VOLUME 1 | ISSUE 14 | June 2025

THE WORLDONOMICS TIMES

Innovation Ignition: Fueling Economic Growth

Overview of Risk Analysis in Mutual Funds

Shri Joshit Ranjan Sikidar
Director Finance
Solar Energy Corporation of India Limited

Prosperity's Promise: Economic **Growth** **Starts** with Human Development

www.worldonomics.in

THE WORLDONOMICS TIMES

PUBLISHED BY

INTERNATIONAL NAVODAYA CHAMBER OF COMMERCE
Established in 2021

Volume 1 | Issue 14 | June 25 Knowledge Box

The Worldonomics Times
Alankrit Society A 31, Plot A1,
Vishwas Nagar, Delhi 110032

Head Office
International Navodaya Chamber Of Commerce
30/26A, Street No. 9, Vishwas Nagar, Delhi 110032
Tel: +91 11 69268366

Email Us
For Circulation, sponsorship and inquiry
info@incoc.in

Website
www.worldonomics.in
MRP: 200 (including GST)
Delhi Legal Jurisdiction

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EDITOR'S DESK

*Prosperity's Promise: Economic **Growth Starts** with Human Development*

Dear Esteemed Readers,

The Worldonomics Times, Volume 1, Issue 14, for June 2025, covers a diverse range of topics spanning economics, finance, and regulatory updates, with a strong emphasis on providing insights for professionals. The magazine is published by the International Navodaya Chamber of Commerce.
Key areas summarized for this edition include:

- Economic Growth and Financial Insights
- Articles focusing on "Innovation Ignition: Fueling Economic Growth" and "Prosperity's Promise: Economic Growth Starts with Human Development".
- Detailed analysis of "Overview of Risk Analysis in Mutual Funds".
- Discussions on strategies to enhance profitability by optimizing resources and implementing effective cost management, particularly in the agricultural sector using Activity-Based Costing. It also delves into understanding process costing within the Indian textile industry.
- Regulatory and Legal Updates (May 2025)
- Income Tax: Includes updates on exemptions for the Telangana State Pollution Control Board, notification of Indian Railway Finance Corporation Ltd (IRFC) Zero Coupon Bonds, and revisions to various Income Tax Return (ITR) forms (ITR-V, ITR-Acknowledgement, ITR-6, ITR-7, ITR-2, and ITR-5) for Assessment Year 2025-26.
- GST: Features advisories regarding appeal withdrawal with waiver schemes and reporting values in GSTR-3B. Several Advance Authority Rulings (AARs) are detailed, covering classification and taxability of products like Sada Tambaku, input tax credit (ITC) eligibility on imported parts, non-admissibility of ITC for factory building construction, and GST rates for agricultural machine parts and groundnuts.
- Custom Duty: Covers the fixation of tariff values for essential commodities like edible oils, precious metals (gold and silver), and areca nuts. It also discusses anti-dumping duties on "Titanium Dioxide" from China, revisions to arrest and incident report formats, and import restrictions for certain goods from Bangladesh. Court judgments are highlighted on crude soybean oil's classification for customs duty exemption and the release of personal effects like a gold Kada.
- DGFT (Directorate General of Foreign Trade): Notifies amendments in export-import norms concerning Di-Octyl Phthalate production.
- SEBI (Securities and Exchange Board of India): Provides updates on the Electronic Book Provider (EBP) platform for debt securities, the use of Expected Loss (EL) based rating scales for Municipal Bonds, extensions for Offshore Derivative Instruments (ODI) and Foreign Portfolio Investor (FPI) disclosures, and changes to the internal audit team composition for Credit Rating Agencies (CRAs). Additionally, it includes information on the Investor Charter for Registrars to an Issue and Share Transfer Agents (RTAs), and consultation papers on FPI investments in Indian Government Bonds and AIF Manager certification requirements.
- IBBI (Insolvency and Bankruptcy Board of India): Reports on the suspension of an Insolvency Professional, the quashing of income tax reassessments post-IBC plan approval, and rulings on resolution plan rejections that violate natural justice principles.
- RBI (Reserve Bank of India): Announces a Line of Credit (LOC) extended to the Government of Mongolia for a crude oil refinery plant.
- Emerging Technologies
- A dedicated section explores Artificial Intelligence (AI), Machine Learning (ML), Natural Language Processing (NLP), and Deepfakes. It delves into their applications, discusses challenges such as data quality, overfitting, interpretability, and computational complexity, and outlines efforts to mitigate misuse.

The magazine aims to be a crucial resource for professionals, offering valuable insights and actionable strategies to navigate the evolving economic landscape and explore the intersections of finance with technology, sustainability, and social responsibility.

Sandeep Kumar

EDITOR-IN-CHIEF

The Worldonomics Times

Courtesy Meeting With Shri Sripad Y Naik Ji,
Union Minister of State for Power & New &
Renewable Energy, Govt. of India

Courtesy Meeting With Smt. Annupurna Devi Ji,
Union Minister of Women and Child
Govt. of India

3rd Foundation Day (23.07.2024) of International Navodaya Chamber of Commerce

Courtesy Meeting With
Shri Harsh Malhotra Ji,
Ministry of Road, Transport & Highways
And
Ministry of Corporate Affairs Govt. of India

TABLE OF CONTENTS

Page Number

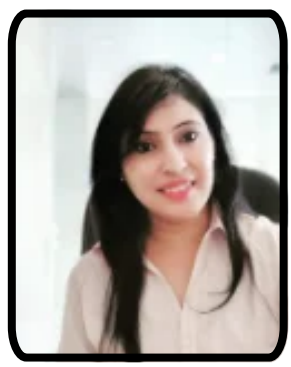
Editorial Team

CMA MADHURI KASHYAP

CMA (DR.) R K MOHAPATRA

CMA DEEPIKA RATERIA

CMA PRAMOD JAISWAL



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NOTIFICATIONS & CIRCULARS ISSUED DURING WEEK (12TH-18TH MAY 2025)

A.Income Tax

Exemptions to Telangana State Pollution Control Board: The Telangana State Pollution Control Board, a Board constituted by the State Government of Telangana under Water (Prevention and Control of Pollution) Act, 1974 has been notified under section 10(46) for exemption on its income arising from Income from consent fees, analysis fees, reimbursements from CPCB, authorisation fees, cess, grants, interest on loans and advances, tender fees, penalties and interest on bank deposits.
(Link: Income Tax Notification 47/2025 Dated 13/05/2025)

Indian Railway Finance Corporation Ltd (IRFC) Zero Coupon Bond notified under section 2(48): Central Government specifies the Ten year Zero Coupon Bond of IRFC as zero coupon bond under section 2(48) Income Tax Act. The duration of the bond is ten years, to be issued on or before the 31st day of March, 2027, the amount to be paid on maturity or redemption of the bond is Rs.1,00,000/- for each bond, the discount is Rs. 49165.10/- per bond, i.e. issue price is Rs. 50834.90/- per bond, the number of bonds to be issued is ten lakhs.

-- A Zero Coupon Bond (ZCB) is a financial instrument that does not pay periodic interest (coupon) during its tenure. Instead, it is issued at a discount and redeemed at its face value upon maturity. The difference between the issue price and face value represents the return for investors. If held beyond 12 months, the long term capital gains will attract a 12.5% tax rate. If sold before 12 months, the short term capital gains will be taxed as per the bondholder's income tax slab.
(Link: Income Tax Notification 48/2025 Dated 14/05/2025)

B. GST

Advisory on appeal withdrawal with respect to waiver scheme: When Withdrawal application (APL 01W) for appeal is filed before issuance of final acknowledgment (APL 02) by the appellate authority, then the system automatically withdraws the appeal application (APL 01). However, if withdrawal application is filed after issuance of final acknowledgment, then the withdrawal of such appeal is subjected to the approval of the appellate authority. Once the appellate authority approves the withdrawal application, the status of the Appeal application changes from "Appeal submitted" to "Appeal withdrawn".

-- While filing Waiver application or in the already filed waiver application, taxpayers need to upload the screenshot of the appeal case folder showing status as "Appeal withdrawn".
(Link: GSTN Advisory Dated 14/05/2025)

Advisory on reporting values in Table 3.2 of GSTR-3B: As per the earlier advisory dated April 11, 2025, it was communicated that the auto-populated values in Table 3.2 of Form GSTR-3B would be made non-editable starting from the April 2025 tax period (i.e., for the return to be filed in May 2025). These details relate to interstate supplies made to unregistered persons, composition taxpayers and UIN holders.

-- In view of representations and grievances from taxpayers, it has been decided that Table 3.2 shall remain editable for the time being. Taxpayers are advised to report or amend the auto populated entries, if required and furnish their returns accurately, ensuring the correctness of the disclosed information.
(Link: GSTN Advisory Dated 16/05/2025)

AAR, Sada Tambaku pre-mixed with Lime classifiable under HSN 24039910, taxable at 28% GST: Case of Zen Tobacco Private Limited, AAR Gujarat Dated 30th April 2025. AAR concluded that mixing tobacco with lime paste in a mixer results in the emergence of a new product – tobacco mixed with lime – which possesses a distinct name, character (chewable), and use (direct consumption). This transformation, making it ready for end use where the original form was not, was held to constitute 'manufacture' under the GST law. It ruled that the goods i.e. 'sada tambaku' pre-mixed with lime' is leviable to GST at the rate of 28% in terms of serial No. 15 of Schedule IV of notification No. 1/2017 dated 28th June 2017 and applicable compensation cess. The product is classifiable under HSN 24039910.
(Link: AAR Gujarat Ruling Dated 30/04/2025)

AAR, denies GST ITC on imported parts where foreign supplier paid tax: Case of Enerzi Microwave Systems Pvt Ltd, AAR Gujarat Ruling Dated 30th April 2025. AAR ruled that the applicant is not eligible for IGST on imports of parts paid by the foreign supplier in terms of section 16 of the CGST Act. The ruling clarifies that even if imported goods are received by a registered person and used in their business, the benefit of ITC on import tax is contingent upon the registered person being the one who bore the tax burden and the value of those inputs being included in their subsequent taxable outward supplies.
(Link: AAR Gujarat Ruling Dated 30/04/2025)

AAR, No ITC admissible for construction-related supplies and services for factory building: Case of HMSU Rollers (India) Pvt Ltd, AAR Gujarat Ruling Dated 30th April 2025. AAR held that Input Tax Credit (ITC) is not admissible on the goods and services used for constructing an integrated factory building, including a Pre-Engineered Building (PEB) structure designed to support an overhead crane. The authority classified such construction as immovable property, falling under the blocked credit provisions of the GST law. It ruled that no proportionate ITC is admissible for supply of the following goods and services:

-- Steel, Cement and other consumables etc., to the extent of their actual usage in the execution of works contract service when supplied for construction of immovable property, in the form of the factory which is an Integrated Factory Building with Gantry Beam, which in turn is used for mounting across the pre-cast concrete beams, poles over which the crane would be operated;

-- Installation and Erection Services of the PEB when supplied for construction of immovable property, in the form of the factory which is an Integrated Factory Building with Gantry Beam, which in turn is used for mounting across the pre-cast concrete beams, poles and over which the crane would be operated;

-- Other capital goods like rails, electrification, etc. installed or erected for smooth operation of the crane.

(Link: AAR Gujarat Ruling Dated 30/04/2025)

AAR, Chaff Cutter Blades (Agricultural Machine Part) attract 18% GST: Case of Neel Kamal Gera, AAR Rajasthan Ruling Dated 23rd April 2025. AAR ruled that the blades used as spare parts in agricultural chaff cutter machines are classifiable under HSN Heading 8208 4000, attracting a Goods and Services Tax (GST) rate of 18%.

(Link: AAR Rajasthan Ruling Dated 23/04/2025)

AAR, Heating of Groundnuts with shell renders it ineligible for HSN 1202 classification: Case of Sitaram Kumhar, AAR Rajasthan Ruling Dated 17th April 2025. HSN code 1202 covers "Ground-nuts, not roasted or otherwise cooked, whether or not shelled or broken," attract a 5% GST rate. AAR ruled that heating groundnuts with shell to reduce moisture for storage and transportation does indeed make them ineligible for classification under HSN 1202.

(Link: AAR Rajasthan Ruling Dated 17/04/2025)

AAR, Members diverge on GST classification of Tipper Body fabrication: Case of Kamal Coachworks Pvt Ltd, AAR Rajasthan Ruling Dated 23rd April 2025. AAR, has highlighted a difference in interpretation regarding the GST classification of fabricating and mounting tipper bodies on chassis provided by a customer. The split decision by the two-member bench means the matter will now be referred to the Appellate Authority for clarity.

(Link: AAR Rajasthan Ruling Dated 23/04/2025)

SC, Section 5A of KGST and 7A of TGST is constitutionally valid: Case of CT Kouchouseph vs State of Kerala, SC Judgement Dated 9th May2025. The apex court held that legislations do not levy the purchase tax to tax the transaction of the sale and purchase twice. It levies purchase tax only where no sales tax was payable on the sale. Accordingly, constitutional validity of section 5A of Kerala General Sales Tax Act, 1963 and section 7A of Tamil Nadu General Sales Tax Act, 1959 is upholded.

(Link: SC Judgement Dated 09/05/2025)

C.Central Excise

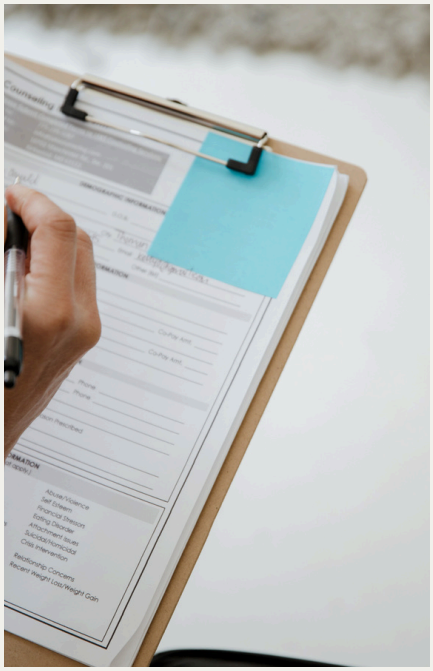
No Notifications/ Circular during the week.

D.Custom Duty

Fixation of Tariff Value of Edible Oils, Brass Scrap, Areca Nut, Gold and Silver: CBDT notified the Tariff Values of Edible Oils, Brass Scrap, Areca Nut, Gold and Silver, which shall come into force w.e.f. 16th May 2025. The tariff value for crude palm oil is set at USD 987 per metric ton, while gold and silver have tariff values of USD 1028 per 10 grams and USD 1065 per kilogram, respectively. The tariff value for areca nuts is fixed at USD 6970 per metric ton.
(Link: Custom Notification 34/2025 (NT) Dated 15/05/2025)

Anti-Dumping Duty on imports of "Titanium Dioxide" originating in or exported from China: Notification No. 12/2025 imposes Anti-Dumping Duty (ADD) on imports of "Titanium Dioxide" originating in or exported from China. It is levied only for specified end uses, and excludes from its scope Titanium Dioxide for use in products covered under its description relating to food, pharma, skin-care, textile, fibre, or nano or ultra fine titanium dioxide. To facilitate smooth clearance, a facility is being introduced in Bill of Entry to make an electronic declaration for those importers importing for use in such excluded products.
(Link: Custom Circular 16/2025 Dated 11/05/2025)

Revision of Arrest Report and Incident Report (where arrest not made): The instruction highlights that details of the DIGIT ID are now mandatory components of both the Arrest Report (revised Annexure-I) and the Incident Report (revised Annexure-II). These updated reports are required to be submitted via email to specified addresses.
(Link: Custom Instructions 10/2025 Dated 13/05/2025)



Port restriction on import of certain goods from Bangladesh to India: Refer notification dated 17th May 2025, whereby a new Para 19 under 'General Notes Regarding Import Policy' has been inserted. For ready-made garments, import from Bangladesh shall not be allowed from any land port, however, it is allowed only through Nhava Sheva and Kolkata seaports. For some specific items imports from Bangladesh shall not be allowed through any LCSs/ICPs in Assam, Meghalaya, Tripura and Mizoram; and LCS Changrabandha and Fulbari, in West Bengal. These restrictions shall not apply to Import of Fish, LPG, Edible Oil, and Crushed Stone to India from Bangladesh. These restrictions shall also not apply to Bangladesh exports to Nepal/Bhutan transiting through India. Necessary action be taken to sensitize officers in this regard.
(Link: Custom Instructions 11/2025 Dated 17/05/2025)

SC, Crude Soybean Oil deemed manufactured product, eligible for customs duty exemption: Case of Noble Resources and Trading India Pvt Ltd vs Union of India, SC Judgement Dated 14th May 2025. The primary question before the court was whether crude degummed soybean oil, derived from soybeans through a series of processes, could still be classified as an agricultural product. The Court noted that crude degummed soybean oil is not simply a processed form of soybean but a distinct marketable product with its own identity. the The apex court allowed the appeal, ruling that crude degummed soybean oil is a manufactured product and not an agricultural product. This classification makes it eligible for customs duty exemption under the relevant notification.
(Link: SC Judgement Dated 14/05/2025)

HC, Gold Kada worn by sikh man is personal effect, court orders release: Case of Daljeet Singh vs Commissioner of Customs, HC Delhi Judgement Dated 28th April 2025. High Court has ruled that a gold kada worn by the petitioner was a personal effect and ordered its release. The petitioner was traveling from Dubai when a 22 carat gold kada weighing 60 grams, which he stated he always wore as a personal effect, was detained by the Customs Department at New Delhi.
(Link: HC Delhi Judgement Dated 28/04/2025)

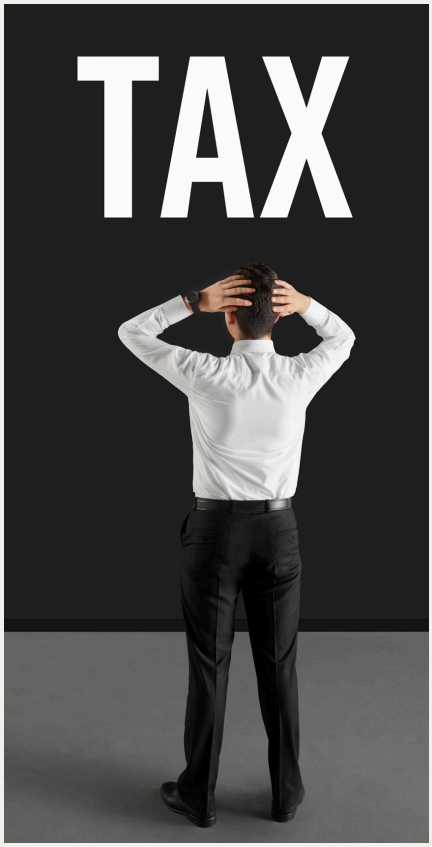
E.Directorate General of Foreign Trade (DGFT)

Amendment in Export-Import norms for Di-Octyl Phthalate production: The export product description for Standard Input Output Norms SION A-1303, which was previously listed as "Di-Octyl Phthalate (DOP)," has been amended to "Di-Octyl Phthalate (DOP) (PVC Plasticizer)." Also, the import quantity of '2- Ethylhexanol (Octanol)' has been reduced from the existing allowance of 0.700 kg to 0.680 kg for every 1 kg of the export product. The quantity permitted for the other import item, Phthalic Anhydride remains unchanged at 0.400 kg.
(Link: DGFT Public Notice 07/2025 Dated 16/05/2025)

F. Securities and Exchange Board of India (SEBI)

Review of provisions pertaining to Electronic Book Provider (EBP) platform for debt securities: The key changes include mandatory use of the EBP platform for private placements of debt securities, non-convertible redeemable preference shares (NCRPS), and municipal debt securities with issue sizes of Rs 20 crore or more (including cumulative tranches). Issuers such as REITs, SM REITs, and InvITs may also opt to use the platform voluntarily.

-- Issuers must now submit the Placement Memorandum and term sheet at least two or three working days before the issue opens, depending on their prior use of the platform. New disclosures include details on green shoe options, anchor investor allocations (with percentage limits based on credit ratings), and pro-rata allotment methods. Timelines for obtaining in-principle approvals and completing the listing process have been standardized.
(Link: SEBI Circular Dated 16/05/2025)



Extension of timeline for disclosures for Offshore Derivative Instruments (ODIs) and Foreign Portfolio Investors (FPIs) with segregated portfolios: These provisions were originally outlined in paragraphs 2.2 to 2.7 of an earlier SEBI circular dated 17th December 2024. The specified paragraphs were scheduled to take effect five months after issuance. However, based on representations from stakeholders, the implementation deadline has been extended to 17th November 2025.
(Link: SEBI Circular Dated 16/05/2025)

Rating of Municipal Bonds on the Expected Loss (EL) based Rating Scale: The circular permits Credit Rating Agencies (CRAs) to use the Expected Loss (EL) based Rating Scale for rating Municipal Bonds. It noted that EL ratings, when used alongside standard or Probability of Default (PD) ratings, could provide a clearer reflection of the recovery prospects for municipal bonds. As that these bonds are frequently issued by Urban Local Bodies and Municipalities primarily to finance infrastructure development, extending the EL-based scale, previously permitted for the infrastructure sector, was considered appropriate.
(Link: SEBI Circular Dated 15/05/2025)

Composition of the Internal Audit team for Credit Rating Agencies (CRAs): Previously, the internal audit team for a CRA needed to include at least a Chartered Accountant and a professional with a Certified Information Systems Auditor (CISA) or Diploma in Information Systems Auditor (DISA) qualification. Under the revised norms, the internal audit team must now comprise at least a Chartered Accountant or a Cost Accountant (holding ACMA or FCMA qualifications from the Institute of Cost Accounts of India). Additionally, the information systems audit requirement can now be met by a professional holding CISA, DISA, or a Diploma in Information System Security Audit (DISSA) from the Institute of Cost Accounts of India.
(Link: SEBI Circular Dated 14/05/2025)

Investor Charter for Registrars to an Issue and Share Transfer Agents (RTAs): The updated charter reflect recent market developments such as the introduction of the Online Dispute Resolution (ODR) platform and SCORES 2.0. Registered RTAs are now required to display the revised charter on their websites, offices, and via email to shareholders. The RTAs must disclose monthly complaint data on their websites. The revised charter outlines key services, expected timelines for service delivery, investors' rights, and a clear grievance redressal mechanism.
(Link: SEBI Circular Dated 14/05/2025)

Extension of timeline for complying with the certification requirement for the key investment team of the Manager of AIF: The regulation mandates that the key investment team of an Alternative Investment Fund (AIF) Manager must include at least one member with the specified certification, i.e. 'NISM Series-XIX-C: Alternative Investment Fund Managers Certification Examination'. In view of industry representations, SEBI now extended the compliance deadline to 31st July 2025.
(Link: SEBI Circular Dated 13/05/2025)

Streamlining of Request for Quote (RFQ) Platform pricing and enhancement of Corporate Bond data: It has been decided to simplify the yield to price computation on the RFQ platform. The cash flow dates for interest, dividend, or redemption payments will be based on the scheduled due date as per the cash flow schedule, without adjustment for day count convention. Also, to centralize information, issuers are now required to disclose the cash flow schedule, including due dates and payment dates as per day count convention, in the centralized corporate bond database upon ISIN activation and update it within one working day of any changes.
(Link: SEBI Circular Dated 13/05/2025)

Consultation Paper on proposal to facilitate relaxation in regulatory compliances for FPI applicants investing only in Indian Government Bonds: The key proposals include aligning the Know Your Customer (KYC) review cycle for these FPIs (termed IGB-FPIs) with the timelines prescribed by the Reserve Bank of India for regulated entities, which are less frequent than current FPI requirements. Also, IGB-FPIs may be exempted from providing investor group details, as the investment limits relevant to such grouping do not apply to their IGB investments under Voluntary Retention Route (VRR) and Fully Accessible Route (FAR). It also suggests permitting unrestricted contribution and control by Non-resident Indians (NRIs), Overseas Citizens of India (OCIs), and Resident Individuals (RIs) in the corpus of IGB-FPIs, noting that NRIs and OCIs can already invest in specified IGBs without limits under FAR. The comments/ suggestions from stakeholders are invited.
(Link: SEBI Consultation Paper Dated 13/05/2025)

G. Ministry of Corporate Affairs (MCA)

No Notifications/ Circular during the week.

H. Insolvency and Bankruptcy Board of India (IBBI)

SC, Non-implementation of resolution plan by JSW for about two years since its approval is not justifiable: Case of Kalyani Transco vs Bhushan Power and Steel Ltd, SC Judgement Dated 2nd May 2025. The apex court rejects resolution plan of JSW since Successful Resolution Applicant (JSW) did not implement the Resolution Plan for about two years since its approval by the NCLAT, though there was no legal impediment in implementing the same. Such flagrant violation of the terms of the Resolution Plan, has frustrated the very object and purpose of the Code.
(Link: SC Judgement Dated 02/05/2025)

HC quashes Income Tax reassessment Post IBC plan, Clean Slate Policy: Case of Surya Manufacturing Private Limited vs ACIT, HC Delhi Judgement Dated 24th April 2025. High Court has quashed the reassessment order and notice issued by the Income Tax Department against Surya Manufacturing Private Limited. The court's decision reinforces the "Clean Slate Theory" in the context of the Insolvency and Bankruptcy Code (IBC), holding that once a resolution plan is approved, pre-existing liabilities not included in the plan are extinguished.
(Link: HC Delhi Judgement Dated 24/04/2025)

NCLAT, Rejection of Resolution Plan without hearing violates natural justice: Case of Essar (India) Ltd vs Prabhat Technologies, NCLAT Delhi Judgement Dated 6th May 2025. The appellate tribunal held that rejection of approved resolution plan on account of alleged fraud without giving an opportunity to resolution applicant to explain its position is against the principle of natural justice. Accordingly, matter remanded back.
(Link: NCLAT Delhi Judgement Dated 06/05/2025)

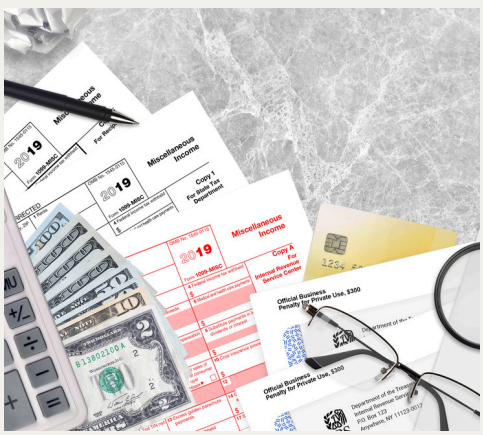
IBBI suspends Mr Viswanathan Rajagopalan IP for lapses in his duties under IBC and related regulations: The multiple lapses include delays in appointing an Authorized Representative for homebuyers, failing to include critical agendas such as the appointment of registered valuers, and issuing an Invitation for Expression of Interest without requisite approvals. The Disciplinary Committee suspended his registration for two years.
(Link: IBBI Order Dated 15/05/2025)

I. Reserve Bank of India (RBI)

Exim Bank's Line of Credit (LOC) for USD 700 million to Govt of Mongolia for financing construction of Crude Oil Refinery Plant in Mongolia: The LoC facilitates the export of eligible Indian goods and services in alignment with the Foreign Trade Policy of India, subject to approval by Exim Bank. The disbursement period is up to 48 months following the scheduled completion date of the related contract. Exporters must declare shipments under the LoC in accordance with existing RBI procedures and are not entitled to agency commission payments from the LoC funds.
(Link: RBI Notification 37/2025 Dated 16/05/2025)

J. Miscellaneous

SC, Dispute Arbitrable even after signing discharge voucher and accepting amount: Case of Arabian Exports Pvt Ltd vs National Insurance Company Ltd, SC Judgement Dated 6th May 2025. The issue before the court was whether a dispute raised by an insured after giving a full and final discharge voucher to the insurer can be referred to arbitration. The court had upheld the concept of economic duress and held that notwithstanding signing of the discharge voucher and accepting the amount offered, the dispute is still arbitrable. The question as to whether the appellant was compelled to sign the standardized voucher/advance receipt forwarded to it by the respondent out of economic duress and whether arbitration claim was sustainable or not were clearly within the domain of the arbitral tribunal. Thus, setting aside the impugned order of the High Court and allowing the appeal, the Bench appointed the sole arbitrator.
(Link: SC Judgement Dated 06/05/2025)



SC, Compensation on mother's death denied to married daughter due to loss of dependency: Case of Deep Shikha vs National Insurance Company Ltd, SC Judgement Dated 13th May 2025. The apes court held that a married daughter may be considered a legal representative, but, she will not be eligible for loss of dependency compensation unless it is proven by the daughter that she was financially dependent on the deceased. Accordingly, compensation was denied due to lack of dependency.
(Link: SC Judgement Dated 13/05/2025)

HC, Registered Trademark holder can't override prior user rights: Case of Goethe Institute EV vs Abhishek Yadav, HC Delhi Judgement Dated 6th May 2025. High Court held that section 34 of the Trade Marks Act, recognizes the rights of a prior user and protects its rights. The rights of prior user are recognized as superior than that of the registration and that even the registered trademark holder cannot disturb/interfere with the rights of the prior user.
(Link: HC Delhi Judgement Dated 6th May 2025)

Disclaimer:

The contents of this article are for informational purposes only. The user may refer to the relevant notification/ circular/ decisions issued by the respective authorities for specific interpretation and compliances related to a particular subject matter)

CMA Yash Paul Bhola

Ex-Director
(Finance), NFL.

NOTIFICATIONS & CIRCULARS ISSUED DURING WEEK (5TH- 11TH MAY 2025)

A.Income Tax

ITR **Form-V and Acknowledgement forms notified for AY 2025-26:** The notification amend the Income Tax Rules. Form ITR-V and Form ITR-Acknowledgement have been replaced with new forms in Appendix-II of the existing rules. The updated Form ITR-V is meant for taxpayers who have filed their income tax returns (ITR-1 to ITR-5 and ITR-7) but have not verified them electronically. Verification can be done electronically using Aadhaar OTP, Net Banking, EVC from a validated bank/demat account, or by sending a signed physical copy to the Centralized Processing Centre in Bengaluru via speed post. The revised Form ITR-Acknowledgement applies to returns that have been filed and verified. It records transmission and verification details, including IP address and verification mode. (Income Tax Notification 45/2025 Dated 07/05/2025)

ITR Form-7 notified for AY 2025-26: The notification amend the Income Tax Rules. Form ITR-7 (For persons including companies required to furnish return under sections 139(4A) or 139(4B) or 139(4C) or 139(4D) only) has been replaced with new form in Appendix-II of the existing rules. It is used by entities such as charitable trusts, religious institutions, political parties, research associations, and other institutions that claim exemption under various sections of the Income-tax Act including section 11, 12, 10(23C), and 13A. The amendment update the structure and reporting requirements of this form, in line with evolving compliance standards and digital filing protocols. (Income Tax Notification 46/2025 Dated 09/05/2025)

ITR Form-6 notified for AY 2025-26: The notification amend the Income Tax Rules. Form ITR-6 (For Companies other than companies claiming exemption under section 11) has been replaced with new form in Appendix-II of the existing rules. Section 11 relates to exemptions from tax for income derived from property under charitable trusts and institutions.

-- The Schedule for Capital Gains has been split to separately report gains earned before and after 23rd July 2024. Provisions have also been added to allow capital losses on share buybacks under specific conditions for income arising post 1st October 2024. A reference to Section 44BBC concerning the cruise business has been included. The Schedule BP (Business Profits) has been updated aligning it with Rule 10TIA, requiring profits from the sale of raw diamonds to be reported as 4% or more of gross receipts. Changes have been made to accurately capture deductions under Section 24(b) for interest on housing loans. The form now mandates reporting the specific TDS section code in the relevant schedule. (Income Tax Notification 44/2025 Dated 06/05/2025)

ITR Form 5 notified for AY 2025-26: The notification amend the Income Tax Rules. FORM ITR- 5 (for persons other than Individuals, HUF, Company and persons filing ITR-7) has been replaced with a new form in Appendix-II of the existing rules. (Income Tax Notification 42/2025 Dated 01/05/2025)

ITR Form 3 notified for AY 2025-26: The notification amend the Income Tax Rules. FORM ITR- 3 (for Individuals and HUFs having Income from profits and gains of business or profession) has been replaced with a new form in Appendix-II of the existing rules. The key changes include a split in the Schedule- Capital Gain for gains before and after 23rd July 2024. Capital loss on share buyback is now allowed if the corresponding dividend income is reported under "Income from Other Sources" for transactions post 1st October 2024. The asset and liability reporting threshold has been increased to Rs 1 crore of total income. Additionally, Section 44BBC (specific to cruise business) has been incorporated, along with enhanced reporting requirements for deductions under Sections 80C and 10(13A), and a mandate to report the TDS section code in Schedule- TDS. (Income Tax Notification 41/2025 Dated 30/04/2025)

ITR Form-2 notified for AY 2025-26: The notification amend the Income Tax Rules. Form ITR-2 (For Individuals and HUFs not having income from profits and gains of business or profession) has been replaced with new form in Appendix-II of the existing rules. The Schedule for Capital Gain now distinguishes gains before and after 23rd July 2024. It permits claiming capital loss on share buyback if corresponding dividend income is declared under other sources post 1st October 2024. The reporting threshold for assets and liabilities has been raised to Rs 1 crore of total income, with enhanced reporting requirements for deductions such as 80C and 10(13A). The form also mandates reporting of TDS section codes in Schedule TDS. (Income Tax Notification 43/2025 Dated 03/05/2025)

SAHAJ (ITR 1) and SUGAM (ITR-4) notified for FY 2025-26: The notification amend the Income Tax Rules. FORM ITR- 1 and ITR-4 will be replaced with new forms in Appendix-II of the existing rules.

-- ITR-1 SAHAJ is for individuals being a resident (other than not ordinarily resident) having total income up to Rs.50 lakh and having Income from Salaries, one house property, other sources (Interest etc.), long-term capital gains under section 112A up to Rs 1.25 lakh, and agricultural income up to Rs 5 thousand. It is not for an individual who is either Director in a company or has invested in unlisted equity shares or in cases where TDS has been deducted under section 194N or if income tax is deferred on ESOP or has assets (including financial interest in any entity) located outside India.

-- ITR-4 SUGAM is for Individuals, HUFs and Firms (other than LLP) being a resident having total income up to Rs.50 lakh and having income from business and profession which is computed under sections 44AD, 44ADA or 44AE, and having long-term capital gains under section 112A up to Rs. 1.25 lakh. It is not for an individual who is either Director in a company or has invested in unlisted equity shares or if income tax is deferred on ESOP or has agricultural income more than Rs. 5000 or has assets (including financial interest in any entity) located outside India. (Income Tax Notification 40/2025 Dated 29/04/2025)

HC, Bandwidth Charges Not Royalty Under Income Tax Act: Case of PCIT International Taxation vs Bharti Airtel Ltd, HC Delhi Judgement Dated 22nd April 2025. The HC upheld the view that payments made for bandwidth to overseas telecom operators do not constitute 'royalty' under Section 9(1)(vi) of the Income Tax Act. (HC Delhi Judgement Dated 22/04/2025)

B. GST

Advisory, Invoice-wise reporting functionality in Form GSTR-7 (TDS monthly return) on the portal: Vide Notification No. 09/2025, Form GSTR-7 has been amended to capture invoice-wise reporting with effect from 01.04.2025 i.e. the return period for April 2025 onwards. In this regard it is informed that development and testing of the same is underway. The enhanced functionality shall be deployed shortly, and users will be duly informed once the changes are made live on the portal. (GSTN Advisory Dated 06/05/2025)

Advisory, Updates in refund filing process for various refund categories: The important changes has been made in the refund filing process under the following categories:

1. Export of Services with payment of tax (statement 2).
2. Supplies made to SEZ Unit/SEZ Developer with payment of tax (statement 4)
3. On account of Refund by Supplier of Deemed export (statement 5B)

The said refund categories are changed from 'Tax Period based filing' to 'Invoice based filing'. Taxpayers must ensure that all the returns (GSTR-1, GSTR-3B etc) due till the date of refund application, are filed. The taxpayers can upload eligible invoices and claim refund. The invoices once uploaded with a refund application will be locked for any further amendment and will not be available for any subsequent refund claims. The said invoices will be unlocked only if the refund application is withdrawn or a deficiency memo is issued. (GSTN Advisory Dated 08/05/2025)

Advisory, Updates in refund filing process for recipients of deemed export: The refund applications under this category is no longer need to be filed in chronological order of Tax Period. Taxpayers must ensure that all the returns (GSTR-1, GSTR-3B etc) due till the date of refund application, are filed. The table "Amount Eligible for Refund" has been modified. The columns of the revised table are:

Col. 1 'Balance in ECL at the time of filing of refund application'. It will be auto populated.

Col. 2 'Net Input Tax Credit (ITC) of Deemed Exports (as per uploaded invoices)'. It will be auto populated based on invoices furnished in Statement 5B.

Col. 3 'Refund amount as per the uploaded invoices' reflects the sum of the amount of ITC claimed under all major Heads (IGST/CGST/SGST/UT) as per the invoices uploaded by the taxpayer in Statement 5B.

Col. 4 'Eligible Refund Amount'. The maximum amount of ITC which is available for refund claim will be auto populated.

Col. 5 'Refund amount not eligible as insufficient balance in the ECL'.

The taxpayers are advised to note these changes. (GSTN Advisory Dated 08/05/2025)

Timely production of records/information for audit: The CAG Audit Report 7 of 2024 report highlighted instances where field formations failed to fully or promptly provide records required for GST audits. It emphasized the constitutional mandate under Article 149, which grants the C&AG authority to audit government accounts and entities receiving government funding. It directed all records and information maintained be promptly provided to C&AG audit teams. Where requested documents are with taxpayers, officers should issue formal letters to those taxpayers and follow up as necessary to ensure timely compliance. (CGST Instructions 05/2025 Dated 02/05/2025)

SC, upholds 5% GST on badam flavoured milk: Case of AC Central Tax vs Sri Vijaya Vishakha Milk Producers Company, SC Judgement Dated 9th May 2025. Fresh milk and pasteurised milk are fully exempt from GST. Further, milk products like curd, lassi, buttermilk, and paneer are also exempt from GST if sold loose, but attract 5 per cent GST when sold in pre-packaged and labelled form. Ultra-High Temperature (UHT) milk also attracts 5 per cent GST. Additionally, a GST of 12 per cent applies to condensed milk, flavoured milk, butter, ghee, and cheese. The apex court upheld AP HC judgement which classified 'flavoured milk' with almonds (badam) under Entry 0402 9990, attracting GST at 5 per cent. (SC Judgement Dated 09/05/2025)

HC, GST ITC block limited to one year under Rule 86A: Case of Sai Ram Enterprises vs DGGI Gurugram, HC Delhi Judgement Dated 28th April 2025. The HC has held that the credit ledger cannot be blocked beyond the period of one year, as stipulated under Rule 86A of the CGST Rules. This is however independent of any other action that the adjudicating authority may have taken, in accordance with law, against the Petitioner. (HC Delhi Judgement Dated 28/04/2025)

AAAR, Value of Free Silver Includible in Battery Taxable Value for GST: Case of High Energy Batteries (India) Ltd, AAAR Tamil Nadu Ruling Dated 25th April 2025. The appellant authority has upheld AAR ruling stating that the value of silver supplied free of cost by Naval formations to must be included in the taxable value of the batteries manufactured and supplied back to the Naval formations for the purpose of GST. (AAAR Tamil Nadu Ruling Dated 25/04/2025)

AAR, Supply of medicines as composite In-Patient healthcare service exempt from GST: Case of Maha Critical Speciality Division, AAR Tamil Nadu Ruling Dated 29th April 2025 AAR ruled that supply of medicines and consumables used in the course of providing health care services to In-patients by pharmacy unit of Maha Critical Speciality Division, having common registration within Tamil Nadu for diagnosis or medical treatment or procedures till discharge is a composite supply of in-patient healthcare service as defined in Para 2(zg) of Notification 12/2017 and the same is exempted from GST as per Serial No 74 of the above notification. (AAR Tamil Nadu Ruling Dated 29/04/2025)

AAR, IIIT housekeeping services taxable under GST:Case of Srinacss Enviro Private Limited, AAR Tamil Nadu Ruling Dated 29th April 2025. AAR ruled that the house-keeping/cleaning service provided to Indian Institute of Information Technology, Design and Manufacturing (IIITDM) Kancheepuram, by the applicant is not exempted from payment of GST. The work assigned to the applicant by IIITDM is nothing but an activity in relation to house-keeping/cleaning services, and not in relation to sanitation or solid waste management. It will not be lawful on the part of the applicant to raise invoice without GST, in the instant case. (AAR Tamil Nadu Ruling Dated 29/04/2025)

AAR, GST exempt on Weekly Market Fee Collection by Panchayat: Case of Kannivadi Town Panchayat, AAR Tamil Nadu Ruling Dated 30th April 2025. The activity of leasing, to the tender contractor, the right to collect entry fees, for sell vegetables, fruits, birds and animals for venders/ farmers/ public in the open space / temporary tents on the days fixed for weekly market days would be covered under the function entrusted to Panchayat under Article 243G of the Constitution as a local authority engaged as public authority. Notification No. 14/2017 as amended, issued in terms of Section 7(2)(b) of CGST Act, is very much available to claim as the activity is 'neither supply of goods nor supply of services'. (AAR Tamil Nadu Ruling Dated 30/04/2025)

C. Central Excise

No Notifications/ Circular during the week.

D. Custom Duty

Customs Duty Exemption on Work of Art & Antiquities Import: The notification exempts works of art, statuary, pictures intended for public exhibition in museums or art galleries, public memorials, and registered antiquities imported into India from the whole of the basic customs duty. For works of art and museum/gallery antiquities, the importing institution must be the purchaser or owner, provide an undertaking that the items are for public exhibition and will not be sold or traded, and furnish a certificate from an Authorized Officer confirming the institution is a publicly accessible museum or art gallery in a suitable building. (Custom Notification 29/2025 (T) Dated 09/05/2025)

Anti-dumping Duty on Glufosinate and its salt originating in or exported from China: Anti-dumping Duty has been imposed on imports of Glufosinate and its salt originating in or exported from China and imported into India. The anti-dumping duty shall be effective for a period of five years. (Custom Notification 09/2025 (ADD) Dated 08/05/2025)

Anti-dumping Duty on Sodium Citrate originating in or exported from China: Anti-dumping Duty has been imposed on imports of Sodium Citrate originating in or exported from China and imported into India. The anti-dumping duty shall be effective for a period of five years. (Custom Notification 10/2025 (ADD) Dated 08/05/2025)

Anti-dumping Duty on Textured Tempered Coated and Uncoated Glass originating in or exported from China: Anti-dumping Duty has been imposed on imports of Textured Tempered Coated and Uncoated Glass originating in or exported from China and imported into India. The anti-dumping duty shall be effective for a period of five years. (Custom Notification 11/2025 (ADD) Dated 08/05/2025)

Anti-dumping Duty on Titanium dioxide originating in or exported from China: Anti-dumping Duty has been imposed on imports of Titanium dioxide originating in or exported from China and imported into India. The anti-dumping duty shall be effective for a period of five years. (Custom Notification 12/2025 (ADD) Dated 10/05/2025)

Counter-veiling Duty on Textured Toughened (Tempered) Coated or Uncoated Glass originating in or exported from Vietnam: Counter-veiling Duty has been imposed on imports of Textured Toughened (Tempered) Coated or Uncoated Glass originating in or exported from Vietnam and imported into India. The anti-dumping duty shall be effective for a period of five years. (Custom Notification 03/2025 (CVD) Dated 10/05/2025)

Closing of the Integrated Check Post, Attari for all types of incoming and outgoing passengers and movement of goods: As per the revised directive, while the ICP remains closed for general movement, Pakistani nationals with valid Pakistani travel documents are now permitted to exit India, and Indian nationals with valid Indian travel documents are allowed to enter India through the Attari ICP. This limited movement will remain in effect until further orders. All relevant customs and immigration authorities have been instructed to implement this update accordingly. (Custom Instructions 08/2025 Dated 05/05/2025)

Closing of the Integrated Check Post, Attari for all types of incoming and outgoing passengers and movement of goods: The instruction convey the Ministry of Home Affairs' direction to close the ICP for all passenger and goods movement. It highlights a one-time exemption, which permits the entry of 162 specified freight trucks carrying perishable agricultural goods for export from Afghanistan into India through Attari. (Custom Instructions 09/2025 Dated 09/05/2025)

E.Directorate General of Foreign Trade (DGFT)

Framework for Stock & Sale Authorization for export of SCOMET Items: The amended Paragraph 10.10 of the Handbook of Procedures 2023, broadens the definition of an eligible 'Stockist' abroad to include a subsidiary, parent company, or affiliate of the Indian exporter, as well as Indian or Foreign Original Equipment Manufacturers (OEM), Electronic Manufacturing Services (EMS), and Contract Manufacturers (CM). Applications for bulk export authorization to these stockists for subsequent transfer to end users will be considered by the Inter-Ministerial Working Group (IMWG). The Indian exporter is required to submit an application with supporting documents, including proof of corporate relationship, an End Use Certificate from the stockist specifying intended countries for re-export, and an undertaking adherence to regulations concerning military or WMD end use. (DGFT Public Notice 04/2025 Dated 06/05/2025)

Reinstatement and amendment of Standard Input Output Norms (SION C-888) for Steel Washers Export: This SION had previously been suspended since 14th January 2020. DGFT has now brought this norm back into effect with a modification, that for the export of 1.0 Kg of stainless steel washers, the allowed import quantity of Prime/Secondary Stainless Steel sheets, sheet cutting, coils, strips, or plates of the relevant grade and thickness will be 1.60 Kg. (DGFT Public Notice 05/2025 Dated 06/05/2025)

Amendments in Standard Input Output Norms (SION A-1294) for Di- Ethyl Phthalate (DEP): The description of a key input material permitted for import, listed at serial number 2 has been changed, from 'Ethanol', to 'Denatured Ethyl Alcohol'. The quantity allowed for import against the export of one kilogram of DEP remains unchanged at 0.435 kilograms. (DGFT Public Notice 06/2025 Dated 07/05/2025)

F. Securities and Exchange Board of India (SEBI)

Amendments to SEBI Issue and Listing of Securitised Debt Instruments and Security Receipts Regulations: The amendment relates to clause g(ii) of regulation 2(1). Under the new rule, any financial asset originated by an originator regulated by RBI qualifies, with conditions. It explicitly prohibits special purpose distinct entities (SPDEs) from engaging in certain securitisation activities or assuming particular exposures, particularly re-securitisation exposures. (SEBI Notification Dated 05/05/2025)

Publishing Investor Charter for KYC Registration Agencies (KRAs) on their Websites: The circular require all KRAs to publish an Investor Charter on their websites and through other means to enhance investor awareness. The charter, outlines the various services provided by KRAs, the rights of investors dealing with them, specific actions investors should and should not take, and the available grievance redressal mechanisms. Key services provided by KRAs include facilitating KYC registration and modifications through intermediaries, online tracking of KYC status, processing solicited/unsolicited KYC feeds, sending alerts on KYC activity, verifying KYC attributes with official databases, and ensuring data protection. (SEBI Circular dated 06/05/2025)

Disclosure Norms for REITs updated: The circular revise chapters 3 and 4 of its Master Circular for Real Estate Investment Trusts (REITs). It cover the disclosure of financial information in offer documents and ongoing disclosure and compliance obligations post-listing. The revised provisions require REITs to disclose certified proforma financial statements covering at least the last completed financial year and any applicable period, particularly in cases involving recent acquisitions or divestments. Disclosures may also reference previously published financials, provided links are included. These must be audited by the seller's auditor. (SEBI Circular dated 07/05/2025)

Financial Disclosure and Compliance Norms for InvIT revised: The circular revise chapters 3 and 4 of its Master Circular for Infrastructure Investment Trusts (InvITs). The revisions relates to disclosure requirements, on the period and nature of financial statements to be included in offer documents and placement memorandums. It updates requirements for disclosing proforma financial statements in case of material acquisitions or divestments post the last disclosed financial period. (SEBI Circular dated 07/05/2025)

Consultation Paper on Separate carve out for the voluntary delisting of Public Sector Undertakings (PSUs): The proposal relates to PSUs where promoter shareholding equals or exceeds 90%. It propose a simplified framework, eligible PSUs may be allowed to delist without complying with Minimum Public Shareholding norms, use a fixed price delisting method with at least a 15% premium over the floor price, and bypass the need for two-thirds public shareholder approval. It also outlined three options for setting exit prices for public shareholders, including using standard valuation rules or relying solely on an independent valuer. The stakeholders comments/ suggestions are invited. (SEBI Consultation Paper dated 06/05/2025)

Draft Circular on Modification to Master Circular for listing obligations and disclosure requirements for Non-Convertible Securities, Securitized Debt Instruments and/ or Commercial Paper: The modifications specifically impact High Value Debt Listed Entities (HVDLEs). It outlines new formats and timelines for HVDLEs to submit their annual secretarial compliance reports and periodic corporate governance compliance reports. It also details the required half-yearly disclosures for related party transactions (RPTs) and specifies the information that must be presented to the Audit Committee, Debenture Trustee, and shareholders for reviewing and approving RPTs. The stakeholders comments/ suggestions are invited. (SEBI Draft Circular dated 09/05/2025)

Consultation paper on providing flexibility to AIFs to offer Co-Investment opportunities to investors: It proposes changes to the Alternative Investment Funds (AIF) Regulations. The paper notes difficulties faced by AIFs offering co-investment outside the fund structure, which limit investment in unlisted securities and affect aligning co-investor and AIF interests. The paper proposes the CIV model (Model C), where a separate AIF scheme would be launched for each co-investment. The proposals for this model include registering CIVs under Category I or II AIFs, filing a shelf Private Placement Memorandum (PPM) for the CIV with SEBI, launching a separate scheme per co-investment for accredited investors, and exempting CIVs from certain requirements like diversification norms, sponsor commitment, and minimum tenure. The stakeholders comments/ suggestions are invited. (SEBI Consultation Paper dated 09/05/2025)

Consultation Paper on use of liquid mutual funds for compliance with deposit requirement by Investment Advisers (IAs) and Research Analysts (RAs): It proposes that liquid mutual funds, considered relatively low-risk and offering digital accessibility, may serve as an alternative to fixed deposits. These units can be held in Statement of Account or demat form and must be lien marked in favour of the relevant Administration and Supervisory Body (ASB) for at least one year. The deposit value will be calculated based on the Net Asset Value (NAV) of the mutual fund, adjusted by a haircut and any applicable exit load, with annual reviews to ensure compliance. If the deposit falls below the required threshold due to changes in value or an increase in client numbers, additional units must be lien marked. The stakeholders comments/ suggestions are invited. (SEBI Consultation Paper dated 09/05/2025)

G.Ministry of Corporate Affairs (MCA)

Amendments to Companies Indian Accounting Standards Rules: The amendments relates to Indian Accounting Standard (Ind AS)- 21, 'The Effect of Changes in Foreign Exchange Rates', clarify the concept of exchangeability between currencies, requiring assessment at the measured date for a specific purpose. If exchangeability is lacking, entities must estimate the spot exchange rate and disclose the impact. (MCA Notification Dated 07/05/2025)

H.Insolvency and Bankruptcy Board of India (IBBI)

SC, NCLAT not empowered to condone delay beyond prescribed period of 45 days: Case of Tata Steel Ltd vs Raj Kumar Banerjee, SC Judgement Dated 7th May 2025. The apex court held that NCLAT has no power to condone delay beyond prescribed period of 45 days to entertain appeal regardless of the reason for delay. Accordingly, order passed by NCLAT condoning delay is ultra vires and liable to be quashed. (SC Judgement Dated 07/05/2025)

NCLAT rejects HDFC Bank appeal to exclude mortgaged units from Resolution Plan: Case of HDFC Bank vs Atul Kumar Kansal, NCLAT Delhi Judgement Dated 8th April 2025. The appellant tribunal has dismissed an appeal by HDFC Bank Ltd., which sought the exclusion of certain mortgaged units from the resolution plan of a Corporate Debtor undergoing the CIRP. It upheld the Adjudicating Authority's decision, ruling that the Appellant when is not the unit holder or any rights in the units except the mortgage right cannot be heard in asking to exclude the unit. The Adjudicating Authority has rightly observed that the Applicant bank has no locus to object to the resolution plan which already stand approved by the Committee of Creditors. (NCLAT Delhi Judgement Dated 08/04/2025)

I.Reserve Bank of India (RBI)

Investments by Foreign Portfolio Investors (FFPIs) in Corporate Debt Securities through the General Route, Relaxations: At present, investments by FPIs in corporate debt securities through the General Route are subject to the short-term investment limit and the concentration limit as prescribed in the Master Direction. It has now been decided to withdraw the requirement to comply with the short-term investment limit and the concentration limit. (RBI Notification 35/2025 Dated 08/05/2025)

RBI Digital Lending Directions 2025: RBI has from time to time issued various directions and circulars on digital lending by Regulated Entities (REs). The consolidated directions on the subject have been prepared and issued. It includes instructions regarding Digital Lending, Transparency in Aggregation of Loan Products from Multiple Lenders. It also includes instructions regarding operationalization of the Public Directory of Digital Lending Apps (DLAs). (RBI Notification 36/2025 Dated 08/05/2025)

J. Miscellaneous

SC, Section 34, 47 and 58 of Consumer Protection Act, 2019 prescribing pecuniary jurisdictions are constitutionally valid: Case of Rutu Mihir Panchal vs Union of India, SC Judgement Dated 29th April 2025. The apex court upholds constitutionality of Sections 34(1), 47(1)(a)(i) and 58(1)(a)(i) of the Consumer Protection Act, 2019 prescribing pecuniary jurisdictions of the district, state and national commissions on the basis of value of goods and services paid as consideration. (SC Judgement Dated 29/04/2025)

Disclaimer:

The contents of this article are for informational purposes only. The user may refer to the relevant notification/ circular/ decisions issued by the respective authorities for specific interpretation and compliances related to a particular subject matter)

CMA Yash Paul Bhola

Ex-Director (Finance), NFL.

NOTIFICATIONS & CIRCULARS ISSUED DURING WEEK (28TH- 4TH MAY 2025)

A.Income Tax

SAHAJ (ITR 1) and SUGAM (ITR-4) notified for FY 2025-26: The notification amend the Income Tax Rules. FORM ITR- 1 and ITR-4 will be replaced with new forms in Appendix-II of the existing rules. It include assessees with only long-term capital gains under section 112A not exceeding Rs 1,25,000 and no brought forward or carry forward losses under that head. (Income Tax Notification 40/2025 Dated 29/04/2025)

ITR Form 3 (for Individuals and HUFs having Income from profits and gains of business or profession) notified for AY 2025-26: The notification amend the Income Tax Rules. FORM ITR- 5 will be replaced with a new form in Appendix-II of the existing rules. The key changes include a split in the Schedule- Capital Gain for gains before and after 23rd July 2024. Capital loss on share buyback is now allowed if the corresponding dividend income is reported under "Income from Other Sources" for transactions post 1st October 2024. The asset and liability reporting threshold has been increased to Rs 1 crore of total income.

Additionally, Section 44BBC (specific to cruise business) has been incorporated, along with enhanced reporting requirements for deductions under Sections 80C and 10(13A), and a mandate to report the TDS section code in Schedule- TDS. (Income Tax Notification 41/2025 Dated 30/04/2025)

ITR Form 5 (for persons other than Individuals, HUF, Company and persons filing ITR-7) notified for AY 2025-26: The notification amend the Income Tax Rules. FORM ITR- 5 will be replaced with a new form in Appendix-II of the existing rules. (Income Tax Notification 42/2025 Dated 01/05/2025)

B. GST

Grievance Redressal Mechanism for processing of application for GST registration: Under the new instructions, applicants whose Application Reference Numbers (ARNs) fall under Central jurisdiction and who face grievances, such as queries raised in contravention of the set procedure or unjustified rejection, may now contact the Zonal Principal Chief Commissioner or Chief Commissioner. CGST Zone is instructed to publicize a dedicated grievance email ID. Applicants should submit grievances including their ARN, jurisdiction (Centre/State), and a brief description of the issue. The directive also requests the GST Council Secretariat to consider implementing a similar mechanism for State jurisdictions. (CGST Instructions 04/2025 Dated 02/05/2025)

Advisory, Reporting of HSN codes in Table 12 and list of documents in table 13 of GSTR-1/1A: It is mandatory for the taxpayers to report minimum 4 digits or 6 digits of HSN Code in Table-12 of GSTR-1 on the basis of Aggregate Annual Turnover (AATO) in the preceding financial year. These changes are being implemented in a phase-wise manner on GST Portal. The Phase-3 of reporting of HSN codes in Table 12 of GSTR-1 & 1A shall be implemented from May 2025 return period. Further , Table 13 of GSTR-1/1A is also being made mandatory for the taxpayers from the said tax period. (GSTN Advisory Dated 01/05/2025)

Advisory on Biometric-based Aadhaar authentication and document verification for GST registration applicants of Sikkim: CGST rule was amended which provide for identification of applicants on biometric- based Aadhaar authentication, which includes taking the applicant's photograph and verifying the original documents submitted with the application. The new functionality mandates that after submitting Form GST REG-01, applicants will receive an email with either a link for OTP-based Aadhaar Authentication or a link to book an appointment at a GST Suvidha Kendra (GSK).

It has been rolled out in Sikkim effective from 1st May 2025. (GSTN Advisory Dated 01/05/2025)

HC, Clarifies 'Any Person' under section 122(1A) of GST: Case of Gurudas Malik Thakur vs CCGST, HC Delhi Judgement Dated 23rd April 2025. HC clarified the scope of liability under the GST framework, particularly concerning company directors involved in fraudulent Input Tax Credit (ITC) claims and tax evasion. The court ruled that the term "any person" under Section 122(1A) of the CGST Act includes both taxable and non-taxable persons. The ruling confirms that even non-taxable persons can be held accountable if they benefit from tax evasion or facilitate GST fraud. (HC Delhi Judgement Dated 23/04/2025)

C.Central Excise

SC, Reclassification unsustainable without furnishing relied upon test reports: Case of Oswal Petrochemicals Limited vs CCE, SC Judgement Dated 28th April 2025. The apex court held that re-classifying products based on the test report, which was leading to consequential differential duty demand, was not furnished to the appellant hence the same was in clear violation of principles of natural justice. Thus, order justifying re-classification cannot be sustained. (SC Judgement Dated 28/04/2025)

D.Custom Duty

Customs notification 50/2017 amended to update bank lists: The notification revises bank names in the List 34A and List 34B in the annexure to the table of the principal notification. List 34A is for Import of Gold or Silver or both by banks. List 34B is for Import of Gold by banks. (Custom Notification 24/2025 (T) Dated 28/04/2025)

Customs tariff notifications aligned with Finance Act: The notification amends 13 existing notifications to bring them into conformity with the changes made by the Finance Act, 2025. The modifications primarily involve the substitution or insertion of specific Harmonized System (HS) codes associated with goods, reflecting updated classifications or tariff structures. (Custom Notification 25/2025 (T) Dated 30/04/2025)

Custom notification 04/2025 rescinded by government: The notification rescinds earlier notification 04/2025 dated 1st February 2025, which relates to exemptions from import duty on certain goods. The rescission will take effect on 1st May 2025. It will not affect any actions already taken or omitted before this date. (Custom Notification 26/2025 (T) Dated 30/04/2025)

Customs Duty Exemptions updated on Rice imports: The notification amends two earlier notifications 27/2011 and 22/2024. It update the classification and duty exemptions on various categories of rice, especially concerning GI-tagged and milled varieties. A revised entry substitutes the earlier listing with "Parboiled Rice, GI recognised" attracting nil duty. A new entry has been added for "Other Parboiled Rice" also at nil duty. Another entry has been updated to cover "Other Rice, GI Recognised" at nil duty, and a new entry has been introduced for "Semi milled or wholly milled rice whether or not polished or glazed" at nil duty, excluding rice already classified under previous items. (Custom Notification 28/2025 (T) Dated 30/04/2025)

Export Duty on Rice, 20% on Parboiled & Other Varieties: The notification levy an export duty of 20% on various categories of rice. Specifically, it substitutes the entry for Parboiled Rice, GI recognised, and inserts a new entry for Other Parboiled Rice, both at a 20% duty. Furthermore, it substitutes the entry for Other Rice, GI Recognised, with a 20% export duty and introduces a new entry for Semi-milled or wholly milled rice also with a 20% export duty. (Custom Notification 27/2025 (T) Dated 30/04/2025)

Adjudicating Authority appointed for SVB Provisional Assessment: CBIC has appointed a Common Adjudicating Authority to finalize the provisional assessment in the SVB case concerning M/s Murrplastik India Private Limited. (Custom Notification 31/2025 (NT) Dated 28/04/2025)

India Customs Cooperation and Mutual Administrative Assistance (CMAA) with New Zealand & Madagascar: The notification adds New Zealand and the Republic of Madagascar to the list of contracting states with whom India has such agreements or arrangements. (Custom Notification 32/2025 (NT) Dated 28/04/2025)

Fixation of Tariff Value of Edible Oils, Brass Scrap, Areca Nut, Gold and Silver: CBDT notified the Tariff Values of Edible Oils, Brass Scrap, Areca Nut, Gold and Silver, which shall come into force w.e.f. 1st May 2025. The tariff value for crude palm oil is set at USD 1076 per metric ton, while gold and silver have tariff values of USD 1064 per 10 grams and USD 983 per kilogram, respectively. The tariff value for areca nuts is fixed at USD 6970 per metric ton. (Custom Notification 33/2025 (NT) Dated 30/04/2025)

Customs ADD notifications amended to align with Finance Act: The notification amends three existing anti-dumping duty (ADD) notifications to bring them into conformity with the changes made by the Finance Act, 2025. (Custom Notification 08/2025 (ADD) Dated 30/04/2025)

Custom CVD notification 05/2024 amended to align with Finance Act: The notification amends previous counter-veiling duty (CVD) notification 05/2025 dated 11th September 2024, to bring it in conformity with the changes made by the Finance Act, 2025. (Custom Notification 02/2025 (CVD) Dated 30/04/2025)

Prohibition on import or transit of all goods originating in or exported from Pakistan: DGFT vide notification dated 2nd May 2025, has inserted a para 2.20A in Foreign Trade Policy, regarding prohibition on import from Pakistan stating that "Direct or indirect import or transit of all goods originating in or exported from Pakistan, whether or not freely importable or otherwise permitted, shall be prohibited with immediate effect, until further orders. This restriction is imposed in the interest of national security arid public policy. Any exception to this prohibition shall require prior approval of the Government of India." Action may be taken to sensitize officers regarding the said matter. (Custom Instructions 07/2025 Dated 03/05/2025)

E.Directorate General of Foreign Trade (DGFT)

Prohibition on import or transit of all goods originating in or exported from Pakistan: The notification inserts a new para 2.20A in Foreign Trade Policy, regarding prohibition on import from Pakistan stating that "Direct or indirect import or transit of all goods originating in or exported from Pakistan, whether or not freely importable or otherwise permitted, shall be prohibited with immediate effect, until further orders. This restriction is imposed in the interest of national security arid public policy. Any exception to this prohibition shall require prior approval of the Government of India." (DGFT Notification 06/2025 Dated 02/05/2025)

Seek comments on alignment of Schedule-II (Export Policy) with amendments introduced by Finance Act 2025: The proposed amendments include changes to Chapter Notes, HS Codes, and Product Descriptions in the First Schedule of the Customs Tariff Act. The comments/ suggestions from stakeholders are invited. (DGFT Trade Notice 04/2025 Dated 29/04/2025)

F. Securities and Exchange Board of India (SEBI)

Amendments to SEBI Infrastructure Investment Trusts Regulations: The change involves a revision to Regulation 18(4), specifically the proviso clause. The existing reference to 'and (v)' has been expanded and replaced with ', (v), (vi), (vii) and (viii)', indicating the inclusion of additional regulatory clauses or conditions. The Regulation 18 relates to Investment conditions and dividend policy. (SEBI Notification Dated 28/04/2025)

Amendments to Securities Contract - Stock Exchange and Clearing Corporation Regulations: The amended provisions allow non-independent directors to be appointed to another recognized stock exchange, clearing corporation, or depository after a cooling-off period specified by the governing board and with prior SEBI approval. Also, a public interest director can be reappointed for another three-year term in a different recognized entity (stock exchange, clearing corporation, or depository) after a cooling-off period set by the governing board and with SEBI's prior approval. (SEBI Notification Dated 30/04/2025)

Amendments to SEBI Depositories and Participants Regulations: The amended provisions allow non-independent director on a depository's governing board can be appointed to a recognized stock exchange, clearing corporation, or another depository with SEBI's prior approval, but only after a cooling-off period specified by the appointing depository's governing board. Also a public interest director to be reappointed for a further three-year term in another depository, stock exchange, or clearing corporation after a cooling-off period determined by the appointing body, applicable specifically to appointments in competing depositories. (SEBI Notification Dated 30/04/2025)

Amendments to SEBI Listing Obligations and Disclosure Requirements (LODR) Regulations: The key amendment allows SCORES registration at the trustee level for all special purpose distinct entities they oversee in the case of securitized debt instruments. It also include new clauses 10 and 11, which mandate that special purpose distinct entities or their trustees must annually disclose to the stock exchange any outstanding litigations and material developments concerning the originator, servicer, or any other party involved in the transaction that could potentially harm investor interests. (SEBI Notification Dated 29/04/2025)

Timelines for collection of Margins other than Upfront Margins, alignment to settlement cycle: The circular relates to collection of margins by Trading Members (TMs) and Clearing Members (CMs) in the cash segment, aligning the timelines with the settlement cycle. TMs and CMs are required to collect all margins (except VaR and ELM) by the settlement day itself, in accordance with the reduced T+1 settlement cycle for cash market transactions. The circular also mandates that TMs/CMs continue to collect upfront VaR margins and ELM before the trade. (SEBI Circular Dated 28/04/2025)

Extension of timeline on optional T+0 settlement cycle for Qualified Stock Brokers (QSBs): The initial circular had mandated that QSBs meeting the active client criteria as of 31st December 2024, should establish the necessary systems and processes for the T+0 settlement by 1st May 2025. Based on feedback received from QSBs and subsequent discussions with stock exchanges, clearing corporations, and depositories, SEBI has decided to extend this deadline to 1st November 2025. (SEBI Circular Dated 29/04/2025)

Clarificatory and Procedural changes to aid and strengthen ESG Rating Providers (ERPs): The circular clarifies the withdrawal process for ESG ratings. For subscriber-pays ERPs, ratings can be withdrawn if no subscribers exist, except for bundled ratings (e.g., indices like Nifty 50), and may also be withdrawn if the issuer lacks a BRSR. For issuer-pays ERPs, ratings of securities may be withdrawn after three years or half the tenure of the security (whichever is higher), with NOC from 75% of bondholders, issuer/entity ratings may be withdrawn after three years. (SEBI Circular Dated 29/04/2025)

Clarifications to Cybersecurity and Cyber Resilience Framework (CSCRF) for Regulated Entities (REs): The circular details specific criteria and thresholds for each category of RE, such as the number of registered clients and trading volume for stockbrokers, and assets under management (AUM) for portfolio managers and AIFs/VCFs. The circular also mandates the use of a dedicated Hardware Security Module (HSM) for Market Infrastructure Institutions (MIIs) and Qualified REs, while allowing other REs to implement alternatives based on a board-approved risk assessment. (SEBI Circular Dated 30/04/2025)

Facilitation to SEBI registered Stock Brokers to undertake securities market related activities in GIFT- IFSC under SBU: The circular simplify the process for undertaking securities market activities within the Gujarat International Finance Tech-city – International Financial Services Centre (GIFT-IFSC). The key change is the removal of the requirement for SEBI-registered stock brokers to obtain specific approval to operate in GIFT-IFSC. Instead, brokers can now establish a Separate Business Unit (SBU) within their existing entity to conduct these activities, or the branch itself can qualify as an SBU. To ensure segregation and ring-fencing of activities, stock brokers must maintain an arm's- length relationship between their Indian market operations and the SBU in GIFT- IFSC, keep separate accounts, and maintain distinct net worth. (SEBI Circular Dated 02/05/2025)

Draft Circular on Framework for Orderly Winding Down of Critical Operations and Services of a KYC (Know Your Client) Registration Agency (KRA): It outline a framework for the orderly winding down of critical operations and services of KYC Registration Agencies (KRAs). The proposed guidelines address scenarios like insolvency, voluntary or involuntary cessation, and regulatory revocation, ensuring service continuity and seamless transfer of activities to a successor entity. KRAs will need to establish a structured mechanism, including identifying potential winding down scenarios, defining critical operations, and creating a standard operating procedure for the process. This SOP should cover record transfer, data security, and communication with stakeholders. The comments/ suggestions from stakeholders are invited. (SEBI Consultation Paper Dated 29/04/2025)

Consultation paper on amendment to SEBI ICDR Regulations, proposes demat for IPO shareholders: It aim to mandate the dematerialization of existing securities for a broader range of shareholders prior to an Initial Public Offering (IPO). The existing regulations require only promoters to hold their shares in demat form before an IPO. The proposed changes would expand this requirement to include promoter groups, selling shareholders, directors, key managerial personnel, senior management, qualified institutional buyers, domestic current employees, shareholders with special rights, registered stock brokers, and non-systemically important Non-Banking Financial Companies (NBFCs). The comments/ suggestions from stakeholders are invited. (SEBI Consultation Paper Dated 30/04/2025)

Consultation Paper on regulatory amendments for Real Estate Investment Trusts (REITs) and Infrastructure Investment Trusts (InvITs): It provide clarification of the definition of "public" for minimum public unitholding, allowing adjustment of negative cash flows at the holding company level with distributions from Special Purpose Vehicles (SPVs) in Net Distributable Cash Flow (NDCF) calculation, and aligning timelines for various report submissions (quarterly reports to stock exchanges and trustees, and valuation reports) with the timelines for submitting quarterly and annual financial results. It also introduces the concept of an Investor Charter for REITs and InvITs. The comments/ suggestions from stakeholders are invited. (SEBI Consultation Paper Dated 02/05/2025)

Consultation Paper on Rationalize the Placement Document used in Qualified Institutions Placement (QIP): The QIP is a key mechanism for listed companies to raise capital from institutional investors. It highlights that current QIP documentation, requires comprehensive disclosures, including financials, risk factors, and corporate details. However, since listed entities are already obligated to provide regular updates under SEBI LODR Regulations, much of this information is already publicly accessible. It suggests that duplication could be reduced by streamlining the required disclosures in the placement document. The comments/ suggestions from stakeholders are invited. (SEBI Consultation Paper Dated 02/05/2025)

G.Ministry of Corporate Affairs (MCA)

No Notifications/ Circular during the week.

H.Insolvency and Bankruptcy Board of India (IBBI)

SC, Arbitration award pronounced after approval of resolution plan cannot be sustained: Case of Electrosteel Steel Limited vs Ispat Carrier Private Limited, SC Judgement Dated 21st April 2025. The apex court held that arbitration proceeding culminating into award post approval of resolution plan by NCLT is not tenable in law since it loses its jurisdiction to proceed and pronounce arbitral award in view of approved resolution plan. (SC Judgement Dated 21/04/2025)

NCLAT, CIRP based on default falling within prohibited period under section 10A of IBC not maintainable: Case of Royal Construction vs Gannon Dunkerley Limited , NCLAT Delhi Judgement Dated 01/04/2025. The appellate tribunal held that no default falling within the prohibited period of Section 10A of the IBC can form basis for initiating CIRP. Accordingly, section 9 application rightly rejected. (NCLAT Delhi Judgement dated 01/04/2025)

NCLAT, IBC Section 9 application valid despite decree holder not being an operational creditor: Case of Venus Buildtech India Pvt Ltd vs Senbo Engineering Ltd, NCLAT Delhi Judgement dated 12th March 2025. The Adjudicating Authority (AA) had dismissed the application solely on the ground that, having obtained a decree from a civil court for the outstanding operational debt, it could no longer be considered an operational creditor under the IBC. NCLAT emphasised that IBC does not intend to create a separate class of 'decree holders' that would exclude them from being either financial or operational creditors based on the origin of the debt. It set aside the AA order, and revived the application. (NCLAT Delhi Judgement dated 12/03/2025)

NCLAT, CoC can seek multiple modifications to Resolution Plans: Case of Sagar Stone Industries vs Sajjan Kumar Dakania, NCLAT Delhi Judgement dated 28th March 2025. The appellate tribunal clarified that Regulation 39(1A) of the CIRP Regulations, which restricts the Resolution Professional from permitting plan modifications more than once, does not bind the CoC. The CoC retains the unrestricted right to request revisions or negotiate with resolution applicants multiple times. It stated that the 'challenge mechanism' is an optional tool for the CoC to maximize value and its absence cannot be a valid ground to question the approval of a resolution plan. . (NCLAT Delhi Judgement dated 28/03/2025)

I.Reserve Bank of India (RBI)

Dispensation of Rs 100 and Rs 200 denomination banknotes through ATMs: RBI has issued a directive to all banks and White Label ATM Operators (WLAOs) to increase the availability of Rs. 100 and Rs.200 denomination banknotes through ATMs. The milestones require that 75% of all ATMs must dispense either Rs.100 or Rs.200 notes from at least one cassette by 30th September 2025 and 90% of all ATMs by 31st March 2026. (RBI Notification 33/2025 Dated 28/04/2025)

Processing of Regulatory Authorisations/ Licenses/ Approvals through PRAVAAH: RBI directs all regulated entities, including banks, financial institutions, NBFCs, payment system operators, credit information companies, and primary dealers, to use the PRAVAAH portal for submitting applications for regulatory authorizations, licenses, and approvals. (RBI Notification 34/2025 Dated 28/04/2025)

Amendments to FEMA Foreign Currency Accounts Regulations: The Schedule II of the principal regulations is amended in the Annex titled 'Application For Opening Diamond Dollar Account/s'. The amendment replaces the words and figures '2 Years' with 'Three Years' in the first paragraph of the application. (RBI Notification Dated 29/04/2025)

J. Miscellaneous

SC, Power of court to modify Arbitral award: Case of Gayatri Balasamy vs ISG Novasoft Technologies Limited, SC Judgement Dated 30th April 2025. The apex court held that Indian courts have a "limited power" to modify arbitral awards. The Court delineated specific circumstances under which such modifications are permissible:

1. Severability: To sever the valid portion of an award from its invalid part.
2. Corrections: To rectify clerical, computational, or typographical errors.
3. Post-Award Interest: To adjust post-award interest in certain situations.
4. 1.Plenary powers of the Court under Article 142: To exercise the Supreme Court's plenary powers under Article 142 of the Constitution to ensure complete justice.

The majority emphasized that while courts can intervene in these limited scenarios, they cannot re-evaluate the merits of the case or act as appellate bodies over arbitral tribunals. (SC Judgement Dated 30/04/2025)

SC, Government can cancel tender to protect state's financial interests: Case of Principal Chief Conservator of Forest vs Suresh Mathew, SC Judgement Dated 25th April 2025. The apex court held that Government is the protector of financial resources of the state and has every right to cancel/call for fresh tender if it is in the nature of protecting the financial interests of the State. (SC Judgement Dated 25/04/2025)

Disclaimer:

The contents of this article are for informational purposes only. The user may refer to the relevant notification/ circular/ decisions issued by the respective authorities for specific interpretation and compliances related to a particular subject matter)

CMA Yash Paul Bhola

Ex-Director (Finance), NFL.

OVERVIEW OF RISK ANALYSIS IN MUTUAL FUNDS

Introduction

Risk analysis is a vital aspect of assessing mutual funds, offering investors valuable insights into the potential challenges associated with their investments. By carefully considering market volatility, credit risk, interest rate risk, and liquidity, investors can make well-informed decisions that align with their financial objectives and risk tolerance.

An investor should make an investment strategy based on risk-tolerance capacity, investment amount, and investment duration. Risk tolerance capacities differ from person to person and the age of investors. Investors generally focus only on the fund's returns, irrespective of risk. When selecting a mutual fund, evaluating your risk tolerance capacity and investment objectives is essential. You may choose a low-beta fund if you are a risk-averse investor. A low beta fund indicates that the fund is less volatile compared to the market. Furthermore, you may choose a fund with a high Sortino ratio, emphasizing limited downside risk. Conversely, if you are inclined to take high risks for higher returns, focus on funds with a high Alpha and Sharpe ratio.

A mutual fund is the best option for investing in long-term goals, as it has several advantages: It is less risky than direct equity, highly operational, transparent, and user-friendly. Mutual funds also have strong regulations, lower costs, are very liquid, are safer than other investment products, and are tax efficient. They diversify investors' money into different asset classes and generate consistent returns over the long run.

Risk denotes the probability of an investor incurring partial or total losses on the original investment. Market risk can be attributed to factors such as macroeconomic trends, global economic crises, geopolitical tension, or regulatory changes. On the other hand, risk arises from multiple sources, such as economic instability, shifts in political scenarios, and specific challenges within certain industries. These factors can significantly impact the performance of mutual funds.

Market risk, the primary risk affecting equity and equity mutual funds, is the risk of loss in the value of securities due to factors affecting the entire stock market. Market risk, also known as systematic risk, is a type of risk that cannot be diversified away. Debt securities and money market investments carry several risks, including interest rate, credit, spread, and liquidity.

Measurement of Risk in Mutual Funds:

However, it is crucial to consider the risk aspect of the investment since risk and returns are two sides of the same coin. Popular ratios to measure risk in mutual funds are Standard Deviation, Beta, Sharpe Ratio, Treynor's Ratio, Sortino Ratio, Alpha, and R-squared. This will give you a better understanding of risk and volatility and help you choose a better fund when comparing mutual funds in the same sector/ category.

Performance measurement is an accounting function that measures the return earned on a portfolio during an investment period, such as one year, two years, and so on. It is necessary to evaluate your investment mutual fund performance based on the return earned in relation to the market average return and another fund return in the same category.

Seven quantitative vital measures are used to analyze mutual funds' performance & risk: Standard Deviation, Beta, Sharpe Ratio, Treynor's ratio, Sortino Ratio, Alpha, and R-squared.

1. Standard Deviation:

Standard deviation, a statistical measure of the dispersion of returns for a given security or market index, measures a fund's total risk. It measures the degree to which the fund fluctuates in relation to its average return over a period of time. A high standard deviation denotes high volatility. A fund with a standard deviation of 14.80% tends to deviate by 14.80% from its category average return.

Let's say an ABC mutual fund scheme has a Standard Deviation of 8% and an average annual return of 21%. Based on the historical data for standard deviation and returns, the investment can be expected to produce a return in the range of 13% to 29% over any given year.

It's important to note that standard deviation is not a measure of good or bad but rather a tool to understand volatility. This measure is essential for understanding the level of uncertainty associated with a fund's return. For instance, funds with a low standard deviation in the 1- 10 range can be seen as more stable, potentially instilling a sense of security in your investment strategy.

2. Beta:

Beta is a measure of a portfolio's volatility or systematic risk compared to the market as a whole. It is a statistical measure of non-diversifiable or systematic risk that shows how sensitive a fund is to market forces. The beta for the overall market is equal to 1. Equity funds can have beta values above, less than, or equal to one. They can be positive or negative.

Beta expresses the fundamental trade-off between minimizing risk and maximizing returns. A fund with a beta of 1 will historically move in the same direction as the market. A beta above 1 is more volatile than the overall market, while a beta below 1 is less volatile. If a fund beta is 1.05, it is marginally more volatile than the overall market. If the Sensex is expected to provide a 10 percent rate of return over the next year, a fund with a beta of 1.05 would be expected to increase return by approximately 10.50% (1.05* 10) over the same period.

3. Sharpe's Ratio:

Sharpe's ratio uses standard deviation to measure a mutual fund's risk-adjusted returns. It will tell you how well your mutual fund portfolio has performed more than the risk-free return (if you would have invested in government securities instead, which are almost risk-free).The higher the Sharpe's ratio, the better the risk-adjusted return of your mutual fund portfolio.

4. Treynor's ratio :

Like the Sharpe ratio, Treynor's ratio uses beta to measure mutual funds risk-adjusted returns. It indicates how much excess return was generated for each unit of risk taken. A higher value means the fund has been able to give better returns for the amount of risk taken. It is calculated by subtracting the risk-free return, defined as an Indian Government Bond, from the fund's returns and then dividing by the beta of returns. For example, if fund X and fund Y both have 3-year returns of 18%, and fund X has a Treynor's ratio of 1.50 and fund Y has a Treynor's ratio of 1.20, then you can choose fund X, as it has given higher risk-adjusted return.

Risk-adjusted performance measures include the Sharp ratio and the Treynor ratio. These ratios assess the fund manager's ability to generate excess return per unit of total risk. However, the two ratios measure risk from different angles. Sharp focused on total risk, whereas Treynor used systematic or market risk.

5. Sortino ratio:

The Sortino Ratio is similar to the Sharpe Ratio, but its main difference is that it focuses solely on the fund's downside or negative volatility. It makes the Sortino Ratio highly relevant for conservative investors who are more concerned about potential losses than overall volatility. The ratio is calculated by subtracting the risk-free rate from the fund's return and dividing it by its downside deviation. A higher Sortino ratio indicates a lower probability of significant losses, making it a crucial tool for evaluating the risk of negative returns.

6. Alpha:

Alpha measures a fund portfolio's volatility (price risk) and compares its risk-adjusted performance to a benchmark index. It gives a measure of your investment's risk-adjusted performance. On the other hand, Alpha is a metric used to understand a mutual fund's performance relative to its benchmark index.

A positive alpha means the fund has outperformed its benchmark index. On the other hand, a negative alpha indicates the fund has underperformed compared to the benchmark index. If a fund alpha is 7.50, it has outperformed by 7.50% more than its benchmark index.

Let's say you invest in an ABC mutual fund, having NIFTY 50 as its benchmark. Let's further assume that the NIFTY 50 Index has given a return of 20% in a specific year. If the given alpha value is positive 4.0, then it means that ABC Mutual Fund has outperformed its benchmark index by 4% and provided 24% as returns for that specific year. Similarly, a negative alpha of 3% may mean that ABC Mutual Fund has underperformed compared to the NIFTY 50 Index and given 17% as returns for the specific year.

For the investor, the more positive a fund's Alpha is, the better for investment. On the other hand, some investors understand Alpha as a measurement of the value added or subtracted by the fund manager. Alpha depends on beta accuracy: If the investor accepts beta as a conclusive definition of risk, a positive alpha would be a conclusive indicator of good fund performance. However, Alpha is based on historical data and does not guarantee future performance.

7. R-Squared - Correlation with the benchmark:

R-squared measures how closely a fund's performance correlates with its benchmark. It ranges from 0 to 100%, where a score of 100 % denotes perfect correlation. A high R-squared value in an actively managed fund may indicate that its performance is similar to its benchmark, suggesting a lack of a unique strategy. This means that the fund's performance is heavily influenced by market conditions and that it may provide little diversification benefits. Conversely, a lower R-squared might imply a more distinctive approach or divergence from the benchmark trends. It could mean that the fund's performance is less dependent on market conditions, potentially providing better diversification benefits. This measure can be particularly useful in understanding the diversification benefits a fund might add to the portfolio.

It's important to note that Alpha and R-squared are based on historical data and do not guarantee future performance. This understanding should guide your investment decisions and inform you of the potential risks involved.

You can combine the inferences from the above methods of measuring risk with information like the funds' track records, fund history, past performance, turnover ratio, and expense ratio to identify the best mutual fund schemes for your portfolio and risk profile.

Summary

All investment avenues carry certain degrees of risk, including business risk, currency risk, operational risk, inflation risk, default risk, interest rate risk, political risk, and market risk. If the returns on these investments are not proportional to the associated risks, pursuing them may not be wise. Therefore, investors should analyze the risks and returns of investment products, develop a strategy before making investment decisions, and set clear financial goals.

Understanding and applying these seven risk measures can significantly assist in selecting suitable mutual funds. However, no single measure provides a complete picture of risk and return analysis. Combining these metrics will offer a comprehensive view of a fund's risk profile and potential performance.

Disclaimer:

Mutual fund investments are subject to market risks. The information contained in this document is for general purposes only and not investment advice. The above-said information is collated from reliable sources based on publicly available data from various websites, newspapers, and internally developed data. The views expressed are only constituent opinions and, therefore, cannot be considered guidelines, recommendations, or professional guides for readers.

CMA (Dr.) R K Mohapatra

CMA (Dr.)R K Mohapatra is a Consultant GM/Finance in IRCON, an Editorial Board Member of "The Worldonomics Times," and an "Eminent Author" awardee. He has 34 years of experience in finance and accounts, portfolio management, cash and wealth management, and tax planning.

TO INCREASE PROFIT, ELIMINATE UNPRODUCTIVE ACTIVITIES AND OPTIMIZING RESOURCES

To increase profit, businesses can significantly boost their bottom line by eliminating unproductive activities and optimizing resources. This involves streamlining processes, identifying redundant tasks, and ensuring that resources are used efficiently. By reducing waste and focusing on core competencies, businesses can decrease operational costs, enhance productivity, and ultimately improve profitability.

Here's a more detailed breakdown of how eliminating unproductive activities can lead to increased profit:

1. Streamlining Processes and Reducing Redundancy:

Identify and eliminate non-essential tasks: Businesses should analyse their workflows and identify tasks that don't directly contribute to customer value or product creation.

Implement automation: Automating repetitive tasks can free up employees to focus on more strategic work and reduce errors.

Reduce multiple layers of approval: Streamlining approval processes can save time and resources.

2. Optimizing Resource Allocation:

Focus on core competencies:

Ensure that resources are directed towards activities that best align with the company's strengths.

Outsource non-core functions:

Consider outsourcing tasks that are not critical to the company's core business to reduce internal costs.

Invest in employee training and development:

Ensure employees have the skills and knowledge to perform their jobs effectively, reducing errors and rework.

3. Enhancing Productivity and Efficiency:

Improve time management: Implement time management strategies to help employees work more efficiently and reduce wasted time.

Reduce distractions: Minimize distractions in the workplace to improve focus and productivity.

Implement project management tools: Use project management tools to help teams track progress, manage resources, and stay on schedule.

4. Reducing Operational Costs:

Negotiate better deals with suppliers: Seek out lower prices for raw materials and other supplies.

Implement energy-saving measures: Reduce energy consumption to lower utility bills.

Reduce waste: Implement waste reduction programs to lower disposal costs and reduce material consumption.

By taking these steps, businesses can create a more efficient and productive environment, leading to reduced costs, improved resource utilization, and ultimately, increased profitability.

FCMA Achal Jain

CFA BLUE BELLS
GROUP OF SCHOOLS

EFFECTIVE COST MANAGEMENT IN AGRICULTURAL SECTOR BY LEVERAGING ACTIVITY BASED COSTING

The Perspective

The landscape of agriculture is fast evolving with an increased focus on enhancing farmers' incomes. The flagship schemes of the government are targeted towards improving purchasing power at the bottom of the pyramid to accelerate overall economic growth. At the same time, advanced technology is providing solutions to tackle the traditional challenges faced by agriculture towards improving the overall efficiency from farm to fork. The business dynamics of the agricultural sector generally call for a system of calculation and cost management that goes beyond output assessment and profit determination, and coordinates a tool that supports the decision-making process, thus facilitating the evaluation of different cultivation techniques, varieties and so on.

As far as cost calculation and management is concerned, the sector presents four characteristics in its productive system that condition cost model design: nature of output, multi production, self-supply, and heterogeneity. To sum up, there is a qualitative diversity (multi production) of products that consume common productive resources and which it is necessary to assess in order to reach an overall and individual determination of the cost and profit generated, and a suitable cost management system to back up decision-making related to production planning

The structure of the agriculture sector is seen to be unorganized and fragmented in nature and thus lack of effective regulation in the given sector is also seen as one of the reasons why farmers seem to be exploited and have been operating at very low margins. One of the key reasons seen for the lack of appropriate cost management in the given sector is with regards to the lack of prioritization of the cost management among farmers becauseof lack of knowledge with regards to the same.

Cost management architecture in Farm Sector

A sound Cost management system improves the data and information base for a wide range of issues related to farm operations, including farm accounts' data on farm cash receipts and farm expenses, net and gross farm incomes, and the degree to which farms are capitalized. It also provides information on farm profitability, household food security and the myriad forms of farm labor, such as hired and self-supplied labor by gender and age group.

The farming process has many costs involved. There are some constant expenses that are considered to be direct costs. It is determined that these costs will be present as long as the farming process is in occurrence. The process itself also creates indirect costs. In order to properly account for these costs, an accounting system must be used. There are many different uses and applications of accounting throughout the industry. Although there are many different fields of accounting in practice, cost accounting is a field of accounting that measures, records, and reports information about costs and the one that is most applicable to a farming operation.

Cost accounting allows farmers to see their farm as more than “x” amount of acres that costs “x” amount of dollars to produce “x” amount of bushels.

Cost accounting allows the farmer to see the farming operation broken into incomes and expenses based on acres and yield units. This is possible because these grain farmers have a unit of production, grain. Being able to break the income and expenses down per acre gives the farmer a basis for comparing performance of different fields, determining why one field may be producing more than another, analyzing optimal use of land, experimenting with agricultural practices to improve yields, and reducing expenses. Some of the farming process will incur the same costs, and other processes will incur process-specific costs. Iowa State University Extension and Outreach has a valuable spreadsheet that calculates the costs incurred all the way through the net proceeds for individual farms

Some typical fixed and variable costs associated with a farming operation are discussed below:

- The fixed costs remain the same even when the acres being farmed increases. The variable costs change in proportion to the amount of acres farmed. Having the ability to track and break down variable costs gives farmers field specific knowledge on the cost per acre.

- Seed, chemicals, and fertilizers are variable costs. They will change in proportion to the acres farmed. Common sense suggests the more acres farmed, the greater are these variable costs.

- A fixed cost is determined for each of the farming processes. Custom hire is not always a part of the farming process, therefore, was not discussed as part of the farming process. Custom hire is the process of hiring a third party company to custom plant, applicate, spray, and harvest crops. This process has unique accounting concerns that are beyond the scope of this paper.

- Labor is also broken into fixed costs and variable costs. In farming, an operator is considered to be the supervisor. For each farming activity, there is usually an operator assigned to each crew. An operator will have many job titles. He or she might work on paperwork, report field conditions to the owner, or even drive a piece of farming machinery. Regardless of the job being done, an operator's labor is considered to be manufacturing overhead and will be treated as a fixed cost.

- Hired labor is an hourly paid employee. Hired labor works directly with the production of the crops and their labor will be a variable cost. This cost will change in proportion to the amount of hours these employees work, which should vary by the acres farmed.

- Land rent will be a fixed cost for each field rented. This is fixed because the cash paid for rent will not change until a new negotiation is agreed upon between the farmer and the landowner. Once the variable costs have been calculated, they are multiplied by the number of acres being farmed. Fixed costs are added to that total to arrive at total costs. To compute a net return, those total costs are then deducted from the calculated total returns.

Uses of an effective Costing System in Farm Sector

At the farm level, Cost of production (CoP) data contributes to improve the economic assessment of farm operation. They allow the producer to question his own operation and to benchmark it against the best practices of farms in the same region with similar characteristics. This, in turn, can lead to better informed decisions at the farm-level and improved market efficiency and performance. Some specific examples of how a robust CoP system can be used at the farm level are as follows:

- Enterprise mix decisions: analysis can illustrate which farm enterprise (commodity) is positively contributing to the whole farm financial picture and lead to reallocation between enterprises, as appropriate.

- Purchasing and marketing decisions: pricing targets for inputs and outputs can be set at different cost break-even levels. Knowing the break-even points allows farmers and policy-makers to take advantage of growing, buying or selling opportunities when they arise. The following formulas can assist in determining break-even points.

- Break-even price to cover variable costs (or gross margin): Total variable costs ÷ expected yield = Amount / unit produced. This is the minimum price needed to cover variable costs

- Break-even price to cover total costs (or net margin): Total costs ÷ expected yield = Amount /unit produced. This is the minimum price needed to cover all costs.

- Break-even yield: Total costs/expected price = unit produced (minimum yield required to cover all costs).

- Investment decisions: Making the right investments in capital assets, such as land, machinery and buildings, is critical to long-term success. CoP information shows the amount the farm can afford to pay for those assets. It is useful when conducting reviews of investments in enterprises that fail to meet total costs in the long run and determining where to redirect resources to more profitable enterprises.

- Total Costs per unit of production or unit of land area (depending on the product) Defined as:

  [Cash-costs + non-cash costs + land costs + capital costs (replacement and opportunity cost of capital) + farm overhead expenses] / Total land area in ha.

- This indicator can also be expressed in terms of total area planted or operated, weight or volume of product, animal head for livestock activities or any other unit of relevance, especially local or customary units. Subsets of the cost indicators can be produced. A common sub-aggregate is to display cash costs or purchased inputs only or to add cash costs and land rental costs. When reliable data are available, indicators are often displayed for individual cost items, such as feed costs per animal unit, seed cost per land area or labor cost per MT of output quantity

Environmental indicators

A wide range of indicators that relate farm activity to environmental variables can be compiled through a costing system These indicators can be useful to characterize the environmental profile of farms within a country or region and to provide some indications on the expected costs for farmers associated with the adoption of environmental policies, such as shifting to less input-intensive practices. Some of these indicators are described below.

- Energy use per hectare Defined as: [Fuel and lubricants use + electricity use] / Land area. This indicator can also be expressed in terms of production unit. The energy used could be converted to standard energy units, such as joules, or into their monetary equivalents. The individual items summed can be tailored to the uses and include the cost (or volume) of fuel used by machinery, equipment and buildings only, excluding electricity costs.

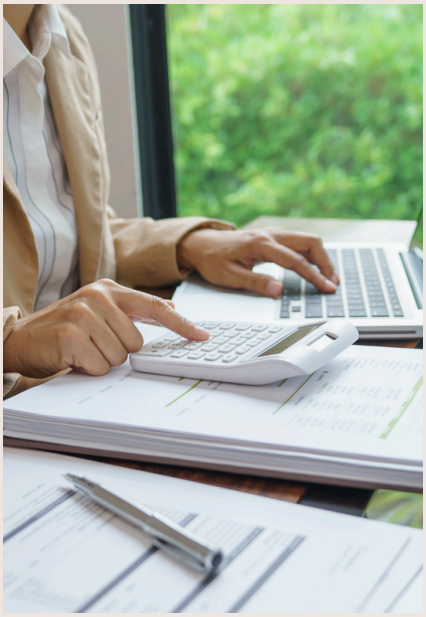
- Fertilizer use per hectare Defined as: [Fertilizer use] / Land area. This indicator measures the intensity in fertilizer application for the production of a given commodity. To be relevant for environmental analysis, data on the type of fertilizer used, especially on the concentrations of the different active components, is necessary

- Pesticide use per hectare Defined as: [Pesticide use] / Land area. The comments made for the fertilizer use indicator also apply for this indicator.

- Environmental Pressure Index Defined as: [Input use x emission factor] / Land area. This index measures the emissions for a given pollutant associated with the use of a specific input. For example, the quantity of nitrogen application can be translated into nitrous oxide emission using an appropriate emission factor and expressed on a per ha basis

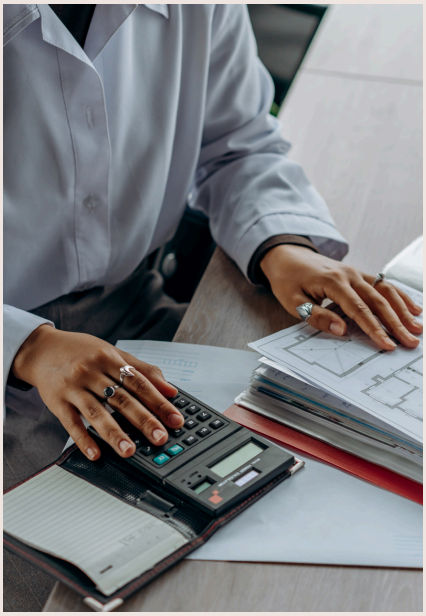
- In addition to indicators that can be used for environmental purposes, a wide range of statistics measuring returns on the different inputs used can be established. These statistics contribute to measuring and identifying the structural changes taking place in agriculture, in which, for example, higher returns on fixed capital are a well-known feature of more sophisticated production technologies.

- Input productivity Defined as: [Value of output] / Input use. This indicator measures the gross output in monetary terms generated by a given unit of input (return on inputs). A well-known indicator is labor productivity, which measures the value of output generated by a given unit of labor use (hour, day or month-equivalents).



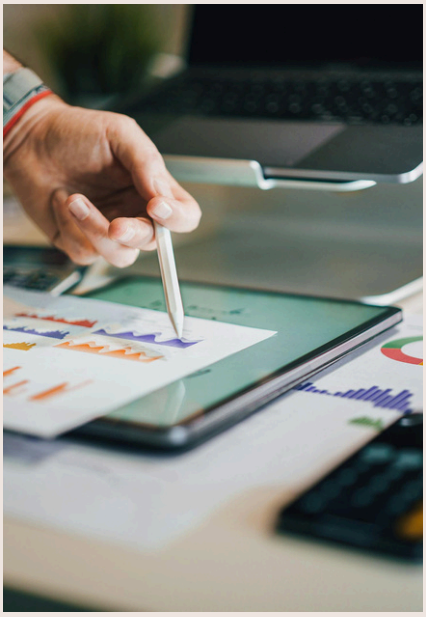
Activity Based Costing : A useful Cost Management technique for Farm Sector

Cost Management focuses upon all the activities internal and external to the value chain process in order tohelp in cost reduction and cost control. In relation to the agricultural sector, the Activity Based Costing techniqueis being increasingly accepted for the purposeof cost management. ABC costing can help in allocation of the costs in relationto the various activities associated with the production based upon the cost drivers identified in relation to each production activity. Benefits of using ABC for cost management in the agricultural sector are : Adjustable costing technique, Faster and more accurate. Enables carrying out more detailed analysis.



- ·An ABC system is based on the idea that products make use of certain general activities and these activities require some resources to be done. It means that, first, the cost of the resources are allocated to the activities and, then, the costs of activities are allocated to the products (costs objects) using specific activity drivers for each activity. In this way, it is possible to assign overheads to products in a more accurate and precise way. This logic enables managers to have a deeper control on how products or services, brands, customers, channels of distribution, or facilities consume resources and generate costs.

- ·Furthermore, this logic fosters the understanding of patterns of resource consumption at the micro level. Framers can have access to a deeper level of information that enables corrective actions directed to the enhancement of revenues, profitability and cost reduction. ABC prevents some distortions related to product cost information that arise from traditional accounting systems where the overheads (indirect costs) are arbitrarily attributed, usually in proportion to an activity's direct cost. Traditional systems create higher distortions when there are sophisticated production structures, with a wide range of products or services that require the assignment of large amount of general costs.



- ·An important element which makes Activity-Based Costing on one hand more useful and on the other hand more accessible/ feasible to farms and farming-related companies is that agriculture-based businesses are making increasingly intensive use of information in several production and management processes (e.g., for quality management or food safety. Activity-Based Costing offers the considerable advantage of improving decision making processes, providing a reliable method to process the wealth of data collected from the field, also with the aid of Precision Agriculture technologies. Farmers face many complex decisions, ranging from crop choices to machinery renewal and the use of external services. In many cases, indirect costs play a pivotal role in a decision, as more and more activities are completed using expensive equipment.

- ·Another important area could be product pricing, although for most agricultural firms price is an exogenous variable rather than a variable decided by the manager. However, by comparing market price information and forecasts with a more accurately quantified cost of the single product, the farm manager increases the chances of making the right decision. Another relevant area where Activity Based Costing could impact the agricultural supply chain is the possibility for associated farmers organizations (such as cooperatives, consortia, etc.) to better plan their production and marketing activities and to provide more insightful advice to their associates.

- ·If cost allocation procedures return a misleading representation, the company is more exposed to risks. Applying Activity-Based Costing, farm managers can achieve greater control on the consumption of resources and improve their decision-making processes. Furthermore, the accounting process itself can be positively influenced. The scope of the Activity-Based Costing system allows fine and accurate adjustments to be made to the company cost structure, reducing overhead cost. In addition, farm management is increasingly requiring greater flexibility and adaptation to rapidly changing market conditions; this makes it necessary to avoid under and over costing situations due to inaccurate allocation of overheads and common costs with concurrent activities, which is a typical problem of traditional costing methods As stated before, the high degree of data intensity required by Activity-Based Costing has been (and still is) an important barrier to adoption.

Adaptation of the general ABC model to the farm sector is not complex. It basically consists of determining the direct consumption and demand of activities and tasks required by each product. So, the central axis of the proposed model is based on the follow-up and control of these two components. For activity control, it is proposed a system of daily work reports in which each worker or group of workers related to the productive activities record the tasks undertaken throughout the day. In this sense, a highly significant aspect is the correct identification and grouping of the activities and tasks associated with the productive process.

Conclusion

In tough economic times, farmers must be aware of all costs, which fields are profitable, and which fields are producing a loss. Sadly, not all farmers make use of a software system that may help assign their costs to fields. In fact, many farmers are not fully aware of what costs are being incurred, the behavior of these costs, what yields are being produced on each plot of land, and the profitability of those plots of land.

By using cost accounting that measures, which records, and reports information about costs, farmers can establish a relationship between costs and the stages of the farming process. Farmers would also be able to distinguish a cost from an expense, an outlay cost from an opportunity cost, and a direct cost from an indirect cost. The ability to categorize these costs essential to the farmer's long-term financial success. With this ability, farmers could determine their value-added and nonvalue-added inputs. In addition, farmers are able to determine the relative importance of each input and assign a spending limit for each activity.

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CMA (Dr.) S K Gupta

Managing Director
ICMAI Registered Valuers Organization

UNDERSTANDING PROCESS COSTING IN INDIAN BUSINESS: A CASE STUDY OF THE TEXTILE INDUSTRY

The Indian textile industry, a key player in the country's manufacturing sector, is known for its complex and multi-stage production processes. This industry involves various stages —from spinning raw fibre's into yarn, weaving fabric, to dyeing and finishing—each with its own associated costs. Managing these diverse and intertwined costs can be challenging for textile manufacturers.

To address this complexity, process costing offers an effective solution. This method helps track and allocate production costs accurately at each stage of the process, ensuring that each unit of product reflects its true cost. By using process costing, textile companies can better manage their expenses, control production costs, and set competitive prices. This article will explore how process costing helps streamline the cost management in the Indian textile industry, with a real-life-inspired case study to illustrate its practical benefits.

What is Process Costing?

As far as cost calculation and management is concerned, the sector presents four characteristics in its productive system that condition cost model design: nature of output, multi production, self-supply, and heterogeneity. To sum up, there is a qualitative diversity (multi production) of products that consume common productive resources and which it is necessary to assess in order to reach an overall and individual determination of the cost and profit generated, and a suitable cost management system to back up decision-making related to production planning

As per CIMA Official Terminology, **Process costing is a 'form of costing applicable to continuous processes where process costs are attributed to the number of units produced. This may involve estimating the number of equivalent units in stock at the start and end of the period under consideration'.**

Significance of Process Costing in Indian Business

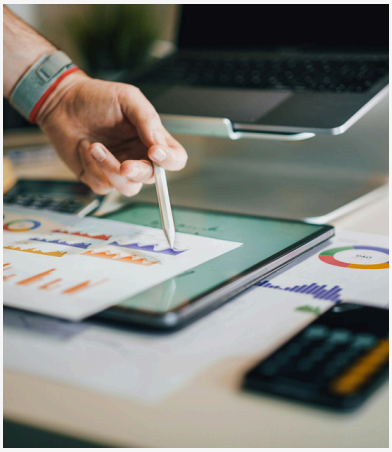
·Enhanced Cost Management Efficiency

- ·Problem: In industries with continuous and large-scale production, tracking costs across various stages can be complex. Businesses may struggle with accurately recording expenses associated with raw materials, labour, and overheads due to the sheer volume and variety of transactions.

- ·Solution: With regard to this issue, Process costing streamlines cost management by systematically accumulating and categorizing costs for each production stage. This method provides a clear and organized view of how costs are distributed, facilitating better oversight and control of expenses.

·Precision in Cost Allocation

- ·Problem: Allocating costs to specific products becomes challenging in multi-stage production environments. Without a methodical approach, it is easy to misallocate costs, leading to inaccuracies in product costing and financial statements. This can result in incorrect pricing and profitability analysis.

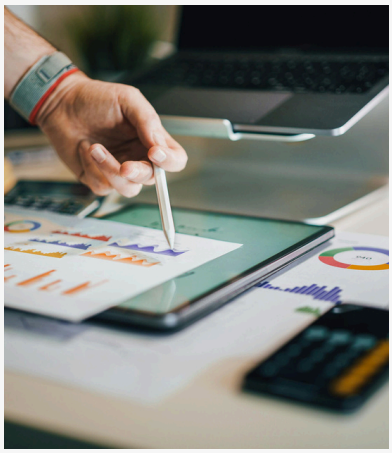


- ·Solution: With regard to this issue, Process costing assigns costs to products based on the stage of production they have completed. By tracking costs at each stage and transferring them accordingly, businesses can ensure that each product reflects its true cost, enhancing the accuracy of financial reporting and pricing strategies.

·Enhanced Cost Control Mechanisms

- ·Problem: Identifying cost inefficiencies can be difficult when expenses are not clearly tracked across different stages of production. For instance, if abnormal material waste, high labour costs or production efficiencies are not identified early, they can lead to significant budget overruns and reduced profitability.

- ·Solution: With regard to this issue, Process costing provides detailed visibility into costs incurred at each stage of production. This detailed tracking helps businesses identify where inefficiencies are occurring and implement targeted measures to address these issues, thereby improving overall cost control.



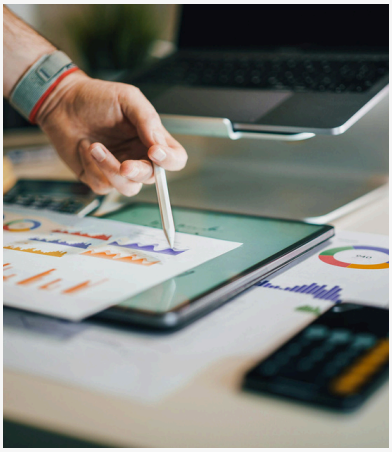
·Strategic Pricing

- ·Problem: Setting competitive prices requires a thorough understanding of production costs. Without accurate cost data, businesses may either underprice their products, leading to losses, or overprice them, resulting in decreased competitiveness in the market.

- ·Solution: By using process costing to determine the accurate & detailed cost of production at each stage, businesses can set prices that accurately reflect their production expenses. This helps in establishing competitive pricing strategies while ensuring that prices cover costs and contribute to profitability.

·Consistent Financial Reporting

- ·Problem: Different cost calculation methods across different departments or periods can lead to discrepancies in financial reports. This inconsistency complicates the comparison of financial performance and makes it harder to make informed business decisions.

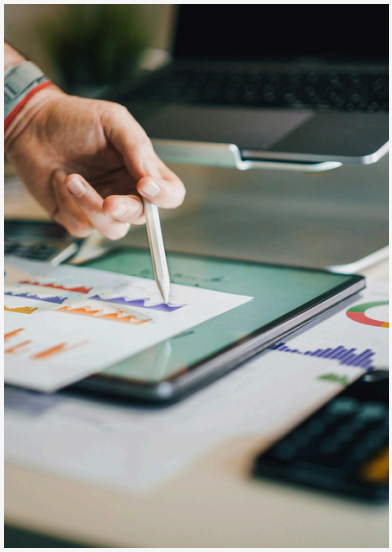


- Solution: With regard to this issue, Process costing provides a standardized approach to cost accumulation and reporting. This uniform method ensures that financial reports are consistent, making it easier to compare performance across different periods or departments and to make informed decisions based on reliable data

·Enhanced Budgeting and Forecasting

- ·Problem: Accurate budgeting and forecasting are challenging without a clear understanding of current and future production costs. Inaccurate cost estimates can lead to flawed budgets and unrealistic financial projections.

- ·Solution: With regard to this issue, Process costing offers detailed insights into production costs, which helps in creating more precise budgets and forecasts. By analyzing cost data from each production stage, businesses can make more informed predictions about future expenses and better allocate resources.



·Streamlined Multi-Stage Cost Control

- ·Problem: Managing and controlling costs across multiple production stages can be cumbersome without a cohesive costing system. Businesses may struggle to track expenses accurately, leading to potential errors and inefficiencies in cost control.

- ·Solution: With regard to this issue, Process costing addresses this challenge by focusing on each stage of production individually. This segmented approach simplifies cost tracking and management, ensuring that expenses are accurately recorded and controlled at every stage of the production process.

Case Study: Revolutionizing Cost Efficiency in Textile Manufacturing at XYZ Textiles Limited

Inspired by real-life successful companies, XYZ Textiles Limited shows how process costing is applied in the textile industry. This fictional company serves as a representative case study for understanding the practical application of process costing.

Overview of XYZ Textiles Limited:

XYZ Textiles Limited, founded in the 1980, is a prominent player in the Indian textile sector, producing a diverse range of yarns, fabrics, and garments. With extensive operations spanning spinning, weaving, dyeing, and finishing, XYZ Textiles provides a comprehensive example of process costing in action.

Application of Process Costing at XYZ Textiles Limited:

·Cost Accumulation:

At XYZ Textiles, costs are being accumulated at each & every stage of production. For example, in the spinning department, costs related to raw materials (such as cotton), labour, and overheads are tracked. These costs are then transferred to the weaving department, where they are further accumulated with the costs associated with weaving operations.

·Cost Allocation:

At XYZ Textiles, costs are being allocated to products at each production stage. For the instance, cost of producing yarn in the spinning department is assigned to the yarn produced, while the costs incurred during pressing are allocated to the units produced. This systematic allocation ensures accurate cost per unit.

·Cost Control Measures:

XYZ Textiles uses process costing to monitor and control production costs. If, for example, the cost of dyeing exceeds the budget, management investigates the cause—such as inefficiencies in dye usage or high labour costs—and implements corrective actions, like optimizing dyeing processes or renegotiating supplier contracts.

·Pricing and Profitability:

Using detailed cost information, XYZ Textiles can set competitive prices for their products. By knowing the exact cost of producing different types of fabrics, the company can price its products competitively while ensuring profitability.

·Financial Performance Analysis:

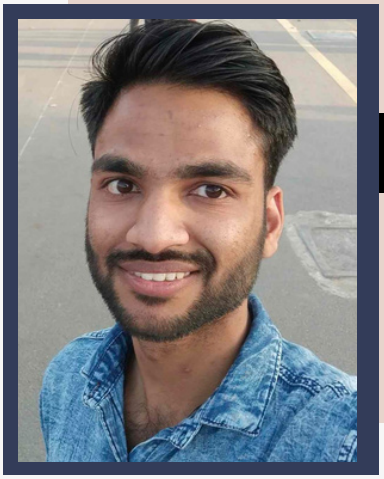
The company employs process costing to analyze financial performance across different production stages. This analysis helps in evaluating the efficiency of each department and identifying opportunities for cost reduction and process improvement.

Challenges and Solutions:

One challenge faced by XYZ Textiles was accurately allocating overheads across various production stages. To address this, the company implemented advanced cost accounting software to automate cost tracking and allocation. Additionally, XYZ Textiles regularly reviews and adjusts its costing methods to adapt to changing market conditions and production technologies.

Conclusion

Process costing is a vital tool for managing expenses and ensuring profitability in industries with continuous production processes, such as textiles. The case of XYZ Textiles Limited, inspired by real-life scenarios, illustrates the practical application of process costing, demonstrating how it facilitates accurate cost allocation, efficient cost control, and effective pricing strategies. By employing process costing, XYZ Textiles not only manages its production costs effectively but also enhances its financial performance and competitive edge. As Indian businesses continue to evolve, the principles of process costing will remain essential for achieving operational excellence and sustaining growth.



Rishabh Jain

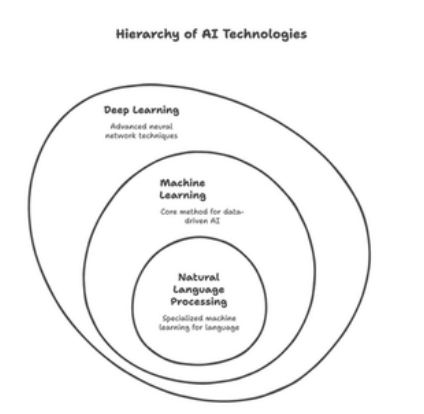
Cost Accountant

CORE COMPONENTS OF ARTIFICIAL INTELLIGENCE

Artificial Intelligence (AI) is an expansive field that intertwines various disciplines such as mathematics, computer science, psychology, and neuroscience. To understand AI thoroughly, it is crucial to delve into its core components, which provide the foundation for developing intelligent systems capable of performing tasks that typically require human intelligence. This chapter explores the essential components of AI, including Machine Learning, Natural Language Processing, Robotics, and Neural Networks, highlighting their roles and interconnections in creating comprehensive AI solutions.

Computers have traditionally executed tasks based on explicit commands and code. However, artificial intelligence (AI) takes this a step further by teaching computers to think and adapt independently, leveraging the human learning process as a model. As a cornerstone of computer science, AI is closely intertwined with fields like machine learning and deep learning. These domains focus on developing algorithms that emulate the decision-making processes of the human brain, enabling machines to “learn” from data and deliver increasingly accurate predictions and classifications over time.

At its core, artificial intelligence simulates human intelligence. To enable machines to "think," humans must guide their learning journey. This involves utilizing pre-programmed datasets, including personal data, to help machines make well-informed decisions. Algorithms and programs developed by humans empower machines to produce consistent, reproducible, and reliable results over time, making them invaluable in solving complex problems.



AI encompasses several components, including basic automation, machine learning, and deep learning. While terms like artificial intelligence, machine learning, deep learning, and data science are often used interchangeably, they represent distinct concepts. Artificial intelligence refers to systems capable of reasoning and learning like humans. Machine learning focuses on algorithms that can learn and adapt without explicit programming. Deep learning, a subset of machine learning, leverages artificial neural networks to process vast datasets. Data science, on the other hand, is an interdisciplinary field dedicated to extracting meaningful insights and value from data, with data scientists at the forefront of identifying patterns, trends, and opportunities to drive better decision-making.

Today, AI and machine learning are among the most impactful advancements in data science, revolutionizing industries worldwide. In India, these technologies have found applications across sectors such as healthcare, finance, and customer service, driving efficiency and enhancing the overall user experience. As technology continues to evolve, AI and machine learning are poised to reshape the future of data science and analytics, empowering businesses to thrive in an increasingly data-driven world.

3.1 Machine Learning (ML)

Machine learning is a transformative branch of artificial intelligence (AI) that equips machines with the ability to learn and adapt based on experience, rather than being explicitly programmed for every

task. In simpler terms, machine learning (ML) is about teaching computers to think and make decisions like humans do by processing data and identifying patterns. This innovative approach has been widely adopted across industries, influencing our daily lives in numerous visible and invisible ways. Let us explore the concept of machine learning in a way that connects with real-life examples, making it easier to grasp.

At its core, machine learning relies on algorithms that process large volumes of data, uncover patterns, and use those insights to make predictions or decisions. Imagine a child learning to recognize different animals. The child is shown pictures of dogs, cats, and birds along with their labels. Over time, the child begins to identify these animals even when seeing new images. This is a basic analogy of how supervised learning, one of the most common types of machine learning, works. In this approach, the algorithm is trained on labelled data, where the correct answers are already known, allowing it to make predictions for new, unseen data.

Let's talk about machine learning (ML) – a fascinating branch of artificial intelligence that empowers computers to learn and make decisions by analysing data and recognizing patterns. Have you ever wondered how this technology impacts your daily life? Let me walk you through it.

Take online shopping platforms like Amazon, for example. Have you noticed how they seem to know exactly what you might want to buy next? That's ML at work! These algorithms analyse your browsing history and compare it with millions of other users to recommend products tailored just for you. It's like having a personal shopping assistant who knows your preferences.

Now, think about your email inbox. How does it know which emails are spam and which aren't? Yes, you guessed it – ML. Spam filters learn from patterns in flagged emails to automatically keep your inbox clean and save you time. Isn't that a relief?

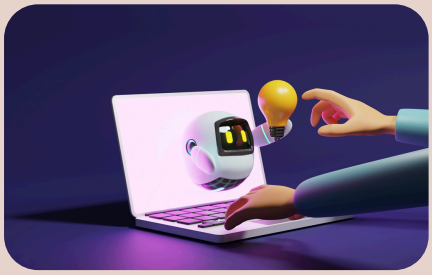
Let's move to healthcare. Imagine doctors using advanced tools that analyse medical data like patient records and imaging scans. ML algorithms are helping detect early signs of diseases, such as cancer, with greater accuracy. This means earlier treatment and, potentially, saved lives. Isn't that remarkable?

And then there's entertainment. Have you ever been amazed by how Netflix or Spotify suggests your next movie or song? ML makes this magic happen by understanding your preferences and comparing them with others. It's like having your own entertainment curator.

ML doesn't stop there. Self-driving cars? They're powered by ML too. These cars use sensors and algorithms to navigate roads, recognize signs, and avoid obstacles. And apps like Uber? They optimize routes and calculate ETAs using ML. Isn't it amazing how transportation is evolving?

In finance, ML works behind the scenes to detect fraud and assess creditworthiness. Social media platforms use it to curate your feeds and even remove harmful content. Voice assistants like Siri and Alexa? They learn from your queries to serve you better. And ML is even helping us save energy and improve agriculture. Incredible, right?

Machine learning is truly reshaping the world around us. As we continue to rely on this technology, let's ensure we use it responsibly, maximizing its benefits while addressing ethical challenges. What do you think? Are you as excited about ML as I am?



3.1.1 AI and ML are not same, though used interchangeably.

Artificial Intelligence (AI) and Machine Learning (ML) are not the same, even though people often use these terms interchangeably. They are related, yes, but they're not identical. Curious about the distinction?

First, think of AI as the broad umbrella term. AI refers to the simulation of human intelligence in machines that are designed to think, learn, and solve problems. Essentially, AI is the overarching concept of creating systems that can perform tasks typically requiring human intelligence, like reasoning, decisionmaking, and even creativity. Now, within this vast field lies Machine Learning - a subset of AI. ML focuses on enabling machines to learn from data and improve their performance over time without being explicitly programmed for every task. So, while all ML is AI, not all AI is ML. Make sense so far?

Let's break it down with an analogy. Imagine AI as a toolbox filled with different tools designed for various tasks. Machine Learning is one of those tools, specifically the one that deals with learning from data. Other tools in the AI toolbox include natural language processing (NLP), robotics, expert systems, and computer vision. Each of these has its unique focus, but together they contribute to making AI what it is.

For example, when you use a voice assistant like Alexa or Siri, AI is at play. The voice recognition feature is powered by NLP, a branch of AI. But when Alexa learns your preferences over time and starts suggesting songs or services you might like, that's where ML steps in. ML is responsible for the learning part, using your interactions to improve its recommendations.

Now, let's talk about what sets ML apart. The key difference lies in how it achieves intelligence. Traditional AI systems are rule-based, meaning developers write specific instructions for the machine to follow. Think of a chess-playing program where every move is pre-programmed. It's intelligent, yes, but it doesn't "learn." ML, on the other hand, flips the script. Instead of giving explicit rules, developers provide

data. The system then analyses this data, identifies patterns, and makes predictions or decisions based on those patterns. Over time, as more data is fed into the system, it becomes better and more accurate. That's learning in action.

Here's another example to consider: fraud detection in banking. AI as a whole could include systems that analyse transaction logs and flag unusual activities. But with ML, the system doesn't just flag anomalies; it learns from historical fraud cases to improve its detection methods. Over time, it can even identify new, previously unseen types of fraud, which a rule-based system might miss. Fascinating, right?

But wait, there's more! AI doesn't always need data to function. Expert systems, for instance, rely on pre-programmed knowledge bases and rules to make decisions. ML, however, thrives on data. The more data you provide, the better it performs. This distinction is crucial to understanding why they're different.

In short, AI is the dream of creating machines that can mimic human intelligence in all its forms. ML is a specific approach to achieving this dream by focusing on data-driven learning. So, next time someone uses AI and ML interchangeably, you'll know the difference and can even explain it with confidence. Pretty cool, right? What do you think? Can you see how these two concepts, though related, are uniquely powerful in their own ways?

3.1.2 AI vs ML

Artificial Intelligence (AI) and Machine Learning (ML) are two buzzwords that dominate conversations about technology, but do you know what sets them apart? While they are closely related, they are not identical. AI represents the grand vision of creating machines capable of performing tasks that typically require human intelligence, like reasoning, problem-solving, and decision-making. ML, on the other hand, is a specific approach within AI that focuses on enabling machines to learn and improve from experience.

Intrigued? Let's delve into how these two concepts connect and differ.

Think of AI as an orchestra and ML as one of the instruments. AI encompasses a range of technologies, including natural language processing (NLP), robotics, computer vision, and expert systems. Each of these fields contributes to AI's overarching aim. ML, however, is the process by which machines develop the ability to learn and make decisions without being explicitly programmed for every single task. It's like teaching the orchestra's musicians to read music and improvise, rather than simply playing predefined notes.

For instance, when you use a voice assistant like Siri or Alexa, AI enables it to understand your voice commands through NLP and respond appropriately. But ML is what allows it to learn your preferences over time and offer personalized suggestions.

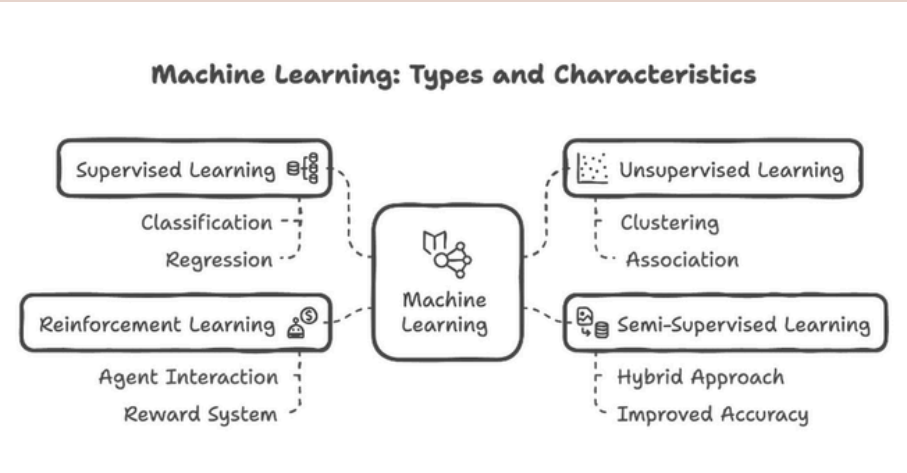
Similarly, in industries like healthcare, AI might involve systems that diagnose diseases using complex algorithms. When those systems improve their accuracy by analysing more patient data, that's ML in action.

What sets ML apart from traditional AI systems is its reliance on data. Traditional AI operates using pre-defined rules. For example, a rule-based system for detecting fraud would flag transactions over a certain limit. ML goes further by analysing historical data to recognize patterns of fraudulent activity, adapting to new methods of fraud as they emerge. This ability to "learn" is why ML is so impactful.

Another example is in entertainment. AI powers platforms like Netflix, recommending shows based on your viewing history. ML refines these recommendations, learning from your choices and adapting to your evolving tastes. Similarly, in transportation, self-driving cars use AI to interpret their surroundings, but ML enables them to improve navigation and safety over time as they gather more driving data.

Here's the big distinction: AI is the goal—creating machines that think and act like humans. ML is one approach to achieving that goal, specifically by using data to help machines learn and adapt. Not all AI involves ML. For instance, expert systems in AI rely on pre-programmed knowledge bases rather than learning from data. On the flip side, all ML falls under the AI umbrella since it's a method of achieving intelligent behaviour. Understanding the relationship between AI and ML is crucial as both are transforming industries worldwide. From personalized recommendations to fraud detection, and from autonomous vehicles to advanced healthcare diagnostics, their applications are vast and varied. While AI provides the vision of machines mimicking human intelligence, ML offers the practical tools to make that vision a reality. What do you think? Can you now see how AI and ML complement each other while maintaining their unique identities?

3.1.3 Subcomponents of Machine Learning include:



3.1.3.1. Supervised Learning: Supervised learning involves training a model on a labelled dataset, which means that each example in the training set is paired with an output label. This method is akin to learning with a teacher who provides the answers. The model makes predictions based on the data, and adjustments are made until the model achieves a high level of accuracy. Examples include spam detection in emails and real-time fraud detection.

Supervised machine learning is a widely utilized technique in fields such as finance, healthcare, marketing, and more. It involves training artificial intelligence (AI) or machine learning systems using labelled datasets, which pair input data with corresponding outputs. For example, a dataset may contain images of various cats, all labelled as "cat." The algorithm learns from this labelled data to identify patterns and make predictions about new, unseen information, such as recognizing images or interpreting speech.

This approach focuses on predicting the likelihood and probability of specific classes or categories based on user-provided input. By categorizing data, supervised learning enables systems to identify what something is and distinguish it from what it is not. Common applications include image recognition.

Supervised learning is characterized by the use of labelled datasets to train algorithms that can classify data or predict outcomes with accuracy. The model continuously adjusts its parameters (weights) as data is fed into it until the optimal configuration is achieved. This process typically involves cross-validation to prevent overfitting or underfitting, ensuring robust model performance.

Supervised learning algorithms are provided with historical input-output pairs for a given problem. Inputs are features or dimensions of the observation to be predicted, while outputs represent the desired outcomes.

Applications and Methodology

Supervised learning is particularly effective for predicting target variables based on input features. It establishes relationships between inputs and target variables, which are then leveraged to make predictions. Common use cases include:

1. **Classification:** Determining which category an instance belongs to (e.g., spam or non-spam in email filtering).
2. **Regression:** Predicting continuous outcomes within a defined range (e.g., house price estimation).
3. **Object Detection:** Identifying objects in images (e.g., recognizing cars across multiple categories).

The methodology involves learning a decision boundary to separate data into distinct classes. The model maps input data to its appropriate label and distinguishes one class from another. While the presence of outliers does not typically affect performance, incorrect classification of a data point can lead to misclassification errors, one of the key challenges of this approach.

Practical Applications of Supervised Learning

Supervised learning helps organizations address real-world challenges at scale, such as:

1. Credit Worthiness: Widely used in the financial sector to evaluate customers' credit scores. This involves analysing financial history, spending habits, and other key indicators to determine loan eligibility.

2. Facial Recognition: Critical for enhancing security in devices like smartphones and laptops. Facial recognition systems ensure only authorized individuals with unique facial features can access personal devices.

Techniques and Tools

Several methodologies are employed within supervised learning, including:

1. Neural Networks: Excel at recognizing patterns and are pivotal in applications like natural language processing, image recognition, and speech interpretation.

2. Linear Regression: Predicts continuous output values, such as forecasting house prices based on historical trends.

3. Logistic Regression: Utilized for binary classification tasks, such as spam detection and quality control in manufacturing.

4. Random Forest: Combines multiple decision trees to model decisions and predict values or categories. It offers ease of validation and audit compared to more complex models like neural networks.

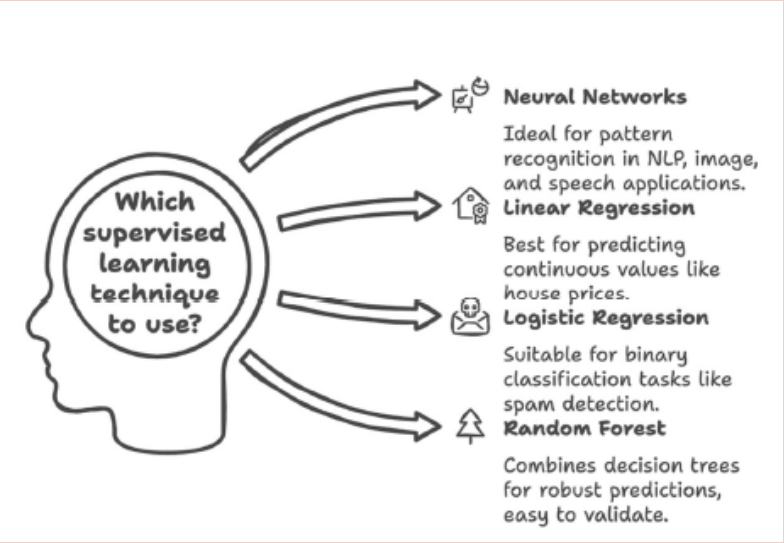
5. Support Vector Machines (SVMs): Create hyperplanes to segregate data in high-dimensional space and identify correct categories.

SVMs are commonly used alongside neural networks for classification
tasks.

Advantages and Challenges

Supervised learning offers several advantages:

1. Accurately learns patterns and relationships between inputs and outputs.
2. Provides reliable predictions and classifications for new data.
3. Demonstrates versatility across a wide array of applications.



However, it also faces notable challenges:

1. Overfitting: Models may perform poorly on new data if overfitted to the training set.

2. Bias: Training data biases can lead to unfair predictions.

3. Resource Intensive: Labelled data preparation can be timeconsuming, costly, and require domain expertise.

3.1.3.2.Unsupervised Learning: In unsupervised learning, the data used to train the model is not labelled, meaning that the system must make sense of the patterns without knowing the outcome in advance. This method is used to discover underlying patterns, group similar data together, and identify significant structures. Common applications are customer segmentation and organizing large databases into clusters that share similar characteristics.

Unsupervised machine learning involves algorithms analysing unlabeled data to identify hidden patterns and structures without explicit guidance. Unlike supervised learning, where models are trained on labelled datasets, unsupervised learning models work independently to discern underlying relationships within the data.

Key Applications of Unsupervised Learning:

1. Clustering: This technique groups similar data points into clusters, facilitating exploratory data analysis, customer segmentation, and image recognition. Common clustering algorithms include K-means, hierarchical clustering, and DBSCAN.

2. Dimensionality Reduction: Methods like Principal Component Analysis (PCA) and Singular Value Decomposition (SVD) reduce the number of features in a dataset while preserving its essential structure. This simplification aids in data visualization and enhances the performance of other machine learning algorithms.

Anomaly Detection: Unsupervised learning models identify unusual data points or outliers, making them valuable in cybersecurity for detecting fraudulent activities and in quality control processes. Unsupervised machine learning involves algorithms analysing unlabeled data to identify hidden patterns and structures without explicit guidance. Unlike supervised learning, where models are trained on labelled datasets, unsupervised learning models work independently to discern underlying relationships within the data.

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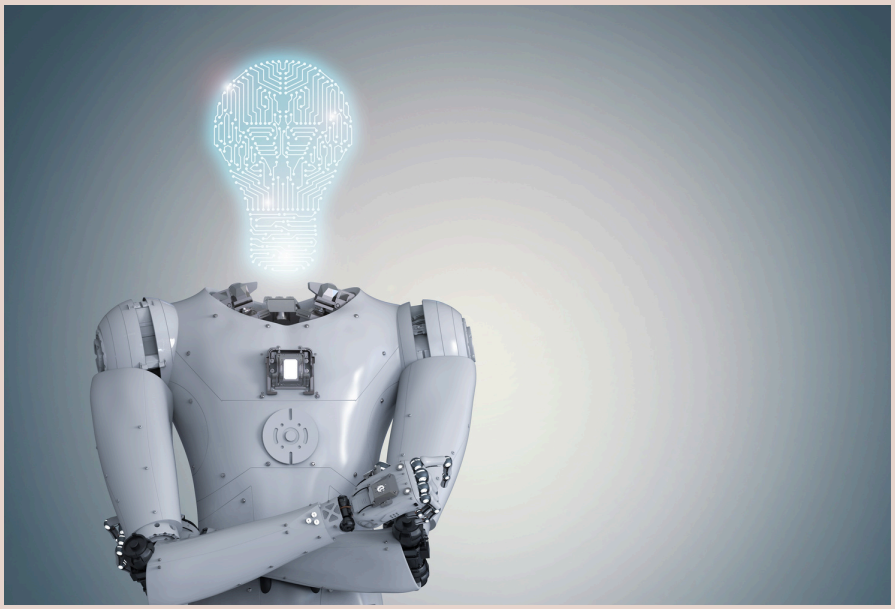

3. Anomaly Detection: Unsupervised learning models identify unusual data points or outliers, making them valuable in cybersecurity for detecting fraudulent activities and in quality control processes.

4. Association Rule Mining: This approach discovers interesting relationships between variables in large datasets. A typical application is market basket analysis, where retailers analyse purchasing patterns to understand product associations.

5. Document Clustering in Text Mining: Unsupervised learning groups similar documents, aiding in organizing large text corpora, improving information retrieval, and enhancing natural language processing tasks.

Advantages of Unsupervised Learning:

1. Data Exploration: It enables the discovery of unknown patterns without prior labeling, providing insights that might not be apparent through manual analysis.

2. Cost-Effectiveness: Since it doesn't require labeled data, unsupervised learning reduces the time and resources needed for data preparation.

Advantages of Unsupervised Learning:

1. Interpretability: The results can be less straightforward to interpret compared to supervised learning, as there are no predefined labels to guide the analysis.

2. Evaluation Metrics: Assessing the performance of unsupervised models can be difficult due to the lack of ground truth labels.

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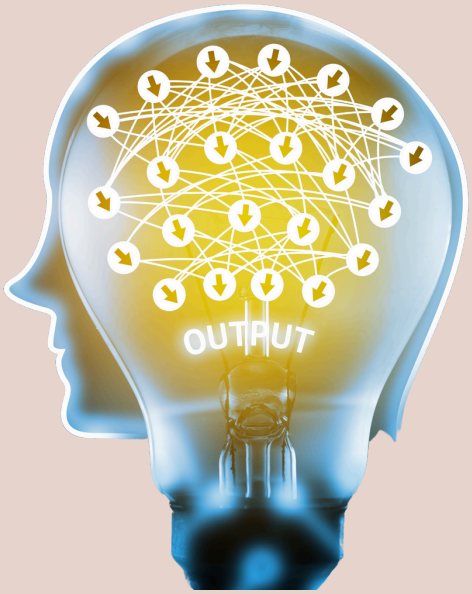
3.1.3.3.Semi-Supervised Learning

Semi-supervised learning bridges the gap between supervised and unsupervised learning by leveraging both labeled and unlabeled data to build robust models. This approach is particularly useful in scenarios where acquiring labeled data is expensive, time-consuming, or infeasible, while a large amount of unlabeled data is readily available.

In semi-supervised learning, a small portion of the data is labeled, providing initial guidance to the model. The model uses this labeled data to learn patterns and relationships, which it then applies to uncover structures and features in the unlabeled data. By iteratively refining its understanding, the model can generalize better and improve its performance on classification, regression, or clustering tasks.

Applications of Semi-Supervised Learning:

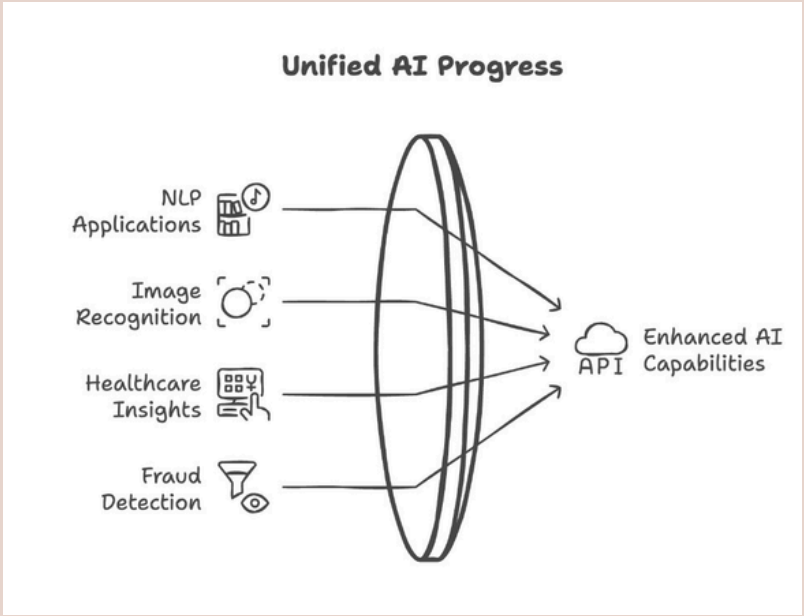


1. Natural Language Processing (NLP): Semi-supervised learning is used in text classification, language translation, and sentiment analysis, where only a fraction of the dataset is labeled.

2. Image Recognition: Models can classify and segment images using a small set of labeled examples, reducing the cost of manual annotation.

3. Healthcare: In medical diagnosis, semi-supervised learning aids in predicting diseases using limited labeled patient records combined with a vast pool of unlabeled health data.

4. Fraud Detection: It identifies fraudulent transactions by combining labeled fraudulent cases with extensive unlabeled transactional data.



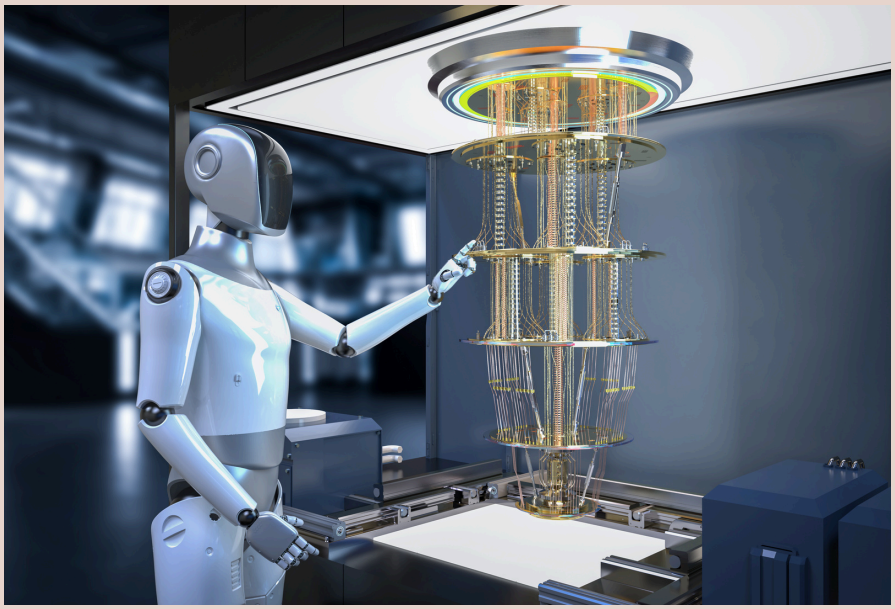
Advantages:

1. Cost Efficiency: Reduces the reliance on labeled data.

2. Improved Performance: Combines the strengths of both learning approaches to achieve higher accuracy.

3. Scalability: Allows for the utilization of vast unlabeled datasets.

Semi-supervised learning strikes a balance by harnessing the power of labeled data for accuracy and unlabeled data for scale, making it an essential tool for modern AI applications.



3.1.3.4. Reinforcement Learning (RL)

Reinforcement learning (RL) is a unique branch of machine learning where an agent learns by interacting with its environment through a system of rewards and penalties. The goal is to develop a strategy, known as a policy, that maximizes the cumulative reward over time. Unlike supervised learning, where the model learns from labeled data, or unsupervised learning, which identifies patterns, reinforcement learning relies on trial-and-error exploration.

In RL, the agent takes actions in an environment, observes the results, and receives feedback in the form of rewards (for desirable outcomes) or penalties (for undesirable outcomes). Over time, the agent refines its policy to improve decision-making, even in uncertain or complex scenarios. This makes reinforcement learning particularly suitable for dynamic environments where the correct course of action is not explicitly known in advance.

Key Applications of Reinforcement Learning:

1. Robotics: RL enables robots to learn complex tasks, such as navigating spaces, manipulating objects, or coordinating multi-robot systems.
2. Gaming: Reinforcement learning has achieved remarkable success in games like chess, Go, and video games, with systems like DeepMind's AlphaGo surpassing human expertise.
3. Autonomous Vehicles: RL is used to optimize driving strategies, such as lane navigation, collision avoidance, and route planning.
4. Healthcare: RL supports personalized treatment plans by learning optimal medication dosages or intervention strategies.
5. Finance: Algorithms optimize trading strategies, portfolio management, and risk assessment through reinforcement learning.

Advantages of RL:

1. Sequential Decision-Making: Excels in scenarios requiring a series of dependent actions.
2. Adaptability: Adjusts to dynamic and uncertain environments.
3. Exploration of Unknowns: Learns strategies without predefined labels.

Reinforcement learning has significant potential in real-world applications requiring adaptability, exploration, and optimization, making it a cornerstone of advanced AI systems.

Machine Learning stands as the fundamental framework behind numerous practical AI applications that have transformed everyday life and industry norms. For instance, facial recognition systems now commonly used in security and personal device unlocking, leverage machine learning algorithms to accurately identify and verify individual faces among billions. Similarly, recommendation engines, integral to e-commerce and streaming services, utilize these algorithms to analyse user behaviour and preferences, thus

providing personalized content suggestions that enhance user experience. Furthermore, the development of selfdriving cars, which are poised to revolutionize the transportation sector, depends heavily on machine learning to process and interpret complex data from the vehicle's sensors, enabling these cars to navigate safely and efficiently in diverse environments. Each of these applications underscores the versatility and impact of machine learning in paving the way for innovative solutions across various fields.

3.1.4 Challenges in Implementing Machine Learning

Machine learning (ML) is a transformative technology that has revolutionized industries by enabling systems to analyse data, make predictions, and automate decision-making. However, the implementation and utilization of ML models are accompanied by several challenges that organizations and researchers must address to fully realize their potential.

One of the foremost challenges in machine learning is data quality and availability. ML models rely heavily on large volumes of high-quality data for training. Insufficient, incomplete, or noisy data can lead to biased models and poor predictions. Additionally, data may be siloed across organizations or contain sensitive information, posing privacy and accessibility concerns. Ensuring data privacy while maintaining its usability, such as through differential privacy techniques, remains a critical hurdle.

Another significant challenge is overfitting and underfitting. Overfitting occurs when a model learns the training data too well, including its noise and irrelevant details, resulting in poor generalization to new data. Underfitting, on the other hand, arises when a model is too simplistic to capture the complexities of the data, leading to inadequate performance. Balancing these issues requires careful model design, tuning, and validation.

The **interpretability and explainability** of machine learning models also present challenges, particularly in high-stakes domains such as healthcare and finance. Many advanced ML models, such as deep neural networks, function as "black boxes," making it difficult to understand their decision-making processes. This lack of transparency can erode trust and hinder the adoption of ML in critical areas where accountability and regulation are paramount.

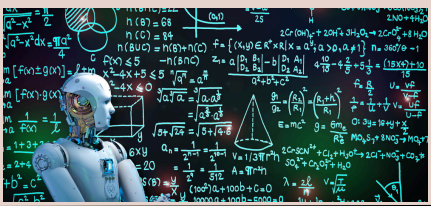
The **computational complexity** of training and deploying ML models is another pressing issue. Modern ML techniques, such as deep learning, require significant computational resources and time for training, especially when dealing with large datasets. This can lead to high costs, making ML adoption challenging for smaller organizations with limited budgets.

Moreover, the lack of skilled talent in the field is a widespread problem. Developing, deploying, and maintaining ML systems require expertise in data science,

programming, and domain knowledge, which are often in short supply. The rapid pace of technological advancements further exacerbates this gap, requiring continuous learning and upskilling.

Lastly, ethical concerns and bias in machine learning are critical challenges. ML models can unintentionally reinforce societal biases present in training data, leading to unfair or discriminatory outcomes. Addressing this requires proactive steps, such as implementing fairness metrics and auditing models regularly.

By tackling these challenges, the field of machine learning can evolve further, ensuring robust, ethical, and scalable solutions for real-world problems.



3.1.5 The Evolution of Machine Learning

programming, and domain knowledge, which are often in short supply. The rapid pace of technological advancements further exacerbates this gap, requiring continuous learning and upskilling.

One of the most significant advancements in machine learning is the rise of deep learning, a subset of ML that leverages neural networks with multiple layers to solve complex problems. Deep learning models, like Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs), have achieved remarkable success in areas such as image recognition, natural language processing, and autonomous systems. Innovations like Generative Adversarial Networks (GANs) and transformer models continue to push the boundaries of what ML can achieve, enabling machines to generate realistic images, text, and even audio.

The integration of machine learning with edge computing is another critical milestone in its evolution. By enabling ML models to run on devices like smartphones, IoT sensors, and drones, edge computing reduces latency and enhances real-time decision-making. This shift empowers industries to deploy ML solutions in environments where connectivity to centralized servers is limited or impractical.

Additionally, the field is witnessing a growing emphasis on explainability and interpretability, addressing concerns about "black box" models. New techniques, such as SHAP (Shapley Additive explanations) and LIME (Local Interpretable Model-agnostic Explanations), are helping make ML predictions more transparent and trustworthy, especially in critical applications like healthcare and finance.

The evolution of machine learning also includes advancements in **automated machine learning (AutoML),** which democratizes access to ML by automating the model-building process. This allows individuals and organizations with limited expertise to harness the power of ML, fostering innovation across diverse sectors.

Despite its progress, ML continues to face challenges, such as data privacy, ethical concerns, and resource-intensive training requirements. However, the emergence of technologies like federated learning and synthetic data generation is helping address these issues, ensuring that ML remains accessible and equitable.

Machine learning's evolution is far from over, with ongoing research and technological breakthroughs continually expanding its potential. As ML becomes increasingly embedded in our lives, it promises to revolutionize how we work, live, and interact with the world.

3.1.6 Natural Language Processing (NLP): SUB-SET OF MACHINE LEARNING

The Technology That Powers Human-Machine Interaction

Natural Language Processing (NLP) is a fascinating field of artificial intelligence (AI) that focuses on enabling machines to understand, interpret, and respond to human language. In simple terms, it's the technology that allows computers to "speak human." Whether you're chatting with a virtual assistant, translating text, or asking ChatGPT a question, NLP is the magic working behind the scenes. Let's dive into what NLP is, how it works, why it's important, and even how it plays a role in creating images—all while keeping it interactive and easy to understand.

3.1.6.1 What is NLP?

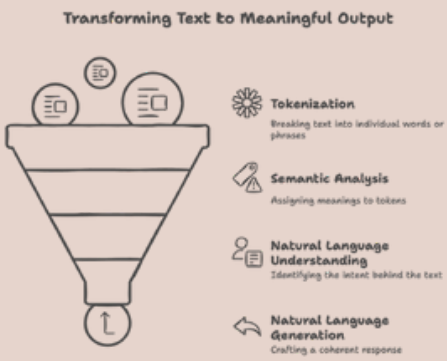
At its core, NLP is the bridge between how humans communicate and how machines process data. Humans use natural language to express thoughts, emotions, and ideas through words, tone, and context. On the other hand, machines rely on structured data—binary codes of 1s and 0s. NLP acts as the translator between these two worlds, enabling computers to process and respond to human language meaningfully.

3.1.6.2 Why is NLP Important?

NLP is crucial because it makes our interactions with technology more natural and intuitive. Instead of learning complex programming languages or coding, we can now communicate with machines in the same way we talk to other humans. This makes technology more accessible and efficient, opening up possibilities across industries like healthcare, education, customer service, and more.

3.1.6.3 How NLP Works: A Simple Explanation

To truly appreciate NLP, let's break it down into easy-to-understand steps. Imagine you type this question into ChatGPT: "What are the benefits of regular exercise?"



1. Tokenization

What is Tokenization?
Tokenization is the process of breaking down a sentence into smaller parts called tokens. These tokens are typically words, punctuation marks, or symbols.

Example:
Take this sentence:
"I I like to exercise."
After tokenization, it becomes tokens:

Token #	Token
1	I
2	like
3	to
4	exercise
5	-

Why Tokenization?

Computers can't directly understand entire sentences or paragraphs. So, before analyzing text, the computer breaks down sentences into these smaller pieces - called "tokens." After tokenizing, it becomes easier for the machine to understand and analyze the meaning, context, and relationships between words.

This is the first basic step for many AI tasks, like language translation, chatbots (like ChatGPT), and text analysis.

This step helps the system process your query word by word.

2. Assigning Meaning (Semantic Analysis)

What is Semantic Analysis?

Semantic analysis means the computer tries to **understand the meaning** behind each word ("token") in a sentence. It figures out what each word means and how these words connect to each other in context.

Simple Example:

Consider the sentence:
"Exercise has many benefits."

- **"Exercise"** → NLP understands this word is related to physical activities like running, jogging, or working out.
- **"Benefits"** → NLP recognizes that this word refers to positive effects, good outcomes, or advantages.

Why do we need Semantic Analysis?

Computers don't naturally understand meanings like humans do. By assigning meanings, NLP helps computers grasp the message you're trying to convey and respond more accurately.

In short, Semantic Analysis is about giving words their proper meanings and understanding the overall context or idea behind a sentence.

3. Identifying Intent (Natural Language Understanding)

When you type or speak something, the computer doesn't just understand the meaning of each word individually. It also tries to understand **what you're trying to achieve or ask** with your sentence.
For example, if you say:
"Tell me the benefits of exercise."
The computer understands clearly that:

- You're looking for **advantages or positive outcomes** (not disadvantages or risks).
- You're interested in **benefits of exercising**—not in how to exercise or reasons not to exercise.

So, **"Identifying intent"** means:

- Figuring out what you really mean (your intention or purpose).
- Understanding the context or overall idea of your statement beyond individual words.

In simple terms, it's like when someone listens carefully and realizes exactly what you're asking, even if you don't say it explicitly.

4. Generating a Response (Natural Language Generation)

What is "Generating Response" (Natural Language Generation)?

Once the computer understands what you asked or said, it needs to give a clear reply that makes sense.
Think of it like when you ask a friend a question, and they respond in their own words clearly and meaningfully. Similarly, the computer generates a sentence to reply based on the information it knows.

Simple Example:

Your statement:
"I like to exercise."

Computer's generated response (example):
"Exercise is great! It improves your health, makes you happier, and reduces
chances of illness."

Why is this important?

- It helps the computer communicate clearly with you
- It allows AI systems (like chatbots) to give you answers that sound natural and helpful.

In short, **Generating a Response** is when AI creates a meaningful, human-like answer that matches what you asked or said.

5. Delivering the Output

What is "Delivering the Response"?

After the computer understands your words and knows exactly what you mean, it must clearly explain its answer back to you.

Think of it like this:

- Imagine asking your friend a question.
- Your friend understands your question, thinks carefully, and then clearly explains the answer to you in simple, easy-to-understand language.

Example:

You say:
"Why should I exercise?"

Computer's clear reply:
"Exercising keeps you healthy, helps prevent sickness, and makes you feel good."

Why does this matter?

- It ensures the computer's answers make sense to you.
- It helps make interactions with AI feel natural, just like talking to a real person.

In short, **delivering the output clearly** means giving you an understandable, useful response rather than confusing you with complicated language or unclear information.

A Simple Analogy: The Librarian Example

Think of NLP as a conversation with a librarian:
i. You ask, "Can you suggest books about space?"
ii. The librarian listens, understands your question, and retrieves a list of relevant books.

NLP works in a similar way. Instead of books, it retrieves answers, generates ideas, or simplifies complex information, all in real time.

3.1.6.4 Real-Life Applications of NLP

NLP is everywhere in our daily lives, even if we don't realize it. Let's look at some common use cases:

1. Chatbots and Virtual Assistants

Tools like ChatGPT, Siri, and Alexa use NLP to process your questions and provide accurate, human-like responses. For instance:
i. You: "Set a reminder for my meeting tomorrow at 10 AM."
ii. Alexa: "Reminder set for 10 AM tomorrow."

2. Language Translation

Apps like Google Translate use NLP to convert text from one language to another, while preserving context and meaning.
i. Input: "The future belongs to those who prepare for it today."
ii. Output (in Spanish): "El futuro pertenece a aquellos que se preparan para ello hoy."

3. Sentiment Analysis

Businesses use NLP to analyze customer feedback and detect sentiment (positive, negative, or neutral).
Example: "I love this product! It's amazing." → Positive sentiment detected.

4. Creative Content Generation

NLP powers tools like ChatGPT to create stories, poems, or even marketing slogans.
i. Input: "Write a slogan for a sustainable clothing brand."
ii. Output: "Wear the change you want to see in the world."

5. Text Summarization

NLP helps summarize long articles or reports into concise summaries.
Example: Summarizing a 1,000-word article on renewable energy into 100 words.

5. Text Summarization

Google uses NLP to understand search queries and deliver relevant results.

i. Query: “Best restaurants near me.”
ii. NLP interprets your location and intent to show nearby restaurants.

How NLP Powers Image Creation

Yes, NLP also plays a critical role in image creation, particularly in collaboration with **Generative AI models** like DALL·E, Mid Journey, and Stable Diffusion. While creating images primarily involves **Computer Vision,** NLP helps process and understand the text-based prompts that guide the image creation.

How It Works

1. Understanding Textual Prompts NLP breaks down and analyzes user-provided text (e.g., "A sunset over a mountain range with clouds") to identify key elements like objects, settings, and styles.
2. Mapping Language to Visual Concepts The NLP engine translates words into structured data, which is then interpreted by an image-generation model to create visuals.
3. Generating the Image The processed data is fed into a Generative Adversarial Network (GAN) or a Diffusion Model to generate an image based on the description.

Example:

i. Input Prompt: "A futuristic city with flying cars at sunset, in cyberpunk style."
ii. Output: A visually detailed cyberpunk cityscape with flying cars and a vibrant sunset.

Applications of NLP in Image Creation

i. Creative Industries: Artists use text prompts to generate concept art.
ii. Marketing: Marketers create custom visuals for campaigns.
iii. Education: Teachers create illustrations or visuals for lesson plans.

3.2 Neural Networks: The Brains Behind Artificial Intelligence

Neural networks are at the heart of many artificial intelligence (AI) applications, enabling machines to perform tasks like recognizing faces, understanding speech, and even driving cars. To understand neural networks, think of them as computer systems inspired by the human brain, designed to process information in ways similar to how we think and learn. This article will explain neural networks in simple terms, breaking down their structure, how they work, and their real-world applications.

3.2.1 What Are Neural Networks?

Neural networks are a type of machine learning model that mimics how the human brain works. Just like our brains are made up of billions of neurons that send signals to each other, a neural network is made up of artificial "neurons" arranged in layers. These neurons work together to analyze data, identify patterns, and make decisions. For example, when you see a dog, your brain processes the image by recognizing features like the shape of its ears or the color of its fur. Similarly, a neural network processes data to understand what it represents.

3.2.2 Structure of a Neural Network

A neural network has three main parts:

1. Input Layer: This is where the data enters the network. For example, if the network is designed to identify pictures of cats, the input layer receives the image's pixel values.

2. Hidden Layers: These layers process the data. Each layer learns something new about the data, such as edges, shapes, and textures in an image. The more layers there are, the more complex patterns the network can learn.

3. Output Layer: This is where the final decision or prediction is made. For instance, it might decide whether the input image is of a cat or not.

Each neuron in one layer is connected to neurons in the next layer, and these onnections are assigned "weights" that determine how important one neuron's output is to another.

3.2.3 How Do Neural Networks Work?

Neural networks learn by example, just like humans do. Let's break this down into simple steps:

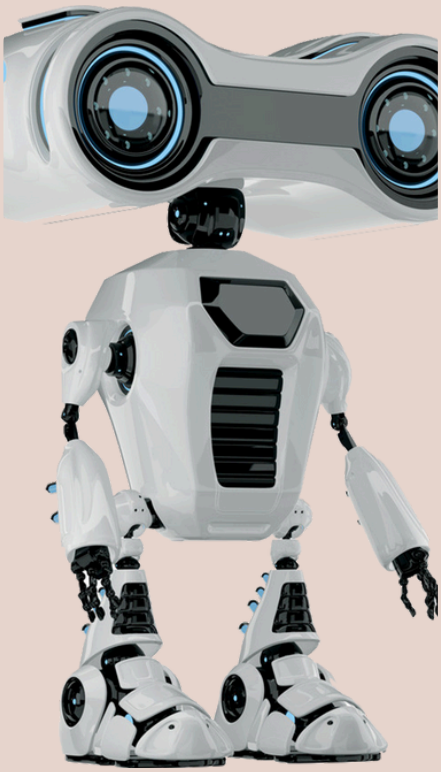
1. Training the Network: The network is fed a large amount of data, such as thousands of labelled pictures of cats and dogs. It learns by comparing its predictions with the actual labels and adjusting its internal settings to improve accuracy. This process is called supervised learning.

2. Forward Pass: When data enters the network, it flows through the neurons layer by layer. Each neuron processes the data and passes it along to the next layer. This is like a chain reaction, where each step refines the understanding of the input.

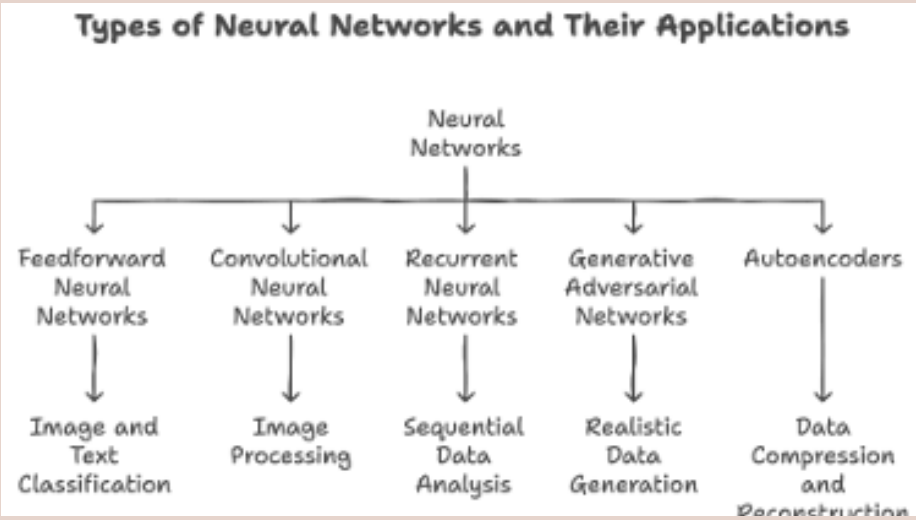
3. Backpropagation: If the network makes a wrong prediction, it uses an error-correcting process called backpropagation to adjust the weights of its connections. This helps the network learn from its mistakes and improve over time.

4. Iteration: The network repeats this process many times, gradually becoming better at recognizing patterns and making accurate predictions.

Imagine teaching a child to identify fruits. You show them pictures of apples and bananas, explaining which is which. At first, they might confuse an apple with a red ball. But as you correct them, they start noticing details like the apple's stem or the banana's curved shape. Over time, they get better at identifying fruits, even when they encounter new ones. Neural networks work in a similar way, learning rom mistakes and refining their knowledge.



3.2.4 Types of Neural Networks



There are different types of neural networks, each suited for specific tasks:

- **Feedforward Neural Networks (FNNs):** These are the simplest type of neural networks, where data flows in one direction—from the input layer to the output layer. They are commonly used for tasks like image and text classification.
- **Convolutional Neural Networks (CNNs):** Designed for image processing, CNNs detect patterns such as edges and textures in images. They are used in applications like facial recognition and object detection.
- **Recurrent Neural Networks (RNNs):** These networks are used for sequential data, such as time-series analysis and language processing. They have memory, allowing them to retain information about previous inputs.
- **Generative Adversarial Networks (GANs):** GANs consist of two networks—a generator and a discriminator. They work together to create realistic images, videos, and other data. GANs are used in creating art, generating deepfakes, and enhancing image quality.
- **Autoencoders**: These networks compress data into a smaller representation and then reconstruct it. They are useful for tasks like data compression, anomaly detection, and noise reduction.

3.2.5 Real-World Applications

Neural networks have transformed numerous industries. Here are some everyday examples:

1. Healthcare: Neural networks analyze medical images, like X-rays and MRIs, to detect diseases such as cancer. They are also used to predict patient outcomes and develop personalized treatment plans.
2. Finance: Banks use neural networks for fraud detection, credit scoring, and algorithmic trading, making financial systems more secure and efficient.
3. Transportation: Autonomous vehicles rely on neural networks to recognize traffic signs, detect pedestrians, and make driving decisions in real time.
4. Entertainment: Streaming platforms like Netflix and Spotify use neural networks to recommend shows, movies, and music based on user preferences.
5. Customer Service: Chatbots and virtual assistants, powered by neural networks, understand and respond to customer queries in natural language.
6. E-commerce: Neural networks optimize product recommendations, predict demand, and improve inventory management.

3.2.6 Advantages of Neural Networks

1. **Accuracy:** Neural networks achieve high accuracy in tasks like image recognition, speech processing, and language translation.
2. **Versatility:** They can handle diverse data types, including images, audio, and text, making them applicable across industries.
3. **Automation:** Neural networks learn from data automatically, eliminating the need for manual feature engineering.
4. **Scalability:** Neural networks can process massive amounts of data, making them suitable for big data applications.

3.2.6 Advantages of Neural Networks

1. **Data Requirements:** Neural networks need large amounts of labeled data for training, which can be expensive and time-consuming to obtain.
2. **Computational Costs:** Training neural networks requires significant computational power and specialized hardware, such as GPUs or TPUs.
3. **Interpretability:** Neural networks often function as "black boxes," making it difficult to understand how they arrive at their predictions.
4. **Overfitting:** Networks can sometimes memorize training data instead of generalizing, leading to poor performance on new data.

3.2.8 The Future of Neural Networks

The future of neural networks is exciting, with ongoing advancements in areas like transfer learning, federated learning, and neuromorphic computing. These innovations aim to make neural networks more efficient, interpretable, and accessible. As technology evolves, neural networks will continue to power breakthroughs in AI, shaping the way we live, work, and interact with the world.

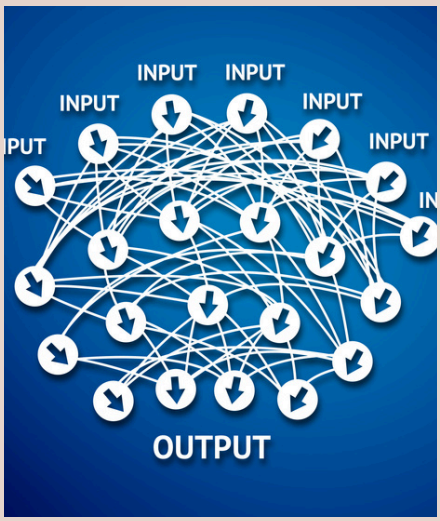
Neural networks are the driving force behind many modern AI applications. By mimicking the human brain's learning process, they enable machines to analyze data, identify patterns, and make intelligent decisions. Whether in healthcare, finance, or entertainment, neural networks are revolutionizing industries and improving lives.

3.3 Deep Learning

Deep learning, a subset of machine learning, represents a transformative leap in artificial intelligence (AI), enabling machines to process and analyze data in ways that mimic human cognition. At its core, deep learning relies on artificial neural networks with multiple layers—hence the term "deep"—to learn from vast amounts of structured and unstructured

data. These layers allow models to pg. 73 identify patterns, features, and relationships in data that were previously difficult to discern using traditional machine learning techniques.

What sets deep learning apart is its ability to perform feature extraction automatically. Instead of relying on human engineers to define features for analysis, deep learning models learn these features directly from raw data. This capability has unlocked breakthroughs in image recognition, natural language processing (NLP), and speech recognition. For instance, convolutional neural networks (CNNs) excel in analyzing visual data, enabling applications like facial recognition and medical imaging, while recurrent neural networks (RNNs) and transformers have revolutionized NLP, powering tools like language translators and chatbots.



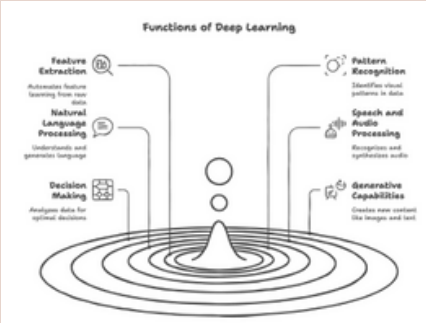
Deep learning's versatility extends across industries. In healthcare, it assists in diagnosing diseases through medical imaging and predicting patient outcomes. In finance, it enhances fraud detection and algorithmic trading. Autonomous vehicles depend on deep learning for real-time decision-making, such as object detection and path planning. Moreover, its creative potential shines through generative models like GANs, which create realistic images, and transformer models like GPT, which generate human-like text.

Despite its capabilities, deep learning is computationally intensive and requires large datasets, making it resource-demanding. However, ongoing advancements in hardware, such as GPUs and TPUs, and innovations in model optimization are addressing these limitations. As research continues to expand its horizons, deep learning remains at the forefront of AI, driving the development of intelligent systems that are transforming the way we live and work.

3.3.1 Functions of Deep Learning

Deep learning is a powerful subset of machine learning that performs a variety of functions by leveraging artificial neural networks with multiple layers.

These functions enable deep learning to analyze vast amounts of data, identify intricate patterns, and make decisions with minimal human intervention. Below are some key functions of deep learning:



- **Feature Extraction:** Deep learning automates feature extraction, allowing models to learn relevant features directly from raw data. This eliminates the need for manual feature engineering, making it particularly useful for complex datasets such as images, audio, and text.
- **Pattern Recognition:** One of the primary functions of deep learning is recognizing patterns in data. Models like convolutional neural networks (CNNs) excel at identifying visual patterns, enabling applications in image classification, facial recognition, and object detection.
- **Natural Language Processing (NLP):** Deep learning is integral to tasks involving language understanding and generation. Recurrent

neural networks (RNNs) and transformer models are used for functions like sentiment analysis, language translation, and text summarization.

- Speech and Audio Processing: Deep learning models process audio data to perform tasks such as speech recognition, voice synthesis, and sound classification, driving advancements in virtual assistants and real-time transcription tools.
- Decision Making: By analyzing complex relationships in data, deep learning aids in decision-making processes, such as predicting outcomes, pg. 75 optimizing resource allocation, and automating responses in real-time environments.
- Generative Capabilities: Deep learning enables generative tasks, such as creating new images, videos, or text. Models like Generative Adversarial Networks (GANs) and transformers power applications like image synthesis and creative content generation.

These functions make deep learning a cornerstone of modern artificial intelligence, driving innovation in fields such as healthcare, finance, autonomous systems, and creative industries. Its versatility and adaptability continue to expand its applications and potential.

3.3.2 How Deep Learning Works

Deep learning is a type of artificial intelligence (AI) that mimics how humans learn and make decisions. It relies on artificial neural networks, which are inspired by the way the human brain processes information. These networks are made up of layers of interconnected "neurons" that work together to analyze data and make predictions.

3.3.3 The Basics of Deep Learning

Imagine you're teaching a child to recognize whether an image is of a cat or a dog. The child doesn't know what makes a cat different from a dog, but you can show them lots of examples. Over time, they start picking up on features like the shape of the ears, the size of the body, and the type of fur.

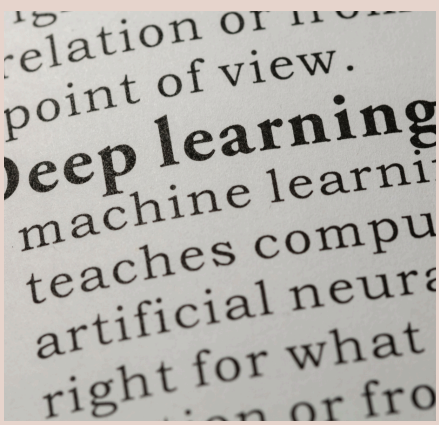
Deep learning works similarly. It starts with raw data (like images of cats and dogs) and processes it through several layers of its "neural network." Each layer learns something different:

- The input layer takes in the data. For example, in an image, it looks at pixels (tiny dots that make up the picture).
- The hidden layers process this information step by step. One layer might focus on basic features like edges, the next on shapes, and the next on complex patterns like the presence of whiskers or floppy ears.
- The output layer makes the final decision, like saying "cat" or "dog."

3.3.4 Learning Through Practice

Deep learning models don't just work perfectly on the first try. They learn through a process called training. In our example, you show the model lots of labeled images (e.g., a picture of a cat labeled "cat"). The model guesses what the image is, and if it's wrong, it adjusts itself to do better next time.

This adjustment happens through a process called backpropagation. Imagine the model saying, "Oops, I called a cat a dog. Let me tweak my understanding of ears and fur." It repeats this process many times until it gets very good at recognizing cats and dogs.



Let's take another relatable example: learning to make pancakes.

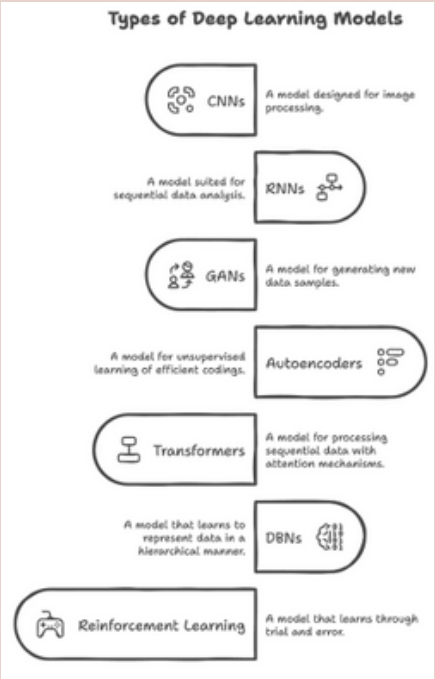
1. **Input Layer:** You start with raw ingredients—flour, eggs, milk, etc. The neural network (you, in this case) takes these inputs.
2. **Hidden Layers:** You go step by step—mixing ingredients, heating the pan, flipping the pancake. Each step improves your understanding of what works and what doesn't. If the pancake burns, you adjust (like backpropagation).
3. **Output Layer:** After several tries, you end up with a perfect pancake. The "neural network" has learned to make pancakes effectively.

Deep learning doesn't need humans to define rules like "Cats have pointy ears." Instead, it learns these rules itself by analyzing massive amounts of data. This makes it incredibly versatile and able to handle complex tasks like translating languages, driving cars, or detecting diseases from medical images.

In simple terms, deep learning works by breaking a problem into small pieces, learning from examples, and improving through practice. Just like how a child learns through experience or how you perfect a recipe, deep learning models refine their abilities by analyzing data repeatedly. This self-learning ability is what makes deep learning a cornerstone of modern AI, transforming industries and solving complex problems in ways humans alone could never achieve.

3.3.5 Types of Deep Learning Models

Deep learning, a subset of artificial intelligence, uses artificial neural networks to mimic the human brain's learning processes. These models are highly versatile and have been tailored to suit various applications through specialized architectures. Below are the key types of deep learning models, along with their unique characteristics and applications:



1. Convolutional Neural Networks (CNNs)

Purpose: Primarily used for image and video data analysis.

CNNs are designed to automatically and adaptively learn spatial hierarchies of features from images. They consist of convolutional layers that apply filters to detect patterns like edges, shapes, or textures. These features are then passed through pooling and fully connected layers to classify or analyze the image.

Applications: •

- Image recognition and classification (e.g., identifying objects in photos)
- Medical imaging (e.g., detecting tumors in X-rays).
- Facial recognition systems.
- Autonomous vehicle vision systems.

2. Recurrent Neural Networks (RNNs)

Purpose: Best suited for sequential data and time-series analysis.

RNNs are designed to process sequential information by retaining memory of previous inputs through feedback loops in their architecture. This makes them ideal for tasks where the order of data matters. Variants like Long Short-Term Memory (LSTM) and Gated Recurrent

Units (GRU) address issues like vanishing gradients, enabling better long-term memory retention.

Applications: •

- Natural Language Processing (NLP), such as text generation and sentiment analysis.
- Speech recognition and synthesis.
- Stock market prediction.
- Machine translation (e.g., English to French).

3. Generative Adversarial Networks (GANs)

Purpose: Generate new data that resembles the training data.

GANs consist of two neural networks: a generator and a discriminator. The generator creates new data samples, while the discriminator evaluates their authenticity. This adversarial setup enables the generator to produce increasingly realistic outputs over time.

Applications: •

- Generating realistic images, videos, and audio.
- Creating synthetic data for training AI models.
- Deepfake generation and detection.
- Enhancing image quality and resolution.

4. Autoencoders

Purpose: Data compression and feature extraction.

Autoencoders are unsupervised learning models designed to encode input data into a smaller, compressed representation and then reconstruct it. They are effective at identifying key features in data and removing noise.

Applications: •

- Dimensionality reduction for large datasets.
- Anomaly detection in cybersecurity and healthcare.
- Noise removal from images or audio.
- Generating synthetic data.

5. Transformers

Purpose: Specialized for NLP tasks but increasingly applied to other domains.

Transformers, such as BERT (Bidirectional Encoder Representations from Transformers) and GPT (Generative Pre-trained Transformer), process sequential data differently from RNNs. They use attention mechanisms to capture relationships between words in a text, regardless of their position.

Applications: •

- Text summarization and generation.
- Chatbots and conversational AI.
- Language translation.
- Sentiment and intent analysis.

6. Deep Belief Networks (DBNs)

Purpose: Layer-wise learning of features.

DBNs are composed of multiple layers of stochastic, latent variables. These models are trained sequentially, with each layer learning features from the outputs of the previous layer.

Applications: •

- Handwriting recognition.
- Dimensionality reduction.
- Pretraining deep networks for better accuracy.

7. Reinforcement Learning Models

Purpose: Decision-making in dynamic environments.

While not exclusively deep learning, reinforcement learning often incorporates deep neural networks to process complex environments. These models learn through trial and error, optimizing actions to maximize rewards.

Applications: •

- Game AI (e.g., AlphaGo, Dota 2 bots).
- Robotics and autonomous systems.
- Dynamic resource allocation.

Deep learning encompasses a wide range of model types, each tailored to specific tasks and data types. From CNNs revolutionizing computer vision to transformers redefining natural language processing, these architectures showcase the versatility and transformative power of deep learning. As research continues, we can expect further innovations that expand the boundaries of what deep learning can achieve.

3.3.6 Deep Learning: Advantages and Challenges

Advantages of Deep Learning

1. **Feature Extraction Automation:** Deep learning models automatically identify relevant features from raw data, eliminating the need for manual feature engineering. This makes it ideal for complex data like images, audio, and text.

2.High Accuracy: Deep learning achieves state-of-the-art accuracy in tasks such as image recognition, speech processing, and natural language understanding. Its ability to process large datasets leads to highly reliable predictions.

3.Versatility Across Domains: Deep learning powers a wide range of applications, from autonomous vehicles and medical diagnostics to language translation and creative tasks like generating art and music.

4.Scalability: With advancements in hardware like GPUs and TPUs, deep learning models can handle enormous datasets, making them suitable for real-time applications and big data analytics.

5.Continuous Learning: These models improve as more data becomes available, adapting to evolving patterns and trends.

Challenges of Deep Learning

1. **Data Dependency:** Deep learning requires large amounts of labeled data for training, which can be expensive and time-consuming to obtain.
2. **Computational Intensity:** Training and deploying deep learning models demand significant computational resources, which may be inaccessible to smaller organizations.
3. **Lack of Interpretability:** Many deep learning models function as "black boxes," making it difficult to understand or explain their decision-making processes.
4. **Overfitting Risks:** Models can sometimes memorize training data instead of generalizing, leading to poor performance on new data.
5. **Ethical Concerns:** Bias in training data can lead to unfair outcomes, while misuse of technology (e.g., deepfakes) raises ethical questions.

Deep learning's potential is immense, but addressing these challenges is critical for its ethical and effective deployment.

3.3 Comparisons between Neural Networks, Machine Learning, and Deep Learning:

Feature	Neural Networks	Machine Learning	Deep Learning
Definition	A subset of machine learning inspired by the	A broad field of AI that enables machines to	A subset of neural networks with multiple
Feature	structure of the human brain, consisting of layers of artificial neurons.	learn patterns from data and make predictions or decisions.	layers (deep architectures) for feature learning and complex pattern recognition.
Complexity	Focuses on interconnected layers of neurons; relatively more complex than traditional ML models.	Includes simpler algorithms like linear regression, decision trees, and support vector machines.	Uses deep neural networks with many layers, requiring more computation and resources.
Data Dependency	Requires large datasets to achieve optimal performance.	Can work effectively with smaller datasets depending on the algorithm used.	Requires massive amounts of data for training to prevent overfitting and achieve high accuracy.
Feature Engineering	Learns features automatically through hidden layers.	Relies on manual feature extraction and selection.	Automates feature extraction, reducing the need for domain specific expertise.

Feature	Neural Networks	Machine Learning	Deep Learning
Processing Type	Processes structured or unstructured data using	Processes structured data with pre-defined rules or	Excels at handling unstructured
	hierarchical feature learning.	engineered features.	data like images, audio, and text.
Key Algorithms	Feedforward Neural Networks (FNNs), Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), GANs.	Linear Regression, Decision Trees, Random Forests, K-Means, SVMs, etc.	Deep CNNs, RNNs, Transformers, GANs, and other multi-layer neural network architectures.
Applications	Image recognition, natural language processing, speech synthesis, generative models.	Predictive analytics, fraud detection, recommendation systems, clustering.	Advanced applications like autonomous vehicles, medical diagnosis, chatbots, and deepfakes.
Training Time	Moderate to high, depending on the architecture.	Generally lower training time due to simpler models.	High, due to complex architectures and large datasets.
Hardware Requirements	Requires GPUs or TPUs for training large networks.	Can often run on standard CPUs for most algorithms.	Strongly dependent on GPUs or TPUs due to high computational needs.

Feature	Neural Networks	Machine Learning	Deep Learning
Interpretability	Can be difficult to interpret	Easier to interpret, especially with	Even less interpretable due to deeper and
	(functions as a "black box").	simpler algorithms.	more complex architectures.
Focus Area	Focuses on learning hierarchical representations of data.	Focuses on algorithms that enable machines to learn patterns.	Focuses on learning intricate patterns in data using multiple layers of abstraction.
Best Suited For	Tasks involving complex relationships and large-scale data.	Tasks requiring structured data and simpler decision-making processes	Applications needing state-of the-art accuracy and high scalability.

3.5 Deepfake Technology

Deepfake technology, a product of advancements in artificial intelligence (AI) and deep learning, refers to the creation of highly realistic but synthetic content, such as videos, images, or audio. The term "deepfake" combines "deep learning" and "fake," signifying the use of AI algorithms to generate deceptive media that mimics real people or events. While it offers exciting possibilities for innovation, it also raises significant ethical, legal, and societal concerns.

Deepfake technology uses artificial intelligence (AI) to create fake but highly realistic videos, images, or audio. It works by analyzing and mimicking a person's face, voice, or actions using advanced algorithms.

Imagine someone making a video where a famous celebrity appears to be saying or doing something they never actually did. For instance, you might see a video of a political leader delivering a speech they never gave, or hear a voice recording of someone agreeing to something they never said.

A simple real-life example is apps that let you swap your face with a celebrity's in a video clip. While it can be fun for entertainment, this same technology can be misused to spread false information, harm reputations, or commit fraud, like imitating a CEO's voice to authorize money transfers.

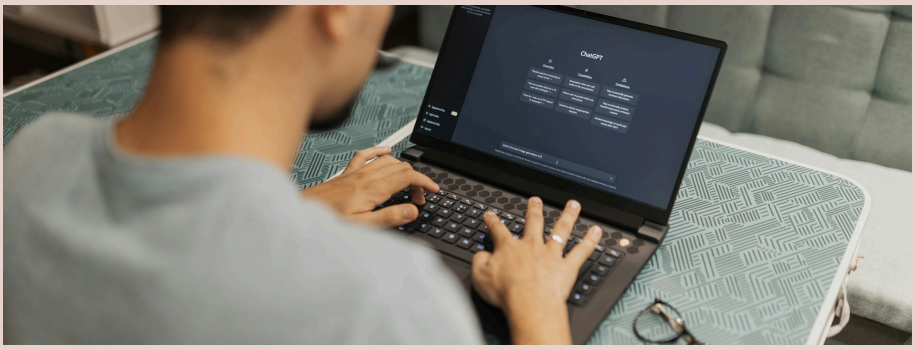
Deepfake technology is both fascinating and concerning, making it important to verify what we see or hear online.

3.5.1 How Deepfakes Work

Deepfake technology primarily relies on **Generative Adversarial Networks (GANs),** a type of neural network architecture. GANs consist of two components:

1. **The Generator:** This creates fake content by learning patterns and features from real data, such as facial expressions or voice modulations.
2. **The Discriminator:** This evaluates the generator's output, identifying whether the content is real or fake.

The two networks compete, and through this adversarial process, the generator improves, producing increasingly convincing outputs. For instance, a deepfake video may combine the facial expressions of one person with the voice of another to create a lifelike yet fabricated representation.



3.5.2 Applications of Deepfake Technology

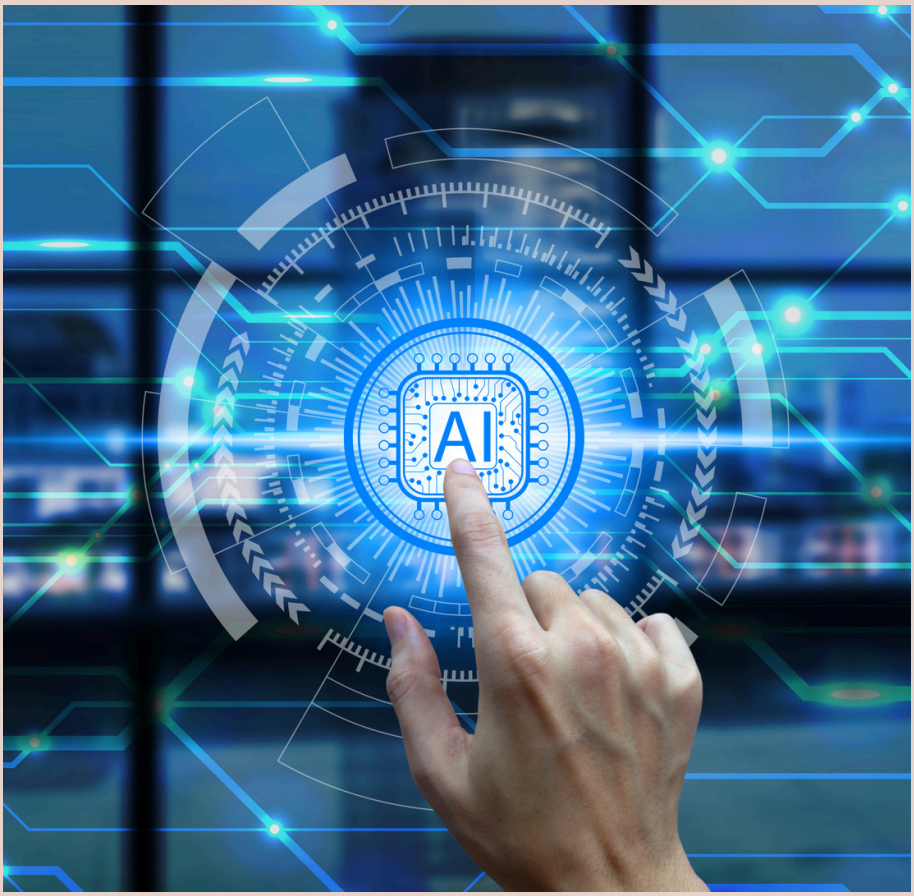
1. **Entertainment:** Deepfakes are transforming filmmaking by enabling actors to appear younger, replacing actors in scenes, or creating digital doubles. They are also used in video games to create lifelike characters.
2. **Education and Training**: Deepfake simulations can create realistic scenarios for training purposes, such as medical procedures or emergency response drills.
3. **Marketing and Advertising:** Companies can use deepfakes to create personalized advertisements or interactive content tailored to specific audiences.
4. **Art and Creativity:** Artists and designers use deepfake technology to create new forms of digital art or to recreate the likeness of historical figures.
5. **Accessibility:** Deepfake voice technology can help people with disabilities, such as generating lifelike voices for those who cannot speak.

3.5.3 Challenges and Risks

Despite its potential, deepfake technology poses significant risks:

1. **Misinformation and Disinformation:** Deepfakes can be weaponized to spread false information, such as fake news or political propaganda, undermining trust in legitimate sources.
2. **Privacy Violations:** Creating unauthorized deepfake content, such as fake videos or images, infringes on individuals' privacy and can lead to reputational damage.
3. **Cybersecurity Threats:** Deepfake technology can be used for fraud, such as mimicking a CEO's voice to authorize unauthorized transactions.
4. **Erosion of Trust:** The ability to fabricate realistic content raises doubts about the authenticity of all digital media, leading to societal mistrust.

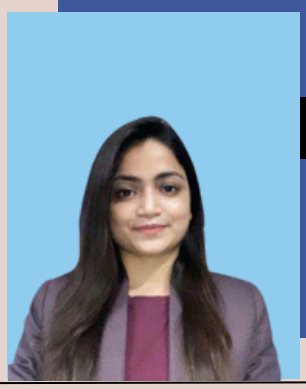
3.5.3 Combating Deepfake Misuse



Efforts to address the risks of deepfakes include:

- **Detection Tools:** AI-powered detection systems analyze inconsistencies in audio, video, or image data to identify deepfakes.
- **Legislation:** Governments are enacting laws to regulate the creation and distribution of malicious deepfake content.
- **Awareness Campaigns**: Educating the public about deepfake technology helps individuals critically evaluate digital content.

Deepfake technology is a double-edged sword, offering innovative applications while posing significant ethical and security challenges. As it continues to evolve, balancing its benefits with the need for safeguards will be crucial to harnessing its potential responsibly.



Inderjeet Kaur Bamrah

CA, CS, Ai Experts

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ISO 9001:2008 Company

Rajesh Kumar Dwivedi
Director (Finance)

एक कदम स्वच्छता की ओर

Heavy Engineering Corporation Ltd.
(A Govt. of India Enterprise)
P.O.- Dhurwa, Ranchi - 834 004 Jharkhand (India)
Phone : 0651-2401372, 2400575 (O)
Fax : 0651-2400574 (O)
Mob. : 9650572233
E-mail : dir_fin@hecltd.com

MESSAGE

Dear Shri Sandeep Kumar,

I take this opportunity to heartily congratulate you on publishing "The Worldonomics Times", which I really feel is a hands-on treasure of useful information.

Today's world is rapidly changing and inter-woven with diverse complexities. In such a global environment, authentic and timely information is a powerful tool which I am sure will be always provided by "The worldonomics Times". I am sure, the adage that "*The Pen is mightier than the Sword*" will be once again be proven right with your magazine.

Congratulations, once again and my Best wishes for this wonderful knowledge endeavour!

(CMA Rajesh Kumar Dwivedi)

हाउसिंग एंड अर्बन डेवलपमेंट कॉर्पोरेशन लिमिटेड
(भारत सरकार का उपक्रम)
Housing & Urban Development Corporation Limited
(A Government of India Enterprise)

एम नागराज
निदेशक (कॉरपोरेट प्लानिंग)
M. NAGARAJ
Director (Corporate Planning)

MESSAGE

Dear Shri Sandeep Kumar,

I extend my warmest congratulations to you on the impending launch of Global Finance and Economics Magazine: The Worldonomics Times on May 5th! This milestone marks the beginning of what promises to be an exciting journey in the realm of global finance and economics journalism.

As our world becomes increasingly interconnected, the need for a comprehensive and insightful resource in the field of finance and economics has never been greater. Your magazine's dedication to providing a platform for experts to share their insights is commendable and much needed in today's complex economic landscape.

I have no doubt that The Worldonomics Times will quickly establish itself as a key resource for policymakers, industry professionals, academics, and anyone with a keen interest in understanding the intricacies of global finance and economics. Your commitment to delivering high-quality, well-researched content will undoubtedly set a new standard in the industry.

I eagerly anticipate the inaugural issue and look forward to the valuable contributions and perspectives that The Worldonomics Times will bring to the forefront of economic discourse.

Once again, congratulations on this significant achievement, and I wish you all the best for a successful launch and a prosperous future ahead.

(CMA - M. NAGARAJ)

Blessing Support

CMA Hrishikesh Kumar
Executive Director(Finance)
NBCC (India) Limited

Dear Shri Sandeep Kumar, At the outset I would like to congratulate you for taking the initiative for publishing this magazine “The Worldonomics Times”. In this era of rapid changing economic environment vis-à-vis the pressure on business to sustain, the importance of seamless transfer of information and knowledge cannot be underestimated which I hope would be fulfilled by your magazine in future.I must say this is a great initiative by you and your team in this regard. All the best for your endeavor

CMA Sanjay Jindal
Director Finance, Engineers India Limite

Dear Mr. Sandeep Kumar, With the launch of The Worldonomics Times, professionals worldwide are poised to embark on a journey of enlightenment and empowerment. In today's fast-paced economic landscape, the need for up-to-date insights and innovative strategies is more crucial than ever. As Director (Finance), I recognize the significance of continuous learning and informed decision-making. This magazine promises to be a comprehensive resource, offering valuable insights and actionable strategies to navigate the challenges and opportunities ahead. The Worldonomics Times is not just a publication; it's a beacon of innovation in economic discourse. Through cutting-edge analysis, thought-provoking articles, and expert commentary, it will serve as a trusted companion for professionals across various sectors. Leveraging the latest technologies, the magazine ensures accessibility and engagement for all readers, regardless of background or expertise. Beyond economics, The Worldonomics Times will explore intersections of finance with technology, sustainability, and social responsibility. By fostering dialogue and collaboration across diverse fields, it will inspire innovative solutions to global challenges. I am proud to be associated with this initiative, and I extend my deepest gratitude to the editorial team, contributors, partners, and supporters who have worked tirelessly to bring this vision to life. I offer my sincerest blessings to all those who will embark on this journey of enlightenment and empowerment, fueling innovation and success in the ever-evolving world of economics. Impressive Initiative! Best Wishes to you and your team for resounding success on this fantastic effort.

Blessing Support

CMA Gaurang Dixit
Former Chairman-cum-Managing Director NSIC - National Small Industries Corporation

Dear Shri Sandeep Kumar, At the onset, I applaud the initiative of the 'International Navodaya Chamber of Commerce' to come out with a magazine 'The Worldonomics Times', which will provide the relevant information and knowledge to the all in this diverse global market. In the present complex business / economic scenario, the whole world market is like a field open for all players to play thereon. This global market is having abundant opportunities and to become a successful entrepreneur in such complex economic environment, the need for having relevant information and knowledge is of paramount significance. Your endeavour to come out with the magazine 'The Worldonomics Times' will certainly help to suffice this requirement. I must congratulate to you and your team for this endeavour. With best wishes.

CMA Yogendra Prasad Shukla
Director Finance HOCL - Hindustan Organic Chemicals Limited

Dear CMA Sandeep Kumar Ji, I extend my heartfelt congratulations on the launch of "The Worldonomics Times." Your dedication to providing a platform for insightful economic knowledge is truly commendable. In today's-paced economic, the significance of facilitating the smooth flow of information and wisdom cannot be overstated, and I am confident that your magazine will excel in meeting this crucial need. Your initiative, alongside your team, is truly praiseworthy, and I foresee great success for "The Worldonomics Times" in the days ahead. Your commitment to empowering minds through economic understanding is inspiring. Best regards

CMA Vijay Kumar Agarwal
GM (Finance) ONGC Videsh

Dear Shri Sandeep Ji, It's my great pleasure to note "The Worldonomics Times" monthly magazine launching by "International Navodaya Chamber of Commerce (INCOC). The various Global Perspectives with relevant data have been covered which are relevant from our local perspective. The contents of magazine in coming days will be way forward in knowledge enhancement as well as for better understanding in correlating the global economics with local need. Congratulations CMA Sandeep ji & Team for such an initiative which will surely provide the tailored world economic information.

Shri BK Sabharwal
Chairman, Capital and Commodity Market Committee, PHDCCI Ex-President CPAI, Ex-chairman FISE, Ex-Director, Delhi Stock Exchange

Dear Sandeep Kumar, Congratulations on the launch of The Worldonomics Times! Your dedication to global finance journalism is commendable. This milestone marks the beginning of an insightful journey. In our interconnected world, timely updates on regulatory changes are vital, and your magazine promises to fulfill this need. Dedicated to providing expert insights and periodic updates, it aims to become a key resource for policymakers, industry professionals, and academics. Your leadership in this initiative is inspiring. Here's to a successful launch and a prosperous future ahead. Best regards

Shri Jyoti Prakash Gadia
Managing Director Resurgent India Limited

Dear Sandeep Ji Congratulations on the launch of The Worldonomics Times! This new publication promises to be a vital resource in financial journalism and stands to reshape our grasp of global financial landscapes. The Worldonomics Times will undoubtedly be an indispensable source for thorough analyses, covering the nuanced intersections of global economics and market dynamics. Your magazine is uniquely positioned to serve the needs of business leaders, policymakers, and those with a keen interest in the complexities of global finance. We eagerly await the fresh perspectives and insights that The Worldonomics Times will bring to the complex world of global finance. Best wishes for your journey ahead!

CMA Yash Paul Bhola
Ex-Director (Finance), NFL. President (Hon.) INCOC

Dear INCOC Team Members, I congratulate and appreciate the efforts by one and all in bringing out Global Finance and Economics Magazine, "The Worldonomics Times". This milestone marks the beginning of an exciting journey in the realm of global finance and economics journalism. As our world becomes increasingly interconnected, and regulatory framework is fast getting changed and updated, the need for a comprehensive magazine in finance field cannot be over emphasised. This magazine is dedicated to providing a platform for periodical up-dation of the developments across the globe and experts to share their insights. It is intended to establish itself as a key resource for policymakers, industry professionals, academics, and anyone with a keen interest in understanding global finance and economics. Once again, I congratulate and wish you all the best for a successful launch of the magazine and a prosperous future ahead.

CMA Ramesh Kumar
Chief General Manager POWERGRID
Corporation of India Ltd.

Dear Shri Sandeep Kumar, With great pleasure we extend our good wishes on the launch of The Worldonomics Times. This publication is poised to become a cornerstone in the landscape of global finance and economics, offering deep insights and valuable perspectives. Your commitment to excellence in disseminating knowledge is not only commendable but vital in these complex economic times. We eagerly anticipate the success and influence your magazine will undoubtedly achieve. Warm regards

CMA R C Gupta
EX Executive Director (Finance & Accounts)
GAIL (India) Ltd.

Dear Shri Sandeep Ji, I have gone through the May 2024 issue of The Worldonomics Times and found it very informative. My heartfelt congratulations on the launch of a world class magazine in the area of Cost Management, Financial Management, Financial Planning, Taxation and World Economic Affairs. The coverage in the magazine is very wide & excellent and is based on the theme of Global Perspective with Local Relevance, in-depth data driven journalism and accessibility of the magazine in print as well as digital formats. It will empower the readers with well researched articles for ready reference, decision making & knowledge enhancement. I wish all the best to you and your team of International Navodaya Chamber of Commerce (INCOC) for bringing the magazine on regular basis with full of information of world economic affairs for use by all professionals. With Best regards,

INCOC

Head Office
Alankrit Society A 31, Plot A1,
Vishwas Nagar Delhi 110032

Tel: +91 11 69268366

Email Us
We'll respond to your inquiry as soon as possible.
info@incoc.in

Website
www.incoc.in

National President
CMA Sandeep Kumar
ceo@incoc.in

National Vice President
CA Sangam Aggarwal
sangam@incoc.in

Connect With Us
Ms Neha Sharma
support@incoc.in

International Navodaya Chamber of Commerce (INCOC)

Welcome to the International Navodaya Chamber of Commerce (INCOC), a dedicated catalyst for positive change, empowerment, and community development. We are committed to enhancing brand value, nurturing essential skills, and facilitating societal growth through a collaborative and community-centric approach.

Our Mission

At INCOC, our mission is to harness the collective potential of individuals and businesses to create a lasting impact. We believe in the power of collaboration, empowerment through knowledge, and a community-centric approach to address local needs and promote inclusivity. Our initiatives are designed to inspire actionable impact, foster continuous learning and adaptation, and contribute to building a brighter future.

How We Operate

- **Collaborative Synergy:** We thrive on collaboration, bringing together diverse minds, expertise, and resources to foster an environment where ideas flourish and innovation thrives.
- **Empowerment through Knowledge:** Knowledge is the cornerstone of growth. At INCOC, we provide access to valuable insights, expert advice, and resources that empower individuals and businesses to make informed decisions and drive positive change.
- **Community-Centric Approach:** Communities are at the heart of change. Our initiatives are designed to address local needs, promote inclusivity, and create a sense of belonging, tailoring our efforts to have a meaningful impact where it's needed most.
- **Actionable Impact:** Our programs inspire action and create tangible results, from skill development workshops to societal initiatives that drive positive change, focusing on making a real difference.
- **Continuous Learning and Adaptation:** We embrace continuous learning and adaptation to stay relevant in a rapidly changing landscape, ensuring that our strategies remain effective and aligned with the needs of the times.