions, air shows, and industry events to showcase HAL's helicopter capabilities and establish a presence in the market.
- **Sales Support:** Providing sales teams with the necessary tools, information, and

materials to effectively present and sell helicopter products to potential customers.

- **Market Segmentation and Targeting:** Identifying specific market segments and customer groups that could benefit from HAL's helicopter offerings and tailoring marketing strategies accordingly.
- **Market Entry Strategies:** Developing strategies for entering new markets or expanding existing ones, considering factors like regulatory requirements, local partnerships, and customer preferences.
- **Public Relations:** Managing media relations, press releases, and communication withstakeholders to maintain a positive public image and share updates about HAL's helicopter projects.
- **Digital Marketing and Online Presence:** Leveraging digital channels such as websites, social media, and online advertising to reach a wider audience and engage with potential customers.

Material Planning Department

The organisation determines which materials are needed, checks customer orders for aircraft, and then determines which materials need to be ordered based on those orders. Next, they publish a call for tenders on the HAL website. Now, suppliers submit their prices. HAL reviews all of the prices and determines whether they satisfy their requirements or not. If so, they choosethe L1 price (L1 = First Lowest Bidder).

- **Demand Forecasting:** Collaborating with various departments to analyze historical data, current orders, production schedules, and market trends to predict the future demand for materials and components.
- **Inventory Management:** Managing inventory levels of raw materials, parts, and components to ensure an adequate supply while minimizing excess or obsolete stock. This involves setting reorder points, safety stock levels, and inventory turnover targets.
- **Procurement Planning**: Developing procurement strategies and plans based on demand forecasts, lead times, and supplier capabilities. Coordinating with the Procurement Department to initiate purchase orders for required materials.
- **Supplier Management:** Identifying reliable suppliers, negotiating contracts, and maintaining strong relationships to ensure timely and quality deliveries of materials

andcomponents.

- **Materials Scheduling:** Creating schedules for the delivery of materials to align with production and assembly timelines, optimizing the flow of materials through the supplychain.
- **Production Coordination:** Collaborating with production departments to ensure that materials and components are available when needed to avoid production delays.
- **Lead Time Management**: Monitoring lead times for materials and components and taking appropriate actions to mitigate delays, such as expediting orders or seeking alternative sources.
- **Risk Management**: Identifying potential risks in the supply chain, such as shortages or disruptions, and developing contingency plans to minimize their impact on production schedules.
- **Cost Management:** Optimizing costs associated with inventory holding, procurement, transportation, and storage to ensure cost-effective material management.
- **Data Analysis and Reporting:** Analyzing data related to materials usage, procurement, lead times, and inventory levels to identify trends, inefficiencies, and opportunities for improvement. Generating reports to inform decision-making.
- **Collaboration:** Working closely with other departments such as Engineering, Production, Quality Assurance, and Finance to ensure seamless coordination and alignment of material planning efforts.
- **Continuous Improvement:** Continuously evaluating and enhancing material planningprocesses, systems, and strategies to improve efficiency, reduce costs, and enhance overall supply chain performance.

Purchase Department

Functions of purchase department

- **Supplier Selection and Evaluation:** Identifying and evaluating potential suppliers based on factors such as quality, cost, delivery reliability, and technical capabilities. Developing a qualified supplier base to support the division's needs.
- **Sourcing Strategy:** Developing strategies for sourcing materials and

components, including decisions about domestic versus international suppliers, single or multiple sourcing, and long-term partnerships.

- **Request for Quotation (RFQ) and Tendering:** Preparing RFQs or tender documents,soliciting bids from suppliers, and analyzing the received proposals to select the most suitable suppliers.
- **Negotiation:** Negotiating terms and conditions, pricing, payment terms, and other contractual aspects with suppliers to achieve the best value for the organization.
- **Purchase Orders:** Creating and issuing purchase orders to selected suppliers, outlining the quantity, specifications, delivery schedules, and terms of the procurement.
- **Contract Management:** Ensuring that contracts with suppliers are well-defined, legally sound, and properly managed throughout the procurement lifecycle.
- **Supplier Relationship Management:** Building and maintaining positive relationships with suppliers, fostering collaboration, addressing issues, and promoting open communication.
- **Cost Management:** Monitoring and managing procurement costs, including price negotiations, cost reduction initiatives, and value analysis.
- **Lead Time Management:** Monitoring lead times for ordered items and coordinating with suppliers to ensure timely deliveries that meet production schedules.
- **Quality Assurance:** Collaborating with Quality Control and Quality Assurance teamsto ensure that procured materials and components meet required quality standards.
- **Risk Management:** Identifying and mitigating potential risks in the supply chain, suchas supply disruptions, quality issues, or changes in market conditions.
- **Sustainability and Compliance:** Ensuring that procurement practices comply with relevant regulations, environmental standards, and ethical considerations.
- **Inventory Management Support:** Providing input to inventory management teams onreorder points, safety stock levels, and inventory turnover for procured items.
- **Documentation and Records:** Maintaining accurate records of procurement

transactions, contracts, communications, and other relevant documentation.

- **Continuous Improvement:** Evaluating and enhancing procurement processes, systems, and strategies to improve efficiency, reduce costs, and enhance overall procurement performance.

IT Department

The Information Technology (IT) Department within the Helicopter Division of Hindustan Aeronautics Limited (HAL) is responsible for managing the organization's technology infrastructure, systems, and digital operations. The IT department plays a critical role in enabling efficient business processes, enhancing communication, and supporting variousfunctions within the division. While specific functions may vary based on the organization's structure and priorities, here are some common functions that an IT Department might perform:

- **Infrastructure Management:** Planning, deploying, and maintaining the division's IT infrastructure, including servers, networks, workstations, and data centers, to ensure reliable and secure operations.
- **Software Development and Maintenance:** Developing and maintaining software applications tailored to the specific needs of the Helicopter Division, such as production management, quality control, inventory tracking, and other operational software.
- **User Support:** Providing technical assistance and support to division employees for hardware, software, and network-related issues.
- **Cybersecurity:** Implementing and maintaining cybersecurity measures to protect the division's sensitive data, systems, and networks from unauthorized access, attacks, andbreaches.
- **Data Management:** Managing and ensuring the integrity, availability, and security ofdata used by the division, including data backups, storage, and disaster recovery planning.
- **System Integration:** Integrating various software systems and technologies to streamline processes and enhance information flow between different departments.
- **Telecommunications:** Managing communication systems, including voice, video

conferencing, and messaging platforms, to facilitate effective communication within the division.

- **IT Governance and Policy:** Developing and enforcing IT policies, procedures, and best practices to ensure consistent and compliant use of technology resources.
- **Vendor Management:** Managing relationships with technology vendors, including procurement of hardware and software, negotiating contracts, and monitoring service level agreements.
- **Technology Planning and Strategy:** Collaborating with division management to develop IT strategies aligned with the organization's goals and future needs.
- **Training and Education:** Providing training to division employees on new technologies, software applications, and best practices to enhance their technology skills.
- **Digital Transformation:** Identifying opportunities for digital transformation and process automation to improve operational efficiency and agility.
- **Project Management:** Managing IT-related projects, including software implementations, system upgrades, and technology rollouts.
- **Research and Innovation:** Staying informed about emerging technologies and trends that could benefit the division, and exploring innovative solutions to enhance operations.
- **IT Budgeting:** Planning and managing the IT budget, including cost estimation,resource allocation, and tracking expenditures.
- **User Experience (UX) Enhancement:** Ensuring that digital tools and systems are user-friendly, intuitive, and designed to meet the needs of division employees.

Finance Department

The Finance Department within the Helicopter Division of Hindustan Aeronautics Limited (HAL) is responsible for managing the organization's financial operations, budgeting, accounting, and financial planning. The department plays a crucial role in ensuring thedivision's financial health, regulatory compliance, and effective allocation of resources. Whilespecific functions may vary based on the organization's structure and priorities, here are somecommon functions that a Finance Department

might perform:

- **Budgeting and Financial Planning:** Developing and managing the division's annual budget, including revenue projections, expense forecasts, and capital expenditureplanning.
- **Financial Reporting:** Preparing and presenting accurate and timely financial statements, reports, and analyses to division management, corporate leadership, and regulatory authorities.
- **Cost Analysis and Management:** Analyzing and monitoring costs related to production, operations, and projects to identify opportunities for cost reduction and efficiency improvements.
- **Financial Control and Compliance:** Ensuring compliance with financial regulations,accounting standards, and company policies to maintain accurate and transparentfinancial records.
- **Treasury Management:** Managing the division's cash flow, liquidity, and short-term investments to optimize financial resources and ensure sufficient funds for operations.
- **Capital Budgeting:** Evaluating and prioritizing capital investment projects, such as equipment upgrades, facility expansions, and technology investments.
- **Risk Management:** Identifying financial risks and developing strategies to mitigate them, including currency exchange risks, interest rate risks, and market volatility.
- **Tax Planning and Compliance:** Ensuring compliance with tax regulations, filing accurate tax returns, and optimizing tax strategies to minimize the division's taxliabilities.
- **Financial Analysis:** Conducting financial analyses, including profitability analysis, cost-benefit analysis, and financial performance assessments, to support decision- making.
- **Internal Controls:** Implementing and monitoring internal controls to safeguard assets,prevent fraud, and ensure the accuracy of financial transactions.
- **Audit Coordination:** Coordinating with internal and external auditors to facilitate audits, address audit findings, and ensure adherence to auditing standards.

- **Financial Systems and Technology:** Overseeing the division's financial systems, software, and technology infrastructure to support efficient financial operations and reporting.
- **Cash Management:** Managing cash inflows and outflows, optimizing working capital,and ensuring the availability of funds for operational needs.
- **Financial Forecasting:** Using historical data and market trends to forecast future financial performance and assist in strategic decision-making.
- **Investment Management:** Managing investments in accordance with the division's investment policies, considering risk tolerance and return objectives.
- **Financial Strategy:** Collaborating with division management to develop financial strategies aligned with the organization's goals and long-term vision.
- **Debt Management:** Managing the division's debt obligations, including loans and bonds, and optimizing debt financing options.

Quality Assurance Department

The Quality Assurance Department within the Helicopter Division of Hindustan Aeronautics Limited (HAL) is responsible for ensuring that the organization's products, processes, and systems meet established quality standards, regulatory requirements, and customer expectations. Quality assurance is critical in maintaining the safety, reliability, and performance of helicopters and related components. While specific functions may vary based on the organization's structure and priorities, here are some common functions that a Quality Assurance Department might perform:

- **Quality Management System (QMS) Implementation:** Developing, implementing, and maintaining a comprehensive quality management system that outlines processes, procedures, and standards for achieving consistent quality throughout the division.
- **Quality Audits:** Conducting regular internal audits of processes, systems, and productsto assess compliance with established quality standards and identify areas for improvement.
- **Regulatory Compliance:** Ensuring compliance with relevant aviation regulations, industry standards (such as ISO 9001 or AS9100), and customer-

specific requirements.

- **Supplier Quality Management:** Evaluating and monitoring the quality of materials, components, and services provided by suppliers to ensure they meet specified quality standards.
- **Inspection and Testing:** Performing inspections, tests, and quality checks at various stages of production to verify that helicopters and components meet design specifications and quality criteria.
- **Non-Conformance Management:** Investigating and addressing instances of non- conformance or defects, determining root causes, and implementing corrective and preventive actions.
- **Documentation Control:** Managing documentation related to quality processes, procedures, specifications, and records to ensure accuracy, accessibility, and traceability.
- **Training and Certification:** Providing training to division employees on quality standards, processes, and best practices to ensure a culture of quality awareness and competence.
- **Continuous Improvement:** Identifying opportunities for process improvement and leading initiatives to enhance efficiency, reduce defects, and optimize quality-related processes.
- **Customer Satisfaction:** Collaborating with other departments to monitor customer feedback, address complaints, and ensure that products meet or exceed customer expectations.
- **Risk Management:** Identifying potential risks to product quality, safety, and reliability, and implementing strategies to mitigate those risks.
- **Statistical Analysis:** Analyzing quality data using statistical methods to monitor trends, identify patterns, and make informed decisions to improve processes.
- **Validation and Verification:** Ensuring that new designs, modifications, or processes undergo appropriate validation and verification activities to ensure their quality and compliance.
- **Root Cause Analysis:** Investigating and analyzing the root causes of quality issues orfailures to prevent recurrence and improve overall product quality.

- **Quality Metrics and Reporting:** Developing and maintaining quality performance metrics and reports to track progress, communicate results, and drive continuousimprovement efforts.
- **Certification and Accreditation:** Working with relevant authorities and certification bodies to obtain and maintain necessary certifications, approvals, and accreditations.
- **Change Control:** Managing changes to products or processes, ensuring that they are properly evaluated, documented, and approved to maintain product integrity.

CHAPTER 4 : FINANCIAL PERFORMANCE ANALYSIS

A profitability ratio is a financial measure that evaluates a company's capacity to earn profits in comparison to its sales, assets, or equity. These ratios provide information about a company's overall financial performance as well as its ability to make profits for its shareholders or owners.

They present a clear image of a company's financial performance, profitability, and efficiency to investors, analysts, and managers. To acquire a thorough knowledge of a company's financial health, several ratios must be used in conjunction with other financial indicators and qualitative aspects.

Profitability ratio

Profitability ratios evaluate a company's ability to generate profits from sales, balance sheet assets, operations, or shareholders' equity. Profitability ratios reflect a company's ability to generate profit and value for its shareholders. Profitability ratios are calculated using income statement financial data.

Gross Profit ratio

Gross Profit Ratio (2023) = Gross profit / Net Revenue

Gross Profit Ratio = 6,506.63 / 26,976.46

Gross Profit Ratio = 0.2411
In terms of percentage = 24.11%

Gross Profit Ratio (2022) = Gross profit / Net Revenue
Gross Profit Ratio = 5,224.76 / 24361.47

Gross Profit Ratio = 0.2144

In terms of percentage = 21.44%
Interpretation: The gross profit in 2023 is more by 2.67% when compared to2022.

Profit Margin
Profit Margin (2023) = Net Profit / Sales Revenue
Net Profit for the year 2023= 5824.86
Sales Revenue for the year 2023 = 26927.46

Profit Margin = 5824.86/ 26927.46 * 100

Profit Margin = 21.63%

Profit Margin (2023) = Net profit / Sales Revenue

Net Profit for the year 2022 = 5080.11

Sales Revenue for the year 2022 = 24361.47

Profit Margin = 5080.11/ 24361.47 * 100

Profit Margin = 20.85%

Interpretation: The net profit for 2023 is 5824.86, whereas the net profit for 2022 is 5080.11, resulting in a 744.75cr rise.

Liquidity Ratio

Liquidity ratios assess a company's capacity to satisfy debt commitments and its margin of safety by calculating indicators such as the current ratio, quick ratio, and operating cash flow ratio.

Current ratio

Current Ratio = Current Assets / Current Liability

Current Assets

Balance sheet of Hindustan Aeronautics Ltd (In Cr.)	Mar-23
CURRENT ASSETS	
Current Investments	0
Inventories	12,160.67
Trade Receivables	4,719.07
Cash And Cash Equivalents	20,306.15
Short Term Loans And Advances	7.62
OtherCurrentAssets	14,692.80
TOTAL CURRENT ASSETS	**51,886.31**

Current Liabilities

Balance sheet of Hindustan Aeronautics Ltd (In Cr.)	Mar-23
CURRENT LIABILITIES	
Short Term Borrowings	0
Trade Payables	3,137.34
Other Current Liabilities	20,911.43
Short Term Provisions	6,776.65
TOTAL CURRENT LIABILITIES	**30,825.42**

Current Ratio (2023) = 51886.35 / 30,825.42

Current Ratio = 1.68

Interpretation: If a firm's current ratio is high, it has less risk and is better for the company; for every one rupee, the company owes Rs 1.68 to its debtors, which is a good sign.

Current Ratio (2022) = 45,007.12 / 25,019.85

Current Ratio = 1.79

Interpretation: For every 1 rupee the company owes Rs 1.79 to its debtors which is healthysign for the company.

Quick ratio

Quick Ratio = Quick Assets / Current liabilities

Quick Ratio (2023) = Quick Assets / Current liabilities

Quick Assets = Current Assets - Inventory - Prepaid Expenses

Quick Assets = 51,886.31 – 12,160.67 -706.86 = Rs 39,018.78

Quick ratio = 39,018.78/ 30,825.42

Quick ratio = 1.26: 1

Quick Ratio (2022) = Quick Assets / Current liabilities

Quick Assets = Current Assets - Inventory - Prepaid Expenses

Quick Assets = 45,007.17 – 14,363.58 – 629.40 = 30,014.19

Quick ratio = 30,014.19 / 25,019.85

Quick ratio = 1.19: 1

Interpretation: Because the company has a quick ratio smaller than one, it has fewer quick assets than current liabilities; therefore, the corporation should raise its fast assets in order to pay off its debt with quick assets in the event of an emergency.

Working capital turnover ratio

Working Capital Turnover Ratio (2023) = Net sales / Working Capital

Working Capital = Current assets - Current liabilities

Working Capital = 51886.35 – 30,825.64

Working Capital = Rs 21,060.71

Working Capital Turnover Ratio = 26,927.46/21,060.71

Working Capital Turnover Ratio = 1.27times

In comparison to the previous year, the company's short-term assets and liabilities are not being utilised efficiently to promote sales.

Solvency Ratio

Solvency refers to a company's ability to pay off long-term debts while continuing to operate in the future. The liquidity ratio assesses how well a company's cash flow covers its long-term debt. Solvency ratios are a critical statistic for measuring a firm's financial health and can be used to predict whether a company will fail on its obligations.

Debt to Equity Ratio (2023) = Total Debt / Total Shareholders' Equity

Total Debt = Short Term Borrowings + Long Term Borrowings Total Debt = 0 + 0 = 0

Total Shareholders' Equity = 334.39

Debt to Equity Ratio (2023) = 0 / 334.39

Debt to Equity Ratio (2023) = 0

Debt to Assets Ratio (2023) = Total Debt / Total Assets * 100

Debt to Assets Ratio = 0 / 67,117.38

Debt to Assets Ratio = 0

Lower the Debt to Assets Ratio better for the company.

Interpretation: The company had zero debt, which is a very good sign; if there was a debt, the company would have to pay the loan on a monthly basis, as well as the interest, but now the company has no debt and can use the cash for expansion.

Trend Analysis of Profit & loss statement

TREND ANALYSIS PROFIT & LOSS STATEMENT										
	2019	**%**	**2020**	**%**	**2021**	**%**	**2022**	**%**	**2023**	**%**
INCOME										
Revenue From Operations [Gross]	**26,927.85**	**100.00**	**24,361.66**	90.47	**22,368.93**	83.07	**21,217.87**	78.80	**19,820.93**	73.60755
Revenue From Operations [Net]	**26,927.85**	**100.00**	**24,361.66**	90.47	**22,368.93**	83.07	**21,217.87**	78.80	**19,820.93**	73.60755
Other Operating Revenues	0.00		258.55		385.65		220.51		187.54	
Total Operating Revenues	**26,927.85**	**100.00**	**24,620.21**	91.43	**22,754.58**	84.50	**21,438.38**	79.61	**20,008.47**	74.304
Other Income	1,671.80	**100.00**	986.34	59.00	358.67	21.45	293.33	17.55	375.51	22.46142
Total Revenue	**28,599.65**	**100.00**	**25,606.55**	89.53	**23,113.25**	80.82	**21,731.71**	75.99	**20,383.98**	71.27353
EXPENSES										
Cost Of Materials Consumed	10,010.26	**100.00**	8,755.25	87.46	7,771.76	77.64	8,173.34	81.65	7,356.68	73.4914
Purchase Of Stock-In Trade	799.15	**100.00**	656.68	82.17	821.16	102.75	587.15	73.47	307.49	38.47713
Changes In Inventories Of FG,WIP And Stock-In Trade	-691.45	**100.00**	592.29	-85.66	2,458.27	-355.52	635.67	-91.93	1,172.01	-169.5
Employee Benefit Expenses	4,895.89	**100.00**	4,589.83	93.75	4,291.02	87.65	4,763.59	97.30	4,295.17	87.73012
Finance Costs	57.91	**100.00**	58.14	100.40	259.11	447.44	348.40	601.62	169.60	292.8682
Provsions and Contingencies	3,742.64	**100.00**	3,739.18	99.91	1,525.93	40.77	1,527.18	40.80	1,549.10	41.39057
Depreciation And Amortisation Expenses	1,783.91	**100.00**	1,286.30	72.11	1,177.58	66.01	997.63	55.92	1,024.47	57.42835
Other Expenses	1,508.40	**100.00**	1,531.89	101.56	1,473.49	97.69	1,624.29	107.68	1,916.76	127.0724
Less: Amounts Transfer To Capital	0.00		834.16		933.94		734.97		1,149.64	
Total Expenses	**22,106.71**		**20,375.4**		**18,844.3**		**17,922.2**		**16,641.6**	

Interpretation

- **Revenue From Operations [Gross]:** The company's gross revenue from operations has been decreasing consistently from 2019 to 2023. This indicates a decline in the company's core business activities and overall sales.
- **Revenue From Operations [Net]:** Net revenue from operations follows the same declining trend, reflecting reduced profitability after accounting for deductions.
- **Other Operating Revenues:** This category shows varying values, with a significant increase in 2021 and a subsequent decrease in 2022 and 2023. These other operating revenues may come from sources other than the company's core operations.

The trend analysis of the Profit & Loss Statement indicates that the company has been experiencing declining revenues from core operations and inconsistent performance in various expense categories. It seems that the company faced challenges in managing costs, inventory, and other operational aspects in certain years. The decrease in total expenses in 2021 is a positive sign, but the subsequent increase in expenses, particularly in 2023, could raise concerns about the company's financial health. Further analysis and strategic actions may be necessary to address these challenges and improve overall financial performance.

COMPARATIVE STATEMENT OF PROFIT & LOSS

COMPARATIVE PROFIT & LOSS STATEMENT				
	2022	2023	Absolute Change	% change
INCOME				
Revenue From Operations [Gross]	**21,217.87**	**19,820.93**	-1,396.94	-6.58
Revenue From Operations [Net]	**21,217.87**	**19,820.93**	-1,396.94	-6.58
Other Operating Revenues	220.51	187.54	-32.97	-14.95
Total Operating Revenues	**21,438.38**	**20,008.47**	-1,429.91	-6.67
Other Income	293.33	375.51	82.18	28.02
Total Revenue	**21,731.71**	**20,383.98**	**-1,347.73**	**-6.20**
EXPENSES				
Cost Of Materials Consumed	8,173.34	7,356.68	-816.66	-9.99
Purchase Of Stock-In Trade	587.15	307.49	-279.66	-47.63
Changes In Inventories Of FG,WIP And Stock-In Trade	635.67	1,172.01	536.34	84.37
Employee Benefit Expenses	4,763.59	4,295.17	-468.42	-9.83
Finance Costs	348.40	169.60	-178.80	-51.32
Provsions and Contingencies	1,527.18	1,549.10	21.92	1.44
Depreciation And Amortisation Expenses	997.63	1,024.47	26.84	2.69
Other Expenses	1,624.29	1,916.76	292.47	18.01
Less: Amounts Transfer To Capital	734.97	1,149.64	414.67	56.42
Total Expenses	**17,922.28**	**16,641.64**		

INTERPRETATION

The comparative Profit & Loss Statement indicates that the company's total revenue has decreased, primarily driven by a decline in revenue from operations. While some expense categories have shown reductions, others have increased, leading to an overall decrease in expenses. The increase in other income is a positive sign, helping to partially offset the decrease in operational revenue. The company seems to have made efforts to control costs, but challenges in inventory management and certain expense categories persist. Further analysis and strategic actions may be needed to address these challenges and improve overall financial performance.

COMMONSIZE PROFIT & LOSS STATEMENT

COMMONSIZE PROFIT & LOSS STATEMENT			
	2023	**Percentage**	
INCOME			
Revenue From Operations [Gross]	**19,820.93**	100.00	
Revenue From Operations [Net]	**19,820.93**	100.00	
Other Operating Revenues	187.54	0.95	
Total Operating Revenues	**20,008.47**	100.95	
Other Income	375.51	1.89	
Total Revenue	**20,383.98**	102.84	
EXPENSES		0.00	
Cost Of Materials Consumed	7,356.68	37.12	
Purchase Of Stock-In Trade	307.49	1.55	
Changes In Inventories Of FG,WIP And Stock-In Trade	1,172.01	5.91	
Employee Benefit Expenses	4,295.17	21.67	
Finance Costs	169.60	0.86	
Provsions and Contingencies	1,549.10	7.82	
Depreciation And Amortisation Expenses	1,024.47	5.17	
Other Expenses	1,916.76	9.67	
Less: Amounts Transfer To Capital	1,149.64	5.80	
Total Expenses	**16,641.6**		

INTERPRETATION

The comparative Profit & Loss Statement indicates that the company's total revenue has decreased, primarily driven by a decline in revenue from operations. While some

expense categories have shown reductions, others have increased, leading to an overall decrease in expenses. The increase in other income is a positive sign, helping to partially offset the decrease in operational revenue. The company seems to have made efforts to control costs, but challenges in inventory management and certain expense categories persist. Further analysis and strategic actions may be needed to address these challenges and improve overall financial performance.

TREND ANALYSIS OF BALANCE SHEET

TREND ANALYSIS										
	2023	**percentage**	**2022**	**percentage**	2021	**percentage**	**2020**	**percentage**	**2019**	**percentage**
EQUITIES AND LIABILITIES										
SHAREHOLDER'S FUNDS										
Equity Share Capital	334.39	100.00	334.39	100.00	334.39	100.00	334.39	100.00	334.39	100.00
Total Share Capital	**334.39**	100.00	**334.39**	100.00	**334.39**	100.00	**334.39**	100.00	**334.39**	100.00
Reserves and Surplus	23,171.78	100.00	18,929.61	81.69	15,022.16	64.83	12,855.54	55.48	11,740.54	50.67
Total Reserves and Surplus	**23,171.78**	100.00	**18,929.61**	81.69	**15,022.16**	64.83	**12,855.54**	55.48	**11,740.54**	50.67
Total Shareholders Funds	**23,506.17**	100.00	**19,264.00**	81.95	**15,356.55**	65.33	**13,189.93**	56.11	**12,074.93**	51.37
NON-CURRENT LIABILITIES										
Long Term Borrowings	0.00		0.00		0.00		0.00		100.00	
Other Long Term Liabilities	11,452.85	100.00	12,788.90	111.67	9,802.72	85.59	7,475.81	65.27	8,802.84	76.86
Long Term Provisions	1,332.94	100.00	1,248.24	93.65	1,200.73	90.08	1,514.39	113.61	1,516.11	113.74
Total Non-Current Liabilities	**12,785.79**	100.00	**14,037.14**	109.79	**11,003.45**	86.06	**8,990.20**	70.31	**10,418.95**	81.49
CURRENT LIABILITIES										
Short Term Borrowings	0.00									
Trade Payables	3,137.34	100.00	2,559.77	81.59	2,246.15	71.59	4,089.23	130.34	2,632.81	83.92
Other Current Liabilities	20,911.43	100.00	17,404.30	83.23	19,280.83	92.20	16,355.23	78.21	17,050.64	81.54
Short Term Provisions	6,776.65	100.00	5,055.78	74.61	3,975.59	58.67	4,800.25	70.84	4,493.57	66.31
Total Current Liabilities	**30,825.42**	100.00	**25,019.85**	81.17	**25,511.64**	82.76	**31,019.89**	100.63	**28,193.22**	91.46
Total Capital And Liabilities	**67,117.38**	100.00	**58,320.99**	86.89	**51,871.64**	77.28	**53,200.02**	79.26	**50,687.10**	75.52
ASSETS										
NON-CURRENT ASSETS										
Tangible Assets	8,711.24	100.00	5,919.85	67.96	6,539.08	75.06	6,344.59	72.83	6,283.27	72.13
Intangible Assets	0.00		838.26		944.07		1,006.86		1,170.99	
Capital Work-In-Progress	0.00		948.01		790.38		857.42		699.15	
Intangible Assets Under Development	0.00		1,523.84		1,286.27		1,182.69		799.86	
Other Assets	0.00									
Fixed Assets	**8,711.24**	100.00	**9,229.99**	105.95	**9,559.83**	109.74	**9,391.59**	107.81	**8,953.31**	102.78
Non-Current Investments	1,385.39	100.00	1,294.14	93.41	989.14	71.40	940.15	67.86	901.79	65.09
Deferred Tax Assets [Net]	1,125.71	100.00	565.57	50.24	52.35	4.65	470.11	41.76	259.31	23.04
Long Term Loans And Advances	6.21	100.00	6.23	100.32	46.13	742.83	47.96	772.30	48.36	778.74
Other Non-Current Assets	4,002.52	100.00	2,217.94	55.41	1,044.62	26.10	954.79	23.85	880.10	21.99
Total Non-Current Assets	**15,231.07**	100.00	**13,313.87**	87.41	**11,692.07**	76.76	**11,804.60**	77.50	**11,042.87**	72.50
CURRENT ASSETS										
Inventories	12,160.67	100.00	14,363.58	118.12	16,560.33	136.18	19,453.92	159.97	19,684.77	161.87
Trade Receivables	4,719.07	100.00	4,641.55	98.36	5,639.36	119.50	11,583.39	245.46	12,459.03	264.01
Cash And Cash Equivalents	20,306.15	100.00	14,343.61	70.64	7,166.33	35.29	297.91	1.47	95.38	0.47
Short Term Loans And Advances	7.62	100.00	8.06	105.77	14.56	191.08	19.28	253.02	27.21	357.09
OtherCurrentAssets	14,692.80	100.00	11,650.32	79.29	10,798.99	73.50	10,040.92	68.34	7,377.84	50.21
Total Current Assets	**51,886.31**	100.00	**45,007.12**	86.74	**40,179.57**	77.44	**41,395.42**	79.78	**39,644.23**	76.41
Total Assets	**67,117.38**	100.00	**58,320.99**	86.89	**51,871.64**	77.28	**53,200.02**	79.26	**50,687.10**	75.52

INTERPRETATION

The trend analysis indicates a general growth in the company's equity and assets, suggesting a positive overall financial performance. However, fluctuations in various

liability and asset categories indicate changing business activities, investment strategies, and financial obligations. The company seems to have increased investments in both tangible and intangible assets, which has contributed to its growth.

COMPARATIVE STATEMENT OF BALANCE SHEET

Comparative statement of balance sheet				
	2022	2023	Absolute chan	% change
EQUITIES AND LIABILITIES				
SHAREHOLDER'S FUNDS				
Equity Share Capital	334.39	334.39	0.00	0.00
Total Share Capital	**334.39**	**334.39**	0.00	0.00
Reserves and Surplus	18,929.61	23,171.78	4242.17	22.41
Total Reserves and Surplus	**18,929.61**	**23,171.78**	4242.17	22.41
Total Shareholders Funds	**19,264.00**	**23,506.17**	4242.17	22.02
NON-CURRENT LIABILITIES			0.00	
Long Term Borrowings	0.00	0.00	0.00	
Other Long Term Liabilities	12,788.90	11,452.85	-1336.05	-10.45
Long Term Provisions	1,248.24	1,332.94	84.70	6.79
Total Non-Current Liabilities	**14,037.14**	**12,785.79**	-1251.35	-8.91
CURRENT LIABILITIES			0.00	
Short Term Borrowings		0.00	0.00	
Trade Payables	2,559.77	3,137.34	577.57	22.56
Other Current Liabilities	17,404.30	20,911.43	3507.13	20.15
Short Term Provisions	5,055.78	6,776.65	1720.87	34.04
Total Current Liabilities	**25,019.85**	**30,825.42**	5805.57	23.20
Total Capital And Liabilities	**58,320.99**	**67,117.38**	**8796.39**	**15.08**
ASSETS			0.00	
NON-CURRENT ASSETS			0.00	
Tangible Assets	5,919.85	8,711.24	2791.39	47.15
Intangible Assets	838.26	0.00	-838.26	-100.00
Capital Work-In-Progress	948.01	0.00	-948.01	-100.00
Intangible Assets Under Development	1,523.84	0.00	-1523.84	-100.00
Other Assets		0.00	0.00	
Fixed Assets	**9,229.99**	**8,711.24**	-518.75	-5.62
Non-Current Investments	1,294.14	1,385.39	91.25	7.05
Deferred Tax Assets [Net]	565.57	1,125.71	560.14	99.04
Long Term Loans And Advances	6.23	6.21	-0.02	-0.32
Other Non-Current Assets	2,217.94	4,002.52	1784.58	80.46
Total Non-Current Assets	**13,313.87**	**15,231.07**	1917.20	14.40
CURRENT ASSETS			0.00	
Inventories	14,363.58	12,160.67	-2202.91	-15.34
Trade Receivables	4,641.55	4,719.07	77.52	1.67
Cash And Cash Equivalents	14,343.61	20,306.15	5962.54	41.57
Short Term Loans And Advances	8.06	7.62	-0.44	-5.46
OtherCurrentAssets	11,650.32	14,692.80	3042.48	26.11
Total Current Assets	**45,007.12**	**51,886.31**	**6879.19**	**15.28**
Total Assets	**58,320.99**	**67,117.38**	**8796.39**	**15.08**

INTERPRETATION

The comparative statement of the balance sheet shows an increase in the company's total assets and equity, indicating positive growth. There were changes in various liability and asset categories, with fluctuations in certain items. The company appears to have invested in tangible and non-current assets while increasing its liquidity through higher cash and cash equivalents. The increase in reserves and surplus contributed to the growth in equity.

COMMONSIZE STATEMENT OF BALANCE SHEET

Common size balance sheet		
EQUITIES AND LIABILITIES	2023	**% 0f total**
SHAREHOLDER'S FUNDS		
Equity Share Capital	334.39	0.50
Total Share Capital	**334.39**	0.50
Reserves and Surplus	23,171.78	34.52
Total Reserves and Surplus	**23,171.78**	34.52
Total Shareholders Funds	**23,506.17**	35.02
NON-CURRENT LIABILITIES		0.00
Long Term Borrowings	0.00	0.00
Other Long Term Liabilities	11,452.85	17.06
Long Term Provisions	1,332.94	1.99
Total Non-Current Liabilities	**12,785.79**	19.05
CURRENT LIABILITIES		0.00
Short Term Borrowings	0.00	0.00
Trade Payables	3,137.34	4.67
Other Current Liabilities	20,911.43	31.16
Short Term Provisions	6,776.65	10.10
Total Current Liabilities	**30,825.42**	45.93
Total Capital And Liabilities	**67,117.38**	**100.00**
ASSETS		0.00
NON-CURRENT ASSETS		0.00
Tangible Assets	8,711.24	12.98
Intangible Assets	0.00	0.00
Capital Work-In-Progress	0.00	0.00
Intangible Assets Under Development	0.00	0.00
Other Assets	0.00	0.00
Fixed Assets	**8,711.24**	12.98
Non-Current Investments	1,385.39	2.06
Deferred Tax Assets [Net]	1,125.71	1.68
Long Term Loans And Advances	6.21	0.01
Other Non-Current Assets	4,002.52	5.96
Total Non-Current Assets	**15,231.07**	22.69
CURRENT ASSETS		0.00
Inventories	12,160.67	18.12
Trade Receivables	4,719.07	7.03
Cash And Cash Equivalents	20,306.15	30.25
Short Term Loans And Advances	7.62	0.01
OtherCurrentAssets	14,692.80	21.89
Total Current Assets	**51,886.31**	77.31
Total Assets	**67,117.38**	**100.00**

INTERPRETATION

The common size balance sheet provides insights into the composition of the company's capital structure, assets, and liabilities. The company has a significant portion of its capital in reserves and surplus, indicating the retention of profits. It has a balanced mix of equity and reserves in its shareholder's funds. The absence of long-term borrowings suggests prudent debt management. The company's current liabilities are relatively high, reflecting its short-term obligations, while cash and cash equivalents contribute significantly to its liquidity.

CHAPTER 5: PROBLEM MAPPING AND SOLVING

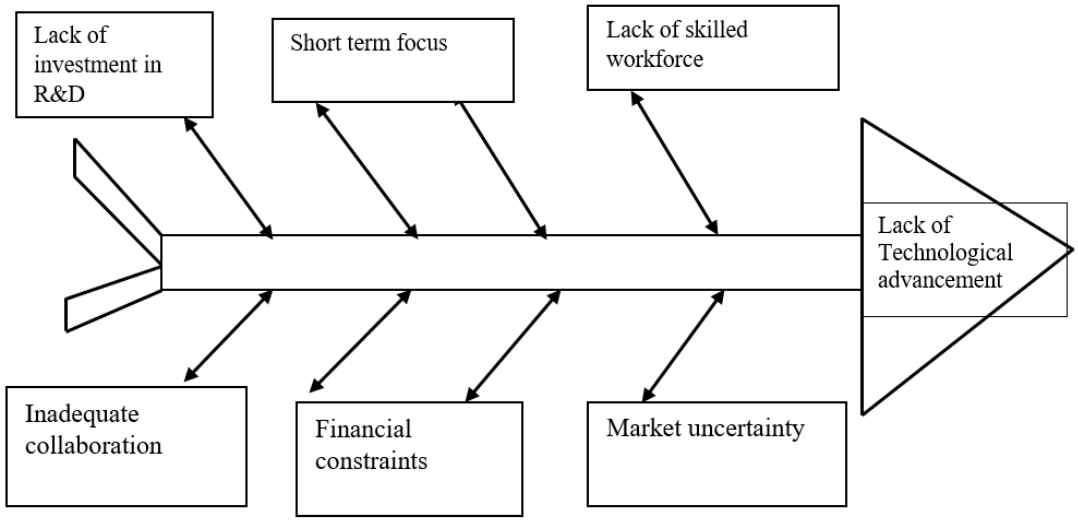
IDENTIFICATION OF MAJOR PROBLEM

Lack of technological advancement

The aerospace industry is highly technology-driven. Keeping up with the latest advancements in aircraft design, materials, avionics, and propulsion systems can be challenging. HAL might need to continually invest in research and development to stay competitive.

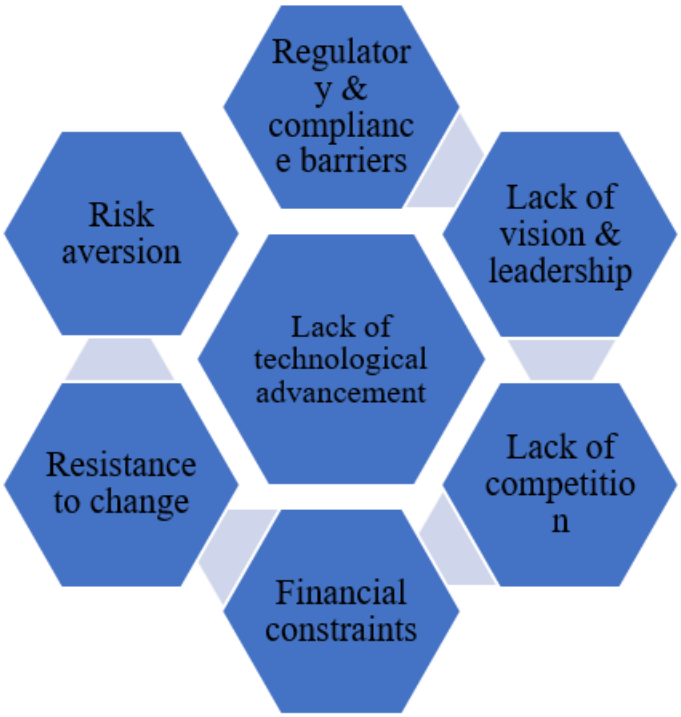
Analytical tool used to analyse the Problem of HAL

The Fishbone Diagram or cause-and-effect diagram, is a visual tool used to analyze the potential causes of a specific problem or issue. It's particularly useful for identifying and categorizing the various factors that might contribute to a problem, making it easier to understand the root causes and develop solutions. The diagram gets its name from its appearance, which resembles the skeleton of a fish.



Mind mapping techniques

Mind mapping is a powerful technique used to visually organize and represent information, concepts, ideas, and relationships in a structured and interconnected manner. . Mind maps are designed to mimic the way our brain naturally processes information, making it easier to understand, remember, and generate new ideas.



Factors affecting the technological advancement

- Funding and Investment
- Bureaucracy and Decision-Making Process
- Skill Gap and Talent Acquisition
- Lack of Collaboration
- Legacy Systems and Practices
- Regulatory Hurdles
- Incentives for Innovation
- Market Demand and Competition
- Lack of Research and Development Infrastructure
- Government Policies and Priorities

INDENTIFICATION AND TESING OF FEASIBLE SOLUTION

1. **Increase Funding and Investment:** Ensure that HAL receives sufficient funding for research, development, and innovation. Allocating a dedicated budget for

technological advancement projects can enable the organization to pursue new technologies and solutions.

2. **Promote a Culture of Innovation:** Foster a culture that encourages employees to generate and share innovative ideas. Implement reward systems, recognition programs, and innovation challenges to motivate employees to contribute to technological advancements.

3. **Establish Research and Development Centers:** Set up specialized research and development centers within HAL. These centers can focus on cutting-edge technologies, conduct research, and collaborate with academia and research institutions.

4. **Collaborate with Academia and Research Institutions:** Forge partnerships with universities, research organizations, and other aerospace companies. Collaborative research projects can lead to the exchange of knowledge, expertise, and resources, accelerating technological advancements.

5. **Invest in Employee Training and Skill Development:** Offer continuous training programs to upskill employees and keep them updated on the latest technologies. Develop a talent pipeline by partnering with educational institutions to ensure a skilled workforce.

6. **Encourage Cross-Disciplinary Teams:** Form cross-functional teams composed of engineers, researchers, designers, and other experts from various disciplines. This approach can lead to diverse perspectives and innovative solutions.

7. **Establish an Innovation Hub:** Create an innovation hub or lab within HAL where employees can experiment with new technologies and collaborate on innovative projects.

8. **Focus on Emerging Technologies:** Identify emerging technologies such as artificial intelligence, advanced materials, additive manufacturing, and sustainable aviation solutions. Prioritize research and development efforts in these areas.

9. **Implement Technology Roadmaps:** Develop technology roadmaps that outline the organization's strategic goals and the steps required to achieve them. These roadmaps can provide a clear direction for technological advancements.

10. **Government and Industry Collaboration:** Engage with government bodies, industry associations, and policymakers to align technological priorities and policies. Advocate for policies that support research, innovation, and the aerospace sector.
11. **Monitor Global Trends:** Stay informed about global aerospace trends and advancements. Attend international conferences, exhibitions, and seminars to learn about the latest technologies and best practices.
12. **Adopt Open Innovation:** Embrace open innovation approaches by collaborating with external startups, tech companies, and innovators. Open innovation can bring fresh perspectives and external expertise to HAL's projects.
13. **Invest in Intellectual Property Protection:** Establish mechanisms to protect intellectual property generated through research and innovation. This can incentivize investment in new technologies.

CHAPTER 6: FINDING, SUGGESTIONS AND LEARNINGS

Major findings

- **Organization provides job security to employees if they are regarded permanent;**

  In the organization, I discovered two types of employees: permanent employees and contract employees. People whose work is appreciated by the officers of that department will be hired as permanent employees**.**

- **Providing travel allowances to employees and officers:**

  The organisation gives transport allowances of Rs3000 per head for employees and officers who operate within the organisation.

- **Organisation is concerned about employee safety:**

  The firm's principal policy is to protect employees from harmful chemicals while they work, and the corporation never backs down from providing safety measures and procedures in the workplace.

- **High-tech machines and processes:**

  The organisation uses cutting-edge technology to manufacture helicopters, aircrafts, and aircraft overhauls.

Feasible suggestion

- The company must reconsider its procurement policies and revise or change them in order to complete the work in a timely manner and fulfil the deadlines set by its customers.
- Employee engagement programmes and policies should be implemented to renew employees and work management.
- Employees should work hard to restructure the organisation and maintain correct consistency in the cost-cutting and profit-maximizing processes.

LEARNING EXPERIENCE

The organizational research undertaken at HAL Helicopter division has greatly aided me in learning more about the organization. It provided me with a platform where I could gain actual experience on how aircrafts work and what the aircraft service process entails, as well as learn about the practical application of the organization's rules and procedures. I learned about the operation of numerous departments as well as their interdependence with one another.

The six-week internship in the HAL Helicopter division provided me with invaluable job experience and confidence. Understanding the working environments of all the departments provided me new insights into the aeronautical industry.

The research process is used to get practical understanding of numerous theoretical elements.

The following are some of the things I learned throughout my internship:

- Punctuality; even for training students, they adhere to very rigorous working hours.
- Culture; it is disciplined, such as a distinct dress code and teamwork.
- We learned about the company's labour job, their behaviour in and around the workplace, how they motivate workers, take initiative to make them obey the company's laws and regulations, and how safety standards are prioritised to keep their employees safe.
- I learned about the company's resources required for helicopter manufacture, such as raw materials and various helicopter parts imported from overseas.
- The implementation of contemporary technology in any department, whether it is the production department, the accounting department, the engineering department, or any other department.
- Each department's reliance on the other department, as well as how communication flows between all departments.