



# Artificial Intelligence (AI)

- a. How AI can be helpful in Audit.
- b. AI policy of India as outlined by NITI Aayog and major points therein.

Group II

YOGESH PANDLA  
NEERAJ  
RAJIV RAJ  
DILEEP KUMAR  
WASEEM AKRAM

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# National Strategy for Artificial Intelligence



Niti Aayog

नीति आयोग

National Institution for Transforming India

NITI Aayog – Government's think tank

- Fostering cooperative, competitive federalism – design strategic and long term policies
- Evaluation and monitoring, creating a knowledge, innovation and entrepreneurial support system

Discussion paper –

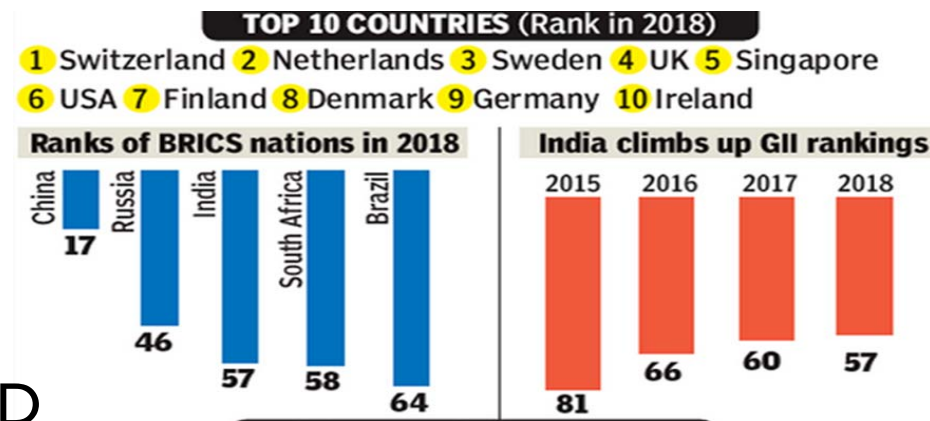
- #AIforAll – Disruptive and transformative technology to ensure social and inclusive growth
- Address the challenges of access, affordability, shortage & inconsistency of skilled expertise
- Maximize the late movers' advantage – garage for the world



# Global and Indian Scenario

- Strategy and policy document
- STEM graduates – advance degree
- Private sector
- Inter disciplinary institutes
- H-Index
- Research publications

## Global Innovation Index



## Investment in R&D

| Rank | Country     | Expenditure (Billion \$) | % of GDP | Expenditure per capita (in \$) |
|------|-------------|--------------------------|----------|--------------------------------|
| 1    | USA         | 511.1                    | 2.74     | 1586                           |
| 2    | China       | 451.9                    | 2.11     | 322                            |
| 3    | Japan       | 165.7                    | 3.15     | 1297                           |
| 4    | Germany     | 118.8                    | 2.94     | 1450                           |
| 5    | South Korea | 91.6                     | 4.29     | 1518                           |
| 6    | India       | 66.5                     | 0.85     | 39                             |

# Focus Areas

## ❖ Criteria

- **Healthcare** - increase access and affordability of quality healthcare.
- **Agriculture** - enhance farmers' income and reduce wastage.
- **Education** - improve access to quality education.
- **Smart Cities and Infrastructure** - provide efficient connectivity to the urban population.
- **Smart Mobility and Transportation** - help create smarter & Eco-friendly transportation system.



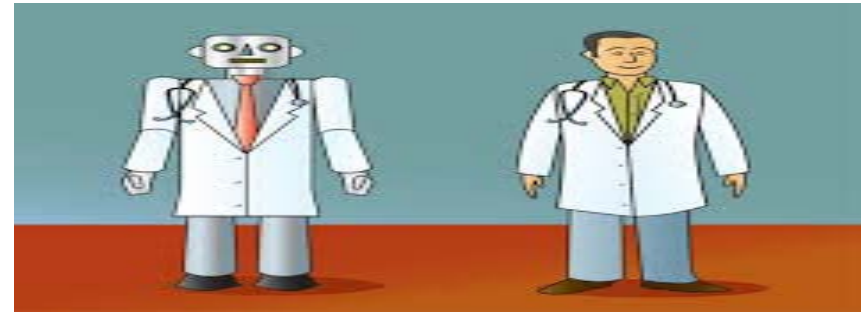
## ❖ Other Possible Areas:-

Environment protection and pollution control, Climate Change prediction.  
India Railways.



# Government initiatives & developments in India

- Prime facilitator, an active promoter and wherever required, off an owner
- CBSE
- Kumbh Mela Experiment
- Budget allocation for DI
- AI (MoC)
- Atal Tinkering Lab



- ✓ Global Hackathon On AI
- ✓ IBM-Indian States (Karnataka, Telangana and Andhra Pradesh) To Train 2 Lakh Women( Women empowerment) For STEM -Related
- ✓ Medical Imaging AI in India (I4F)
- ✓ AI start ups
- ✓ 5 Research Parks Across the country
- ✓ DIKSHA Portal





## Challenges

- lack of broad based expertise in research and application of AI
- absence of access to intelligent data / enabling data ecosystem
- privacy and security issues
- high resource cost and low awareness for adoption of the technology
- absence of collaborative approach to adoption and application of AI.

## Ways Forward - two-tiered structure

- Core – focus on developing better understanding of existing core research and pushing technology frontiers through creation of new knowledge
- ICTAI - develop and deploy application-based research. Private sector collaboration is envisioned to be a key aspect of ICTAIs

## Recommendations

- multi-stakeholder marketplace
- large foundational annotated data sets
- partnership and collaborative approach

# Shortcomings of AI in recent times

- Google Photos auto-tag feature goes bizarre
- IBM Watson comes up short in healthcare
- Uber self-driving car kills a pedestrian
- Alexa brings the party with her in Germany
- Facebook chat bots shut down after developing their own language



# RETHINKING THE AUDIT BY JON RAPHEL

- Artificial Intelligence
- Workflow Automation
- Analytics and Visualisation
- Mobile
- Block chain





## Comparative Analysis B/W AI-Enabled Audit v/s Traditional Audit

| Phase                                                        | AI Enabled Automated Audit Process                                                                                                                                                                                                                                                                                                                          | Traditional Audit Process                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pre-Planning                                                 | <ul style="list-style-type: none"> <li>•AI collects and analyzes Big Data (exogenous)</li> <li>• Data related to the client's organizational structure, operational methods, and accounting and financial systems feed into AI system</li> </ul>                                                                                                            | <ul style="list-style-type: none"> <li>•Auditor examines client's industry</li> <li>•Auditor examines client's organizational structure, operational methods, and accounting and financial systems</li> </ul>                                                                                                                  |
| Contracting                                                  | <ul style="list-style-type: none"> <li>•AI uses the estimate of the risk level (from Phase I) and calculates audit fees and the number of hours</li> <li>•AI analyzes a database of contracts and prepares the contract</li> <li>•Auditor and client sign contract</li> </ul>                                                                               | <ul style="list-style-type: none"> <li>•Engagement letter prepared by the auditor based on the estimated client risk</li> <li>• Auditor and client sign contract</li> </ul>                                                                                                                                                    |
| Understanding Internal Controls and Identifying Risk Factors | <ul style="list-style-type: none"> <li>•Feed flowcharts, questionnaire answers, and narratives into the AI system and use image recognition and text mining to analyze them</li> <li>• Use visualization and pattern recognition to identify risk factors</li> <li>•AI aggregates all these data to identify fraud and illegal-acts risk factors</li> </ul> | <ul style="list-style-type: none"> <li>•Document understanding (flowcharts, questionnaires, narratives, walkthrough)</li> <li>•Auditor aggregates this information and uses their judgment to identify risks factors</li> <li>• Understanding of IC to determine the scope, nature, and timing of substantive tests</li> </ul> |
| Control Risk Assessment                                      | <ul style="list-style-type: none"> <li>•Continuous control monitoring systems examine controls continuously</li> <li>• AI runs process mining to verify proper IC implementation</li> <li>• Logs are automatically generated to ensure their integrity</li> </ul>                                                                                           | <ul style="list-style-type: none"> <li>•Examination of the client's IC policies and procedures</li> <li>•Risk assessment for each attribute</li> <li>• Test of controls</li> <li>• Risk reassessment</li> <li>• Document testing of controls</li> </ul>                                                                        |

## Comparative Analysis B/W AI-Enabled Audit v/s Traditional Audit

| Phase                  | AI Enabled Automated Audit Process                                                                                                                                                                                                                                                                                                                                                                                                                | Traditional Audit Process                                                                                                                                                                                                                                                                                                       |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Substantive Tests      | <ul style="list-style-type: none"> <li>• <b>Continuous Data Quality Assurance</b> ensures quality of data and evidence</li> <li>• <b>AI examines data provenance</b></li> <li>• <b>Continuous test of details of transactions on 100% of the population</b></li> <li>• <b>Continuous test of details of balances (at all times)</b></li> <li>• <b>Continuous pattern recognition, outlier detection, benchmarks, and visualization</b></li> </ul> | <ul style="list-style-type: none"> <li>• <b>Periodical sampling-based tests, and nature, extent, and timing depend on IC tests</b></li> <li>• <b>Tests of details of a sample of transactions</b></li> <li>• <b>Test of details of balances (at a certain point in time)</b></li> <li>• <b>Analytical procedures</b></li> </ul> |
| Evaluation of Evidence | <ul style="list-style-type: none"> <li>• This becomes part of the previous phase</li> </ul>                                                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>• Auditor must evaluate the sufficiency, clarity, and acceptability of collected evidence. Accordingly, auditor may either collect more evidence, or withdraw from engagement</li> </ul>                                                                                                 |
| Audit Report           | <ul style="list-style-type: none"> <li>• AI uses a predictive model to estimate the various risks identified</li> <li>• Audit report can be continuous (graded I–00 for example) rather than categorical (clean, qualified, adverse, etc.)</li> </ul>                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>• Auditor aggregates previous information to issue a report</li> <li>• Report is categorical: clean, qualified, adverse, etc.</li> </ul>                                                                                                                                                 |

## Few Examples Of AI-Enabled Audit

- Deloitte collaborated with KIRA system which is a cognitive technology that quickly read thousands of complex documents, extracting and structuring textual information for better analysis.
- KPMG working with IBM which developed first automated AI platform named WATSON that analyzes bank credit files for commercial mortgage loan portfolio.
- Naoto Ichihara from Japan who is an assurance partner for EY company. He innovated a tool named Helix GLAD(Helix GL Anomaly Detector) to detect fraud and sense anomalous entries in large database.
- Punjab National Bank (PNB) has announced its plan to implement AI in account reconciliation as well as using analytics to improve its audit systems. This nimble change comes after the fraud carried out by the pair of Nirav Modi and Mehul Choksi in February 2018, which almost paralysed the bank's operation for a short time.
- All EU companies will have to report Digitally by 2020.

**Thank you**